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HEALTH EDUCATION IN THE PREVENTION OF URINARY TRACT INFECTION: EXPERIENCE REPORT

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ABSTRACT:

Background: Urinary tract infections (UTIs) are the second most prevalent infections affecting humans, following respiratory infections. The high incidence of UTIs highlights the need for guidelines on therapy's role in prevention.

Objective: To report on an extension activity involving nursing students aimed at preventing UTIs and raising awareness through education, held at Aga Khan University during the III Nursing Week.

Methods: The activity comprised frontal lessons, water distribution, and a questionnaire assessing symptoms indicative of UTIs. The data collection focused on the prevalence of UTIs among teachers and academics.

Results: Out of 278 participants, 61% reported having experienced at least one UTI. Symptoms reported included:

Dysuria: 7%
Oliguria: 9%
Anuria: 7%
Hematuria: 1%
Pelvic pain: 3%
Urinary frequency: 12%
Polyuria: 13%
Strong odor: 3%
Urinary incontinence: 1%

Regarding sexual activity, 146 women and 20 men reported having at least one UTI. The significance of the action is underscored by over 50% of participants having encountered a UTI.

Conclusion: Health education programs are recommended to inform the public about UTI consequences and preventive measures, such as maintaining proper hygiene and urinating as needed. Such measures could potentially reduce the number of clinical cases.

KEYWORDS: Urinary Tract Infections, Health Education, Disease Prevention, Urinary tract infections (UTIs), Infection prevalence, Nursing education, Preventive health measures, Symptoms of UTIs, Public health awareness, Hygiene practices, Clinical pathology prevention.

INTRODUCTION:

Urinary tract infection (UTI) is currently the second most common infection affecting humans, from childhood to old age, predominantly in women. It is a multifactorial clinical pathology with a high incidence worldwide and is also the second leading cause of consultation in medical practice, behind only respiratory infections. UTI occurs due to a decrease in the patient's defense mechanisms. According to Damião, R. et al., there are four possible routes through which bacteria enter the urinary tract; the most common is the ascending route through the urethra. The prevalence of UTIs in females during childhood is 10 to 20 times higher than in males. And throughout adult life, this incidence continues (Agrawal et al., 2024; Fitzpatrick et al., 2024; Gleicher et al., 2024).

This percentage is mainly explained by the fact that the anatomical conditions of the woman, such as the shorter urethra and the proximity of the vagina and anus, as well as another set of factors, such as sexual activity, with an estimate of 0, 5-0.7 episodes of cystitis per year in sexually active women; pregnancy, previous episodes of cystitis, diabetes, poor hygiene, clothing, among others, making the condition more frequent in women with disadvantaged socioeconomic conditions and obese, whereby this combination of factors leads to the fact that 50% of women have at least one episode of UTI in their lifetime (Alsolami & Tayyib, 2024; Gad, Rasmussen, Ladefoged, Mathiesen, & Finderup, 2024).

Second, approximately 150 million people are diagnosed with symptomatic urinary tract infections worldwide each year, of which approximately 90% of patients experience cystitis and 10% experience pyelonephritis (bacterial infection in the kidney). UTIs are considered one of the most common bacterial infections, responsible for 80 out of 1,000 clinic visits per year. It is the third most common infection in hospitals, responsible for approximately 40% of all infections, common in intensive care units - ICU -, being one of the essential sources of sepsis (Brady et al., 2024; Jones, Krein, Mantey, Harrod, & Mody, 2024).

In Roraima, teacher Aline Gondim de Freitas collected data from April 2010 to January 2015 at the Central Laboratory of Roraima (LACEN-RR), where urine cultures were carried out on 4,501 urine samples, of which 3,770 samples (83 .8%) there was no evidence of microbial growth (negative). In 731 (16.2%), microbial growth was observed, and urine cultures were considered positive, of which 58.3% (426) corresponded to patients of female while 37.9% (277) in male patients, demonstrating a higher incidence in women. However, according to Chambo Filho and collaborators, data regarding the incidence of UTIs are probably underestimated since the resolution of the infectious condition often occurs without medical intervention (da Silva, da Silva, da Cruz, & Barbosa, 2024; Lambert & Coulthard, 2024; Safwan, Dias, & Dilhari, 2024).

Although the urinary tract is considered sterile, it is estimated that most urinary tract infections are due to contamination by gram-negative bacteria, of which Escherichia coli is the most common (approximately 76.7% of cases), followed by other less common uropathogens such as Streptococcus, Klebsiella, Staphylococcus, Enterococcus faecalis, Enterobacter sp, and Proteus mirabilis. One of the ways to prevent bacterial growth is through adequate bladder emptying and optimal urinary flow. According to Damião, R. et al., urinary residues after

urination exceeding 180 ml lead to a greater predisposition to urinary tract infections, as they are related to greater bacteriuria (Abdelbadee Abdallah, Mohamed, Hasab Allah, & Soliman, 2024; Al Karmi et al., 2024; Benseler, Tomlinson, Lovatsis, Alarab, & McDermott, 2024).

Therefore, an adequate intake of water is necessary to maintain the frequency of urination without leaving residue. Regarding the ideal amount of water per day, there is a generalization that leads individuals to drink insufficient amounts of water. There is a calculation that shows precisely how much water each person should ingest, and it is obtained by multiplying 35 ml of water per kilogram. For example, a person weighing 80 kilos should drink 2800 ml of water per day. However, other factors must be considered, such as the degree of physical activity, altitude, humidity, and climate of the place of residence (Alhaj et al., 2024; Mititelu et al., 2024).

Table 1: Prevalence and Risk Factors of UTIs

Population	Prevalence (%)	Risk Factors	References
Females (childhood)	10-20 times higher than males	Shorter urethra, proximity of vagina and anus, sexual activity, pregnancy, previous cystitis, diabetes, poor hygiene, clothing, socioeconomic status, obesity	Agrawal et al., 2024; Fitzpatrick et al., 2024; Gleicher et al., 2024; Alsolami & Tayyib, 2024; Gad et al., 2024
General population	50% (lifetime incidence in women)	Anatomical conditions, sexual activity, socioeconomic conditions, obesity	Agrawal et al., 2024; Fitzpatrick et al., 2024; Gleicher et al., 2024; Alsolami & Tayyib, 2024; Gad et al., 2024
Symptomatic UTIs worldwide	150 million per year	-	Brady et al., 2024; Jones et al., 2024

Table 2: Bacterial Pathogens and Prevention

Bacterial Pathogen	Prevalence (%)	Prevention Measures	References
Escherichia coli	~76.7%	Adequate bladder emptying, optimal urinary flow, adequate water intake	Abdelbadee Abdallah et al., 2024; Al Karmi et al., 2024; Benseler et al., 2024; Damião et al.
Other uropathogens (e.g., Streptococcus, Klebsiella, Staphylococcus, Enterococcus faecalis, Enterobacter sp, Proteus mirabilis)	<23.3%	-	Abdelbadee Abdallah et al., 2024; Al Karmi et al., 2024; Benseler et al., 2024

Table 3: Complications of Untreated UTIs

Complication	Description	References
Pyelonephritis	Infection of the kidneys	Hari et al., 2024
Urosepsis	Generalized infection	Hari et al., 2024
Urethritis	Inflammation of the urethra	Hari et al., 2024
Kidney abscesses	Formation of pus in the kidneys	Hari et al., 2024
Loss of kidney function	Permanent damage to the kidneys	Hari et al., 2024
Death	Result of infection with resistant bacteria	Hari et al., 2024

Table 4: Regional Data on UTI Incidence

Region	Period	Number of Samples	Positive Cultures (%)	Female Patients (%)	Male Patients (%)	References
Roraima	Apr	4,501	16.2	58.3	37.9	da Silva et al.,

(LACEN-RR)	2010 - Jan 2015					2024; Lambert & Coulthard, 2024; Safwan et al., 2024

Table 5: Recommended Water Intake

Body Weight (kg)	Daily Water Intake (ml)	Factors to Consider	References
80	2,800	Physical activity, altitude, humidity, climate	Alhaj et al., 2024; Mititelu et al., 2024

As for complications, urinary tract infections do not present a complicated treatment and can be resolved by administering antibiotics. However, if left untreated, it can progress to aggravate the clinical condition, as in the case of ascending infection, generating pyelonephritis, which is an infection of the kidneys, which can be acute or chronic, which can progress to urosepsis or generalization. Infection. It can also cause urethritis, kidney abscesses (formation of pus), loss of kidney function, and, in the case of resistant bacteria, can even lead to death. In light of this information, the need to guide the population on the relevance of self-care in the prevention and symptoms of UTIs is evident (Hari et al., 2024; Raphael & Huang, 2024; Swart, Benrimoj, & Dineen-Griffin, 2024).

METHODOLOGICAL PROCEDURE:

This is a description of an extension activity done with nursing students at Aga Khan University to kick off III Nursing Week. Lessons on UTIs, indicators, risk factors, and prevention were given to an audience of about 278 people on April 10, 2023, at 2:00 and 6:00 p.m. The sessions ended with a survey with sign indicators, the results of which were aimed at collecting an estimation of the total number of instructors and students who were previously affected (Matovelle et al., 2024; Wynn et al., 2024).

In addition, 150 water bottles were personalized and placed in the institute's restrooms containing data on the color of the pee, as depicted in Figure 1, to promote drinking the recommended amount of water throughout the day. The water bottles were given out after the lessons (Sundas et al., 2024).

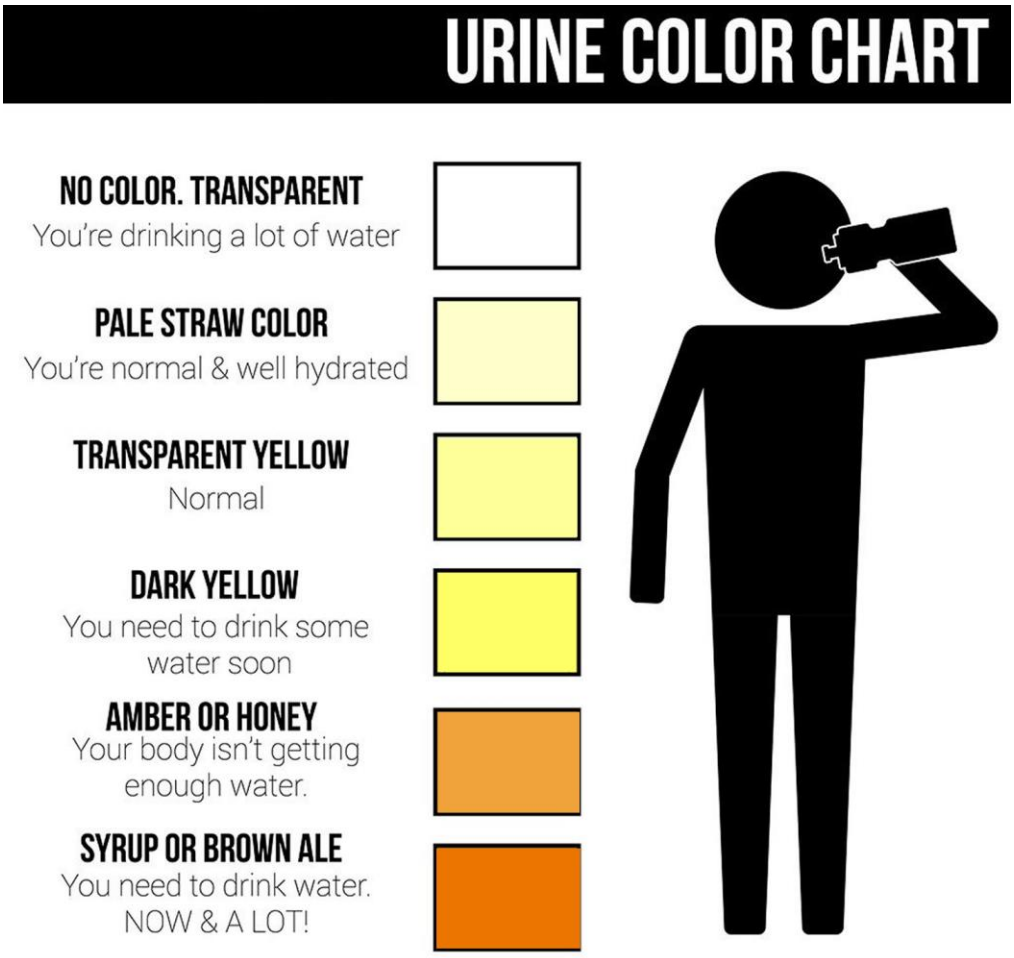


Figure 1. Poster used in the bathrooms of the institution, with information on the color of urine.

RESULTS AND DISCUSSIONS:

The objectives of the extension action were achieved, through which a sample of 278 completed questionnaires was obtained. When participants were asked if they had ever had an episode of a urinary tract infection, 172 responded yes, 93 responded no, 11 did not know, and 2 responded, data shown in Table 1 (Wyman et al., 2024).

PRESENTED AT		

LEAST ONE UTI CASE	N	%
No	93	≅ 33.4%
Yes	172	≅ 61.8%
Didn't respond	2	≅ 0.7%
Didn't know	11	≅ 3.9%

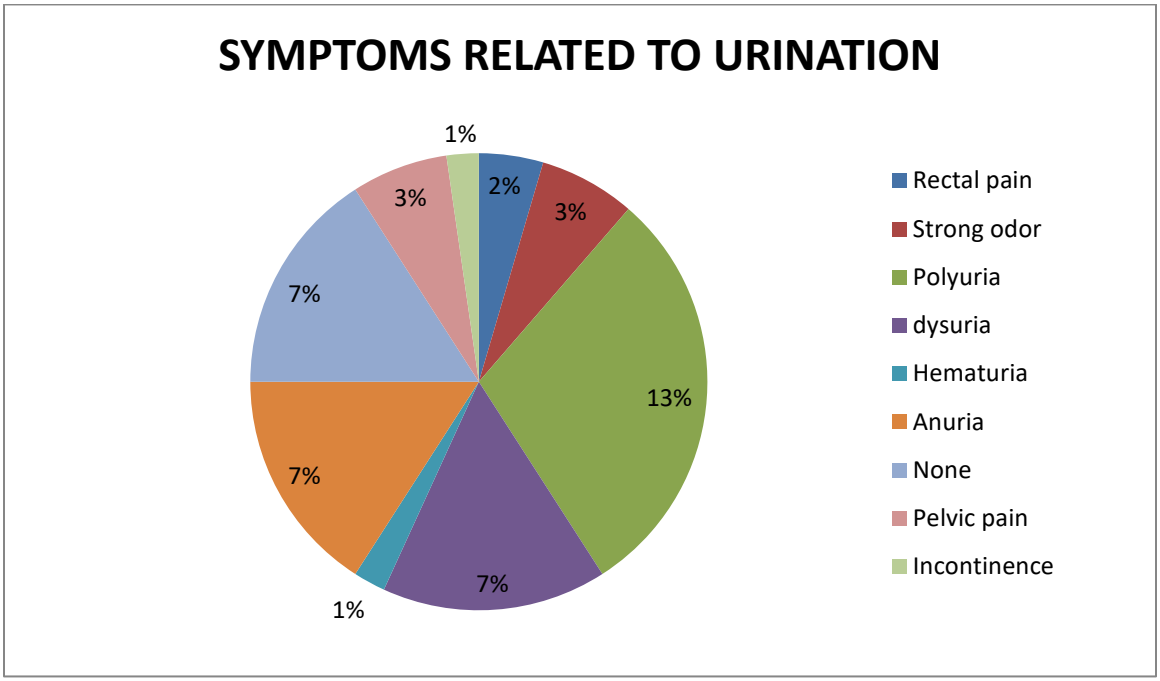
Table 1: Distribution of participants who reported having at least one case of UTI.

Table 2 shows that, of the 172 people who had cases of urinary tract infection, 87.95% were women and 12.04% men, while six did not respond regarding sex (Köse & Çiftçi, 2024).

NUMBER OF PEOPLE WHO HAD UTI BY GENDER	N	%
Male	20	≅ 11.6%
Female	146	≅ 84.8%
Didn't respond	6	≅ 3.5%

Table 2: Distribution of participants who had a case of UTI by gender.

Graph 1 lists the symptoms that the participants reported feeling when urinating, of which 7% had dysuria; anuria 7%; 9% oliguria; 1% hematuria; 3% pelvic pain; urinary frequency 12%; 13% polyuria; 3% strong odor, 2% rectal pain, and 1% urinary incontinence (König et al., 2024).



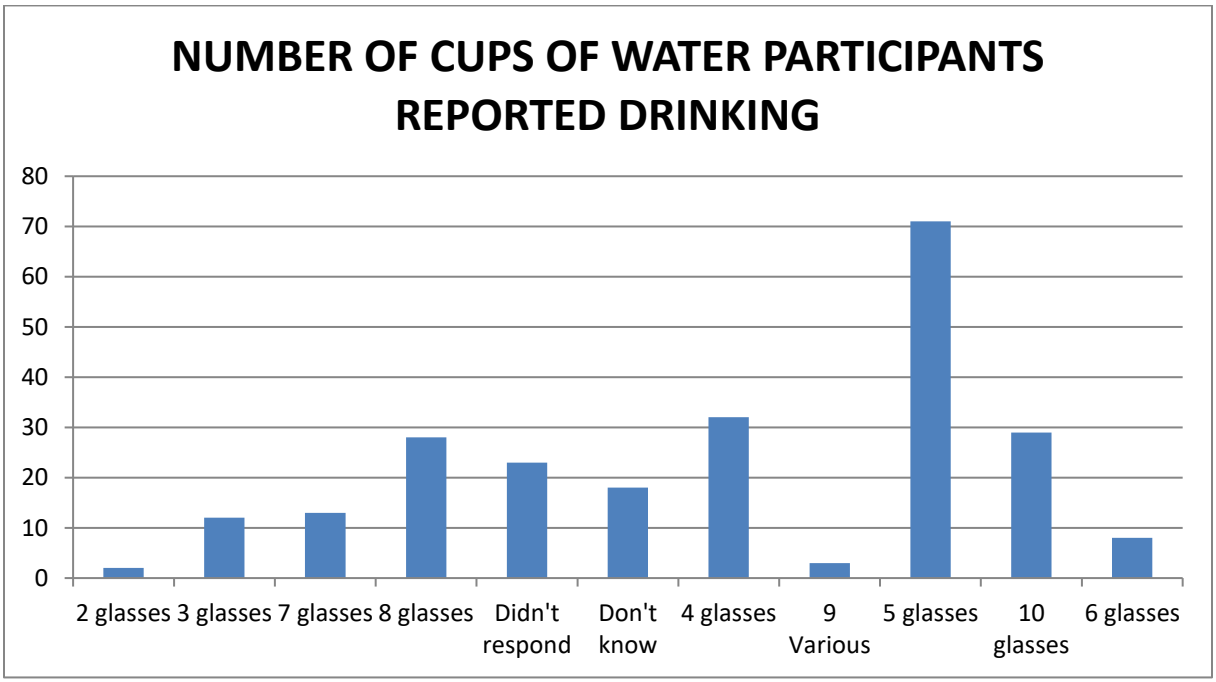
Graph 1: Symptoms reported by research participants.

In Table 3, there is a sample of 105 people who declared that they drink water only when they are thirsty. In comparison, the majority answered no to this question (172 people), and one person did not answer (Collins, Yawawa, Ugiagbe, & Leliopoulou, 2024).

REPORTED DRINKING WATER ONLY WHEN THIRSTY	N	%
Yes	172	≅ 61.8%
No	105	≅ 37.7%
Didn't respond	1	≅ 0.3%

Table 3: Distribution of participants who drink water only when thirsty.

Graph 2 shows the number of glasses of water consumed by respondents, of which 71 reported drinking ten glasses of water per day. This data demonstrates that the majority of these drink a considerable amount of water daily (Maina & Malusha, 2024).



Graph 2: Quantity of glasses of water drunk daily reported by participants.

In addition to the data collected, there was good use of the lesson and the display of educational posters in the bathrooms, which had a good impact (Al Obeisat et al., 2024).

FINAL CONSIDERATIONS:

Based on the data collected, what was reported in research and literature was confirmed: a considerable number of people, especially women, are affected by UTIs. As well as highlighting the fact that there are still people in the academic community who need to be in the habit of drinking an adequate amount of water. The reported project was positive, as it had an educational function and fulfilled the role of providing health education. In addition to being successful in this educational field, it was also an excellent pedagogical practice, led by the teacher of the institution, who encouraged academics to get in touch by planning and implementing an extension action with the preparation of conferences, posters, and questionnaires, be productive for their learning process so much so that this action received an award for good pedagogical practices by the institution.

Extension, being one of the pillars of teaching, is essential for the student's learning process, allowing one to develop skills such as organization, teamwork, and interpersonal interactions while also making significant contributions to science and society as a whole. From research like this, we can see the importance of encouraging academics to plan and develop such actions, as they reinforce the need to work on the three pillars of higher education: teaching, research, and dissemination, as well as reinforce the importance of prevention and water intake to avoid complications caused by UTI.

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