



Awareness of Women about the Causes of Urinary Tract Infection and its Complications

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ABSTRACT

Background: Urinary tract infection (UTI) is a prevalent infection that frequently affects women. It can be symptomatic or asymptomatic and if left untreated, it could lead to morbidity and mortality complications. UTIs to Affect Over Half of Women during their Lifetime.

Objective: To assess the awareness of women about the causes of UTI and its complications.

Methods: An observational study conducted in the Dakshina Kannada district spanned over a period of 1.5 months. The information was gathered through an online survey that was carefully designed and administered on various social media platforms. The survey comprised inquiries regarding demographic information and knowledge concerning urinary tract infections (UTIs) including causes, risk factors, signs and symptoms, complications, and treatment.

Results: A total of 113 women from Dakshina Kannada district, aged between 15 and 49 years, were enrolled in the research study. The majority of women (70, 61.9%) reported that all the listed factors i.e., prolonged retention of urine, poor menstrual hygiene, low level of environmental/personal hygiene, inadequate water intake, and changes in gut bacteria, can cause UTI. Most women (49, 43.4%) think bacterial infection of the vagina is a risk for UTI. Most women (86, 76.1%) reported that they consult a physician as soon as symptoms arise. The most known complications of UTI are kidney infection (74, 65.5%), recurrent infections and urinary tract scarring (67, 59.3%), urosepsis (48, 42.5%), vaginitis and kidney failure (44, 38.9%). Drinking a lot of water as the most appropriate way to treat (56, 49.6%) as well as prevent (93, 82.3%) UTI was known by most women.

Conclusion: It has been observed through this study that there is a significance of the level of education on the awareness and knowledge regarding the disease. Though our study result presents an adequate level of awareness among the women in the population, it also shows a significant number of women not aware/partially aware of the various aspects of the disease including its prevention and symptoms.

Keywords: Awareness, causes, complications, urinary tract infection, women.

Introduction

Urinary tract infection (UTI) is a prevalent infection that frequently affects women. Females have a significantly higher susceptibility to urinary tract infections (UTIs) in comparison to males^[1]. Women are particularly at risk of developing UTIs because of their short urethra, and certain behavioural factors which include delay in micturition, sexual activity, and the use of contraceptives which promote colonization of the periurethral area with coliform bacteria^[2]. Bacteria present in the urinary tract can either be silent without causing any symptoms or result in symptoms like frequent urination and a strong urge to urinate. If left untreated, the infection can spread to the upper urinary tract and lead to fever, chills, and pain in the side of the body. It should be noted that when bacteria enter the bloodstream, it can cause serious health issues such as sepsis and even death. Most women in outpatient settings present uncomplicated UTIs and respond promptly to short-term, inexpensive oral antimicrobial therapy. Complicated or recurrent UTIs occur in patients with any anatomic, structural, or functional abnormality that compromises therapy^[3].

Recurrent UTIs are mainly caused by reinfection by the same pathogen^[4]. Re-infection refers to a new infection, i.e., the urine shows no growth after the previous infection, but the same organism is re-grown 2 weeks after treatment, or a different strain is grown at any time. A relapse is a UTI caused by the same bacterial strain from a focus inside the urinary tract within 2 weeks of treatment^[3]. One significant contributing factor to urinary tract infections (UTIs) is the utilization of a catheter. Other factors that can increase the risk of UTIs include age, lower socioeconomic status, multiple pregnancies, previous history of UTIs, aminoaciduria, anemia, and diabetes mellitus^[5].

Nomenclature

UTI – Urinary Tract Infection

Objectives

The objective is to evaluate women's awareness regarding the causes of urinary tract infections (UTI) and its potential complications.

Methodology

The methodology employed in this study involved an observational approach with a population-based cross-sectional design, conducted in the Dakshina Kannada district. The research was carried out over 1.5 months, focusing on a sample size of 100 women within the reproductive age group of 15 to 49 years. Inclusion criteria encompassed women residing in the study area within the specified age range, who expressed willingness to participate. Exclusion criteria excluded women below 15 years and above 49 years of age. Data collection was facilitated through online surveys utilizing structured questionnaires derived from previous research, customized to align with the study's objectives. The questionnaire, developed in English, covered relevant variables concerning the study's goals and consisted of two sections: one addressing demographic details and the other focusing on awareness about the causes and complications of urinary tract infections (UTI).

Results

The study included 113 women from Dakshina Kannada district with their ages ranged from 15 to 49 years in which 62.5% belonged to age group 15-25, 22.3% to age group 26-35 and 15.2% to age group 36-49. Majority of study participants (64.6%; 73) were single, while 40 (35.4%) were married. As for their education level, 86 (76.1%) were university graduated while others (23.9%;27) were graduated from high school. Considering occupation, 59 (52.2%) were students, 18 (15.9%) were homemakers, 18 (15.9%) worked in a private sector, 11 (9.7%) were involved in academic/teaching institute, 4 (3.5%) were health care workers and remaining 3 (2.8%) had other occupations. A significant portion of the students (59.4%, 41 individuals) hailed from a medical field.

Table 1 - Demographic data

Demographic details	n (%)
Age	
15 – 25	70 (62.5%)
26 – 35	25 (22.3%)
36 – 49	17 (15.2%)
Marital status	
Single	73 (64.6%)
Married	40 (35.4%)
Level of Education	
Primary school	0
Secondary school	0
High school	27 (23.9%)
University or above	86 (76.1%)
Occupation	
Home maker	4 (3.6%)
Academics/Teaching	11 (9.7%)
Healthcare worker	18 (15.9%)
Private sector	18 (15.9%)
Student	59 (52.2%)
Others	3 (2.8%)
Field of study*	
Medical	41 (59.4%)

Non-Medical	28 (40.6%)
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(*students only)

Table 2 presents an overview of the level of awareness among women in Dakshina Kannada district regarding the causes and complications of urinary tract infections (UTI). Among the participants in the study, 77.9% (88) acknowledged having knowledge about UTI, while 14.2% (16) stated that they were unaware of UTI, and 8% (9) were unsure.

Table 2 - Knowledge about UTI based on level of education

Know about UTI?	Level of Education (n)	
	High school	University or above
Yes	17	71
No	9	7
Not sure	1	8
TOTAL	27	86

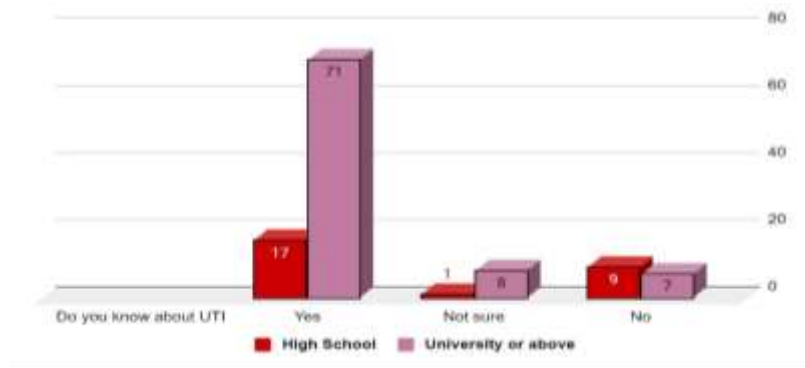


Fig. 1 – Knowledge based on level of education

Out of 113 women, 26 (23%) were previously diagnosed with UTI. 61.1% (69) women think that UTI can be recurrent. Regarding factors that can cause UTI, majority of women (70, 61.9%) reported that all the listed factors can cause UTI. Out of which most of the women (34, 30.1%) reported prolonged retention of urine and inadequate water intake can be the cause whereas 29.2% (33) reported low level of environmental/personal hygiene, 27.4% (31) reported poor menstrual hygiene and 15.9% (18) reported changes in gut bacteria can cause UTI.

Table 3 - Awareness about factors that cause UTI

Factors that cause UTI	Number of responses
Prolonged retention of urine	33
Poor menstrual hygiene	31
Low level of environment / personal hygiene	33
Inadequate water intake	33
Changes in gut bacteria	18
All the above	68

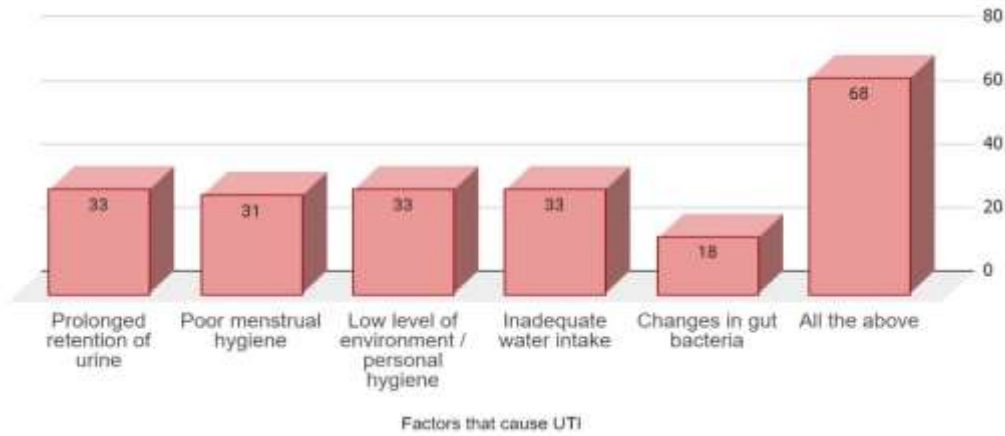


Fig. 2 – Awareness about factors that cause UTI

Most known complications of UTI are kidney infection (74, 65.5%), recurrent infections and urinary tract scarring (67, 59.3%), urosepsis (48, 42.5%), vaginitis and kidney failure (44, 38.9%). Furthermore, 33 (8.0%) women reported that STDs and 23 (20.4%) women reported that appendicitis are also complications of UTI. Only 12 (10.6%) women reported death as a complication.

Table 4 - Awareness about complications of UTI

Complications of UTI	Number of responses
Kidney infection	74
Kidney failure	44
Recurrent infections	67
Urinary tract scarring	67
Urosepsis	48
Appendicitis	23
STDs	33
Vaginitis	44
Death	12

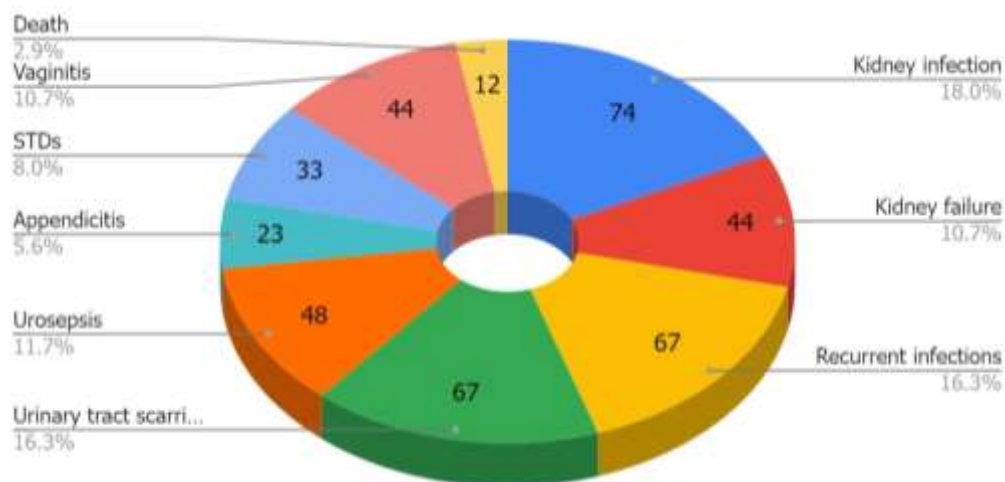


Fig 3 – Awareness about complications of UTI

As for the factors that increase risk of UTI, most women (49, 43.4%) think bacterial infection of vagina as a major risk, followed by previous diagnosis of UTI (36, 31.9%), poor nutrition (29, 25.7%), use of birth controls like diaphragms and spermicides (26, 23%), sexual intercourse (25, 22.1%),

pregnancy (22, 19.5%), diabetes (17, 15%) and menopause (16, 14.2%). Although 48 (42.5%) women think all the listed factors can increase risk of getting UTI.

In terms of the symptoms experienced by individuals diagnosed with a urinary tract infection (UTI), the most commonly reported ones include abdominal pain and increased frequency of urination, accounting for 54 cases or 47.8%. Following closely behind are the symptoms of urgency to urinate, reported in 49 cases or 43.4%. Other frequently mentioned symptoms include blood in urine (45 cases or 39.8%), dysuria (39 cases or 34.5%), and fever (34 cases or 30.1%). Only 20.4% (23) and 15% (17) reported vomiting and diarrhea respectively. Majority of women (38; 33.6%) think white and sticky vaginal discharge is seen during UTI whereas 33 (29.2%) think yellow discharge, 30 (26.5%) think no changes and only 12 (10.6%) women think grey discharge is seen during UTI.

As for changes in the urine seen during UTI, 67 (59.3%) women reported foul smell, 58 (51.3%) reported dark yellow, 39 (34.5%) reported cloudy, 32 (28.3%) reported dark brown/red. Only 10 (8.8%) reported orange coloured urine and 6 (5.3%) reported fruity smell of urine. Most women (86, 76.1%) reported that they consult physician as soon as symptoms arise followed by if symptoms haven't resolved after few days (45, 39.8%), when they get UTIs frequently (44, 38.9%), when they see blood in urine (41, 36.3%), when they have pain in the lower tummy or in the back (39, 34.5%), when symptoms are severe or getting worse and if symptoms come back after treatment (38, 33.6%).

The most known effective methods to prevent UTI were drinking an adequate amount of (93, 82.3%), going to bathroom when needed and not holding urine for longer periods (85, 75.2%), ensuring cleanliness of undergarments (69, 61.1%), wiping from front to back after using washroom (60, 53.1%), empty your bladder soon after having sexual intercourse (45, 39.8%). 43 (38.1%) women think washing genitals with perfumed soap or bubble bath and using diaphragm or condoms with spermicidal lubricant 29 (25.7%) are also effective ways to prevent UTI.

Drinking a lot of water as the most appropriate way to treat UTI was known by most women (56, 49.6%) along with antibiotics (51, 45.1%), increase vitamin C intake (33, 29.2%), herbs (31, 27.4%) and taking probiotics (28, 24.8%). Folk remedies was known by least women (25, 22.1%) as an appropriate way to treat UTI. However, 51 (45.1%) women reported that all the listed ways are effective to treat UTI.

Table 3 - Distribution of awareness regarding causes of urinary tract infection and its complications among women of Dakshina Kannada.

Awareness questions	Response n (%)
Do you know about UTI?	
a. Yes	88 (77.9%)
b. No	16 (14.2%)
c. Not sure	9 (8%)
Have you previously been diagnosed with UTI?	
a. Yes	26 (23%)
b. No	76 (67.3%)
c. Not sure	11 (9.7%)
Do you believe that UTIs can recur?	
a. Yes	69 (61.1%)
b. No	10 (8.8%)
c. Not sure	34 (30.1%)
Which of the following factors can cause UTI in women?	
a. Prolonged retention of urine	34 (30.1%)
b. Poor menstrual hygiene	31 (27.4%)
c. Low level of environmental / personal hygiene	33 (29.2%)
d. Inadequate water intake	34 (30.1%)
e. Changes in gut bacteria	18 (15.9%)
f. All the above	70 (61.9%)
Which of the following things can make women more susceptible to UTIs?	
a. Pregnancy and childbirth	22 (19.5%)

b.	Poor nutrition	29 (25.7%)
c.	Previous diagnosis of UTI	36 (31.9%)
d.	Bacterial infection in vagina- Bacterial vaginosis	49 (43.4%)
e.	Sexual intercourse	25 (22.1%)
f.	Diabetes	17 (15%)
g.	Menopause	16 (14.2%)
h.	Birth control	26 (23%)
i.	All the above	48 (42.5%)

What are the symptoms that a UTI patient feels?

a.	Dysuria	39 (34.5%)
b.	Increased frequency of urination	54 (47.8%)
c.	Urgency to urinate	49 (43.4%)
d.	Blood in urine	45 (39.8%)
e.	Abdominal pain	54 (47.8%)
f.	Fever	34 (30.1%)
g.	Vomiting	23 (20.4%)
h.	Diarrhea	17 (15%)
i.	All the above	42 (37.2%)

What changes in the vaginal discharge may be seen during UTI?

a.	No changes	30 (26.5%)
b.	White & sticky discharge	38 (33.6%)
c.	Gray discharge	12 (10.6%)
d.	Yellow discharge	33 (29.2%)

What changes in the urine may be seen during UTI?

a.	Clear / pale yellow	23 (20.4%)
b.	Dark yellow	58 (51.3%)
c.	Dark brown / red	32 (28.3%)
d.	Cloudy	39 (34.5%)
e.	Orange	10 (8.8%)
f.	foul smell	67 (59.3%)
g.	fruity smell	6 (5.3%)

When should you consult a physician?

a.	As soon as symptoms arise	86 (76.1%)
b.	When symptoms are severe or getting worse	38 (33.6%)
c.	When you get UTIs frequently	44 (38.9%)
d.	When you can see blood in urine	41 (36.3%)
e.	Have pain in the lower tummy or in the back	39 (34.5%)
f.	If the symptoms haven't resolved after few days	45 (39.8%)

g.	If symptoms come back after treatment	38 (33.6%)
What are the effective ways to prevent UTI?		
a.	Drinking adequate amount of water	93 (82.3%)
b.	Going to bathroom when needed and not holding urine for longer periods	85 (75.2%)
c.	Washing genitals with perfumed soap or bubble bath	43 (38.1%)
d.	Using diaphragm or condoms with spermicidal lubricant	29 (25.7%)
e.	Ensuring cleanliness of undergarments	69 (61.1%)
f.	Wiping from front to back after using washroom	60 (53.1%)
g.	Empty your bladder soon after having sexual intercourse	45 (39.8%)
What are the complications of UTI?		
a.	Kidney infection	74 (65.5%)
b.	Kidney failure	44 (38.9%)
c.	Recurrent infections	67 (59.3%)
d.	Urinary tract scarring	67 (59.3%)
e.	Urosepsis	48 (42.5%)
f.	Appendicitis	23 (20.4%)
g.	STDs	33 (29.2%)
h.	Vaginitis	44 (38.9%)
i.	Death	12 (10.6%)
What is the best course of action for treating a UTI?		
a.	Antibiotics	51 (45.1%)
b.	Herbs	31 (27.4%)
c.	Folk remedies	25 (22.1%)
d.	Drink lot of water	56 (49.6%)
e.	Increase vitamin C intake	33 (29.2%)
f.	Taking probiotics	28 (24.8%)
g.	All the above	51 (45.1%)
Do you know about UTI?		
d.	Yes	88 (77.9%)
e.	No	16 (14.2%)
f.	Not sure	9 (8%)

Discussion

The purpose of this study was to evaluate women's knowledge about urinary tract infections (UTIs), particularly with relation to the risk factors for UTIs in women. Among the subjects, the most reported cause of UTI was prolonged retention of urine and inadequate water intake (34, 30.1%) which is similar to the results found by Asiri AA *et al.*^[5]

A study conducted by Harmanli HO *et al.*^[6] concluded that women with bacterial vaginosis are at increased risk for urinary tract infections. Most women in the current study (18.3%) stated that bacterial infection of the vagina is a risk factor for UTI which entails that awareness about factors that increase risk of UTI is good among the study population.

The most diagnostic symptoms of urinary tract infections according to Chu MC *et al.* [7] include change in frequency, dysuria, urgency, and presence or absence of vaginal discharge. According to the current study, study subjects had a strong understanding of these symptoms because most women reported increased frequency of urine, abdominal pain, and dysuria during UTI.

In the survey conducted by Cyran O *et al.* [8], women were asked to rank the methods of UTI prevention in order of importance. Wiping in the proper direction was identified as the most important (81.3%), followed by water consumption (43.3%) and bladder emptying (33.3%) when necessary. Women reported the same approaches in the current survey, although the percentages were slightly different and in the following order: drinking enough amounts of water (82.3%), going to the toilet when needed and not retaining urine for prolonged durations (75.2%), and wiping from front to back (53.1%).

In this study 65.5% of the women reported kidney infection and 38.9% reported kidney failure as complication of UTI which shows that awareness of women about how UTI can affect the kidney is greater compared to that found by Sidi AI *et al.* [9] Most women consult a physician as soon as symptoms arise (86, 76.1%) parallel to that reported by Tabassum F *et al.* [10]

Future prospective

This study could be extended to a longer duration thereby ensuring better results and power of the study. This study can also be extended to a pre-post interventional design by providing education and then determining its effect on the population to further provide proof of the effect of educational interventions in the general population regarding urinary tract infections.

Conclusion

UTI is one of the most common illnesses in women, with a high probability of recurrence and reinfection, necessitating a high degree of public awareness and education. It has been observed through this study that there is a significance of the level of education on the awareness and knowledge regarding the disease. Though our study result presents an adequate level of awareness among the women in the population, it also shows a significant number of women not aware/partially aware of the various aspects of the disease including its prevention and symptoms. The response of few women with respect to the treatment of the disease shows their tendency to follow home remedies and other alternative therapy. Thus, extensive educational programs can be provided to general population in particular women to increase their chances of prevention and also appropriate and timely antibiotic treatment of the disease.

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