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Original Research Article

A prospective comparative study to analyse the cause of urinary tract infection in different working women and to suggest conducive measures to lower their incidence

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ABSTRACT

Background: Urinary tract infections (UTI) are one of the commonest causes of abdominal pain in gynecology as well as surgical outpatient departments (OPDs). Untreated UTIs are a major threat to the quality of life of people thereby necessitating its early diagnosis and treatment. Women are particularly at risk of developing UTIs because of their short urethra, and certain behavioural factors which include poor fluid consumption and delayed voiding habits of life. Additionally, the complete treatment of this condition adds to the consumption of antibiotics, their adverse reactions and resistance, if patient falters.
Methods: We conducted a population based, prospective cross-sectional, comparative study between 268 working women of reproductive age group, barring extremes of age. Group A comprised of 125 school teachers, from secondary, higher secondary schools and special schools in Navi Mumbai whereas group B comprised of women working in hospitals. A consent was obtained prior to filling the 5-point questionnaire.
Results: The knowledge and habits in working women were studied and their analysis suggested that decreased water intake as workplace, due to paucity of time to regularly urinate were predominant risk factors for urinary infections.
Conclusions: In an attempt to reduce the morbidity associated with infections of genitourinary system, as well as the adverse reactions due to the drugs, the risks associated with non-compliance as well as decreasing institute's potential due to manpower absenteeism, we need to come out with manageable policy towards making workplace "voiding friendly".

Keywords: UTI, Working women, Chronic UTI, Improper voiding practices, UTI in females, Lower urinary tract symptoms

INTRODUCTION

Urinary tract infections (UTI) are one of the commonest causes of abdominal pain in gynecology as well as surgical outpatient departments (OPDs) especially in women of the reproductive age group (15-44 years).[1] Untreated UTIs are a major threat to the quality of life of people thereby necessitating its early diagnosis and treatment. Women are particularly at risk of developing UTIs because of their short urethra, and certain behavioural factors which include poor fluid consumption, delay in micturition, sexual activity and the use of contraceptives which promote bacterial accumulation around the urethra leading to UTI.[1] They may complain of pain in abdomen, dysuria, increased urinary frequency, fever as well as bloody urine (haematuria) or acute retention of urine amounting to heavy morbidity, affecting their quality of life.

After a first episode of an uncomplicated urinary tract infection, at least one second episode will occur in 27% of women in the next 6–12 months especially when there are uncorrected recurrent factors mentioned below, which by themselves are leading causes of UTI in women of reproductive age group - decrease fluid intake, holding back the urge to urinate, kidney stone (renal calculi), faulty vaginal douching technique, diabetes mellitus/high blood sugar level, honeymoon cystitis/post-coital UTI, women with cystocoele or bladder descent, senile vaginitis and UTI in post-menopausal women, urethral stenosis/old fistula post-surgery/irradiation, partner having diabetes mellitus (DM), and concurrent STDs or vaginitis or poor perineal hygiene.[4]

Few of the above factors are avoidable/correctable/ reversible while few are special situations, thereby causing hospitalisation, increasing cost to healthy well-being as well as failing output at workplace. Additionally, the complete treatment of this condition also adds to the consumption of antibiotics, their adverse reactions and resistance, if patient falters making prevention of recurrent infection a bigger challenge.[9] Chronic, infrequent voiding may be a risk factor for lower urinary tract symptoms (LUTS) in women.[3]

Objectives

Objectives were: to study the voiding practices amongst working women between 18-45 years that predominantly contribute to uncomplicated UTI, and to educate and concurrently develop standards to prevent them.

METHODS

Study design

We took up a population based, prospective cross-sectional, comparative study amongst working women of reproductive age group, barring extremes of age.

Study period

The knowledge and voiding practices of working women in two groups were considered over a period of four months from 01 August 2024 to 30 November 2024.

Study population and place

The study was conducted in 268 educated working women using a 5-point questionnaire* to assess their knowledge and voiding practices. There were randomly selected cohorts from two institutions: Ethical approval was sought from our Institution's Ethics Committee.

Group A comprised of school teachers from secondary, higher secondary and special schools in Navi Mumbai, and group B comprised of women working in hospitals: sisters and a few office staff.

Sample size

In all 125 female teachers and their sub staff working in the same institute were interviewed via a brief five-point questionnaire that reflected their knowledge, beliefs and practices about bladder care and its functions.

A similar parallel study was conducted by interviewing and comparing the practices in 143 women working as staff nurses in corporation as well as private nursing homes in Navi Mumbai. They too, signed the consent form and then filled the five-point questionnaire with respect to their voiding habits.

Inclusion criteria

Working women between 18-45 years age who consented to participate in the study, and all who were working on site at institutes: schools/colleges/hospitals/nursing homes were included in the study. A 5-point questionnaire was filled by the participants in the study and results analysed.

Exclusion criteria

Women employees more than 18 years (permissible as per norms), women with recurrent UTI, pre-existing renal stricture/urethral stenosis, post-menopausal women (avoiding bias of senile vaginitis, atrophy, cystocoele, more prone to develop UTI), pelvic organ prolapse, renal transplant, and women on any antibiotic therapy were excluded.

Both groups were compared with respect to parameters studied and results analysed using Chi-square test.

RESULTS

The percentage of avoidable factors in women's lives that can be modified so as to reduce the morbidity associated with UTI were studied.

Daily office hours were less than 4 hours, 4-8 hours or more than 8 hours

In both groups, a majority of women were working for more than 8 hours (Figures 1a and b).

Average consumption of water per day

In both groups, women are seen to consume less than 3 litres water per day (Figure 2).

Frequency of voiding (urination)

It is depicted in Figure 3.

Reasons for holding back urine on duty

It is depicted in Figure 4.

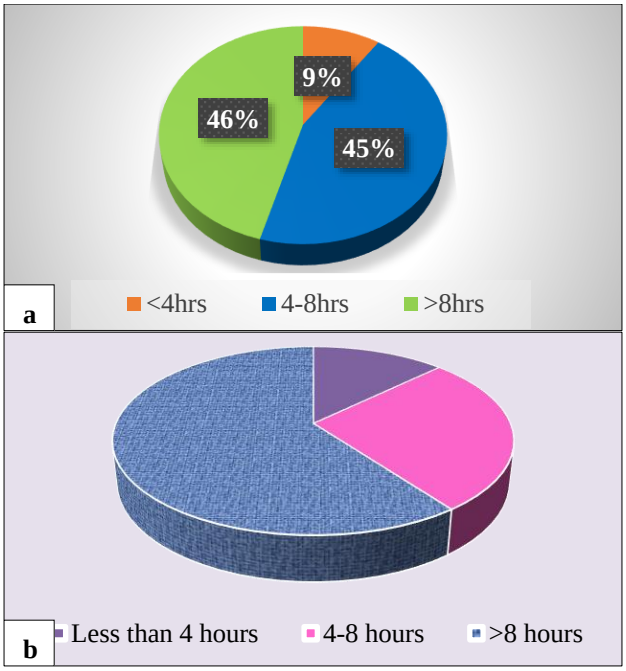

Figure 1: (a) Office hours: school teachers, and (b) working hours: staff nurses.

Symptoms suggestive of UTI

It is depicted in Figure 5.

We applied the Chi-square test for statistical significance. The incidence of UTI in both groups was not significant as $p<0.0000001$ with 95% confidence limits. With 95% confidence limits, the water consumption between both groups was also not significant, so also were the voiding habits (Table 1).

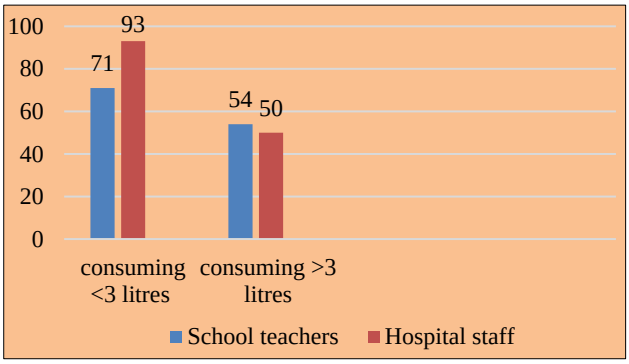

Figure 2: Daily water consumption in the two groups.

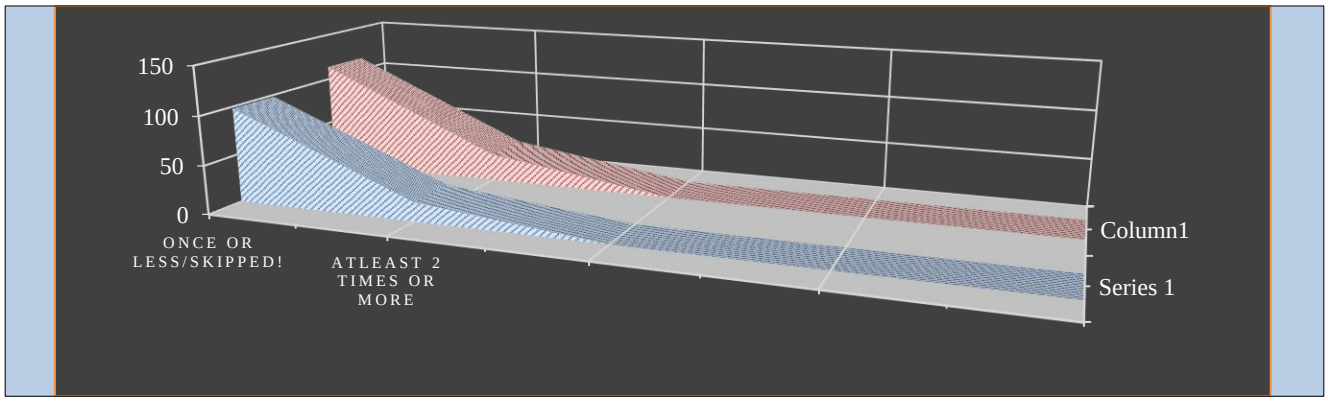

Figure 3: Frequency of voiding.

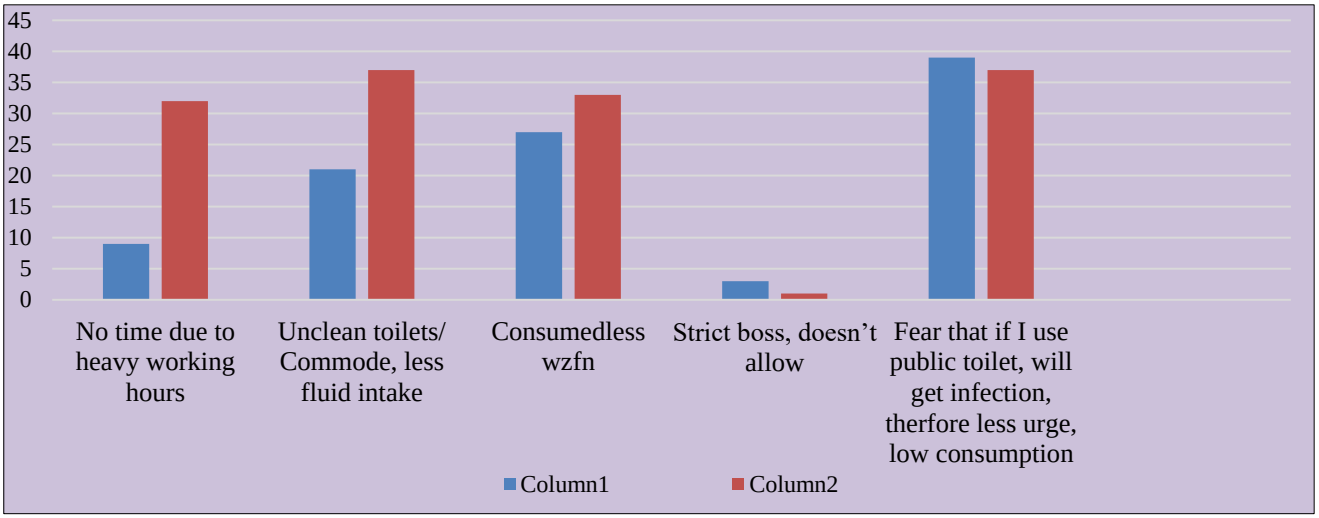

Figure 4: Reasons for holding back urine on duty.

Table 1: Comparison of water consumption and Voiding habits in two groups.

Variables	Sample size	Mean	Standard deviation	t stats
The incidence of UTI	143	23	8.81	-16.53
	125	37	3.698	-17.33
The water consumption between both groups	143	93	8.81	25.985
	125	71	3.698	27.243
Voiding habits at workplace	143	104	7.08684	7.086
	125	98	7.42968	7.429

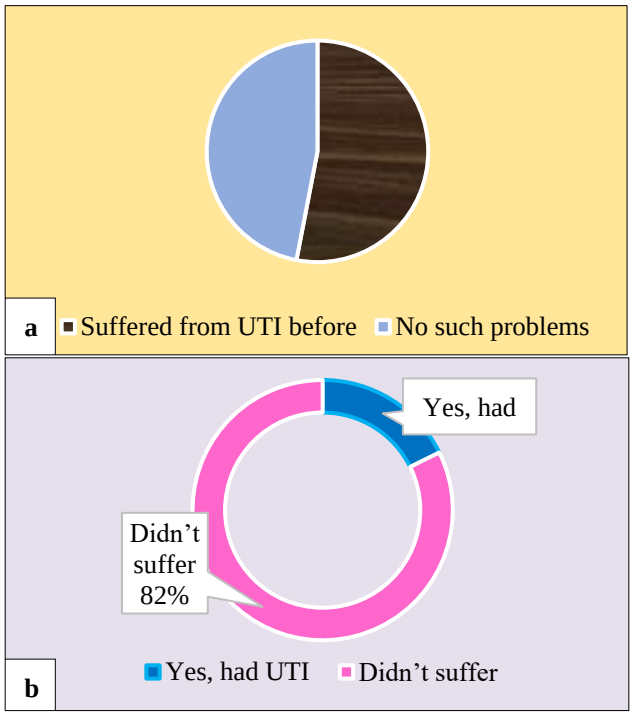

Figure 5: (a) Percentage of teachers suffered UTI, and (b) percentage of UTI in nurses.

DISCUSSION

Untreated UTIs, one of the most prevalent infections, are a major threat to the quality of life of people thereby necessitating its early diagnosis and treatment.

Women are particularly at risk of developing UTIs because of their short urethra, anatomic proximity to anus and faulty douching techniques and certain behavioural factors which include poor fluid consumption, delay in micturition, sexual activity and the use of contraceptives which promote bacterial accumulation around the urethra leading to UTI.[1,8]

UTIs in women are occurring at various stages of life. These are caused by few factors that can be modified if not eliminated. Since age, religion and marital status did not show statistical significant association, we did not separate the study group for those parameters.[1] It is known that prophylactic strategies are desirable that aim to reduce both the rate and burden of UTIs than antibiotics given for therapeutic treatment.[2]

Women may avoid voiding and use of public toilets due to various hygienic myths as well as difficulty in accessibility, privacy, safety, and cleanliness.[3]

In our study, we have not accounted for asymptomatic Urinary tract infection, which could have intensified further the magnitude of the problem, as we did not consider current evaluation and have relied on patients' symptoms only, thereby refrained from laboratory involvement.

According to a study by Brady et al, future research should direct workplaces to promote or constrain bladder health (e.g., flexible schedule to void when desired and safe restroom facility with water availability).[5]

The findings of our study were similar to strenous job impact study mentioned above, that although the medical group had knowledge about causes and prevention of UTI, they suppressed the urge to void and at times barely consumed water while on duty, so as to avoid the 'fullness' sensation totally, due to no time to void![5]

In sync with these practices and practical difficulties, in US, the National Institutes of Health (NIH)/National Institutes of Diabetes and Digestive and Kidney Diseases (NIDDK) in 2015, have focussed on The prevention of lower urinary tract symptoms (PLUS) research consortium, expansion to focus on UTI prevention, with the assumption that the degree of women's knowledge, attitudes, and beliefs influence their risk of developing lower urinary tract symptoms (LUTS).[6] Also, institution's policies or ecosystem need to be supportive of for preventive health as suggested by the PLUS conceptual framework, especially applicable to our 'working' study group.[7]

In a study, it was noticed that training on health-related issues was significantly associated with good knowledge and improved bladder habits towards preventing UTI.[10]

Limitations

Of our study was that a bigger sample size could have been chosen for analysing a larger population. However, going to various institutes and seeking permission to interview their women employees is quite exhaustive. However, the personal presence while getting the questionnaire filled,

rather than google docx, was an add-on to the genuine-ness of our study.

CONCLUSION

Urinary tract infection usually develops in the lower urinary tract (urethra and bladder) and if not properly treated they ascend to the upper urinary tract (ureters and kidneys) and cause severe damage to the kidneys.

In an attempt to reduce the morbidity associated with infections of genitourinary system, as well as the adverse reactions due to the drugs, the risks associated with non-compliance, increasing the antibiotic resistance as well as toll on overall economy due to absence at workplace as well as decreasing institute's potential due to manpower absenteeism, we plan to come out with manageable policy or making workplace "voiding friendly".

Subtle changes in construction/ small workable policies that can help women adopt healthy lifestyle like: creating Indian toilets vis a vis commode, provision of basic water supply, providing separate washroom for different genders, restrooms placed close to work place but at decent distance with adequate locks and blinds ensuring safety and introducing 2-3, restroom breaks like 'lunch break' might take us ahead in our mission to curb this iatrogenic, universal problem.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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