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A CROSS-SECTIONAL STUDY ON INDIVIDUAL AND COMMUNITY RELATED FACTORS CONTRIBUTING TO INCREASED CASES OF URINARY TRACT INFECTIONS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINIC AT LUWERO GENERAL HOSPITAL, LUWERO DISTRICT.

Josephine Nansubuga, Cliffe Atukuuma
Kampala School of Health Sciences

Abstract

Background

A urinary tract infection (UTI) is an inflammation caused by the presence and growth of microorganisms in any part of the urinary tract**.** This study determined the individual and community-related factors contributing to increased cases of urinary tract infections among pregnant women attending the antenatal clinic at Luwero General Hospital, Luwero district.

Methodology

The study basically employed a cross-sectional study design on a sample of 50 respondents. A simple random technique was used as a sampling technique with a semi-structured questionnaire written in English as a data collection tool. Data was later analyzed manually and presented in tables and figures with narratives for easy interpretation.

Results

(52%) were within the age bracket of 28-32 years, (68%) had attained a secondary level of education. The majority of the respondents (78%) were aware of UTIs before the diagnosis, (50%) knew poor hygiene as a risk factor that predisposes to UTIs, (52%) knew their undergarments contained non-cotton materials, and (48%) knew good hygiene as a preventive measure of UTIs. From community related factors showed that; most of the respondents (52%) where from villages, (50%) their husbands had attained secondary level of education, (98%) had one sexual partner, (72%) their mode of defecation was private, (38%) shared toilets at home with more than five households and (56%) where from nuclear families

Conclusion

Generally, the study discovered that the quality of undergarments mothers used, irregular washing of genitals after sex, materials used during douching, husband's low levels of education, and sharing toilets with many households.

Recommendation

Luwero general hospital should intensively continue to sensitize pregnant women on urinary tract infection as well as reproductive tract infection prevention strategies, and personal hygiene practices should also be encouraged as a way of reducing bacterial urinary tract infections in pregnant women.

Keywords: *Urinary Tract infections, community related factors, pregnant women, Luwero general hospital.*
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Corresponding Author: *Josephine Nansubuga*
Email: *nansubugajosephine00@gmail.com*
Kampala School of Health Sciences

Background

A urinary tract infection (UTI) is an inflammation caused by the presence and growth of microorganisms anywhere in the urinary tract. This could be the lower UTI (urethritis, cystitis) and or upper UTI (pyelonephritis). The global prevalence of UTI in pregnant women was 23.9% in 2022. About 50% of women experience UTI at least once in their lifetime. During pregnancy, UTI is one of the most common infections, with a reported prevalence of 20% among pregnant women. The prevalence of this infection is higher in developing countries than in developed countries (Salari et.al., 2023).

In Africa, the country wise overall prevalence of UTI among pregnant women showed that in South Africa was (47.8%), Nigeria (35.4%), Nepal (30.5%), Yemen (30.5%), India (23.6%), Cameroon (23.5%), Ethiopia (20.5%), Tanzania (17%), Brazil (15.6%), Sudan (14%), Uganda (13.1%), Iran (8.9%), Ghana (6.2%), Pakistan (4.3%), Sri Lanka (3.6%), Iran (3.3%) and Saudi Arabia (1.7%) (Melaku et.al., 2020).

The prevalence of UTI in Bangladesh among pregnant mothers was 8.9% (4.4% symptomatic UTI, 4.5% asymptomatic bacteriuria). The predominant uropathogens were E. coli (38% of isolates), Klebsiella (12%), and staphyloccocal species (23%). Group B streptococcus accounted for 5.3% of uropathogens. Rates of antibiotic resistance were high, with only two-thirds of E. coli susceptible to 3rd. Generation cephalosporin (Anne et.al., 2020). Subgroup analysis from Ethiopia revealed that more than one-fifth of pregnant women were diagnosed with UTI in the SNNP region, with a prevalence of 22.2%. The lowest overall prevalence of UTI among pregnant women was recorded in Amhara regional state of Ethiopia, which was 11.6% while in Tigray, 16.3% and in AA 09% of pregnant women were diagnosed with UTI (Temesgen et.al., 2021). A meta-analysis of a national pooled prevalence of urinary tract infection in Uganda among pregnant women was 24.92% with the predominant isolates of Staphylococcus aureus, Escherichia coli, and Klebsiella pneumonia, Gram-negative bacteria uropathogens (Danlad

et.al., 2023). This study determined the individual and community-related factors contributing to increased cases of urinary tract infections among pregnant women attending the antenatal clinic at Luwero General Hospital, Luwero district.

Methodology

Study design

A descriptive cross-sectional study was used with quantitative methods to examine the relationship between the study variables. This design was preferred because of convenience purposes, time saving, and the least costly alternative.

Study area

Luwero general hospital is located in the central region of Uganda, in the Luwero district, with 65.39 km in the Northern part of Kampala district. The facility is a government-aided facility with several departments such as outpatient, inpatient, pediatric, major and minor surgery, laboratory, pharmacy, ART and maternity, dental, and others. The facility receives an average of 100 patients daily. The study area is chosen by the researcher because she's familiar with the area and, therefore, it is convenient for her, and she has worked there during the placement period and observed the increased cases of UTIs in pregnancy.

Study population

The study population was comprised of all pregnant women attending ANC at Luwero general hospital during time of study.

Sample Size determination

Sample size was determined using Burton's formula (1952) S=2(QR) O: where
S= required sample size
Q=Number of days the researcher spent while collecting data
R=Maximum number of people per day
O= Maximum time the interviewer spent on each participant.
5×10×1hr

=50
Therefore, the researcher used 50 respondents.

Sampling technique
Simple random sampling was used to select respondents. This method was preferred because it provides ease of its use and accuracy of representation of study findings.

Sampling procedure
The sampling procedure started with the pregnant women with a UTI diagnosis on the particular day of data collection, based on how they reported. Respondents who accepted to participate had to consent and participate in the study.

Data collection method
Data was collected using semi-structured questionnaires written in the English language with both open and closed questions designed based on the specific objectives. Questions were translated into the local language (Luganda) by the researcher and research assistants for some respondents who were not well conversant with the English language. The researcher considered questionnaires as the most convenient way of collecting data from respondents because it was easy for the researcher to administer and obtain data within a short time from a large number of respondents.

Data collection tools
Data was collected using a well-organized semi-structured questionnaire with both open-ended and closed-ended questions developed on the basis of specific objectives from the literature review. The researcher also used the observation tool to critically notice pregnant mothers' previous medical forms, HMIS records of the facility, and their results from laboratory tests specifically for UTIs.

Data collection procedure
After approval of the research proposal, an introductory letter from the Kampala School of Health Sciences research committee to the study area was obtained. When permission was granted, two research assistants were trained by the researcher on how to administer the questionnaire to the respondents. The sampling procedure commenced with distributing the questionnaire to respondents who fulfilled the inclusion criteria, and respondents were selected randomly without a specific procedure following the medical forms. Therefore, data was collected within specific days for ANC, and this procedure continued on each day of data collection until the required sample size was achieved.

Study variables
Variables are termed as any facet of a theory that can change or vary as part of the interaction within the theory.

Dependent variable
Dependent variable was urinary tract infections.

Independent variable
Independent variables were individual factors and community factors contributing to increased cases of urinary tract infections among pregnant women.

Quality control
A Pre-test was done on 5% of the total sample size at Kasangati Health Centre IV in order to make necessary corrections so as to produce a final copy, and necessary modifications were performed based on the pre-test. Two research assistants were trained for one day on the objectives of the study, how to select study participants, how to keep the collection format, and data quality management. In addition, the questionnaire was given to the study supervisor from Kampala School of Health Sciences to ascertain its validity.

Selection criteria
Inclusion criteria
The study only included pregnant women seeking ANC diagnosed with UTIs and those who had been treated for at least one month, who were ready to consent voluntarily to participate in the study during the time of data collection.

Exclusion criteria
The study excluded pregnant women who were critically ill, pregnant women without a UTI diagnosis, and pregnant women with a UTI diagnosis but not willing to consent voluntarily to participate in the study during the time of data collection.

Data management
The team met after data collection to review the collected data and cross check the filled questionnaires for correctness and completeness.

Data analysis and presentation
Data analysis was done using tallying, coding, and editing methods. Data was analyzed using Microsoft Excel, having been entered into the computer, cleaned for frequency distribution tables and charts.

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Results

Demographic data

Table 1: Shows the distribution of respondents according to their demographic data (N=50)

Variables	Frequency (f)	Percentage (%)
Age of respondents		
18-22 years	05	10
23-27 years	10	20
28-32 years	26	52
33-37 years	07	14
38-45 years	02	04
Total	**50**	**100**
Education level		
Never went to school	03	6
Primary	04	8
Secondary	34	68
Tertiary institution / University	08	16
Total	**50**	**100**
Marital status		
Married	41	82
Single	06	12
Widowed	01	2

Divorced	02	4
Total	**50**	**100**
Religion		
Catholic	20	40
Protestant	09	18
Muslim	04	8
Pentecostal	07	14
Others	10	20
Total	**50**	**100**
Occupation		
Employed	13	26
Un employed	20	40
Self employed	17	34
Total	**50**	**100**
Gestational age		
1-3 months	04	8
4-6 months	35	70
7-9 months	11	22
Total	**50**	**100**

Table 1 shows that most of the respondents (52%) were within the age bracket of 28-32 years, whereas the least (4%) were within the age bracket of 38-45 years. The study further revealed that more than half of the respondents (68%) had attained a secondary level of education, whereas the least (6%) had never gone to school. The study results regarding marital status showed that the majority of respondents (82%) were married, whereas the least (2%) were widowed. The study further revealed that most of the respondents (40%) were catholic by religion, whereas the least (8%) were Muslims by religion. Based on the occupation of respondents, the study revealed that most of the respondents (40%) were employed, whereas the least (26%) were unemployed. Study results also revealed that the majority of the respondents (70%) were within the gestation ages of 4-6 months, whereas the least (8%) were within the gestation age of 1-3 months.

Individual factors contributing to increased cases of UTIs among pregnant women.

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Figure 1: Shows the distribution of respondents according to whether they were aware of UTIs before being diagnosed with the infection (N= 50).

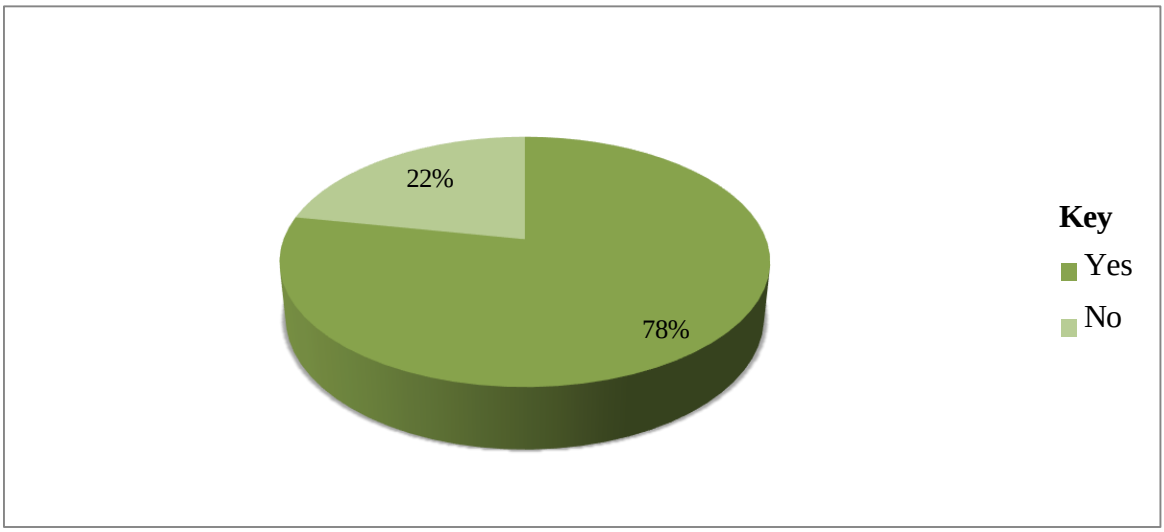

Figure 1 indicates that the majority of the respondents (78%) were aware of UTIs before the diagnosis, whereas the least (22%) reported that they were not aware of UTIs.

Table 2: Shows distribution of respondents according to their knowledge about the risk factors that predispose to UTIs (N= 50)

Response	**Frequency (%)**	**Percentage (%)**
Multiple sexual partners	09	18
Poor hygiene	25	50
Sexual activity	03	06
I don't know	02	4
Others	11	22
Total	**50**	**100**

Table 2 shows that half of the respondents (50%) knew poor hygiene as the risk factors that predispose to UTI, whereas the least (4%) didn't know the risk factors that predispose to UTIs.

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Figure 2: Shows the distribution of respondents according to type of material of their undergarments (N=50)

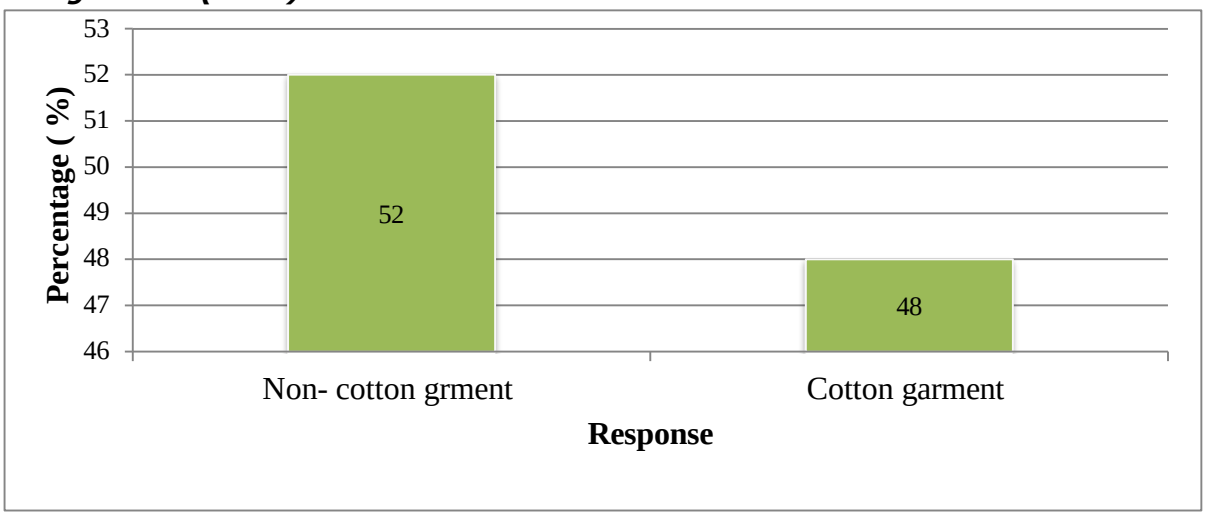

Figure 2 indicates that most of the respondents (52%) reported that their undergarments contain non-cotton material, whereas the least (48%) reported that their undergarments contain cotton material.

Table 3: Shows distribution of respondents according to their knowledge about preventive measures of UTIs (N= 50)

Response	**Frequency (%)**	**Percentage (%)**
Avoiding multiple partners	05	10
Wearing of dry clean cotton under wear	07	14
Good personal hygiene	24	48
I don't know	01	2
Others	13	26
Total	**50**	**100**

Table 3 shows that most respondents (48%) knew good hygiene as a preventive measure for UTIs, whereas the least (2%) didn't know the preventive measure for UTIs.

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Figure 3: Shows the distribution of respondents according to whether they always wash genitals after sex (N=50)

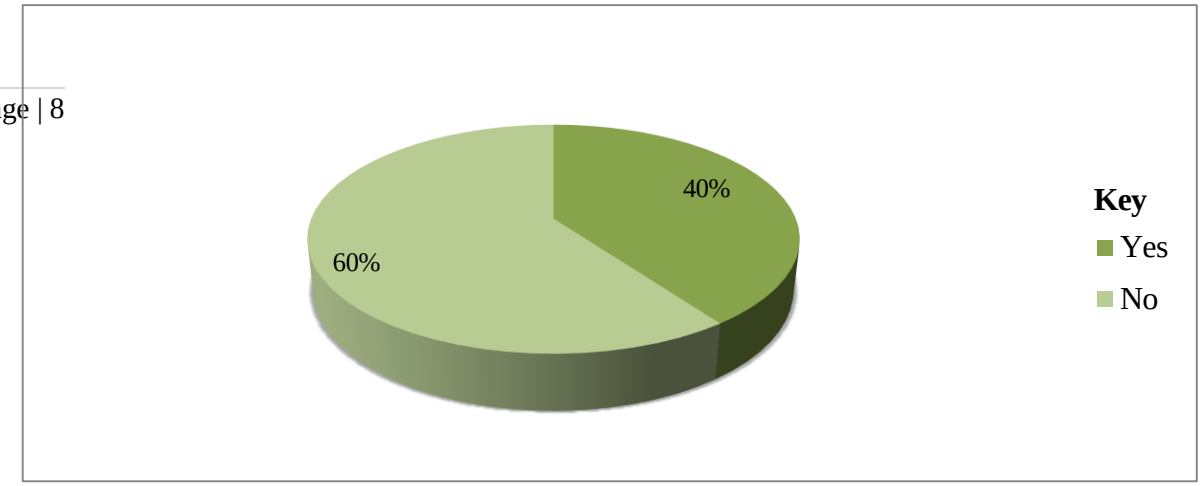

Figure 3 indicates that more than half of the respondents (60%) reported that they don't always wash their genitals after sex, whereas the least (40%) reported that they always wash their genitals after sex.

Table 4: Shows distribution of respondents according to how they clean their genital parts (N= 50)

Response	Frequency (%)	Percentage (%)
Cleaning from forward to backward	28	56
Cleaning backward to forward	22	44
Total	**50**	**100**

Table 4 shows that most respondents (56%) reported cleaning their genital parts from front to back, whereas the least (44%) reported cleaning their genital parts from back to front.

Table 5: Shows distribution of respondents according to what they use for douching (N= 50)

Response	Frequency (%)	Percentage (%)
Tissue paper	19	38
Paper	24	48
Water	07	14
Total	**50**	**100**

Table 5 shows that most of the respondents (48%) reported that they use papers for douching, whereas the least (14%) reported that they use water for douching.

Community related factors contributing to increased cases of UTIs among pregnant women

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Figure 4: Shows the distribution of respondents according to the location of their homes (N=50)

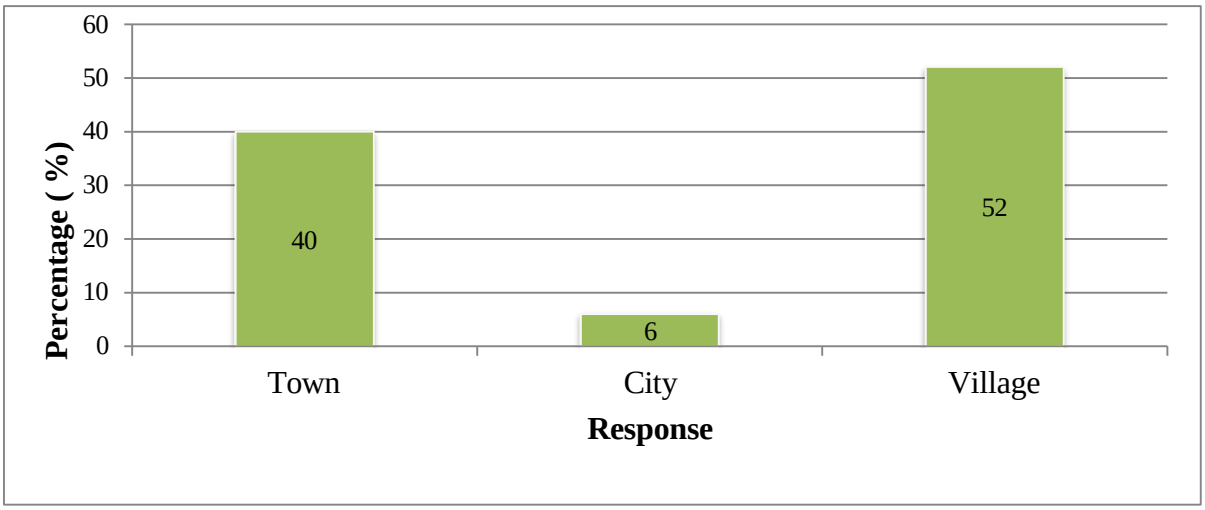

Figure 4 shows that most of the respondents (52%) reported that their homes were located in villages, whereas the least (8%) reported that their homes were located in the City.

Table 6: Shows distribution of respondents according to husband's level of education (N=50)

Response	**Frequency (%)**	**Percentage (%)**
Never went to school	07	14
Primary	13	26
Secondary	25	50
Tertiary institution / University	05	10
Total	**50**	**100**

Table 6 indicates that half of the respondents (50%) had husbands who had attained a secondary level of education, whereas the least (10%) had husbands who had never attained any level of education.

Table 7: Shows distribution of respondents according to the number of sexual partners (N= 50)

Response	**Frequency (%)**	**Percentage (%)**
One sexual partner	49	98
More than one sexual partner	01	2
Total	**50**	**100**

Table 7 shows that almost all respondents (98%) had one sexual partner, whereas the least (2%) had more than one sexual partner.

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Table 8: Shows distribution of respondents according to the mode of defecation (N= 50)

Response	Frequency (%)	Percentage (%)
Private toilets	36	72
Public Toilets	03	6
Open defecation	11	22
Total	**50**	**100**

Table 7 shows that the majority of respondents (72%) reported using private toilets, whereas the least (6%) reported using public toilets.

Figure 5: Shows the distribution of respondents according to the number of households they share with the defecation system (N=50).

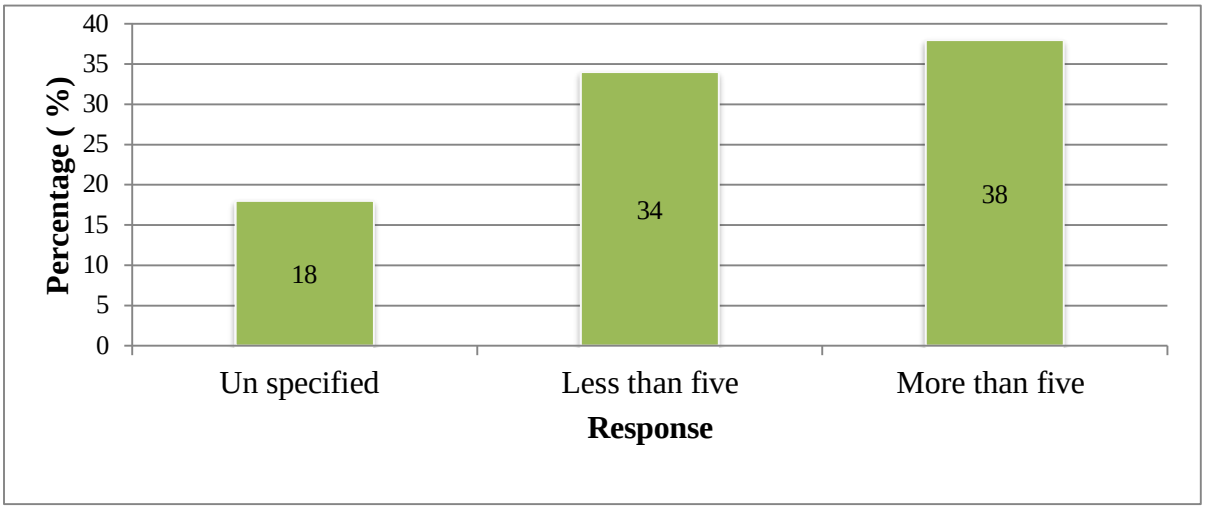

Figure 5 shows that most of the respondents (38%) reported that they share toilets at home with more than five households, whereas the least (18%) reported that they share toilets at home with an unspecified number of households.

Figure 6: Shows the distribution of respondents according to the type of family they belonged to (N=50)

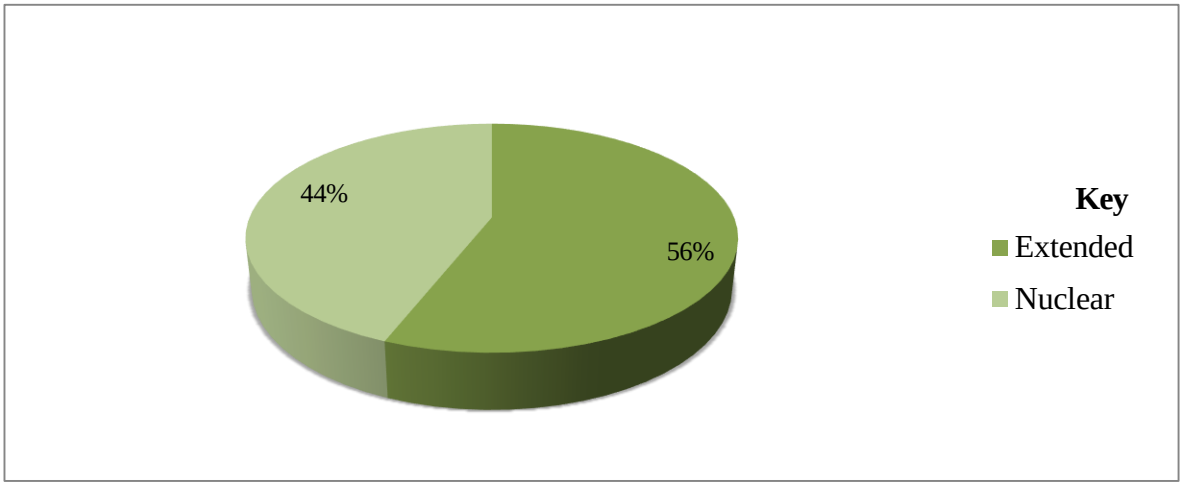

Figure 6 showed that most of the respondents (56%) were from nuclear families, whereas the least (44%) were from extended families.

Discussion of findings

Individual factors contributing to increased cases of UTIs among pregnant women.

The study results revealed that the majority of the respondents (78%) were aware of UTIs before the diagnosis. This could be attributed to the fact that a substantial number of the study participants had ever been sensitized before from different sources of information about the study background. The study findings were comparable with results from a study that was done in Ekiti state, Nigeria by (Deborah et.al., 2023), where the majority (90%) of the respondents had heard about UTI. The study further revealed that half of the respondents (50%) knew poor hygiene as the risk factor that predisposes to UTIs. Such a response signifies that an average number of the study participants were aware of the risk factors, even though the general awareness never influenced the preventive practices towards UTIs. The study results were in disagreement with (Kinene et.al., 2023), where 77.6% of respondents knew UTI can be from sex.

Nevertheless, most of the respondents (52%) reported that their undergarments contained non-cotton materials. Therefore, this implies that pregnant women who don't always wear non-cotton garments are most likely to be more prone to fungal and bacterial infection due to increased temperature and vaginal discharge. The study results were quite comparable with (Hellen et.al., 2018), where findings showed that those who used non-cotton garments were 3 times more likely to develop a UTI compared to those who used cotton garments.

The researcher assessed respondent's general awareness towards preventive measures of UTIs, whereby most of the respondents (48%) knew about good hygiene. However, despite the fact that the general awareness was a little bit fair, preventive practices were neglected. This was in disagreement with (Kampiire, 2023), where (40%) of respondents were aware of avoiding multiple sexual partners as a measure to prevent UTIs.

Grippingly, more than half of the respondents (60%) reported that they don't always wash their genitals after sex. Therefore, in one way or another, this was a predisposing factor since regular genital washing after sex may reduce susceptibility to infections. This is in line with (Badran et.al., 2015), where 70% were not washing genitals pre-coitus and 65% after sex. However, most of the respondents (48%) reported that they use papers for douching. This could be attributed to accessibility, but the quality of papers they use may not be suitable for douching. Hence, increasing their risk of UTI infections. The study results were in agreement with the findings from (Ezekeil et.al., 2023), where results showed that the use of paper was the commonest mode of cleaning after defecation, 235(42.0%).

Community related factors contributing to increased cases of UTIs among pregnant women.

Half of the respondents (50%) said their husbands had attained a secondary level of education. Therefore, low education levels predispose individuals to risks of UTIs, since they are most likely to have low knowledge of preventive measures. The current findings were in line with (Candice et.al., 2021), where higher UTI prevalence was associated even more strongly with husband's low educational attainment (52%) for high school level. The study results showed that the majority of the respondents (72%) reported that their mode of defecation was a private facility. However, despite the fact that they were using private toilets, the general cleanness was somehow questionable. The study results were inconsistent with findings from the Northern Region of Ghana by (Ezekiel et.al., 2023),

where observation remarks showed that a considerable proportion (55.0%) of the participants used public toilet facilities. Given the study results, most of the respondents (38%) reported that they share toilets at home with more than five households. Therefore, sharing toilets with many households with poor sanitation behaviors predisposes individuals to UTIs. The study results were comparable with (Kinene et.al., 2023), where 68.4% of respondents who shared toilets had UTI.

Conclusion

Quality of undergarments since (52%) reported that their undergarments contains non- cotton, irregular washing of genitals after sex as noted by (60%) reported that they don't always wash their genitals after sex and materials used during douching as (48%) used papers for douching were the main individual factors contributing to increased cases of UTIs among pregnant women.

Low levels of education, as (50%) of respondents, their husbands had attained secondary level of education, and sharing toilets with very many households, as (38%) shared toilets at home with more than five households, were the focal community-related factors contributing to increased cases of UTIs among pregnant women.

Study limitations

Some respondents were not willing to participate in the study.

The researcher faced a short duration of study limitation since the study was conducted within the same time frame as attending lectures and practicum.

Recommendations

The variation in the resistance pattern of isolates to various drugs observed in this study and the consequences of undiagnosed and untreated UTIs underpin the need to perform urine culture and antibiotic susceptibility before treatment. Therefore, this will be achieved by thorough provision of timely access to UTIs screening equipment, re-agents and medicines at health facilities by the ministry of health all over the country.

Regardless of the associated risk factors or not, health workers at Luwero general hospital should intensively continue to sensitize pregnant women on urinary tract infection as well as reproductive tract infection prevention strategies, and personal hygiene practices should also be encouraged as a way of reducing bacterial urinary tract infections among pregnant women.

Acknowledgement

I praise God Almighty with gratitude for his miracles I have experienced during my studies.

I express my gratitude to my supervisor, Mr. Atukuuma Cliffe, for the technical guidance throughout the development of this research work.

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I also acknowledge the willing assistance and cooperation given by all the respondents in the study. Finally, I am forever grateful to my friends, especially those in my study group, for their support during this time.

List of abbreviations

AA	**:**	Addis Ababa
ANC	**:**	Antenatal Clinic
HMIS	**:**	Health Management Information System
KSHS	**:**	Kampala School of Health Sciences
MoH	**:**	Ministry of Health
SNNP	**:**	Southern Nations, Nationalities and Peoples' Region
UBOS	**:**	Uganda Bureau of Statistics
UTI	**:**	Urinary Tract Infections
WHO	**:**	World Health Organization

Source of funding

There is no source of funding.

Conflict of interest

No conflict of interest declared.

Availability of data

Data used in this study is available upon request from the corresponding author

Author's contribution

JN designed the study, conducted data collection, cleaned and analyzed data, drafted the manuscript, and CA supervised all stages of the study from conceptualization of the topic to manuscript writing.

Ethical approval

Having approved this research proposal, a letter introducing the researcher to the administration of Luwero General Hospital was provided, seeking permission to conduct the study at the facility. Detailed information about the study was explained to all participants before their involvement in the study. Having understood all details, informed consent was obtained by filling out a consent form. No participant was forced to participate in the study. All information obtained from the respondents was kept confidential, including questionnaires, and was accessed by only the researcher.zJN designed the study, conducted data collection, cleaned and analyzed data, drafted the manuscript, and CA supervised all stages of the study from conceptualization of the topic to manuscript writing.

Informed consent

A consent form was filled out by the respondents after

explaining the purpose of the study to them. The respondents were assured of confidentiality as no names would appear on the questionnaire. No participant was forced to participate in the study, and all the study materials used during the interviews were safely kept under lock and key, only accessible by the researcher.

Author's biography

Josephine Nansubuga is a student of diploma in clinical medicine and community health at Kampala School of Health Sciences. Cliffe Atukuuma is a research supervisor at Kampala School of Health Sciences.

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