

# Role of Behavioural Risk Factors in Symptoms Related to UTI Among Nursing Students

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## ABSTRACT

**Introduction:** UTI is a well known entity amongst young girls, and the majority of girls have recurrent infections within one year. Anything that disturbs the usual vaginal environment would result in conditions favouring the production of unwanted microorganisms leading to infections of this very sensitive area. Studies have shown that, there is an evident relation of UTI's among students and practices of personal hygiene.

**Aim:** To determine association between the behavioural risk factors and UTI among nursing girls.

**Materials and Methods:** The present study was undertaken amongst unmarried nursing students of a Medical College Hospital. A predesigned pretested questionnaire was used

to know the personal hygiene of students and to find out its association with UTI in the last three months. Chi-square test was used to analyse the data.

**Results:** A significant association was observed between perineal hygiene and UTI. The major risk factors of UTI identified were incorrect perineal washing technique, use of synthetic/silk innerwears, not sundrying the innerwears, improper menstrual hygiene.

**Conclusion:** There are still major gaps in the knowledge regarding causation of UTI among the nursing students. This calls for an urgent need for educational talks periodically addressing these gaps.

**Keywords:** Behavioural factors, Perineal, Personal hygiene

## INTRODUCTION

Urinary tract infection (UTI), with its diverse clinical syndromes and affected host groups, remains one of the most common but widely misunderstood and challenging infectious disease encountered in clinical practice [1]. Anything that disturbs the vaginal flora would result in conditions favouring the production of unwanted microorganisms leading to infections of this very sensitive area [2]. For this reason, women with a UTI should first understand the aetiology of infections. The pathogenesis of UTI is very complex and is influenced by many host, genetic, biological and behavioural factors [3]. Although several studies have found role of other factors, such as urination habits, clothing, menstrual protection and diet, but it is still less clear [4]. The main factor pre-disposing to urinary tract infection has been attributed to poor personal hygiene and culture habit imposition [5]. Hence masses should be educated on the importance of personal hygiene in order to help them elevate their health status and manage themselves properly [6].

Although acute UTI is common in young women, the associated risk factors have not been defined prospectively [7]. Because of the paucity of epidemiological data on young age group, we aimed at evaluating the risk factors specially the behavioural variants for UTI in young nursing students. The study was conducted amongst nursing students as they are often the primary care givers who can undertake the role of health educator and mentor through proper approaches in identifying and resolving women issues, particularly in a country like India, where such issues are considered strictly private. They also play a critical role in identifying various infectious symptomologies which may assist in preventing urinary infections-as well as in ensuring that the patients comply with the recommended hygienic practices [8]. In addition, within the context of reproductive health services, nurses are typically expected to have knowledge on the causes of various infections and the methods of preventing and managing such conditions and teaching these to young girls & women. Education provided to women, particularly adolescents, by

nurses and by trainers who have relevant experience and knowledge may ensure proper hygiene practices [8]. A part of the study has already been published which mainly catered around Fluid intake & output in relation to UTI [9]. The subjects were same in both the studies. The present study takes into consideration another aspect i.e. behavioural risk factors of UTI. For this reason, this study was conducted particularly among young nursing girls to find out the risk factors for Lower Urinary Tract Symptoms (LUTS) and to initiate early educational intervention in order to enhance their knowledge regarding the same so as to mitigate this common issue not only among them but also in other risk groups.

## AIM

The aim of the present study was to determine association between the behavioural risk factors and Lower Urinary Tract Symptoms (LUTS) among nursing girls.

## MATERIALS AND METHODS

This cross-sectional descriptive study was carried out among the nursing students of all years (1<sup>st</sup> year to Final Year) of Nursing School, of a Tertiary care Hospital of North India from Aug 2011-Oct 2011. Ethical permission was sought prior to the study. The study criteria included unmarried female nursing girls within 18-30 years of age group studying in Nursing College of Tertiary Care Hospital and had completed at least six months period at the present institution were invited to participate in the study. Male nursing students, nursing girls who did not give consent, were non co-operative, refused to provide the necessary information were married and did not report a recent history of hospitalization or catheterization, were excluded from the study. All the nursing students were residing in the nursing hostel. For the development of questionnaire, a literature review was initially done through various web based search engines on similar studies (i.e. risk factors of UTI) conducted globally. The search sites were primarily Google scholar, Medline, Pubmed and Directory of

Open Access journals. The key words for search included “UTI”, “risk factors” and “Nursing”. Also, search of articles was done from the institute’s library to collect related material. The articles which were screened were used to develop the instrument. Delphi technique was used in the study which is based on the assumption that a group opinion has a greater validity than an individual opinion. Finally, the instrument was refined and drafted. The questionnaire thus prepared was divided into three sections. Section-A was meant to assess demographic profile of nursing students, Section-B contained questions related to the clinical features of UTI and Section-C to identify risk factors regarding the same (UTI). There were 25 questions in the questionnaire. Only those nursing students were included in the study who had completed at least six months period at the present institution. The study tool was a predesigned pretested self administered structured questionnaire containing questions related to risk factors for UTI and the occurrence of UTI in the previous three months. The participation in the study was voluntary.

The questionnaire was divided into three sections. Section-A was meant to assess demographic profile of nursing students, Section B contained questions related to the clinical symptoms of UTI (voiding frequency, burning sensation during voiding) over the last 3 months and Section-C to identify risk factors (clothing, medical history or history of urinary stones or urinary tract anomaly, health/hygiene practices, e.g. direction of washing genitals (front to back/back to front), frequency of changing underwear (number of times per week), menstrual hygiene, past history of the urinary tract (trauma, remote infections, or stones), regarding the same (UTI). There were 25 questions in the questionnaire. Before starting the survey a pilot study was done by intervening 20 staff nurses of the hospital and questions were modified based on pilot study. The subjects meeting the inclusion criteria were entered into the study after giving informed verbal consent. Before distributing the questionnaires and seeking informed verbal consent, the purpose of the study and contents of the questionnaires were explained to the students and they were ensured confidentiality regarding their data. Nurses were asked to submit the completed questionnaire within 45 minutes without Discussing amongst themselves [9]. They were requested to once go through it before the final submission. The following Operational definition of UTI was utilized for the study.

**Any girl complaining of Burning micturition with +/-**

- Fever
- Increased frequency
- Flank pain
- Urgency

**Anal Washing Technique:** Direction from front to back (anus to behind) was considered as a right technique. Washing in the direction from anus to genitals was considered as wrong technique as there was a chance of soiling the genitals with feces and scope for Urinary tract infection (UTI) [10]. The data variables were related to Data entry and management were carried out using MS excel sheet and software statistical package (SPSS-17 version). The age group was categorized during the data entry. The minimum age group found was 17 years and the maximum found was 30 years. Hence, the age group was divided into three groups as i.e. (17-20 years, 21-25 years, 26-30 years). Analysis was carried out using percentage, chi-square test with p-value shown against statistically significant item only. Descriptive results were expressed as frequency and percentage.

**RESULTS**

The data obtained from 177 students in nursing course was analyzed. All of the students were nulliparous, 18-30 years of age, single and not sexually active. Regarding the Sociodemographic characteristics, maternal education [Table/Fig-1] and Socioeconomic condition

[Table/Fig-1] did not have a significant association with UTI. The behavioural risk factors were found to have a significant association with UTI. Majority of the girls used synthetic innerwear (66.67%) [Table/Fig-2] of which, majority had UTI in the previous three months. The present study did not demonstrate any relationship between the frequency of changing innerwear or bathing or exchanging clothes on the occurrence of urinary infections [Table/Fig-2]. A higher no of girls were not drying their innerwear in direct sunlight (71.75%) of which maximum had a symptomatic episode in the last three months (57.14%) [Table/Fig-2]. Almost 64.4% of girls were using incorrect washing & wiping technique to wash genitals of which most had a symptomatic UTI. Regarding the menstrual hygiene, although the proportion of girls using cloth were quite low (8.47%) but the

| Variables                   | UTI     |       |        |       |       |       | X <sup>2</sup> Test | p-value |
|-----------------------------|---------|-------|--------|-------|-------|-------|---------------------|---------|
|                             | Present |       | Absent |       | Total |       |                     |         |
|                             | No      | %     | No     | %     | No    | %     |                     |         |
| <b>Mother's Education</b>   |         |       |        |       |       |       |                     |         |
| Illiterate                  | 9       | 25.71 | 14     | 9.86  | 23    | 12.99 | 7.76                | >0.05   |
| Upto Primary School         | 10      | 28.58 | 34     | 23.94 | 44    | 24.86 |                     |         |
| Upto Intermediate           | 9       | 25.71 | 59     | 41.55 | 68    | 38.42 |                     |         |
| Graduate                    | 7       | 20.0  | 35     | 24.65 | 42    | 23.73 |                     |         |
| <b>Socioeconomic status</b> |         |       |        |       |       |       |                     |         |
| Upper Class                 | 6       | 17.15 | 36     | 25.35 | 42    | 23.73 | 0.35                | >0.05   |
| Middle Class                | 27      | 77.14 | 99     | 69.72 | 126   | 71.19 |                     |         |
| Lower class                 | 2       | 5.71  | 7      | 4.93  | 9     | 5.08  |                     |         |

[Table/Fig-1]: Socio-demographic characteristics of nursing students

| Variables                        | UTI     |       |        |       |       |       | X <sup>2</sup> Test | OR                |
|----------------------------------|---------|-------|--------|-------|-------|-------|---------------------|-------------------|
|                                  | Present |       | Absent |       | Total |       |                     |                   |
|                                  | No      | %     | No     | %     | No    | %     |                     |                   |
| <b>Change in innerwear</b>       |         |       |        |       |       |       |                     |                   |
| Unsatis-factory                  | 16      | 45.71 | 87.00  | 61.27 | 103   | 58.19 | 2.19                | 0.53 (0.25-1.12)  |
| Satisfactory                     | 19      | 54.29 | 55     | 38.73 | 74    | 41.81 |                     | 1                 |
| <b>Type of innerwear</b>         |         |       |        |       |       |       |                     |                   |
| Cotton                           | 11      | 31.43 | 48     | 33.80 | 59    | 33.33 | 5.85*               | 1                 |
| Synthetic/Satin                  | 24      | 68.57 | 94     | 66.20 | 118   | 66.67 |                     | 1.11(0.50-2.46)   |
| <b>Dry under direct Sunlight</b> |         |       |        |       |       |       |                     |                   |
| Yes                              | 15      | 42.86 | 35     | 24.65 | 50    | 28.25 | 4.59*               | 1                 |
| No                               | 20      | 57.14 | 107    | 75.35 | 127   | 71.75 |                     | 0.44(0.20-0.94)*  |
| <b>Wash and Wipe</b>             |         |       |        |       |       |       |                     |                   |
| Incorrect Technique              | 22      | 62.86 | 92     | 64.79 | 114   | 64.41 | 8.89**              | 0.92(0.43-1.98)*  |
| Correct Technique                | 13      | 37.14 | 50     | 35.21 | 63    | 35.59 |                     | 1                 |
| <b>Bath in a Day</b>             |         |       |        |       |       |       |                     |                   |
| Once/day                         | 15      | 42.86 | 77     | 54.22 | 92    | 51.98 | 10.0                | 1                 |
| Alternate day                    | 7       | 20.00 | 45     | 31.69 | 52    | 29.38 |                     | 0.80(0.30-2.11)** |
| Once every week                  | 13      | 37.14 | 20     | 14.08 | 33    | 18.64 |                     | 3.34(1.37-8.13)** |
| <b>Exchange Clothings</b>        |         |       |        |       |       |       |                     |                   |
| Usually                          | 16      | 45.71 | 65     | 45.77 | 81    | 45.76 | 6.42                | 0.25(0.06-0.95)*  |
| Sometimes                        | 14      | 40.00 | 72     | 50.71 | 86    | 48.59 |                     | 0.19(0.05-0.76)   |
| Occasionally / Never             | 5       | 14.29 | 5      | 3.52  | 10    | 5.65  |                     | 1                 |

[Table/Fig-2]: Association of behavioural risk factors with UTI

| Variables              | UTI     |       |        |       |       |       | X <sup>2</sup> Test | OR                 |
|------------------------|---------|-------|--------|-------|-------|-------|---------------------|--------------------|
|                        | Present |       | Absent |       | Total |       |                     |                    |
|                        | No      | %     | No     | %     | No    | %     |                     |                    |
| <b>No of Napkins</b>   |         |       |        |       |       |       |                     |                    |
| 1-2                    | 20      | 57.14 | 16     | 11.27 | 36    | 20.34 | 33.69**             | 9.80(3.44-27.90)** |
| 3                      | 8       | 22.86 | 78     | 54.93 | 86    | 48.59 |                     | 0.70(0.24-2.06)    |
| >3                     | 7       | 20.0  | 48     | 33.80 | 55    | 31.07 |                     | 1                  |
| <b>Type of Napkins</b> |         |       |        |       |       |       |                     |                    |
| Home made              | 8       | 22.86 | 7      | 4.93  | 15    | 8.47  | 8.79**              | 5.71(1.91-17.09)** |
| Sanitary               | 27      | 77.14 | 135    | 95.07 | 162   | 91.53 |                     | 1                  |

**[Table/Fig-3]:** Association of Menstrual Hygiene with Symptomatic UTI

| Variables                           | UTI     |       |        |       |       |       | X <sup>2</sup> Test | OR               |
|-------------------------------------|---------|-------|--------|-------|-------|-------|---------------------|------------------|
|                                     | Present |       | Absent |       | Total |       |                     |                  |
|                                     | No      | %     | No     | %     | No    | %     |                     |                  |
| <b>Mother's History</b>             |         |       |        |       |       |       |                     |                  |
| Yes                                 | 5       | 14.29 | 25     | 17.61 | 30    | 16.95 | 0.047               | 0.78(0.27-2.21)  |
| No                                  | 30      | 85.71 | 117    | 82.39 | 147   | 83.05 |                     | 1                |
| <b>H/O Renal Stones</b>             |         |       |        |       |       |       |                     |                  |
| Yes                                 | 3       | 8.57  | 5      | 3.52  | 8     | 4.52  | 0.696               | 2.57(0.58-11.31) |
| No                                  | 32      | 91.43 | 137    | 96.48 | 169   | 95.48 |                     | 1                |
| <b>Allergic/sensitive to creams</b> |         |       |        |       |       |       |                     |                  |
| Yes                                 | 9       | 25.71 | 15     | 10.56 | 24    | 13.56 | 5.5*                | 2.93(1.16-7.41)* |
| No                                  | 26      | 74.29 | 127    | 89.44 | 153   | 86.44 |                     | 1                |

**[Table/Fig-4]:** Association of non behavioural riskfactors with Symptomatic UTI

prevalence of UTI was quite common amongst them [Table/Fig-3]. The present study identified a significant association between the frequency of changing menstrual absorbent and UTI [Table/Fig-3]. The current study shows that maternal history of UTI, history of renal stones was not found as a risk factor, although sensitivity with vaginal creams was again found as a risk factor for the occurrence of UTI [Table/Fig-4].

## DISCUSSION

The present study demonstrated a higher frequency of urinary infections among girls with incorrect perineal hygiene habits. No significant association was found between UTI and age groups as was found in a study by Sevil S et al., [8]. This may be associated with the fact that the students in the study group were of similar age groups.

The synthetic & nylon type of the innerwear and the frequency with which it is changed are important risk factors of getting a urinary infection. In contrast to previous studies by Moustafa MF et al., Dimetry et al., the present study did not demonstrate any relationship between the frequency of changing innerwear and of urinary infections [11,12]. Amiri FN in Iran in their study found that students with UTI replaced their inner wear significantly less often than control women [13].

There is a commercial trend to make nylon and synthetic innerwear more attractive to women, especially amongst younger females. These types of innerwears, however, does not absorb perspiration as much as the cotton innerwear does, causing the perineum to remain humid and leading to an increased risk of urinary tract infections. The present study also demonstrated a significantly higher frequency of urinary infections among the students who used nylon or synthetic inner wear [8] (68.57%) as also found in other studies by Sevil S et al., and Foxman et al., Dimetry et al., [11]

where innerwears other than cotton were found as a potential risk factor for UTI as they can keep the moisture and secretions within which favour conditions for bacterial growth and the occurrence of UTI [4,8,12].

Though nursing students are well aware of the disinfecting effect of UV radiations on clothes but still a higher no of girls were not drying their inner wears in direct sunlight (71.75%) of which maximum had a symptomatic episode in the last three months (57.14%). This may be due to various inhibitions amongst the girls in putting their innerwear outside.

Almost 64.4% of girls were using incorrect washing and wiping technique to wash genitals of which most had a symptomatic UTI. Our finding are in line with Moustafa MF, Kameswararao AA et al., and Ahmed et al., according to whom, majority of women don't wash Genital region in correct direction and hence suffer from UTI the most whereas Sheikh et al., in his study demonstrated no significant association between personal hygiene and UTI [11,14-16].

Regarding the menstrual hygiene, although the proportion of girls using cloth were quite low (8.47%) but the prevalence of UTI was quite common amongst them. Similar findings were noted in a study by Ahmed et al., [15]. Though more nursing girls were using >3 pads in a day, UTI was more common in girls who were using less no of pads a day. This may be, in part, explained by the fact that not changing the daily pads at appropriate intervals will increase the humidity of the genital area especially during the periods of intensive discharge and in increased temperatures leading to poor ventilation and thus providing a suitable environment for infections [8]. Additionally, there is a higher risk of infection during menstruation as the cervix opens up during menstruation and creates a pathway for bacteria to enter the uterus and pelvic cavity. Also, the pH of the vagina is less acidic which creates a good environment for microorganisms and hence a woman gets prone to infections during this period [14]. Moist, warm and haematic environment resulting from accumulation of menstrual blood within the pads provides a suitable habitat for microorganism, growth and increases the risk of infections [8].

The present study identified a significant association between the menstrual absorbent and frequency of infections Our findings are completely in line with Narayan et al., Ahmed et al., Omidvar et al., and Kameswararao AA who have identified clear links between poor menstrual hygiene and UTI [14,15,17,18].

It has been described by the previous studies that wrong perineal hygiene practices (i.e. back to forward) may lead to infections due to the transfer of microorganisms from the anus to the vagina [8]. The present study also found a higher frequency of urinary infections among participants who were using incorrect technique to clean the perineum. Our study was supported by other studies as Hacialolu et al., Singh MM et al., and Narayan BK who reported a lower frequency of genital infections among the participants practicing correct genital hygiene in those who clean the genital area incorrectly [17,19,20]. All these findings indicate that the awareness regarding correct perineal cleaning is not adequate in our country even among the medics and paramedics. This contrasts with the report of Beisel et al., which did not show a statistically significant difference [21].

The current study shows that maternal history of UTI, history of renal stones and was not found as a risk factor, although sensitivity with vaginal creams was again found as a risk factor for the occurrence of UTI, although these factors were found to have an association with UTI according to Scholes D et al., [22]. Krcmery et al., also found a strong relation between some non-behavioural risk factors as maternal history of UTI etc [23]. This suggests that anatomic and genetic factors are also involved in the causation of UTI.

## LIMITATIONS

Several problems had occurred in this study which could affect the results. Firstly, the study was non representative of the general

population. Secondly, the sample size was quite small, also some of the students refused to participate in this study. The reasons were; doubtful of the confidentiality of the study, some claimed the questionnaire was too personal, and few did not answer the question completely. Thirdly, there could be some dishonesty in answering personal questions.

## CONCLUSION

To conclude, though this study is not an uncommon study, it yielded enough and very useful information to initiate health intervention measures for the prevention and control of UTI among young nursing females. The major risk factors of UTI identified were incorrect perineal washing technique, use of synthetic/silk innerwear, not sundrying the innerwear, lesser frequency of changing menstrual absorbents. In summary, we found that behavioural factors play a key role in the causation of UTI.

## RECOMMENDATIONS

Although the students were well aware of the symptomology, there are still major gaps in their knowledge regarding causation of UTI. This calls not only for a health education message addressing these gaps, but it also highlighted two important needs, a need for training the health care team regarding the prevention of UTI which should also include principles of correct genital hygiene and on effective patient communication on the other hand. Therefore, it is highly recommended that workshops targeting doctors and nurses in the outpatient clinic should be conducted about effective patient communication. Educational talks on UTIs and its risk factors should be held periodically amongst the nursing students.

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