PREVELANCE OF URINARY TRACT INFECTION IN RELATION TO GENDERS AMONG PATIENTS VISITING AL KHIDMAT HOSPITAL NISHTARABAD, PESHAWAR

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Abstract

Urinary tract infections (UTIs) are a common and significant health concern affecting both genders, among genders women are more frequently affected due to anatomical and physiological factors. A descriptive cross-sectional study was conducted spanning of four months, from April to July 2025, at Al Khidmat Hospital Nishtarabad and the laboratory of Sarhad Institute of Allied Health Sciences, Peshawar. A total of 197 participants, including both males and females across all age groups, were selected using a non-probability convenience sampling method. Inclusion required voluntary consent and the ability to provide a urine sample, while individuals on recent antibiotic treatment or unwilling to participate were excluded. Participants ranged in age from 1 to 80 years and were grouped into eight age groups, with the highest number (81 individuals) falling within the 21–30 years group, followed by those aged 11–20 years. Out of the total participants, 55 were male and 142 were female. UTI prevalence was notably higher among females, with 68 out of 142 testing positive (47.8%), compared to 16 out of 55 males (29%). These findings suggest that females, particularly in the reproductive age group, are more susceptible to UTIs, highlighting the need for targeted prevention and early diagnostic strategies in this population.

INTRODUCTION

Urinary tract infections (UTIs) are among the most common bacterial infections worldwide, occurring in both community and healthcare settings (Mancuso *et al.*, 2023). UTIs are often classified into lower or upper and range from uncomplicated (uUTIs) to complicated (cUTIs), Upper UTIs affect the kidneys, and the ureters like in case of pyelonephritis, while lower UTIs affect the urethra and the bladder (Kaur*et al.,* 2021). UTIs are mostly caused by bacteria, among

those Uropathogenic *Escherichia coli* (UPEC) is the most common causative agent for both uUTIs and cUTIs. Followed by other pathogenic microorganisms like *Klebsiella pneumoniae*, *Proteus mirabilis*, *Enterococcus faecalis,* and *Staphylococcus* spp, although more rarely, other microorganisms, such as fungi and some viruses, have been reported to be responsible for UTIs. (Mancuso *et al.,* 2023).

Urinary tract infection (UTI) is one of the most significant bacterial infections in the 21st century causing various types of health problems in both males and females. Both sexes are exposed to the infection; women are more susceptible due to their reproductive physiology and morphology as compared to males (Vasudevan*et al.,* 2020). UTI is one of the most widespread infectious diseases found in outpatients and could also be caused by certain fungi and viruses as well as bacteria (Flores Mireles*et al.,* 2021). More than 80 % of UTI is caused by Gram negative bacteria and other due to Gram positive bacteria. Many factors are associated with the prevalence of UTI particularly the presence of more than 105 CFU/ml bacteria in the urine. Escherichia coli is the most prevalent uropathogen (60- 90 %), followed by Staphylococcus species accounts for 10-15 % UTIs (Ashur*et al.,* 2021).

The clinical symptoms of UTI include urgency, painful urination, feelings of urination after urination, dysuria, pyuria, pain in the back, and abdominal pain. Other host related factors increase the rate of urinary tract infection, including urine factors, sexual factors, osmolality, vaginal pH, and secretory condition (Nigussie and Amsalu., 2022). The severity of a UTI is dictated by the virulence of the bacteria as well as the host's susceptibility (Hannan*et al.,* 2020). Because of antibiotic overuse, uropathogen isolates now have an unacceptably high proportion of resistance to practically all antibiotics across the world. (Khan *et al.,* 2022).Lower UTIs are usually marked by pain during urination with or without frequency, pain in the suprapubic region or visible haematuria. Upper UTIs are generally manifested by fever (>100°F), flank pain, chills, vomiting,

costovertebral-angle tenderness, nausea, with or without symptoms of cystitis (Hooton *et al.,* 2020*).* Fever is uncommon in lower UTIs and is generally associated with complicated forms of UTIs (Salvatore *et al.,* 2021). It is important to note that these symptoms do not confirm that the person is suffering from UTIs. There is only a 50–50 chance that a person showing these symptoms is suffering from UTIs in a primary care setting. This possibility increases to 84%–92% if patients are having a history of a recurring UTI. Further, elderly women suffering from UTIs seldom show the symptoms. It is possible that the only symptom they show is urinary incontinence. In women who have already hit their menopause, urine loss increases significantly due to low oestrogen levels in a 3-day period post UTI.(Salvatore *et al.,* 2021). The common signs and symptoms of UTI include fever, itching, burning sensation, blister formation in the genital area, suprapubic pain and pyuria. The symptomatic infection shows inflammation and white blood cell (WBC) count of >8 cells/mL in the urine. The urine may be hazy in appearance and the condition is called pyuria or leucocyturia. (Kaur*et* al., 2021).

METHODOLOGY

Study design

A descriptive cross-sectional study was conducted at Al Khidmat Hospital Nishtarabad, Peshawar.

Study Setting:

The current study was conducted at Al Khidmat Blood Bank & Diagnostic Center, Peshawar and lab of Sarhad Institute of Allied Health Sciences, Sarhad University of Science and Information Technology, Peshawar.

Study duration:

The duration of this study was 4 months from 15 April 2025 to 15 July 2025.

Inclusion Criteria

1. In current study we included patients with both sexes (male and females) and all age

group visited to Al Khidmat Hospital Nishtarabad, Peshawar.

2.   Only those Patients who voluntarily agreed to provide samples were included in this study.

Exclusion Criteria

1.   Those patientswho were on **antibiotic therapy** or completed an antibiotic course within last 7 days were excluded from this study.

2.   Those patients who were unable or unwilling to provide urine sample are excluded from this study.

Sample Size:

The sample size for this study was calculated using Cochran's Sample Size formula:

$$n = \frac{Z2.P.(1-p)}{d2}$$

Where:

Z=1.96 for a 95% confidence level

Based on a previously reported prevalence of UTI was reported as 11.6% in a study conducted at Kohat, Pakistan (Anwar Ullah *et al.*, 2018). Another study was conducted at Peshawar, Pakistan reported a prevalence of 17% (Malik *et al.*, 2015). The average prevalence of these studies is 14.3%.

d=0.05 (margin of error)

$$n = \frac{(1.96)2 \times 0.143 \times (1-0.143)}{(0.05)2}$$

$$n = \frac{(3.84 \times 0.143 \times 0.857}{0.0025}$$

$$n = \frac{0.471}{0.0025}$$

n= 197

Thus, a total of 197 isolates were taken to achieve statistically significant results for this study.

Sampling technique:

A **non-probability convenience sampling** technique was used in this study.

Requirement

The materials required for urine routine examination include urine samples collected in sterile bottle, 10% formalin for preservation, dip strips for chemical analysis, microscopic slides, cover slips, Centrifuge for sedimentation and microscope for urine analysis.

Sample Collection and Processing

A total of 197 patients were enrolled as participants in the study conducted at Al Khidmat Hospital Nishtarabad, Peshawar, spanning from April 2025 to July 2025. The participants were provided with comprehensive information about the research study and their written consent was obtained prior to their inclusion. To ensure proper sample collection, a standardized protocol was followed. Each participant's urine sample, approximately 50ml in volume, was collected using a sterilized bottle. After collection 10% formalin were added for the preservation of urine sediments. The collected samples were than transport to the lab of Sarhad Institute of Allied Health Sciences, Sarhad University of Science and Information Technology, Peshawar where samples were centrifuged for 3 to 5 minutes as per standard protocol. The procedures were conducted in accordance with established Standard Operating Procedures (SOPs) to ensure consistency and accuracy throughout the sample processing stage.

3.10. Processing of samples

The physical examination of urine routine examination was performed by naked eye in lab and then chemical examination were performed by dipping dip strip in urine sample for 1 to 2 minutes. After evaluating the physical and chemical examination of urine one drop sediments of urine was placed on clean microscopic glass slide, the drop was then covered with cover slip. The sediment was than analyzed by microscope for different cells.

RESULTS

Age wise distribution:

All the patients that were included in this study were divided into eight age groups. The first group includes those participants who were having age between 1 to 10 years. In first group fall 21 participants out of 197. In second group we included those participants with age between 11 to 20 years fall 48 participants show high numbers of frequency after third age group. In third group includes participants with age between 21 to 30 years falls 81 participants which

shows the maximum number of frequency among all age groups. In forth group includes participants with age between 31 to 40 years falls 27 participants in this age group. . In fifth group includes participants with age between 41 to 50 years falls 12 participants in this age group. . In sixth group includes participants with age

between 51 to 60 years falls 5 participants in this age group. . In seventh group includes participants with age between 61 to 70 years falls 2 participants in this age group. . In eighth group includes participants with age between 71 to 80 years falls only 1 participant in this age group as shown in table 4.1.

Table 4.1 shows Age wise distribution		Frequency	Percent	Cumulative Percent
Age	1 to 10 Years	21	10.7	10.7
	11 to 20 Years	48	24.4	35.0
	21 to 30 Years	81	41.1	76.1
	31 to 40 Years	27	13.7	89.8
	41 to 50 Years	12	6.1	95.9
	51 to 60 Years	5	2.5	98.4
	61 to 70 Years	2	1.0	99.4
	71 to 80 Years	1	.5	100
	Total	197	100.0	

Gender wise distribution:
In this study total 197 patients were included are categorized into male and female. Out of total 55

participants were male and 142 participants were female as shown in table 4.2.

Table 4.2 shows gender wise distribution.		Frequency	Percent	Cumulative Percent
Gender	Male	55	27.9	27.9
	Female	142	72.1	100.0
	Total	197	100.0	

Correlation of gender with Urinary tract infection:
In this study total 197 patients were included are categorized into male and female. Out of 55 male participants 39 were negative for urinary tract infection and 16 were positive showing 29%

prevalence in male participants. Out of 142 female participants 74 were negative for urinary tract infection and 68 were positive showing 47.8% prevalence in female participants as shown in figure 4.3.
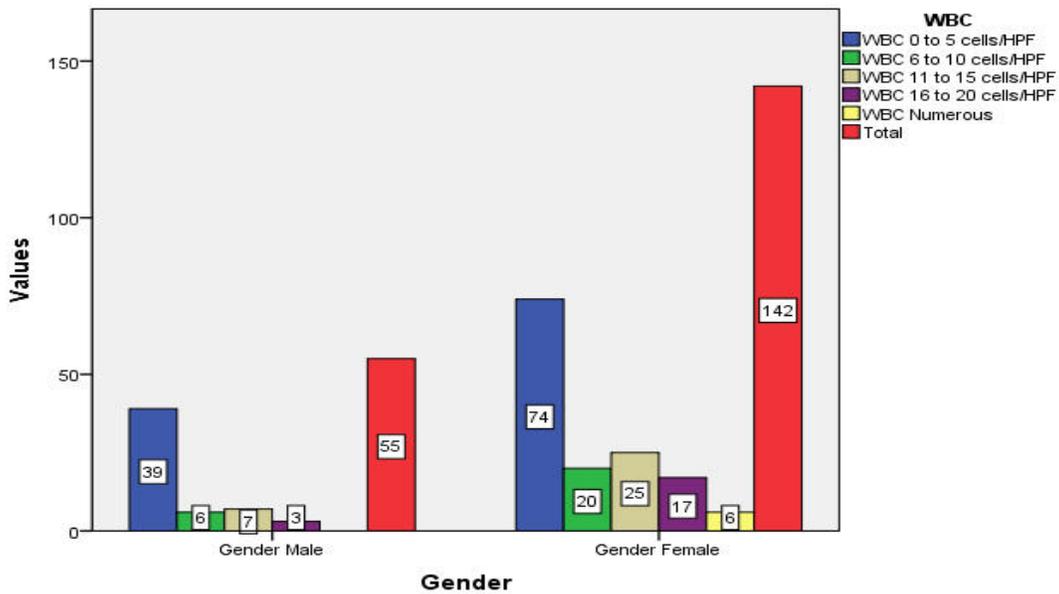
Figure 4.3 shows correlation of gender with urinary tract infection.

Frequency of leukocyte esterase:
In current study total 197 patients were included are categorized into male and female. Out of 55 male participants 37 were negative for leukocyte esterase and 18 were positive for leukocyte esterase. Out of 142 female participants 73 were negative for leukocyte esterase and 69 were positive for leukocyte esterase as shown in figure 4.4.
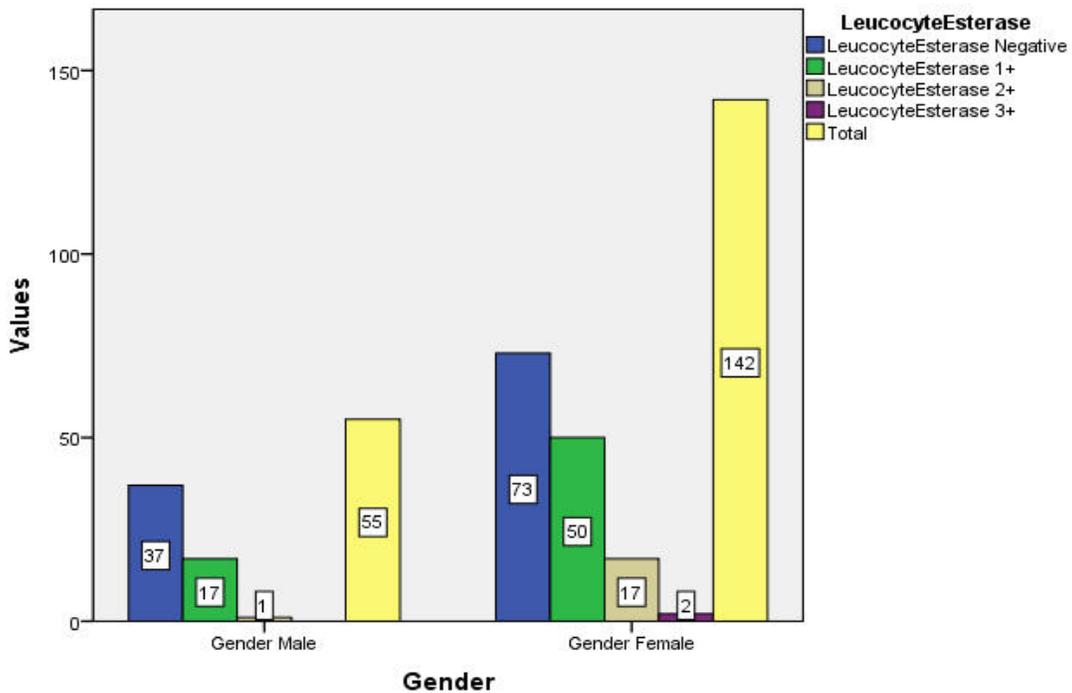

Figure 4.4 shows frequency of leukocyte esterase.

DISCUSSION

The present study investigated the prevalence of urinary tract infections (UTIs) in relation to gender among patients visiting Al Khidmat Hospital, Nishtarabad, Peshawar, from April to July 2025. The findings demonstrated a higher prevalence of UTIs among females compared to males, which aligns with global epidemiological trends. This gender disparity has been consistently attributed to anatomical and physiological factors, such as the shorter urethra in females and its proximity to the anus, facilitating bacterial colonization and ascension into the urinary tract (Foxman, 2014; Flores-Mireles*et al.*, 2021).

In comparison to regional data, our prevalence rate was moderately higher than that reported in a study conducted at Khyber Teaching Hospital, Peshawar, which found a UTI prevalence of 12.3% among outpatient attendees (Bashir *et al.*, 2008). This difference could be explained by variations in study population, seasonal patterns, and diagnostic criteria. Notably, our findings are consistent with a multicenter study in Pakistan that also reported a significantly higher burden of UTIs in females, particularly in the 20–40 year age group (Akhtar*et al.*, 2019).

The predominance of female cases in our study may also be related to cultural and behavioral factors in the local context. Limited awareness of personal hygiene, restricted access to healthcare facilities, and social taboos regarding reproductive health can delay treatment-seeking behavior among women (Shrestha*et al.*, 2019). Additionally, hormonal changes during pregnancy and menopause are known to increase susceptibility to UTIs, which may further contribute to the observed prevalence in the female subgroup (Nicolle*et al.*, 2019).

Our study's results are also comparable to global findings. For instance, the U.S. Centers for Disease Control and Prevention (CDC) estimates that nearly 50–60% of women will experience at least one UTI in their lifetime, whereas recurrent infections are significantly less common in men (CDC, 2023). This similarity suggests that while geographic and socioeconomic factors influence the burden of UTIs, biological predisposition remains a universal determinant.However, it is important to acknowledge the limitations of this study. Being hospital-based, the findings may not fully represent the general population of Peshawar, as individuals with asymptomatic or mild infections may not seek medical care. Moreover, the study did not differentiate between complicated and uncomplicated UTIs, which could have provided deeper clinical insights. Future research should include a larger community-based sample and explore antimicrobial resistance patterns, as resistance is an emerging public health concern in Pakistan (Shaikh *et al.*, 2019).

CONCLUTION

The findings of our study indicate a significant variance in urinary tract infection distribution across different age groups and genders. The age group with the highest frequency of participants was 21–30 years, followed by 11–20 years. Gender-wise analysis revealed that females had a significantly higher prevalence of UTIs (47.8%) compared to males (29%). Similarly, the presence of leukocyte esterase which is a key indicator of UTI was more frequently observed in females (48.6%) than in males (32.7%). These findings suggest that females, particularly in the reproductive age group, are more susceptible to UTIs, highlighting the need for targeted prevention and early diagnostic strategies in this population.

RECOMMENDATION

1. Larger Sample Size: Increasing the sample size will enhance the statistical power of the study, allowing for more reliable and generalizable results.

2. Broader Demographic Inclusion: Future studies should aim to include a more diverse demographic, including patients from different hospitals and regions, to gain a more comprehensive understanding of urinary tract infection distribution across a wider population.

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