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Factors Associated with Urinary Tract Infections among Women Aged 18 – 59 Years in Consolata Mission Hospital, Nyeri County, Kenya

Humphrey Kihoro Maina and James Malusha
The Catholic University of Eastern Africa,
Department of Community Health and Development,
P.O. Box 62157-00200, Nairobi, Kenya

ABSTRACT

Urinary tract infection (UTI) is a condition in which bacteria invade and grow in the human urinary tract. UTIs generally happen when microscopic organisms enter the urinary lot through the urethra and start to spread in the bladder. The microbes may then grab hold and develop into an all-out contamination in the urinary tract. Because their urethra is closer to the anus and their urethral opening is closer to the bladder, women typically have a more at risk of acquiring a urinary tract infection (UTI) than males. The aim of the study was to assess factors contributing to urinary tract infections among women between 18 to 59 years at Consolata Mission hospital, Nyeri County, Kenya. A cross-sectional study was used. The target population was 171 women attending Consolata Mission hospital where systematic sampling was used. Data was collected using questionnaires. Chi-square test statistics was used to determine associations. The study revealed majority of the respondents were married (51.8%) and 85.6% of the respondents were Christians. Vast majority of the respondents had adequate education and also 70.7% had some form of employment. 83.8% of the women were knowledgeable on what UTIs are according to the study. The bulk of the women (75.6%) were familiar with how UTIs are treated, 84.4% knew the signs and symptoms and an additional 76.9% are conversant with how they are prevented. Cross-tabulation of the data using Chi-square statistics revealed there was no association between the independent and dependent variables. In conclusion, though socio-demographic factors such as age, marital status, religion, occupation, level of education and residence did not show any association with urinary tract infection, nonetheless these factors play a crucial role in a person's health status.

Key words: Urinary, Tract, Infections, Women, Kenya

INTRODUCTION

A urinary tract infection (UTI) is a condition wherein microbes attack and fill in the urinary tract (the kidneys, ureters, bladder, and urethra) [NCI def.] UTIs in the upper urinary parcel, that is the kidneys and ureters, are typically more serious when contrasted with that of the lower urinary tract (Verneda Lights, 2023). Women are normally at a more serious gamble of fostering a UTI than men due to their urethra is near the rear-end and the urethral opening is near the bladder. This makes it simpler for microbes around the rear-end to enter the urethra and to venture out to the bladder.

Urinary tract diseases generally occur when micro-organisms enter the urinary tract through the urethra and start to spread in the bladder. The microbes may then grab hold and develop into an all-out contamination in the urinary lot. Disease of the bladder and the urethra is normally brought about by gastrointestinal microorganisms especially *Escherichia coli* spread from the rear-end. This disease of the urethra additionally can be brought about by physical contaminations with pathogenic micro-organisms such as herpes, gonorrhea, Chlamydia and mycoplasma (Mayo facility).

Moreover uropathogenic *Escherichia coli* (UPEC) is the most predominant irresistible specialist in both straightforward and confounded UTIs (Medina & Castillo-Pino, 2022).

Notably urinary tract infections (UTIs) are the most common bacterial infections, affecting 150 million people every year worldwide. An unexpected 10.5 million office visits for UTI side effects were made in US in 2007 (comprising 0.9% of every mobile visit) and 2 - 3 million crisis division visits (Ana, 2015). In Africa, UTIs have also been reported to be a major problem in health care. For instance, UTIs recorded in Algeria among all patients admitted in acute care units for more than 48 hours had prevalence of 4.5%.

Whereas in Senegal 0.7% of patients admitted in university hospital had UTIs, besides more women than males were affected. A study conducted in Nigeria among 12458 urine samples collected, showed that community-acquired and nosocomial UTIs to have prevalence of 12.3% and 9.3%, respectively. On the other side in Uganda, it was found to be 13.3% and 20-60% of antenatal mothers had drug resistance Mulago hospital (Odoki *et al.*, 2019). A study done in Kenya at the Kiambu Level 5 Hospital by Wanja *et al.* (2021), revealed 27.6% of UTI prevalence, with females having higher rate at 80.7% compared to males at 19.2%. In rural Kenya, there is not much studies being done on UTIs hence making it necessary for more research on the topic and thus will help create more awareness on the issue. Knowledge on UTIs will help tackle people's dread of the infections since most women are stigmatized by UTIS and cannot speak up due to the embarrassing nature of the disease.

Urinary tract diseases in both local area and emergency clinic settings are assessed to influence around 405 million individuals worldwide and almost 0.23 million individuals passed on from UTIs, adding to 5.2 million handicap changed life years (DALYS) in 2019 (Zhilin Zhen *et al.*, 2022).

The pinnacle occurrence of suggestive contaminations happens in youthful, physically dynamic ladies ages 18 to 24 years, with 33% to one-half of women self - announcing no less than one UTI by age 32. Recurrent UTIs affect between 2% and 5% of healthy women over their lifetime. When compared to a patient who has never had an infection before, women are more likely to develop subsequent infections. The yearly medical care costs related with UTIs are generally 1.6 billion and climbing. Antimicrobial solutions for UTIs represent 15% of all short-term remedies. Women for the most part experience the ill effects of intense cystitis, addressing 4% of all short-term visits. According to WHO (2020), 52% of these visits are directed to a primary care clinic, while 23% are directed to the emergency room.

Related examinations in Africa among grown-ups have likewise uncovered novel proof that demonstrates UTIs are a genuine wellbeing trouble. Perceiving these announced UTI pervasiveness patterns and a lot more implies that more exploration should be finished to assess the commonness, occurrence and hazard related variables of urinary plot diseases among grown-ups (Wanja *et al.*, 2021).

Urinary tract infections are a serious health problem affecting most women regardless of the age group. Most women will choose to remain silent about a urinary tract infection because of fear of discrimination or judgement brought about by the fact that most people view UTI as a sexually transmitted infection. The result of this is that infected women hide away the illness and therefore posing a threat to their own life since it can result to death or even abnormalities. On the off chance that left untreated, the contamination can spread further as the microbes climb from the bladder by means of the ureters. Pyelonephritis, a kidney infection, can occur if they reach the kidneys. Pyelonephritis is related with a critical weight of care because of the gamble of hospitalization (Medina & Castillo-Pino, 2019).

Very little effort to control and create awareness on UTIs has been done in Kenya. In Kenya, UTIs are however a public health concern. Research has already proven the prevalence of urinary tract infections in Kenya is still high, therefore making it a serious public health concern. Measures to eradicate UTIs should be prioritized. Even though deaths arising from

UTIs are few, the disease is still a burden to the country's health care because of the consequent hospitalizations that result from the untreated infections. Reduction in the incidence and prevalence of urinary tract infections will greatly help in achieving the Sustainable Development Goals on promoting "health for all" as well as ensuring equality for all regardless of gender since urinary tract infections are normally high among women.

MATERIAL AND METHODS

Research Design

The researchers conducted a cross-sectional study using questionnaires to collect data. This was conducted in Consolata Mission hospital in Nyeri county, Kenya in March 2024. The study population consisted of all women, aged between 18-59 years of age, attending Consolata Mission hospital, Mathari, Nyeri county.

Sample Size and Sampling

The size of sample was determined using Yamane's formula yielding 171 units to be sampled. The sample was purposively chosen using simple random procedure. Women attending Consolata Mission hospital who were 18-59 years of age and willingly volunteered to participate were included in the study. However women who were not in the age bracket of 18-59 years, who did not attend Consolata Mission hospital and unwilling to participate were excluded in the study. Pretested questionnaires were used to collect data in the hospital after explaining the purpose and nature of study to the respondents to obtain their consent. Analysis of data done using SPSS software to obtain descriptive statistics such as frequencies and percentages as well as inferential statistics. Tables and figures were used to present data. Ethical practices were adhered to throughout the study. During the entire process privacy, confidentiality, voluntary participation and anonymity the respondents including obtaining of consent were adhered to and ensured.

RESULTS

Completed questionnaires constituted 94.0% response rate. This rate is acceptable considering that Magenta and Mugenda (2003), finding of above 60% questionnaire return rate as acceptable proportion adequate for analysis. Analysis of data was done by adopting descriptive statistics of percentages and frequencies. Analysis was done using SPSS version 20 and tables, bar graphs and pie charts were graphics for presenting data. Results were as follows:

Socio-Demographic Information

Table 1 shows the various sociodemographic characteristics that were investigated. According to the data, the majority of the respondents belonged to the age category (45-59 years) this was at 33.1% (53 respondents). The majority of women (51.8%) were married, according to the research. The remaining 6.9% are divorced, 27.5% widowed, 13.8% single. The chart also showsthat the majority of the respondents (29.4%) were unemployed, followed by the formally employed (25%), then the self-employed (23.8%) and the least were in informal employment (21.9%). The majority of the respondents (33.1%) stated that their households consist of 4 members with the least (13.8%) having only 2 members. The vast majority of the people in the survey had adequate education. 17.5% of them completed primary education, 32.5% secondary education and 45.0% had post-secondary education. A lesser 5.0% had only pre-primary education. In terms of religion, the survey indicated that 85.6% percent of the participants were Christians, followed by Muslims at 6.3%, Hindus at 0% and 8.1% of them did not affiliate with any of the major religion. This indicates that Christianity is the dominant religion in the research area**.** Besides, the majority of the

responders were from Nyeri town neighborhood (30.6%), with the fewest coming from Chaka (12.5%).

Table 1: Summary of socio demographic factors

Factor	Categories	Frequency	Percentage
Age group	18-24 years	32	20
	25-35 years	37	23.1
	36-44 years	38	23.8
	45-59 years	53	33.1
	Total	160	100
Marital status	Single	22	13.8
	Married	83	51.8
	Widowed	44	27.5
	Divorced	11	6.9
	Total	160	100
Household size	2	22	13.8
	3	49	30.6
	4	53	33.1
	5 and above	36	22.5
	Total	160	100
Livelihood means	Self-employed	38	23.8
	Unemployed	47	29.3
	Informal employment	35	21.9
	Formal employment	40	25
	Total	160	100
Religion	Muslim	10	6.3
	Hindu	0	0
	Christian	137	85.6
	Other	13	8.1
	Total	160	100
Level of education	Below primary	8	5
	Primary	28	17.5
	Secondary	52	32.5
	Post-secondary	72	45
	Total	100	100
Residence	Mathari	24	15
	Ihururu	22	13.8
	Chaka	20	12.5
	Nyeri town	49	30.6
	Any other town	45	28.1
	Total	160	100

Economic Characteristics of the Respondents

The participants were asked to identify their primary source of income. This was required in order to link the source of income to the chances of one getting a urinary tract infection.

Figure 1 illustrated that, because the self-employed were 23.8%, informally employed were 21.9%, and formally employed were 25.0%, it's clear that the majority of the respondents had some type of employment.

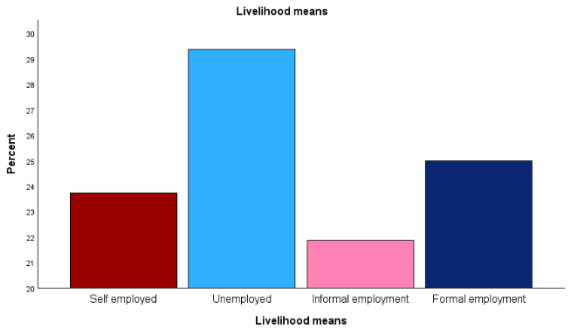

Figure 1: Source of income

Healthcare Provider for Urinary Tract Infections

Figure 2 shows that majority (61.9%) seek healthcare services for urinary tract infections at a private hospital. A small percentage of 3.8% were not sure of where they seek the services.

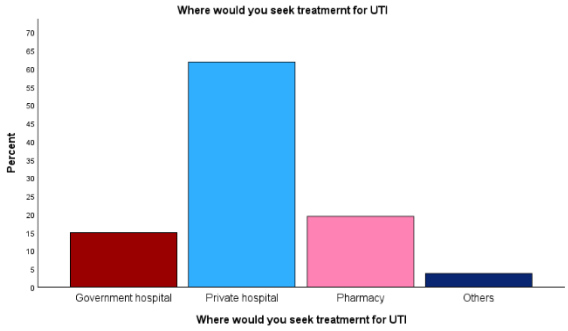

Figure 2: Health care provider

Respondents' Level of Knowledge

The other objective was to measure the knowledge level on urinary tract infections among women aged 18-59 years at Consolata Mission hospital, Nyeri county. According to the studies, most women are informed about urinary tract infections and their knowledge is quiet high.

In further pursuant to this objective women's understanding of urinary tract infections who fall within the age bracket of 18-59years was measured. It also explored if knowledge available affected the prevalence of urinary tract infections among women aged 18-59 years.

Figure 3 illustrates that only 83.8% knew were aware of urinary tract infections while the remaining 16.2% were not aware.

Figure 4 illustrates that 79.4% knew how urinary tract infections typically occur while 20.6% didn't know how UTIs occur.

Figure 5 shows that 76.9% of the respondents knew how UTIs are prevented while a lesser number of 23.1% didn't know how UTIs are prevented.

Results have been presented in the pie charts below.

Figure 3: Respondents who knew what urinary tract infection is

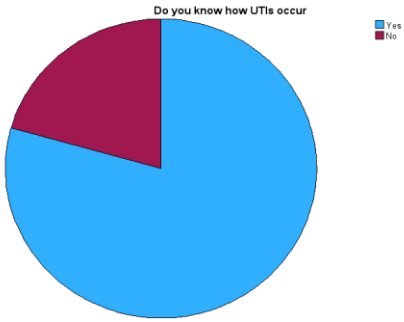

Figure 4: Respondents who knew the way UTIs typically occur

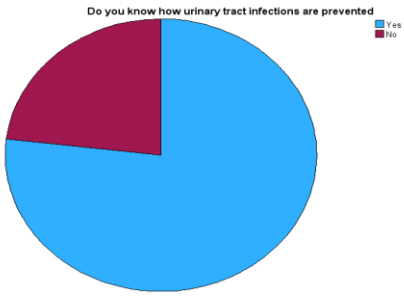

Figure 5: Respondents who are aware of how urinary tract infections are prevented

Respondents' knowledge on how UTIs are treated, signs and symptoms of UTIs, whether they've ever had a UTI and if it was recurrent

The research participants were asked if they were aware of how UTIs are usually treated and the symptoms that occur. This was necessary to see if the information supplied had persuaded respondents of the importance of having adequate knowledge on UTIs.

It was important to know if the respondents had ever contracted a UTI and whether it was recurrent. This was necessary to determine the prevalence of UTIs among the women attending Consolata Mission hospital and who are between 18-59 years of age. Table 2 demonstrates that the majority of respondents (84.4%) knew at least one sign or symptom of UTI, whereas 15.6 percent said they didn't know. The majority of respondents (75.6%) indicated they knew how urinary tract infections are treated, while a tiny minority of respondents (24.4%) reported they were not familiar with the treatment of UTIs. When asked if they've ever contracted a urinary tract infection, the majority of respondents (71.9%) said yes,with only a minor percentage of 28.1 admitting they have never. Besides, 69.9 percent of respondents reported to have had a recurrent infection of the urinary tract, while 33.1% said their infection wasn't recurrent.

Table 2: Women's knowledge on how UTIs are treated, signs and symptoms of UTIs, whether they've ever had a UTI and if it was recurrent

Factors	Categories	Frequencies	Percentages
Familiarity with treatment of UTIs	Yes	121	75.6
	No	39	24.4
	Total	160	100
Signs and symptoms of UTIs	Foul-smelling urine	17	10.6
	Pain in the lower abdomen	11	6.9
	Pelvic pain	24	15
	Frequent urination in small amounts	11	6.9
	Fever and chills	11	6.9
	All of the above	61	38.1
	None of the above	25	15.6
	Total	160	100
Have you had a UTI	Yes	115	71.9
	No	45	28.1
	Total	160	100
Was the UTI recurrent	Yes	107	69.9
	No	53	33.1
	Total	160	100

Respondents' Perception of Urinary Tract Infections

Who is likely to get a UTI, this was a question asked to the respondents so as to know their knowledge on who can get UTI? Figure 6 revealed that 68.1% of the respondents' thought women were more likely to get a UTI while 31.9% thought young girls were more likely to get a UTI. The responses are shown in the pie chart below.

Figure 6: Respondents' view on who is more likely to get UTI

The respondents were also asked how they viewed UTIs. Table 3 shows most of the respondents believe UTI is just a normal infection not necessarily a sexually transmitted infection, 140(87.5%).

Table 3: Respondents view of urinary tract infections

Categories	Frequencies	Percentages
Witchcraft	0	0
Sexually transmitted infection	8	5
Normal infection not necessarily an STI	140	87.5

Other	4	2.5
I don't know	8	5
Total	160	100

Practices and Prevention of Urinary Tract Infections

Table 4, shows that the respondents visit the health facility more often thus increasing their chances of receiving adequate health management.

The respondents were also asked their own opinion on why women shy away from seeking health services, Table 5 shows that most respondents agreed that 'fear of stigma from the community in case they become aware of your condition' (33.8%) was a major factor causing women to shy away from seeking health services. Other respondents responded as follows, lack of time (10.6%), inadequate knowledge (21.9%), distance (3.1%) and unwelcoming health care providers (23.1%). Another 5.6% agreed on all of the above while 1.9% claimed not to know.

The findings are tabulated in the below sections.

Table 4: Respondents' last routine health check

Factor	Categories	Frequencies	Percentages
The last time to undergo a routine health check-up	Within a month	6	3.8
	1-3 months	12	7.5
	4-6 months	24	15
	7-12 months	12	7.5
	Over 12 months	106	66.2
	Total	160	100

Table 5: Respondents' view on why women shy away from seeking health services

Factor	Categories	Frequencies	Percentages
Opinion on why women shy away from seeking health services	Inadequate knowledge	35	21.9
	Lack of time	17	10.6
	Unwelcoming health care providers	37	23.1
	Fear of stigma from the community in case they become aware of your condition	54	33.8
	Distance	5	3.1
	All of the above	9	5.6
	I don't know	3	1.9
	Total	160	100

Chi-square Test

Chi square statistics were used to test this hypothesis and examine the impact of socio-demographic factors on UTI prevalence. The significance level was set at 0.05 (p-0.05), which means that the null hypothesis is rejected and the alternative hypothesis is accepted if the estimated p-value is equal to or less than 0.05 (significance). The following statements were used to test this hypothesis:

i) There is no association between age group and UTI prevalence (p-value>0.05).
ii) Education level has no bearing on UTI prevalence (p-value>0.05).
iii) Household size has no influence on UTI prevalence (p-value>0.05).
iv) There is no association between marital status and UTI prevalence (p-value>0.05).
v) Means of livelihood has no bearing on UTI prevalence (p-value>0.05).

vi) Religion has no bearing on UTI prevalence (p-value>0.05).
vii) Residence has no influence on UTI prevalence (p-value>0.05).

Cross-tabulation of the independent and dependent variables using chi-square statistics has been presented in the below section (Table 6).

Table 6: Level of significance

Socio-demographic factors	Dependent variable	x-value	p-value	Significance
Age group	UTI prevalence	1.062	0.786	NS
Marital status	UTI prevalence	1.637	0.651	NS
House hold size	UTI prevalence	3.692	0.297	NS
Livelihood means	UTI prevalence	3.25	0.355	NS
Religion	UTI prevalence	2.922	0.232	NS
Level of education	UTI prevalence	1.525	0.677	NS
Residence	UTI prevalence	6.857	0.144	NS

Key: NS – Not Significant; S - Significant

Health Assessment

A health assessment was conducted to determine the women's state of health. 47.5% of the women were found to be of normal weight, 24.4% were underweight and 28.1% were overweight. Majority of the participants (83.1%) reported to be free of any underlying health condition while a minority (16.9%) reported to have an underlying health condition. A lesser (31.2%) admitted to have gotten ill in the past one month while most (68.8%) did not fall sick. Of those who got ill 85.7% of them had an acute illness and a minority (14.3%) got a chronic ailment.

DISCUSSION

Information on Social Demographics

When it comes to sources of income, the majority (70.7%) had some form of employment. A study done by Foxman (2002), revealed that the financial implications of UTI are enormous which makes it difficult for people of little or no income to experience difficulty accessing medical care due to direct costs of outpatient visits, antimicrobial prescriptions and hospitalization expenses as well as the non-medical costs associated with travel, sick days and morbidity. According to Rosenberg (1999), low antibiotic susceptibility is reflected in increased numbers of costly return visits and cases of pyelonephritis and diminished cost-effectiveness. This is greatly influenced by one's income. Income, however, was not found to influence the prevalence of urinary tract infections.

The vast majority of the people in the survey had adequate education, with about 77.5% of them having completed basic education. These findings point to a population that may find it fairly easy evaluating important information from published sources. This indicate that women should have no difficulty evaluating information on urinary tract infections. However, UNFPA (2021) revealed that nearly half of all women are denied their bodily autonomy. 'In essence, hundreds of millions of women and girls do not own their own bodies. Their lives are governed by others', Dr. Natalia Kanem, UNFPA Executive Director**.** These findings support the conclusions that urinary tract infections and overall women's health is greatly influenced by socio-demographic factors and cumulative societal norms.

It was discovered that the marital status of women had no impact on UTI prevalence although a study done in England by Cooper *et al*. (2023), revealed that women with children in their household, who were aged under 45 years, or who were married or cohabiting were

more likely to experience UTI symptoms.

Religion doesn't have a significant association with urinary tract infections seeing that 87.5% of women reported UTI being a normal infection and every woman can get it. A study done in England revealed that the association of religion with to UTI is contradictory (Ramana, 2015).

The distance between a health facility and the community is critical in ensuring access to health care. According to Jordan *et al*. (2004), a long distance to a health care facility discourages people from seeking care. In this regard, the purpose of this study was to determine the residence of the respondents so as to know if there are people being affected by distance.

The distance to Consolata Mission hospital was found to have no impact or association to urinary tract infections. The majority of the respondents were from localities next to the facility.

A study done in Sweden (1997-2018) revealed that region of residency was strongly associated with the risk of uncomplicated UTI. In this case, region, did not affect the prevalence of UTI since most of the respondents are from the surrounding areas.

As mentioned in the above sections, the socio-demographic features of the respondents studied were crucial in determining their association with urinary tract infections**.**

Knowledge on Urinary Tract Infections

Majority of the women (83.8%) were aware of what urinary tract infections are, according to the study.

This high figure can be related to the study's findings of adequate education. The women's adequate understanding of UTIs explains the relatively sufficient knowledge about urinary tract infections. A study done by Almaghlouth *et al.* (2023) revealed that about 70.1% of people in Alhassa, Saudi Arabia are knowledgeable of UTIs despite misperceptions of UTIs and their risk factors being evident. It further underscored the need for heightened awareness on UTIs among Saudi Arabia people. Purposed awareness interventions are crucial in addressing misperceptions and promoting proper understanding of risk factor as well as encouraging suitable management strategic measures. Available studies have revealed that women will contract a urinary tract infection in the course of their life regardless of their socio-economic background. About 50-70% of women will have a UTI sometime in their lifetime, and 20 to 30% of women who have a UTI will have a recurrent UTI, according to Geerlings (2016).

This finding shows that women's knowledge was adequate to ensure that they take sufficient measures to manage UTIs.

Knowledge on Signs and Symptoms, Treatment and Prevention of UTI

One of the objectives was to determine if the women knew the signs and symptoms of UTIs, how they are treated and prevention. The bulk of the women are familiar with how UTIs are treated, the signs and symptoms and the prevention measures, according to the study. This is an outstanding response as it indicates that majority of them are adequately informed about urinary tract infections. This could be attributed to government measures such as the Kenya Female Advisory Organization (KEFEADO), which promotes women's rights and aims to eradicate gender disparities in education, health and work. The Kenya National Policy on Gender and Development (NPGD) 2000, also outlines an approach to mainstreaming of gender as well as empowerment of women. It clearly states that it is the right of women, men, girls and boys to be actively involved in order to equally benefit from diverse developments. The United Nations Fund for Population Activities (UNFPA) in Kenya works with the government, other UN agencies, civil society and donors to ensure universal accessibility to

sexual and reproductive health services. This means that a woman could get family planning, antenatal care, HIV testing and general health services one health facility. These interventions help in creating awareness on women's health.

The majority of women (59.4%) reported that they would seek treatment for UTIs in private hospitals. This is because reputation in Kenya favors private hospitals which are known to be reliable and very efficient in delivery of services. A study done by Udeme *et al.* (2021), revealed that private hospitals attract more patients because of attitude of healthcare providers. A study done by Barnea *et al.* (2022) revealed that patients who underwent surgery in a private hospital, medical stuff showed higher accountability, had better credentials, assured the correct prescription to avoid error and demonstrated more confidence and reliability hence recommending private facilities to other users despite economic challenges. The nexus of patients and medical staffs is important in securing patient trust and treatment compliance. This will go along in enhancing quality of care. Access to healthcare today in Kenya has greatly improved therefore making it easier for women to get health services.

The study discovered that women's level of education has an impact on their knowledge and perception of urinary tract infections. Education is intended to provide individuals with the knowledge, abilities, and mind-sets necessary to make informed decisions. This explains why educated women are more likely to know the management measures of urinary tract infections. These findings are corroborated by Eslami *et al*. (2023) in Iran, who found that a high educational attainment is a major determinant to improve UTI preventive behaviors.

Women were asked the last time they went for a routine health check-up. This information was important as it helped the researchers understand if the women came timely for health services. The results from the study were quite promising as most of the respondents reported to have routine health check-up. World health organization recommends people to undergo a routine health checkup at least once every 3 years for those under 50 and once every year for those over 50 years of age (WHO, 2022).

Moreover results showed that there was no significant association between socio-demographic and urinary tract infection variables ($p>0.05$). Thus though socio-demographic factors such as age marital status, religion, occupation, level of education and residence does not show any association with urinary tract infection, these factors play a crucial role in a person's health outcome. For example, people are more likely to opt for cost-effective medication regardless of the efficacy. High level of education improves autonomy and awareness therefore improving general health outcomes.

CONCLUSION

Sequel to the results, the study concludes that women are aware of UTIs and have substantial level of understanding on the same. Though socio-demographic factors such as age marital status, religion, occupation, level of education and residence does not show any association with urinary tract infection, these factors play a crucial role in promoting and maintaining one's personal health including preventing urinary tract infections.

RECOMMENDATIONS

The study recommends the following to improve the health of women through prevention and effective management of urinary tract infections.

1. As women's level of education has an impact on their knowledge and perception of urinary tract infections, this study efforts should be made to ensure that women at all times have access to education. This can be made possible by ensuring that the cost of education is made affordable.
2. Since the study found out that majority of women would seek treatment for UTIs in private hospitals, this study suggests that the government develop a strategy to ensure

that public hospitals improve standard of services and that quality affordable healthcare is available to everyone at all times. This can also be made possible by putting in place policies that ensure better staff commitment in patient autonomy and patient-staff communication.

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