

## Research Article

# Evaluation of the Prevalence of Urinary Tract Infection in Females Aged 6-50 Years at Kinondoni District, Tanzania

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## Abstract

**Objective:** The study is aimed at the determination of the prevalence of urinary tract infection among females aged 6-50 years at Kinondoni district receiving health services at Mwananyamala Hospital, Dar Es Salaam, Tanzania. The effect of age and marital status on the prevalence of urinary tract infection was also determined. **Materials and Methods:** A total of 323 females with and without symptoms of urinary tract infection were included as a study subject. Midstream urine samples were collected and processed following standard bacteriological tests. Data concerning associated risk factors were collected using structured questionnaires and were processed and analyzed. **Results:** An overall prevalence of 63.47% was observed in this study. The prevalence of urinary tract infection was significantly higher in females aged 18-29 years (58.54%) and whose marital status is single (53.66%). **Conclusion:** The high prevalence recorded in this study makes it necessary for the females to be adequately educated on urinary tract infections. There is need for the government to provide improved, adequate and affordable health care services in the communities.

**Key words:** Urinary tract infection, prevalence, females, prevalence percentage

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**Competing Interest:** The authors have declared that no competing interest exists.

**Data Availability:** All relevant data are within the paper and its supporting information files.

## INTRODUCTION

Urinary tract infection is an infection of the urinary system that may involve the lower urinary tract or both the lower and upper urinary tracts<sup>1</sup>. Urinary tract infections are considered as the most frequent bacterial infections worldwide<sup>2,3</sup>. Symptomatic urinary tract infection is characterized by the presence of  $\geq 10^5$  colony forming units of bacteria per milliliter (CFU mL<sup>-1</sup>) in one urine sample along with urinary tract specific symptoms<sup>4,5</sup>. Asymptomatic bacteriuria and asymptomatic pyuria are characterized by the presence of bacteria and white blood cells in the urine, respectively. In these conditions, specific clinical signs or symptoms of urinary tract is not seen<sup>4,5</sup>.

Women those aged 16-64 years are significantly more likely to experience urinary tract infection than men<sup>6</sup>. The factors responsible for the probable cause of urinary tract infection include genital anatomical structure of females, pregnancy, old age, person hygiene and education status. Pregnant women, elderly or patients with catheters, spinal cord injuries or diabetes are at increased risk. Microorganisms responsible to cause urinary tract infections are: *Saprophyticus staphylococcus*, *Escherichia coli*, *Proteus*, *Acinetobacter*, *Pseudomonas aeruginosa* and *Klebsiella pneumonia*<sup>7,8</sup>. Symptoms of urinary tract infection include urinary frequency, dysuria, urgency, flank pain and lower abdominal pain. Also, urinary tract infection has been linked to premature birth and low birth weight.

The greater part of the reports in the literature pertaining to urinary tract infections globally has measured urinary tract infection in pregnant women<sup>9,10</sup> and elderly women<sup>11</sup>. To the best of our knowledge, no studies were found measuring prevalence of urinary tract infections in females aged 6-50 years. The present study is aimed to provide data on the prevalence of urinary tract infections in females aged 6-50 years at Mwananyamala Hospital, Kinondoni district, Dar Es Salaam, Tanzania. The present study is also designed to determine the knowledge and awareness of the community about urinary tract infections and the risk factors associated with the infection. This information is very important. This will be useful to inform the community about the actual condition of urinary tract infection and also help to explain the community about prevention and control of urinary tract infection.

## MATERIALS AND METHODS

**Study design and study population:** Hospital based cross-sectional descriptive study was conducted which employed quantitative methods of data collection to determine the prevalence of urinary tract infection. The study

population was females in the age group of 6-50 years at Kinondoni district receiving health services at Mwananyamala Hospital, Dar Es Salaam, Tanzania. A total number of 323 of women were considered for the current study.

**Inclusion and exclusion criteria:** Females with the age of 6-50 years receiving health services at Mwananyamala Hospital are included. Females who are in menstrual period and females with the age below 6 years and above 50 years were not included in the study.

**Ethical consideration:** Data were collected anonymously and no data was tailed with any respondent's name. The respondents were assured that the information collected would only be used for purpose of the study and not otherwise. The permission to conduct this study was sought from International Medical and Technological University ethical clearance committee and also an informed consent were obtained from the participants before collection of urine specimens. All the information obtained from the participants was treated confidentially. The results were used in the management of patients since the research is hospital based.

**Sampling procedure:** A serial sampling method was used. At least 5 females were recruited daily until the sample size reached (323 participants). A standardized questionnaire was prepared and given to each patient to obtain social-demographic information.

**Urine sample collection and analysis:** Urine samples were collected with clear instructions to the participants. The participants are instructed to collect mid stream urine after vulval swabbing with clean water. The specimen was delivered to the laboratory within 1 h of collection. Urine analysis was done using urine dipstick and binocular microscope with the aid of standard operating procedure.

Urine specimens were cultured on cysteine lactose electrolyte deficient agar, MacConkey agar and blood agar media plates. The inoculated plates were incubated for 24 h at 37°C. Diagnosis of urinary tract infection was made when there was at least  $10^5$  CFU mL<sup>-1</sup> of urine. High colony counts with more than one species of bacteria were considered as contamination. For contaminated specimen, culture was repeated. Symptomatic patients were given treatment empirically before culture results.

## RESULTS

In the present study a total of 323 females in the age of 6-50 years participated. The demographic characteristic features of the participants are shown in Table 1. Among the

Table 1: Demographic characteristics features of the participants

Demographic characteristics feature	Frequency	Percentage
<b>Age (years)</b>		
6-17	84	26.01
18-29	171	52.94
30-41	52	16.10
42-50	16	4.95
Total	323	100.00
<b>Marital status</b>		
Single	194	60.06
Married	91	28.17
Divorced	7	2.17
Cohabiting	4	1.24
Widow	19	5.88
Separate	8	2.48
Total	323	100.00

Table 2: Prevalence of urinary tract infection among various age groups

Age (years)	No. of positive cases	Prevalence (%)
6-17	40	19.51
18-29	120	58.54
30-41	36	17.56
42-50	9	4.39

Table 3: Prevalence of urinary tract infection according to marital status

Marital status	No. of positive cases	Prevalence (%)
Single	110	53.66
Married	73	35.61
Divorced	3	1.46
Cohabiting	3	1.46
Widow	10	4.88
Separate	6	2.93

323 participant, the number and percentage of participants were more in the categories like: Age group 18-29 years and living single.

The overall prevalence of urinary tract infection in the participants was found to be 63.5%. Among the 323 participant, 205 (63.47%) of them had urinary tract infection with positive culture and 118 (36.53%) of them had negative urine culture.

The highest prevalence of urinary tract infection was recorded among the age group of 18-29 years (58.54%) while the lowest prevalence was recorded among the age group of 42-50 years (4.39%) as is illustrated in Table 2.

Table 3 shows the prevalence of urinary tract infection among participants whose marital status is single was found to be higher (53.66%). The prevalence of infection was found to be less in participants who were divorced (1.46%) and cohabiting (1.46%).

The level of knowledge on urinary tract infection among participants was determined. This involved describing whether the participant have heard about urinary tract infection or not. It was found that most of participants

220 (68.11%) have never heard about urinary tract infection. While only 103 (31.89%) participants have heard of urinary tract infection.

## DISCUSSION

Hospital based cross-section study design was conducted to determine the prevalence of urinary tract infection among females with the age of 6-50 years. The participants were sent to laboratory with their laboratory request form. The study involved 323 patients in which among those, 205 (63.47%) were diagnosed positive, while 118 (36.53%) patients were negative. Most of participants had little knowledge and awareness about urinary tract infection.

From the current study, it was observed that there was high prevalence (63.47%) of urinary tract infection among participants at Mwananyamala Hospital at Kinondoni district, Tanzania. The prevalence of urinary tract infection among the participated females is greater than the prevalence of urinary tract infection among pregnant women in Bugando Medical Centre, Mwanza, Tanzania (14.6%)<sup>12</sup>, Tikur Anbessa specialized hospital, Addis Ababa, Ethiopia (11.6%)<sup>13</sup> and among adolescent girls in Karimnagar district, Andhra Pradesh, India (12.7%)<sup>14</sup>. The study results calls the Tanzania government to do mass screening of the community to both symptomatic and asymptomatic individuals so as to prevent the impact caused by urinary tract infection. Also the community should be educated on how to prevent and control of urinary tract infection so as to reduce a number of the patients in the community.

The study found that most of participants (68.11%) have little knowledge and awareness about urinary tract infection. According to this study, the knowledge about urinary tract infection is still a problem despite several studies come with this factor and recommendations. This factor was also seen in the study done by Ahmed<sup>14</sup> in India on the prevalence of urinary tract infection among adolescent girls. The results of Ahmed<sup>14</sup> study showed that there was an association between prevalence of urinary tract infection and improper perineal washing techniques. The study conducted by Raya in Nublus, Palestina on prevalence of urinary tract infection in children in the age group of 6-12 years also showed that there were a poor knowledge and unhygienic use of toilets among school children<sup>15</sup>. According to these research findings, more education should be provided to females in the community concerning personal hygiene which are the major contributing factors for urinary tract infections.

The risk factors for urinary tract infection were categorized as anatomic, physiologic, genetic and behavioural. Anatomically it is hypothesized that females are more prone to urinary tract infection because their urethra is shorter and in closer proximity to the anus and vagina which make contamination to be very easy<sup>16</sup>. Urine incontinence and physiological anomalies, which restrain the flow of urine, delayed bladder emptying or an increased post-void residual volume, seem to be risk factors for urinary tract infection<sup>17</sup>. Urine incontinence is also a suggested risk factors for urinary tract infection since the urine that stays in the bladder is more likely to grow bacteria and cause an infection<sup>18,19</sup>. Genetic risk factor is another factor which means that some females seem to have a genetic predisposition to urinary tract infection with the history of recurrent urinary tract infection.

The present studies showed that behavioural factor, such as sexual activity, among the teenage girls are suggested as an important risk factor for urinary tract infection. The results showed high prevalence in the adolescence age group 18-29 (58.54%), where they are sexually active while other age groups showed low prevalence of urinary tract infection. This is in agreement with the findings of Oladeinde *et al*<sup>20</sup>, Orrett<sup>21</sup> and Ogomaka *et al*<sup>22</sup>. The prevalence of urinary tract infection differs significantly between different age groups in this study.

### CONCLUSION AND FUTURE RECOMMENDATIONS

Urinary tract infection is still a problem to females despite several researches have been done and coming up with recommendations of overcoming this problem. The results of the present study showed a prevalence of 63.47% among female participants aged 6-50 years at Mwananyamala Hospital, Kinondoni district, Tanzania. From the present study, it was concluded that the knowledge, awareness, prevention and control of urinary tract infection is insufficient among the participants. The anatomical structure, physiologic, genetic, urine incontinence, age and behavioral pattern were suggested as the risk factors for the urinary tract infection.

The Tanzania government through the ministry of health and social well affairs should establish a program which will be dealing with mass screening of the community to both symptomatic and asymptomatic individuals and treating those who are infected so as to prevent and control of this problem in the community. The government should provide the health education to the community about the risk factors, prevention, control and impacts of urinary tract infection to the human health.

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