

# Urinary Tract Infection- Knowledge and Habitual Practices among Adolescent Girls Residing in College Hostel of Mangaluru, India: A Cross-sectional Study

SONIA KAREN LIZ SEQUERA<sup>1</sup>, LEENA KUNNATH CHACKO<sup>2</sup>, PRIYA SWEETY PEREIRA<sup>3</sup>

## ABSTRACT

**Introduction:** Urinary Tract Infection (UTI) is a common infection among female adolescents, causing significant distress in the hospital or community settings. Most of the issues related to UTI could be prevented by adequate knowledge and safe habitual practices. Within the context of reproductive health services, nurses or nursing students being healthcare providers are typically expected to have knowledge on the causes of UTI, methods of preventing and managing such conditions and teaching the same to young girls and women. Education provided to women, particularly adolescents, by nurses and by trainers who have relevant experience and knowledge may ensure proper hygiene practices.

**Aim:** To determine the level of knowledge, expressed habitual practice among 82 adolescent girls of a selected nursing college hostel.

**Materials and Methods:** This was a descriptive cross-sectional study conducted between June 2019 and December 2019. Tools included structured questionnaire on knowledge of UTI and a rating scale on expressed habitual practice on UTI prevention. All the 82 students of 1<sup>st</sup> BSc Nursing from the study institute

were recruited. Adolescent girls who have undergone training on prevention of UTI in nursing curriculum and who had congenital defects of urinary system were excluded from the study.

**Results:** The mean age of the subjects was 18.69±0.46 years. Total 13.4% experienced UTI in their life time. In terms of overall knowledge score, out of 82 subjects, around 40.2% had average (scoring between 8-10 out of 14) and few (28%) had good knowledge ( $\geq 11$ ) on UTI prevention. In terms of overall expressed habitual practice, majority (53.7%) had average practice (score between 26-33 out of 46) whereas, 4.9% had unsafe practice (score  $\leq 25$ ). The Karl Pearson correlation coefficient was 0.1 and showed weak positive correlation between knowledge and expressed habitual practice. Association was found between experience of UTI p-value<0.001 and expressed habitual practice.

**Conclusion:** Pooled results showed overall knowledge and expressed habitual practice was average and safe. Healthcare professionals, especially primary care givers such as nurses and nursing students, have the responsibility to broadcast proper information about UTI so that women/adolescents can identify the causes, risk factors, symptoms of UTI in early stages thereby preventing the mortality and morbidity related to UTI.

**Keywords:** Healthcare professionals, Morbidity, Nursing students

## INTRODUCTION

The UTI is a common infection that can upset any part of the urinary system [1]. This causes distress in the hospital or community settings that result in high healthcare and financial cost [2,3]. UTI has been the major cause of morbidity and mortality among Indian population [4].

Urinary Tract Infection (UTI) most commonly occurs in adolescent age group [5]. Lower UTIs are considered as the most common adolescent girl's infection. At least one episode of UTI occurs in nearly 5-6% of girls during their entry from high schools to graduation. Compared to boys, the recurrence rate is 50% greater in girls [4]. The vagina and anus are positioned close to the urinary opening which makes females more prone for the development of UTI [6]. Due to UTI, every year nearly 6-7 million young women visit physicians and therefore it is a major concern for the parents and healthcare providers [1,4]. Any delay in the treatment leads to permanent kidney damage, bacterial endocarditis and infertility [4,7].

Among adolescent girls, poor hygiene and dysfunctional voiding pattern increases the risk for UTI. Silent UTI may occur among adolescent girls due to inadequate intake of water and infrequent passage of urine. The possible link between the prevalence of UTI among students residing in the hostel includes the use of western toilets, unhygienic mass toilets; improper menstrual hygiene and toileting habits [7]. A study also reveal that nursing students

confessed an indiscriminate consumption of antibiotics whenever they fell sick or difficulty while micturition is noticed [8].

Early identification of the disease by proper diagnostic measures and management will help to prevent the complications of UTI. Proper preventive measures like maintenance of good hygienic measures during menstruation, intake of more amount of water etc., also will help to reduce the incidence of UTIs [5].

The investigators have come across many nursing students residing in hostel and suffering from recurrent UTI. Another reason to conduct study among nursing students is that, they would be the primary care givers who can undertake the role of health educator through proper approaches in identifying and resolving issues, particularly in a country like India, where these problems are considered strictly private. So, understanding their own issues being an adolescent girl will further motivate them in using adequate knowledge and skills for themselves and also in identifying various symptoms, which may assist in preventing urinary infections, as well as in ensuring that the women comply with the recommended hygienic practices. Education provided to women, particularly adolescents, by nurses and by trainers who have relevant experience and knowledge may ensure proper hygiene practices [9].

Hence the above mentioned factors motivated the investigator to undertake this study. The primary aim of this study was to assess the knowledge and expressed habitual practices among adolescent girls towards prevention of UTI.

## MATERIALS AND METHODS

A cross-sectional descriptive survey approach was employed to study 82 adolescent girls' knowledge and expressed habitual practice towards the prevention of UTI. Ethical clearance was obtained from Institutional Review Committee (IRC/FMCON/2018/FAC-28) and Father Muller Institutional Ethics Committee (FMIEC/CCM/44/2019). The study has been registered under CTIRI-Ref/2019/06/026318. Permission for data collection was obtained from the principal of Nursing College and the chief warden of the hostel. Written informed consent was obtained from all the subjects.

The investigator conducted pilot study from 15<sup>th</sup> June 2019 to 30<sup>th</sup> June 2019, among eight adolescent girls of 1<sup>st</sup> year diploma in General Nursing and Midwifery (GNM) residing in the nursing hostel located in Mangaluru, Dakshina Kannada District, Karnataka, India and the main study was conducted from 1<sup>st</sup> November 2019 to 30<sup>th</sup> December 2019, as per the duration assigned for data collection.

**Inclusion criteria:** The nursing students of 1<sup>st</sup> year BSc nursing residing in the selected hostel of a nursing college were chosen for the study (2018 batch-entry level). Sampling technique and size was not applicable, as all the students of 1<sup>st</sup> BSc Nursing were recruited.

**Exclusion criteria:** Adolescent girls who had undergone training on prevention of UTI in the nursing curriculum and who had congenital defects of urinary system were excluded. Therefore, the students who just entered into the profession (freshers) were recruited for the study and no students met the exclusion criteria.

### Data Collection

The tool was developed after an intensive review of literature, consultation and discussion with experts [9,10]. A blue print was prepared, which showed the distribution of items according to the content areas. Tools of data collection consisted of baseline proforma, structured knowledge questionnaire covering two domains- basics of UTI comprising questions from 1-7 and preventive aspects towards UTI from questions 8 to 14. Total knowledge questionnaire comprised of 14 multiple choice questions. The maximum possible score was 14. The scores  $\geq 11$  (80%) was considered as good knowledge, scores between 8 to 10 (61-79%) as average and scores  $\leq 8$  (60%) was considered as poor knowledge. The mean percentage knowledge score  $\geq 80\%$  would be considered as good knowledge level and the mean percentage knowledge score  $\leq 60$  would be considered as poor knowledge (for all domains and overall knowledge score).

To assess the expressed habitual practice, a three-point rating scale (with score 0, 1 and 2) was used which covered two domains- the hygienic practices from question 1-14 and fluid and dietary habits from questions 15-21. The maximum score was 42. The scores  $\geq 34$  (74%) was considered as safe practice, scores between 26-33 (55-73%) was average and scores  $\leq 25$  (54%) was considered as unsafe practice. The mean percentage practice score  $\geq 80\%$  would be considered as safe practice level and the mean percentage practice score  $\leq 60$  would be considered as unsafe practice (for all domains and overall practice score).

All the tools of data collection were validated by experts from the field of medicine and nursing and the Content Validity Index (CVI) and Scale Content Validity (SVI) was calculated. To find the reliability of the tool, the Stability (intra class correlation coefficient) and internal consistency (Cronbach's alpha) was used. The stability (intra class correlation coefficient) of the knowledge questionnaire was 0.963 and internal consistency (Cronbach's alpha) was 0.762. For the rating scale on expressed habitual practice, the stability (intra class correlation coefficient) of the tool was 0.995 and the internal consistency (Cronbach's alpha) was 0.809. Self-reported technique was used for data collection.

## STATISTICAL ANALYSIS

The data was analysed using Statistical Package for Social Sciences (SPSS) version 16.0. Descriptive statistics such as frequency,

percentage, mean and standard deviation was used. For inferential statistics, Karl Pearson correlation test and Chi-square test was used to find the association with selected demographic variables.

## RESULTS

The mean age and SD of the subjects was  $18.69 \pm 0.46$  years. Out of 82 subjects, a few 16 (13.4%) have experienced UTI at least once in their life time. Less than half had received information about UTI from friends/relatives 56 (46.3%) and health personnel 52 (42.7%). None had the history of any other illness.

In terms of knowledge about prevention of UTI, results showed that, majority of the subjects had average knowledge on prevention of UTI {33 (40.2%)}, whereas a few had good knowledge {23 (28%)}. [Table/Fig-1] shows the areawise mean, standard deviation and mean percentage of knowledge on prevention of UTI. The mean knowledge score was higher in the domain of knowledge on basics of UTI (66.71%) than in the domain of knowledge on preventive aspects of UTI (62.85%). The overall mean knowledge score was considered average (64.78%). [Table/Fig-2] shows knowledge towards UTI prevention related questions with frequency and percentage.

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Domain	Item	Maximum score	Range	Mean $\pm$ SD	Mean knowledge score (%)
Basics of UTI	1-7	7	4	4.67 $\pm$ 1.07	66.71
Preventive aspects towards UTI	8-14	7	7	4.40 $\pm$ 1.45	62.85
Over all knowledge score	14	14	9	9.07 $\pm$ 2.25	64.78

**[Table/Fig-1]:** Mean, standard deviation and mean percentage of the knowledge score of the pilot study (N=8).

Sl. No.	Statements related to knowledge on UTI	Frequency (n)	(%)
1.	Females are more prone for UTI due to the presence of short urethra	36	44
2.	Pale yellow is the normal color of urine.	80	98
3.	Holding urine for long time is one of the causes of UTI	74	90
4.	Women with diabetes mellitus are more prone for getting UTI	50	61
5.	Blood in the urine is one of the typical symptoms of UTI	63	77
6.	Diabetes mellitus is not a complication of UTI	22	27
7.	Urine culture is the confirmatory test for UTI	47	57
8.	Antibiotics is one of the treatments of UTI	75	91
9.	Voiding/ urinating frequently is encouraged in UTI	40	49
10.	UTI can be prevented by wiping from front to back when using a washroom	65	79
11.	Recurrence of UTI occurs with incomplete course of antibiotics.	37	45
12.	The ideal time to change your sanitary napkins is every 4 hours.	64	78
13.	Regular intake of water leads to flushing the bacteria from the urinary tract through voiding.	44	54
14.	Sweetened fruit juice should be avoided during UTI.	42	51

**[Table/Fig-2]:** The knowledge towards UTI prevention related questions with frequency and percentage (N=82).

In terms of expressed habitual practice, results also showed that, less than half of the subjects had safe practices {34 (41.5%)} whereas majority {44 (53.7%)} had average practice towards prevention of UTI.

[Table/Fig-3] shows the mean, standard deviation and mean percentage of expressed habitual practice. The mean percentage of the practice score was highest in the domain of hygienic practice (73.12%) whereas, in the domain of fluid and dietary habits the mean percentage score was 63%. The overall mean percentage of the practice score was 70.10% indicating average practice.

Domain	Item	Maximum score	Range	Mean±SD	Mean practice score (%)
Hygienic practices	1-14	28	17	23.40±3.61	73.12
Fluid and dietary habits	15-21	14	7	8.82±1.76	63
Overall habitual practice score	21	42	19	32.25±3.79	70.10

**[Table/Fig-3]:** Mean, standard deviation and mean percentage of the expressed habitual practice score (N=82).

[Table/Fig-4] shows expressed habitual practice related questions towards UTI prevention in frequency and percentage and the [Table/Fig-5,6] show distribution of subjects according to the level of knowledge and practice score.

Sl. No.	Question	Never f (%)	Sometimes f (%)	Always f (%)
1	Take bath everyday	0	3 (4)	79 (96)
2	Change clothes everyday	0	5 (6)	77 (94)
3	Change the undergarment everyday	0	3 (4)	79 (96)
4	Wash perineum with soap and water after urination	2 (2)	21 (26)	59 (72)
5	Wash hands after touching perineum	5 (6)	4 (5)	73 (89)
6	Apply feminine sprays to maintain genital hygiene(negative question)	52 (63)	25 (30)	5 (6)
7	Use common swimming pool/pond (negative question)	44 (54)	29 (35)	9 (11)
8	Dry undergarments under sunlight after washing	0	24 (29)	58 (71)
9	Change pads during menstruation every four hours	10 (12)	10 (12)	62 (76)
10	Flush the commode/toilet before and after using	2 (2)	17 (21)	63 (77)
11	Use public/common toilets frequently (negative question)	26 (32)	52 (63)	4 (5)
12	Pass urine at least 6 times in 24hours	6 (7)	27 (33)	49 (60)
13	Use cloth during menstruation instead of sanitary napkins (negative question)	59 (72)	18 (22)	5 (6)
14	Use tampons during menstruation	66 (80)	7 (9)	9 (11)
15	Drink minimum 7 glass of water/day	0	25 (30)	57 (70)
16	Consume yogurt in the diet at least twice a week	4 (5)	45 (55)	32 (39)
17	Drink coffee more than 1 cup per day	28 (34)	48 (59)	6 (7)
18	Drink carbonated beverages at least once a week	18 (22)	56 (68)	8 (10)
19	Use excess spice in the diet	17 (21)	57 (70)	8 (10)
20	Consume lot of sweets in the diet	13 (16)	60 (73)	9 (11)
21	Consume medicinal herbs such as garlic in the diet	4 (5)	53 (65)	25 (30)

**[Table/Fig-4]:** Expressed habitual practice related questions towards UTI prevention in frequency and percentage (N=82).

Knowledge score	Knowledge score percentage	Grading level of knowledge	Frequency	Percentage
≥11-14	≥80%	Good	23	28
8-10	61-79%	Average	33	40
<8	<60%	Poor	26	32

**[Table/Fig-5]:** Distribution of subjects according to the level of knowledge (N=82).

Practice score	Practice score percentage	Grading level of practice	Frequency	Percentage
≥34-42	≥74%	Safe practice	34	42
26 -33	55-73%	Average practice	44	54
<25	<54%	Unsafe practice	4	5

**[Table/Fig-6]:** Distribution of subjects according to the level of practice (N=82).

Furthermore, result showed, there was a weak positive relationship between knowledge and expressed habitual practice as depicted by the Karl Pearson correlation coefficient ( $r=0.1$ ). The computed p-value was 0.37 ( $>0.05$ ).

The p-value computed between experience of UTI and expressed habitual practice ( $<0.001$ ) was  $<0.05$ . This shows that expressed habitual practice had a significant association with experience of UTI among adolescents.

## DISCUSSION

The present study throws light on the knowledge of adolescent girls towards UTI prevention and the application of this knowledge in their habitual practices. Adolescent girls (17-18 years) were chosen for the study as UTI is more prevalent in adolescent girls and young females, than in male population. In India, the National Family Health Survey (NFHS) 2000 reported the prevalence of UTI among adolescent girls (10-19 years) as 16.6% and the risk of bacteraemia developing in adolescent girls as 5-10% [6].

In the present study, majority of the respondents age was of 19 years {57 (69.5%)} and very few {11 (13.4%)} experienced UTI in their life time. Out of 11, {1 (9.1%)} experienced UTI more than 3 times, {6 (54.5%)} have experienced 2-3 times UTI and {4 (36.4%)} experienced UTI only once. A similar study was conducted at the medical university of Jos (Nigeria) among the 185 female students residing in the hostel, and the results revealed that majority of the students were between 18-22 years (62.5%) and most (62.5%) of the respondents have never experienced UTI, 34.9% experienced it at some point while 1.3% had no response [10].

In this present study, in terms of knowledge on prevention of UTI, results showed that, majority of the subjects had average knowledge 33 (40.2%), whereas a few had good knowledge 23 (28%). The results were congruent to the similar study conducted among nursing students at Sri Guru Ram Das Institute (SGRD) Nursing hostel, Vallah, Amritsar, revealed that 83.3% have moderate knowledge, 9.3% of students have inadequate knowledge and 7.7% of students have adequate knowledge [3].

In the present study, 74 (90%) respondents knew that holding urine for long time causes UTI, 44 (54%) responded that regular intake of water leads to flushing of bacteria from the urinary tract through voiding. This results were similar to the study conducted at medical Jos University among 185 female students, where {108 (71.1%)} responded that emptying the bladder frequently helps to prevents UTI [10].

In terms on preventive practices of UTI, the present study showed majority of the students maintained an average level of practice. This study also showed that 49 (60%) adolescents passed urine at least six times in 24 hours and majority (70%) drank minimum seven glass of water per/day. The findings of this study are congruent to the study conducted in the University of Jos which also showed that 52.6% students drink plenty of water and 53.3% empty their bladder when full [10]. The above results show that nursing students follow healthy and safe practices which aids in the prevention of UTI.

In this study, 79(96%) students expressed that they take bath as well as change their undergarments every day, majority (71%) dried undergarments under sunlight after washing, 76% changed pads during menstruation every four hours and 72% used sanitary napkins instead of cloths during menstruation. A similar study was conducted among unmarried nursing students of a medical college hospital of northern India, to find the role of behavioural risk factors in symptoms related to UTI, showed that 54.29% student changed the innerwear satisfactorily, 42.86% dried innerwear under sunlight and 42.86% took bath once a day; while 20% took bath on alternative day [11]. Although the proportion of girls using cloth were quite low (8.47%), around 35 students out of 177, have experienced symptomatic UTI in the last three months [9]. But in the present

study only 11 (13.4%) had experienced UTI at least once in their life time. The studies above conclude that life style and behavioural modification play a vital role in the prevention of UTI.

The present study identified significant association between experiences of UTI with expressed habitual practice. A similar study in northern India also showed significant association between the menstrual absorbent and frequency of infections [9].

Nursing students being a part of healthcare team must be educated and self-motivated to follow the preventive techniques and this could also be instrumental in providing health promotional activities to their peer groups. Peer support and good relationship among adolescent groups are considered as factors contributing to a positive learning attitude.

Various studies prove that an effective strategy on prevention of UTI would help the adolescents to overcome this issue. Results of a quasi-experimental study conducted at Egypt to evaluate preventive programme on knowledge and habitual practices regarding prevention of UTI, conducted among 462 female adolescents, revealed a general pattern of improved knowledge and hygienic practices related to habit score level after programme implementation. Knowledge regarding menstrual hygiene shifted from 80.5% (unsatisfactory) to 100% after programme implementation. Hygienic practice regarding clean perennial area was shifted to 89% from 53.9%. There was reduction in health complaints after the implementation programme. Burning sensation during urination reduced from 50.6% to 6.1% [12].

This study yielded very useful information to initiate health intervention measures for the prevention and control of UTI among young nursing females. Based on the findings of this study, it is recommended that, there should be an awareness campaign, designing and implementation of educational programs to increase the awareness and susceptibility about chances of getting UTI.

The investigator of the study designed an educational programme Structured Counselling And Preventive Strategies (SCAPS) to sensitise the women of reproductive age group, towards the improvement of knowledge and prevention of UTI. The programme includes various components such as therapeutic counselling at the initial opening and throughout the process to build rapport and trust, open communication and mutual understanding - snake and ladder game as a motivational factor to change life style, educational video on UTI and its prevention to deliver the instructions effectively, case scenarios and discussion to learn with real life situation.

Healthcare professionals, especially nurses, have the obligation to disseminate proper information about UTI so that females become aware of the causes, risk factors, symptoms and prevention practices of this infection [10]. Adolescents must be encouraged to inculcate health promotional behaviour, and student nurses have a responsibility to motivate their peer adolescent groups towards the prevention of UTI.

### Limitation(s)

The findings need external validation, since it was limited to a small population. The data were not compared between the students who experienced UTI and those who did not. Study results could

be influenced by the information girls obtained from various sources such as media, relative/friends or by a healthcare professional.

## CONCLUSION(S)

To conclude, though this study is not uncommon, it yielded enough and very useful information to initiate and develop health intervention measures for the prevention and control of UTI among young nursing adolescent girls. Although the students were aware regarding UTI and its prevention, appropriate training to maintain adequate hygienic practices, food and life style modification was the need highlighted from this study. Educational talks on UTIs and its risk factors should be held periodically amongst the nursing students to improve knowledge and improve their preventive practices towards UTI.

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### PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Community Health Nursing, Father Muller College of Nursing, Mangalore, Karnataka, India.
2. Dean/Principal, Department of Community Health Nursing, Yenepoya Nursing College, Mangalore, Karnataka, India.
3. Assistant Professor, Department of Community Health Nursing, Father Muller College of Nursing, Mangalore, Karnataka, India.

### NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Sonia Karen Liz Sequera,  
Associate Professor, Department of Community Health Nursing, Father Muller College of Nursing, FMCI, Kankanady, Mangalore-575002, Karnataka, India.  
E-mail: soniakaren@fathermuller.in

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