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Factors Influencing Urinary Tract Infections Practices among Male and Female Patients in Wasit Hospitals, Iraq

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ABSTRACT

***Objective**: Urinary tract infections (UTIs) remain a significant global health challenge, requiring a deep understanding of preventive practices for patients to reduce recurrence. The study aimed to identify the key socio-demographics and the factors influencing practices related to UTIs among patients in Wasit hospitals, Iraq. **Method**: A descriptive cross-sectional study with 350 participants using non-random, convenience sampling. It was carried out at Al-Zahraa and Al-Karama Teaching Hospitals in Wasit Governorate, Iraq. Practice levels were categorized based on scores: Poor (<50%), Fair (50%–75%), and Good (≥75%). **Results**: A total of 350 patients, the sex ratio is 66.9% female to 33.1% male. Although this study discovered that 56.0% of patients have a good practice score for UTIs, a large proportion of patients (57.1%) have a history of recurrent infections. This study found a statistically significant correlation between practice scores with sex, educational level, employment status, and socioeconomic status (SES) at $P < 0.001$. **Novelty**: In this study, more than half of the patients avoid taking antibiotics directly without a prescription. This study clarifies that male sex, high education, high professional occupation, and high SES have good assessment scores for practices about UTI. Also, it clarifies that men have better prevention practices than women.*

INTRODUCTION

Urinary tract infections (UTIs) are amidst the most commonplace bacterial infections globally, posing a significant challenge to healthcare systems, patients, and communities [1]. It can affect individuals at any age and manifest in various clinical forms, from uncomplicated lower UTIs to more severe cases involving the kidneys and bloodstream [2]. Due to changing healthcare practices, changing demographics, and an increase in predisposing circumstances, the prevalence and burden of UTIs have been progressively rising globally over the past few decades [3]. According to recent global estimates, there are billions of UTI infections each year, with notable variations by age and sex. Because of these trends, UTIs are an ongoing public health concern that calls for in-depth behavioral and population-level studies [4]. UTIs are common in Iraq and Arab countries and are primarily caused by *Escherichia coli* (*E. coli*) and *Klebsiella* species [5]. These bacteria produce extended-spectrum beta-lactamases. Which become resistant to antibiotics, particularly cephalosporins and fluoroquinolones [6]. Iraq and the Eastern Mediterranean region have some of the highest rates of resistance worldwide, according to data from the World Health Organization (WHO). Antibiotic stewardship and surveillance must be strengthened in order to address this expanding issue [7]. Anywhere throughout the urinary system, a UTIs (UTI) might develop [8]. When the infection affects the kidneys or bladder, it usually presents as fever, burning or pain when urinating, a change in the color or appearance of the urine (such as cloudy, dark, or bloody urine),

and lower back or lower abdominal pain (flank or suprapubic pain) [9]. However, because they all promote bacterial colonization and ascent, poor personal hygiene, recent sexual activity, pregnancy, diabetes (which impairs immune response and increases bacterial growth), delaying urination, or incomplete bladder emptying are risk factors that increase the likelihood of developing a UTI [10]. Appropriate therapy is determined by a clinical examination (history, urinalysis, and, if needed, culture); early detection of these symptoms and attention to modifiable risk factors might reduce complications such as pyelonephritis [11].

A number of crucial interventions are part of preventive strategies to lower the incidence of UTIs. Drinking enough water to stay well hydrated promotes regular urine flow and helps the urinary system get rid of infections[12]. Urinating immediately after sexual activity also helps wash out any microorganisms that may have entered the urethra. By good hygiene practices, the risk of bacterial transfer is further reduced, such as scented soaps and washing the genital area from front to back. Avoiding lengthy urine retention and regular bladder emptying are also advised to prevent bacterial growth [13]. The management of symptoms after they manifest is the main emphasis of UTI practices[14]. Early detection of discomfort, prompt consultation with medical professionals, and treatment plan adherence are all components of effective therapy. For healing and relapse prevention, reasonable antibiotic use and routine follow-up are essential[15]. Successful UTI management requires consistent physician supervision and disciplined treatment [16]. While infections in men are typically more complex and clinically severe, UTIs are generally more prevalent in women [17]. Anatomical and physiological reasons are primarily responsible for this discrepancy. Bacterial entrance into the urinary tract is facilitated by women's shorter urethras and their close proximity to the vagina and anus [18]. Furthermore, the vaginal microbiome and local immune responses can be changed by hormonal changes during the menstrual cycle, pregnancy, and menopause, raising the risk of recurrent infections [19]. Male UTIs, on the other hand, are less common but more complicated and challenging to treat since they are frequently linked to underlying disorders such as catheterization, prostate enlargement, or urinary blockage [20]. Therefore, this study aims to assess factors influencing UTIs practices among male and female patients in Wasit hospitals, Iraq.

RESEARCH METHOD

Study Period:

This investigation was established on September 1, 2025, and ended on January 20, 2026.

Design for Study:

It is a descriptive cross-sectional study designed to determine factors influencing UTI practices among male and female patients in Wasit hospitals, Iraq.

Population source:

Adult males and females (18 years of age and older) who come to public and government hospitals in Al-Kut City, Wasit Governorate, Iraq, make up the sample population.

Inclusion Criteria:

Participants in the urology outpatient clinics who were at least eighteen years old.

Only individuals who could comprehend and finish the questionnaire in Arabic were allowed to participate, and participation was contingent upon informed consent.

Exclusion Criteria:

Medical students or practitioners.

Patients who did not want to participate or who did not complete the surveys.

Sample size and Sampling techniques

Based on population size, "the Daniel and Cross formula" for calculating sample size was used to account for the sample size. As a result, the minimal sample size is 300, while we have taken 350 to boost the study, as shown below: [21].

$$\boldsymbol{n = \frac{Z^2\, P\, (1 - P)}{d^2}}$$

Where:

n = sample size (=350)

Z = Z-score corresponding to the degree of assurance (for a 95% confidence level, Z ≈ 1.96)

P =Expected prevalence (according to the previous study in Baghdad, Iraq [22], which found that the prevalence of UTIs was found to be 26.6%, with 62.9% among females and 37.1% among males.

d = Precision (*d* = 0.05) (The greatest permitted discrepancy between the proportions of the population and the sample), with the sample size proportionally distributed between both facilities.

Variables of the study

Dependent variables

The dependent variables were the levels of practices regarding UTIs, categorized into poor, fair, and good, for practices based on percentage scores.

Independent variables:

The independent variables included sex, educational level, occupation status, SES (low, medium, high), and history of UTI.

Data Collection Method:

The data was obtained through in-person interviews post the questionnaire was translated as Arabic (the local language) with closed-ended inquiries. Participants were informed of the study's objectives and assured that the data would remain confidential. During the interview, the researcher filled out the structured questionnaire.

Validity and Reliability

Validity of the questionnaire is decided by a committee of experts with various specializations. All expert comments were taken into account for slight modifications.

Using Cronbach's alpha, the internal consistency of the questionnaire was assessed to ensure the reliability of the items. With a Cronbach's alpha of 0.77, the results indicated that the questionnaire demonstrated a good level of reliability.

Data scoring

In this study, socio-demographic characteristics included sex, educational level, occupation status, SES (low, medium, high), and history of UTI. SES was assessed using a structured scoring system based on the WHO guidelines [23]. The SES score was calculated from five domains: educational level (0–5), occupation (0–2), income level (0–2), house ownership (0–2), and car ownership (0–1), with a total possible score of 12. Participants were classified into three categories according to their total score: low (1–4), medium (5–8), and high (9–12).

Practices related to UTI prevention and treatment were assessed using 14 items on a five-point "Likert scale" (Always = 5, Often = 4, Sometimes = 3, Rarely = 2, Never = 1). The maximum obtainable score was 70. The overall practice score was calculated using (observed score / highest score × 100) and categorized as poor (<50%), fair (50% – <75%), and good (≥75%) according to [24].

Statistical Analyses:

Each questionnaire item's data was entered into a desktop or laptop computer, and the data was analyzed using the statistical software SPSS-27. Basic statistics like frequency, percent, average, standard deviation, and range displayed the data. Fisher's exact test or the Chi-square test (χ^2-test) was performed to find out the significance of percentage distinctions in the qualitative data. In this study, a non-independent t-test was also employed. The P-value was considered statistically significant when it was equal to or less than 0.05 [25].

Ethical Considerations:

The Wasit Health Directorate (Human Development and Training Center) and the College of Health and Medical Techniques in Basra both gave their official clearance for the study's visitation of the chosen Al-Kut City facilities. After obtaining the necessary administrative clearances, the study was conducted at Al-Zahraa Teaching Hospital and Al-Karama Teaching Hospital.

With verbal and written confirmation of their willingness to participate, participants were interviewed after giving their informed consent. Each participant received a thorough explanation of the study's goals and assurances that the data they provided would only be utilized for research. Throughout the study, personal data privacy and confidentiality were rigorously upheld. Participants were also made aware that their involvement was entirely voluntary and that they could stop at any moment without facing any repercussions.

RESULTS AND DISCUSSION

Socio-demographic variables for participants:

In Table 1, the findings showed how patients were distributed based on the sociodemographic traits of the study group. The majority 66.9%) of the population is

female, and 33.1% is male. Bachelor's degree holders make up the largest percentage (22.0%), followed by primary (19.7%), intermediate (17.1%), postgraduate level (16.9%), high school (14.6%), and illiterate or read-and-write (9.7%). In terms of occupation, 34.3% of participants were unskilled laborers, and 38.3% of participants were lower professionals. However, high-level professional and managerial positions are held by 27.4% of the participants. Medium SES accounts for more than half of patients (52.9%), followed by high SES (26.9%) and low SES (20.3%). Lastly, a history of UTIs was reported by 57.1% of patients, with the largest percentage (46.0%) having three to four recurrent UTIs.

Table 1. The distribution of patients according to sociodemographic characteristics of the study population.

Socio-demographic Characteristics		Freq.	%
Sex	Male	116	33.1
	Female	234	**66.9**
Educational level	Illiterate or read & write	34	9.7
	Primary school	69	19.7
	Intermediate school	60	17.1
	High school	51	14.6
	University graduate	77	**22.0**
	Post Graduate Studies	59	16.9
Occupation status	Unskilled workers	120	34.3
	Lower professionals, skilled, and semiskilled workers	134	**38.3**
	High professional and managerial jobs	96	27.4
SES	Low (1-4 scores)	71	20.3
	Medium (5-8 scores)	185	**52.9**
	High (9-12 scores)	94	26.9
	Mean± SD (Range)	**6.8±2.4 (1-12)**	
History of UTI	Yes	200	**57.1**
	No	150	42.9

In **Table 1**, the present study includes a large portion as female (66.9%). This disparity may be since females are generally more likely to seek medical consultation when experiencing symptoms. Notably, these findings are consistent with a study conducted in Jordan, which reported a female participation rate of 68.4% [26]. Whereas results showed that the highest percentage of participants had a university degree (22.0%). That are generally more health-conscious and more likely to seek medical consultation and laboratory testing when symptoms appear. This finding is supported by a study conducted in Qatar, with 25.3% of patients with UTIs holding a university degree [27]. Our study results showed that the largest group of participants was those in low-skilled, skilled, and semi-skilled occupations (38.3%). This percentage is attributed

to the fact that these occupations (such as school staff, teachers, administrative employees, small business owners, military personnel, and police officers) often constitute the most common occupations in society, with a high level of awareness. Our outcomes are in line with a Egypt study that found that individuals engaged in manual labor and skilled occupations had the highest prevalence of UTIs (41.2%) [28]. The majority of participants (52.9%) in our study had medium SES, since many members of the community would rather not be asked directly about their SES and monthly income. Our study's results are consistent with another study conducted in Jordan. This found that a high percentage were in the moderate state for SES [29]. Half of the participants (57.1%) in our study had a documented history of UTIs. This is due to inadequate medical follow-up and the emergence of multidrug-resistant bacterial strains resulting from the irrational use of antibiotics. This result compares with a previous study in Baghdad, which reported 58.5% of patients had a history of UTIs [30].

The Practices about UTIs

In **Table 2**, the distribution of patients' responses by their practices regarding UTIs. The present findings established that the highest percentages (35.7%, 41.7%, 50.0%, 50.6%, 38.0%, 55.1%, 57.1%) of the patients were always experienced drinking more water when having a UTI, using antibiotics as part of UTI treatment, urinating immediately when feeling the urge, avoiding holding urine for long periods, wearing loose or breathable underwear to reduce UTI risk, cleaning the genital area from front to back after making use of the toilet, and avoiding perfumed soaps or sprays around the genital area, respectively. Furthermore, 30.3%, 34.3%, and 34.3% of the patients often experienced taking analgesics (pain relievers) for UTI symptoms, going to the hospital to treat UTI, and seeking medical attention for UTI, respectively. While the highest proportion of the participants sometimes experienced resting at home when experiencing a UTI (36.9%), taking more showers when having a UTI (28.6%), and drinking cranberry juice or supplements to prevent recurrence (44.6%). More than half of the patients were inexperienced in taking antibiotics directly without a prescription (57.7%).

Table 2. The patients' reactions according to their practices about UTIs.

ID	Practices	Never	Rarely	Sometimes	Often	Always
		Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)
1.	Resting at home when experiencing a UTI	39 (11.1%)	33 (9.4%)	129 (36.9%)	94 (26.9%)	55 (15.7%)
2.	Drinking more water when having a UTI	44 (12.6%)	42 (12.0%)	55 (15.7%)	84 (24.0%)	125 (35.7%)
3.	Going to the hospital to treat a UTI	33 (9.4%)	11 (3.1%)	89 (25.4%)	120 (34.3%)	97 (27.7%)
4.	Seeking medical attention for UTI	22 (6.3%)	21 (6.0%)	80 (22.9%)	120 (34.3%)	107 (30.6%)

5.	Using antibiotics as part of UTI treatment	8 (2.3%)	63 (18.0%)	77 (22.0%)	56 (16.0%)	146 (41.7%)
6.	Taking analgesics (pain relievers) for UTI symptoms	35 (10.0%)	59 (16.9%)	85 (24.3%)	106 (30.3%)	65 (18.6%)
7.	Taking antibiotics directly without a prescription	202 (57.7%)	44 (12.6%)	24 (6.9%)	34 (9.7%)	46 (13.1%)
8.	Avoiding holding urine for long periods	17 (4.9%)	14 (4.0%)	89 (25.4%)	53 (15.1%)	177 (50.6%)
9.	Urinating immediately when feeling the urge	11 (3.1%)	4 (1.1%)	97 (27.7%)	63 (18.0%)	175 (50.0%)
10.	Taking more showers when having a UTI	77 (22.0%)	18 (5.1%)	100 (28.6%)	61 (17.4%)	94 (26.9%)
11.	Drinking cranberry juice or supplements to prevent recurrence	53 (15.1%)	29 (8.3%)	156 (44.6%)	68 (19.4%)	44 (12.6%)
12.	Wearing loose or breathable underwear to reduce UTI risk	32 (9.1%)	42 (12.0%)	46 (13.1%)	97 (27.7%)	133 (38.0%)
13.	Cleaning the genital area from front to back after using the toilet	24 (6.9%)	32 (9.1%)	44 (12.6%)	57 (16.3%)	193 (55.1%)
14.	Avoiding perfumed soaps or sprays around the genital area	49 (14.0%)	30 (8.6%)	29 (8.3%)	42 (12.0%)	200 (57.1%)

In **Table 2**, the present study demonstrated the largest proportion of participants sometimes (36.9%) resting at home, with always drinking more water (35.7%) when experiencing a UTI. This combination explains participants' preference for the "standard non-pharmaceutical pattern". This behavioral pattern is supported by some studies, which observed that patients used some form of self-management [31], [32]. At the same time, most participants often tend to go to the hospital and often reported seeking medical attention to treat UTIs, with a similar percentage (34.3%). The participants consider the hospital as a primary and reliable source for both information and treatment. This proactive health-seeking practice is consistent with a study conducted in Saudi Arabia, which emphasized that patients increasingly favor professional medical consultations from hospitals [33]. As management of UTI, 41.7% of participants always used antibiotics, and the 30.3% of participants often took analgesics as part of UTI treatment. However, indicated 57.7% of the participants never took antibiotics without a prescription, which aligns. These results reflect a high level of awareness of pharmacological indications; participants reject indiscriminate treatment and adhere to medications only when medically necessary. This integrated pattern of responsible medication use is consistent with a study conducted in Saudi Arabia, which found that public awareness campaigns have significantly improved patient compliance [34]. A high level of awareness among participants for home management practice for treating

UTIs, specifically 50.6% who always avoided prolonged urinary retention, led to always urinating immediately upon feeling the urge (50.0%), to prevent bacterial colonization and the subsequent development of infection. This proactive voiding behavior is consistent with a study conducted in Egypt, which highlighted adhering to frequent voiding habits and avoiding "holding urine" as a fundamental non-pharmacological strategy to mitigate the risk of recurrent infections [35]. The current study addressed uncommon practices for managing UTIs. Specifically, 28.6% of participants sometimes increased their showering frequency, while 44.6% sometimes consumed cranberry juice or related supplements to prevent recurrence. This behavioral pattern suggests that participants perceive these actions as secondary, supportive habits rather than primary therapeutic requirements. Our findings align with a study conducted in Lebanon, which demonstrated that patients often integrate occasional lifestyle modifications (such as intensified personal hygiene and the use of herbal or fruit-based supplements) as a holistic approach to managing urinary health [36]. In addition, significant portion in our study reported always adhering to correct hygiene practices, including cleaning from front to back (55.1%), wearing loose or breathable underwear to reduce UTI risk (38.0%), and avoiding perfumed soaps or sprays (57.1%). Collectively, these behaviors indicate a high level of literacy regarding the preservation of the natural urogenital flora and the prevention of bacterial translocation. By minimizing moisture and avoiding chemical disruptors, participants actively maintain the urogenital tract's protective barriers. This integrated approach to local hygiene is consistent with a study conducted in Jordan, which highlighted that women with higher health awareness consistently prioritize non-pharmacological defenses to mitigate the colonization of pathogens like E. coli [35].

The total practice score of the participants

In Figure 1, shown Pie chart illustrates the total practice score of the participants. The results found that 56.0% of patients have a good practice score, followed by 22.9% of the participants have a fair practice score, and only 21.1% of patients have a poor practice score.

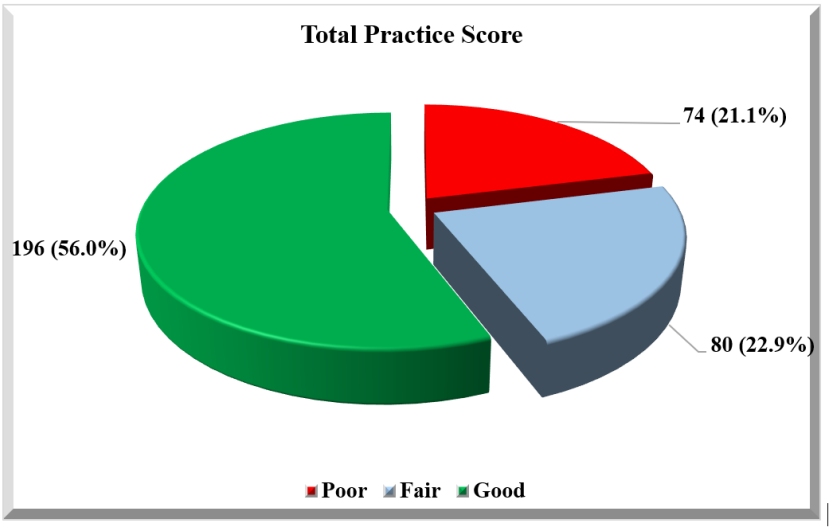

Figure 1. The pie chart illustrates the total practice score of the participants.

In **Figure 1**, the majority of participants in our study fell into the "Good" category (56.0%), which represents possess a good level of health consciousness and a commitment to following preventive guidelines. Our findings align significantly with a study where a substantial portion of the participants also demonstrated positive practices [37].

The relationship between total practice scores and the socio-demographic characteristics of patients

In Table 3, the relationship between total practice scores and the socio-demographic variables of patients. The results revealed a significant relationship between socio-demographic characteristics (such as sex, educational level, occupational status, and SES) and the total practices score (P <0.001). On the other hand, no statistically significant correlation was found with only a history of UTI.

Table 3. The relationship between total practice scores and socio-demographic characteristics of patients.

Socio-demographic characteristics		Total Practice Score						P-value
		Poor		Fair		Good		
		Freq.	%	Freq.	%	Freq.	%	
Sex	Male	23	19.8	28	24.1	65	56.0	**<0.001**
	Female	131	56.0	52	22.2	51	21.8	
Educational level	Illiterate or read & write	15	44.1	5	14.7	14	41.2	**<0.001**
	Primary school	19	27.5	4	5.8	46	66.7	
	Intermediate school	15	25.0	12	20.0	33	55.0	
	High school	11	21.6	12	23.5	28	54.9	
	University graduate	7	9.1	25	32.5	45	58.4	
	Post Graduate Studies	7	11.9	22	37.3	30	50.8	
Occupation status	Unskilled workers	44	36.7	20	16.7	56	46.7	**<0.001**
	Lower professionals, skilled, and semiskilled workers	18	13.4	31	23.1	85	63.4	
	High professional and managerial jobs	12	12.5	29	30.2	55	57.3	
SES	Low (1-4 scores)	27	38.0	6	8.5	38	53.5	**<0.001**
	Medium (5-8 scores)	36	19.5	52	28.1	97	52.4	
	High (9-12 scores)	11	11.7	22	23.4	61	64.9	
History of UTI	Yes	48	24.0	43	21.5	109	54.5	0.306
	No	26	17.3	37	24.7	87	58.0	

*Chi-square test (χ^2-test) at p-value ≤ 0.05

*Fisher's exact test is used for cells that have an expected count less than 5.

In **Table 3**, the study demonstrated the relationship between total practice score and some socio-demographic characteristics all with <0.001. Speciality total practice score is

reflection with the sex characteristics of patients. Although females comprised a larger proportion of the total sample, these results suggest that male participants were more likely to exhibit good practices than female participants. This result consistent with a study conducted in Babil, Iraq, which found that males demonstrated more consistent preventive behaviors and a higher level of adherence to urinary health guidelines [38]. Our results also revealed that there was a statistically significant relationship between educational level and the total practice score with high percent in good practice score. This can be interpreted as participants tend to follow the advice of healthcare professionals in dealing with infections. These outcomes differ from a study conducted in Iran which reported that educational level did not significantly influence the quality of UTI preventive practices [39]. The study indicated that individuals in lower professional, skilled, and semiskilled workers and high professional and managerial jobs constituted the largest groups exhibiting good practices (63.4% and 57.3%, respectively).

This phenomenon arises from be individuals in these groups are often more health-conscious due to higher education and professional training, which motivates them to adopt healthier hygiene and preventive behaviors regarding UTIs. However, our findings contrast with a study in India, which found no statistically significant association between job type (e.g., professionals, workers, and students) and the preventive health practices related to infections [40].This inconsistency may be explained by differences in the availability of occupational health programs and the varying impact of professional environments on health awareness across different geographic and economic contexts. Moreover, showing a highly statistically significant correlation between SES status and total practices score, indicated that individuals in the high SES group constituted the largest group exhibiting practices. This due to the fact that higher social standing often facilitates better access to private healthcare and high-quality educational resources, which enhances the implementation of preventive measures specifically related to urogenital health. Our findings are consistent with a study conducted in Saudi Arabia, which reported that high SES was significantly associated with higher adherence to UTI preventive measures [41].

Table 4 shows the comparison between males and females by levels of practice**.** The results found that there were levels of practices that were higher in males compared to females (P <0.001), with males demonstrating higher mean scores in better preventive practices (49.77, 10.47) compared to females. Although both fall under the descriptive rating "Fair scores."

Table 4. The comparison between males and females based on practices.

	Gender						**P-value**
	Male			**Female**			
	Mean	**±SD**	**Ass.**	**Mean**	**±SD**	**Ass.**	
Practices	49.77	10.47	Fair	38.41	10.57	Fair	**<0.001**

*Non-independent t-test at p-value ≤ 0.05

In **Table 4**, the study results indicated that there was a statistically significant difference between males and females regarding their practice levels ($P < 0.001$). The men males demonstrating higher mean scores in better preventive practices. It is attributed to the fact that the symptoms of UTIs in men are sometimes more obvious, which motivates them to adhere more closely to preventive or therapeutic practices. Although many published studies on UTI practices focus mainly on females because they are more vulnerable to UTIs anatomically. Our findings are consistent with a study conducted in Jordan, which reported that while knowledge levels were similar across genders, significant differences existed in health-seeking behaviors and preventive practices related to UTIs [42]. On the other hand, our findings contrast with a study conducted in Iran, which reported that females exhibited significantly better preventive practices regarding UTIs than males [43].

CONCLUSION

Fundamental Finding : The study showed that males exhibited better practice and greater adherence to prevention and treatment standards compared to females, even though females were more prone to UTIs in the sample. Also, the majority of participants avoided taking antibiotics without a prescription, reflecting a growing awareness of the risks of indiscriminate antibiotic use. This study found a statistically significant correlation between practices score with sex, educational level, employment status, and SES. **Implication :** We recommend the importance of targeting disadvantaged populations (especially females and those with limited income or education) with focused health education programs in Wasit Governorate hospitals to promote preventive behaviors. **Limitation :** The cross-sectional nature of the study, which makes it impossible to prove causation, was a limitation. The results may not be as broadly applicable as they could be because the sample was restricted to two hospitals in Al-Kut. Additionally, recall or response bias may have been introduced because the data relied on self-reporting (convenient sampling). **Future Research :** Future studies should include broader samples from multiple hospitals and use longitudinal or mixed-method designs to better establish causal relationships and reduce recall or response bias.

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