International Journal of Community Medicine and Public Health
Tabassum F et al. Int J Community Med Public Health. 2021 Feb;8(2):564-569
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20210203

Original Research Article

Assessment of knowledge and awareness regarding urinary tract infections among the university students of Bangladesh

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Received: 05 November 2020
Revised: 20 December 2020
Accepted: 29 December 2020

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ABSTRACT

Background: Urinary tract infections (UTIs) are the major health problems in young population. The aim of the study is to determine the knowledge and awareness about UTI among the university students of Bangladesh.
Methods: The survey carried out among 403 students of different private universities of department of Pharmacy. Data were collected using structured questionnaires containing 6 questions related to the students' demographics and 10 questions related to the knowledge and 6 questions related awareness to UTI. Data was analyzed by the Microsoft Excel version 10.
Results: Among the respondents there were 61.04% female, majority of them were unmarried (93.80%) and the average limit for age was found to be 21 years. The result showed that 76.92% of respondents correctly identified bacteria as the principle pathogens forming UTIs and 80.15% suggested antibacterial drugs for the treatment of UTIs. 60.04% showed poor knowledge on the further consequences of untreated UTIs in the long run and 51.86% don't know the adverse effect of urinary retention. This study showed that cumulatively 77.79% respondents had positive attitude towards the measures against UTIs. Among the subjects 71.46% are against holding urine , 93.80% thinks drinking plenty of water is good for heath, 94.79% wanted to contact the doctor when get ill.
Conclusions: Short-term morbidity in terms of fever, dysuria, and lower abdominal pain (LAP) and may result in permanent scarring of the kidney may caused by UTIs. Students must be made aware of these symptoms and their causes and also aware about the prevention of UTIs to decrease the morbidity rate.

Keywords: Awareness, Bangladesh, Knowledge, University students, UTIs

INTRODUCTION

Urinary tract infections (UTIs) are the inflammatory disorders of the urinary tract caused by the abnormal growth of pathogens.[1] Urinary tract infection may cause short-term morbidity in terms of fever, dysuria, and lower abdominal pain (LAP) and sometimes may result in permanent scarring of the kidney.[2] These are a significant cause of morbidity in females of all ages, infant boys and older men. Urinary tract infections (UTIs) are some of the most common bacterial infections, globally affecting 150 million people each year[3]. Serious sequelae associated with UTIs include frequent recurrences, renal damage in young children, pyelonephritis with sepsis, pre-term birth and complications caused by frequent antimicrobial use, such as high-level antibiotic resistance and Clostridium difficile colitis.[4] Several factors such as gender, age, race, diabetes, urinary catheter, genitourinary tract abnormalities, circumcision, pregnancy, infants, elderly, HIV and hospitalization status causes significant risk for recurrent UTIs.[5]

Clinically, UTIs are classified as uncomplicated or complicated. Uncomplicated UTIs typically affect people who are otherwise healthy and have no structural or

neurological urinary tract abnormalities; these infections are differentiated into lower UTIs (cystitis) and upper UTIs (pyelonephritis).[6] Female gender, a prior UTI, sexual activity, vaginal infection, diabetes, obesity and genetic susceptibility are the main risk factors associated with cystitis.[7] Complicated UTIs are defined as UTIs related with the factors that compromise the urinary tract or host defence, including urinary retention caused by neurological disease, urinary obstruction, immunosuppression, pregnancy, renal transplantation, renal failure, and the presence of foreign bodies such as calculi, indwelling catheters or other drainage devices.[8] Catheter-associated UTIs (CAUTIs) are related with increased morbidity and mortality, and are the most common cause of secondary bloodstream infections. Risk factors for developing a CAUTI include prolonged female gender, catheterization, diabetes and older age.[9]

UTIs are mainly caused by both Gram-negative and Gram-positive bacteria, as well as by certain fungi. Uropathogenic *Escherichia coli* (UPEC) is the most common causative agent for both uncomplicated and complicated UTIs. For the agents involved in uncomplicated UTIs, UPEC is followed in prevalence by *Klebsiella pneumoniae, Enterococcus faecalis, Staphylococcus saprophyticus*, group B *Streptococcus* (GBS), *Proteus mirabilis, Staphylococcus aureus, Pseudomonas aeruginosa*, and *Candida* spp. For complicated UTIs, the order of prevalence for causative agents, following UPEC as most common, is *Enterococcus* spp., *K. pneumoniae, S. aureus, Candida spp., P. mirabilis, P. aeruginosa* and GBS.[4]

METHODS

Study area Dhaka city is the capital city of Bangladesh. The study was conducted at two leading private universities of Bangladesh which were Northern University Bangladesh and Stamford University Bangladesh. Respondents composed of Pharmacy undergraduate students and the students were divided into 5 classes-first year, second year, third year, forth year and Masters students. All students of Department of Pharmacy of the two universities were included in this research.

The study was a descriptive cross-sectional study, webbased survey, which was conducted from April 2020 to June 2020.A standard questionnaire was developed in the Google form focusing the knowledge and awareness regarding UTIs.

The questionnaires were randomly distributed to the male and female students of the selected universities. Appropriately fulfilled responses were collected for further analysis.

The data analysis was carried out by using Microsoft Excel version 10. The descriptive data such as distribution of respondents according to the knowledge and awareness regarding UTIs as well as demographic characteristics, were expressed in percentage and figures.

Chi square test was performed to identify the significance correlation among the factors related to knowledge and awareness.

RESULTS

Demographic characteristics of the respondents

Total 403 completed forms were collected from participants of 27 districts studying in different universities of Bangladesh; which given rise to a response rate of 80.60%. Among the respondents there were 61.04% female and 31.96% male.

About 72.95% of the total students lives in town and 27.05% in village; where the Dhaka district alone encompassed 81.89% of their residential area. Demographic data including gender, marital status, age, education level, home town and residential area of the respondents are shown in Table 1.

Table 1: Demographic figures of respondents.

Variables	N	Percentage
Gender		
Female	246	61.04
Male	157	38.96
Marital status		
Unmarried	378	93.80
Married	25	06.20
Age (in years)		
Below 18	01	00.25
18-21	194	48.14
22-24	195	48.39
Above 24	13	03.23
Education level		
1st year student	77	19.11
2nd year student	106	26.30
3rd year student	72	17.87
4th year student	142	35.24
Masters	06	01.49
Residential area		
Town	294	72.95
Village	109	27.05
Lives with		
With Parents	237	58.81
With Brother or sister	09	02.23
With uncle	02	00.50
With relative	12	02.98
Hostel	37	09.18
Mess	73	18.11
Mixed (With Parents, With Brother or sister; Mess)	19	04.71
Others	14	03.47

Prevalence of UTIs among the participants

Demographic figures about the prevalence of UTIs are presented in Table-2. This lower rate of infection may be due to poor knowledge and the social culture for hiding diseases like UTIs by both the men and women in Bangladesh. Among the infected ones the highest infection rate was found in the unmarried 19.11%, female 14%, 4th year students 8.19%, embracing the age group 22-24 (12%). On the other hand the male counterpart had the infection rate of 7%, which coincides with the prevalence of UTIs in men worldwide.[11]

Table 2: Prevalence of UTIs among the respondents based on Demographic figures.

Status	Subjects	Infected ()	Non-Infected ()
Education	1st Year students	2	16.63
	2nd Year students	4	21.84
	3rd Year students	5	12.90
	4th Year students	8	27.05
	Masters	1	0.50
Age	Below 18	0	0.25
	18-21	8	39.95
	22-24	12	36.72
	Above 24	1	1.99
Sex	Male	7	32.01
	Female	14	46.90
Marital Status	Unmarried	19	74.69
	Married	2	4.22

Table 3: Advertency of UTIs among the respondents based on demographic figures.

	Advertence about UTIs				Source of Advertence									
Variables	**Yes**	**%**	**No**	**%**	**Book**	**%**	**Media (TV, Net)**	**%**	**Friends & Family**	**%**	**Teacher**	**%**	**Don't Know**	**%**
Education level														
1st Yr student	62	15.38	15	3.72	30	7.44	25	6.20	13	3.23	4	0.99	7	1.74
2nd Yr student	99	24.57	7	1.74	60	14.89	16	3.97	12	2.98	2	0.50	8	1.99
3rd Yr student	65	16.13	7	1.74	34	8.44	19	4.71	8	1.99	3	0.74	6	1.49
4th Yr student	138	34.24	4	0.99	111	27.54	15	3.72	6	1.49	1	0.25	7	1.74
Masters	6	1.49	0	0.00	5	1.24	2	0.50	3	0.74	1	0.25	5	1.24
Age														
Below 18	1	0.25	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.25
18-21,	174	43.18	20	4.96	103	25.56	46	11.41	21	5.21	4	0.99	8	1.99
22-24	183	45.41	12	2.98	126	31.27	28	6.95	16	3.97	4	0.99	11	2.73
Above 24	12	2.98	1	0.25	11	2.73	3	0.74	5	1.24	3	0.74	13	3.23
Gender														
Male	140	34.74	17	4.22	93	23.08	25	6.20	18	4.47	5	1.24	23	5.71
Female	230	57.07	16	3.97	147	36.48	52	12.90	24	5.96	6	1.49	10	2.48
Marital status														
Unmarried	346	85.86	32	7.94	212	52.61	71	17.62	34	8.44	7	1.74	25	6.20
Married	24	5.96	1	0.25	28	6.95	6	1.49	8	1.99	4	0.99	8	1.99
Total	370		33		240		77		42		11		33	

Advertency of UTIs among the participants

Among 403 participant in this survey, 370 (91.381%) was found to have advertency regarding UTIs showing good knowledge about this disease among the young generation.

Demographic characteristics regarding the awareness of UTIs for the subjects are presented in Table 3.

Knowledge of UTIs

About 76.92% correctly identified bacteria as the principle pathogens forming UTIs and 80.15% suggested antibacterial drugs for the treatment of UTIs. Statements are presented in Table 4.

Although most of the subjects (83.13%) were positive concerning the proper maintenance of hygiene as an approach to avoid UTIs, but 27.05% of them they do not

know the accurate susceptible gender for UTIs and only 29.28% subjects know the possible symptoms of UTIs.

In addition 60.04% showed poor knowledge on the further consequences of untreated UTIs such as affecting the lung in the long run and 51.86% don't know the adverse effect of urinary retention.

Table 4: Knowledge components of UTIs among the respondents.

Knowledge components					
The causative factor for UTIs	**Male**	**Female**	**Total**	**%**	**p-value (Chi square)**
Bacteria	113	197	310	76.92%	
Not sure	33	41	74	18.36%	0.096682
Virus	11	8	19	04.71%	
Cloudy urine can be a symptom of UTIs					
Yes	44	74	118	29.28%	
No	62	96	158	39.21%	0.895609
Not sure	51	76	127	31.51%	
UTIs only affects woman					
Yes	15	46	61	15.14%	
No	119	175	294	72.95%	0.027321
Not sure	23	25	48	11.91%	
Frequently emptying fully loaded bladder helps in the prevention of UTIs					
Yes	73	121	194	48.14%	
No	24	34	58	14.39%	0.849824
Not sure	60	91	151	37.47%	
Maintenance of proper hygiene related to urination is essential to prevent UTIs					
Yes	117	218	335	83.13%	
No	8	8	16	03.97%	0.000801
Not sure	32	20	52	12.90%	
Type of drug is used to treat UTIs caused by bacteria					
Antibiotics	120	203	323	80.15%	
Antiviral	24	24	48	11.91%	0.219345
Vitamin	0	2	2	00.50%	
Other	13	17	30	07.44%	
UTIs can cause damage to the lungs					
Yes	51	106	157	38.96%	
No	59	62	121	30.02%	0.020724
Not sure	47	78	125	31.02%	
Grand Total	157	246	403		

Table 5: Awareness components of UTIs among the respondents.

Awareness component					
	Male	**female**	**Total**	**%**	**P value (Chi square)**
Drinking more water, may help your body clear the infection faster.					
True	141	237	378	93.80%	
False	10	6	16	03.97%	0.029148
Not sure	6	3	9	02.23%	
Untreated UTIs may not have life threatening event.					
True	54	65	119	29.53%	
False	67	152	219	54.34%	0.000356
Not sure	36	29	65	16.13%	
If you suspect a UTIs, then you need to contact your doctor as soon as possible.					
True	147	235	382	94.79%	
False	1	3	4	00.99%	0.414385

Continued.

Awareness component					
Not sure	9	8	17	04.22%	
A simple examination and urine or blood test could save you from a lot of trouble in the long run					
True	115	208	323	80.15%	
False	11	9	20	04.96%	0.020573
Not sure	31	29	60	14.89%	
Holding in urine and not draining your bladder fully can increase your risk of UTIs					
True	102	186	288	71.46%	
False	12	14	26	06.45%	0.068516
Not sure	43	46	89	22.08%	
Do you empty your bladder frequently when full?					
True	99	192	291	72.21%	
False	26	25	51	12.66%	0.004611
Not sure	32	29	61	15.14%	
Grand total	157	246	403		

Awareness of UTIs

The awareness components were divided into three groups true, false and not sure. Table 5 presents statements from each groups. This study showed that cumulatively 77.79% respondents had positive attitude towards the measures against UTIs. Among the subjects 71.46% are against holding urine, 93.80% thinks drinking plenty of water is good for heath, 94.79% wanted to contact the doctor when get ill whilst 80.15% thinks sampling could be beneficial in the long run. On the other hand 70.47% respondents took the magnetite of the adverse effect of the UTIs.

DISCUSSION

Majority of respondents were unmarried (93.80%) with lower percentage (06.20%) were married and most of them were young having ages of 22-24 (48.39%) and 18-21 (48.14%). (Table-1) The average limit for age was found to be 21 years. Maximum respondents (58.81%) live with parents followed by mess (18.11%) and hostel (09.18%). All the respondents were from honours level with minimal (01.49%) from Masters level. The largest portion of respondents was the fourth-year students (35.24%) followed by second year students.

Analysis of the prevalence for the UTI (Depicted in Table -02) shows majority of the participants (79.81%) didn't experienced UTIs, only 21.09% experienced it. Within the participants the overall infection rate experienced was lower than that reported by Christine M.Chu for Americans.[10] Respondents with lower age limit like the students from 1st to 3rd year had a gradual increase in the infection rate. As major participants were young generation thus the overall scenario indicating age dependent increase in the infection rate.[12]

Amid the educational level the best awareness regarding the disease was observed for the 4th year students 34.24%, while the age group 22-24 (45.41%) and unmarried (85.86%) female (57.07%) took the crown for the best awareness. For these young generations the book (59.55%) acted as the principle source of information. Other notable source was Media (Internet, TV; 19.11%) as well as Friends and family members (10.42%).

The knowledge amongst the subjects was categorized as yes, no and not sure in addition the treatment strategy and causative factors were characterized under the drug class and pathogens respectively. The study resulted most respondents had fair to good knowledge of various aspects of UTIs. This knowledge component suggests the implementation of measures to provide additional knowledge and make the young generations more aware in the prevention of UTIs. Educational program containing knowledge transfer may be effective to introduce the necessary information rendering the graduate students updated in this regard.

There was a significant role of education on the awareness of the subjects. The lack of understanding on the long term effect for UTIs could partly be attributed to the initially high knowledge for many items.

CONCLUSION

As the students are Pharmacy under graduate students, most of the students have good knowledge about UTIs, though in some cases, they are confused about the correct knowledge. The students have lack of understanding on the long term effect for UTIs. Awareness programs should be done to increase students's knowledge about UTIs and make them aware to prevent UTIs and encourage them to visit doctors if necessary to reduce the sufferings of morbidity related to UTIs.

ACKNOWLEDGEMENTS

We express our heartfelt thanks to all individuals who participated in the study: respondents and data collectors.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Tabassum F, Parvin MN, Manik MIN. Assessment of knowledge and awareness regarding urinary tract infections (UTIs) among the university students of Bangladesh. Int J Community Med Public Health 2021;8:564-9.