INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

ASSESS THE KNOWLEDGE OF NURSING STUDENTS ABOUT PREVENTIVE MEASURES OF UINARY TRACT INFECTION

Original Research

Aleena Arooj[1]*, Madiha Mukhtar[2], Suriya Jamil[3], Qubra Bibi[1]
[1]Intern Trainee, Lahore School of Nursing, The University of Lahore, Pakistan. alenaalenaarooj@gmail.com
[2]Associate Professor, Lahore School of Nursing, The University of Lahore, Pakistan.
[3]BSN, Lahore School of Nursing, The University of Lahore, Lahore, Pakistan.
Corresponding Author: Aleena Arooj, Intern Trainee, Lahore School of Nursing, The University of Lahore, Pakistan. alenaalenaarooj@gmail.com
Acknowledgement: The authors express gratitude to all participants and the University of Lahore for their support in this study.

Conflict of Interest: None

Grant Support & Financial Support: None

ABSTRACT

Background: Urinary tract infections (UTIs) are among the most prevalent bacterial infections, affecting individuals across all age groups. They commonly occur due to pathogenic microorganisms in the urinary tract, often leading to significant morbidity if not properly managed. Despite being largely preventable, UTIs remain a frequent healthcare concern, particularly in hospital settings where catheter-associated infections are prevalent. Adequate knowledge of preventive strategies is essential, especially among healthcare professionals. This study aimed to assess the knowledge of nursing students regarding UTI prevention measures.

Objective: To evaluate the level of knowledge among undergraduate nursing students regarding UTI prevention and identify potential gaps that may require targeted educational interventions.

Methods: A descriptive cross-sectional study was conducted among third-year Bachelor of Science in Nursing (BSN) students at the University of Lahore. A structured, pre-tested Likert-scale questionnaire was administered to assess knowledge. The study employed a convenience sampling technique, enrolling 65 participants. Data were analyzed using descriptive statistics in SPSS version 25.0. Ethical approval was obtained from the institutional ethics committee, and informed consent was obtained from all participants before data collection.

Results: Among the 65 participants, 21 (32.3%) were male, and 44 (67.7%) were female, with all aged between 20 and 25 years. Marital status showed that 61 (93.9%) were single, and 4 (6.1%) were married. Knowledge assessment revealed that 5 (7.7%) had poor knowledge (<40%), 21 (32.3%) had fair knowledge (40–60%), and 39 (60.0%) exhibited good knowledge (>60%). Responses varied across different preventive measures, with 33.8% agreeing that emptying the bladder every four hours helps prevent UTIs, while 24.6% disagreed. Increased fluid intake was recognized as beneficial by 24.6%, whereas 13.8% disagreed. Washing the vaginal area from front to back was acknowledged as a preventive measure by 35.4%, while 24.6% disagreed.

Conclusion: The findings indicate that the majority of nursing students demonstrated good knowledge of UTI prevention, reinforcing the impact of structured healthcare education. However, knowledge gaps still exist, emphasizing the need for continuous education and practical training to enhance preventive practices among future healthcare professionals.

Keywords: Catheter-associated urinary tract infection, Knowledge, Nursing students, Prevention, Risk factors, Urinary tract infection, UTI prevention.

INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH
AND REHABILITATION

INTRODUCTION

Urinary tract infections (UTIs) are among the most prevalent bacterial infections globally, affecting individuals of all ages and genders. These infections can involve both the lower and upper urinary tract, and their classification depends on the severity and underlying patient-related factors. UTIs are commonly categorized as either uncomplicated or complicated, with hospital-acquired infections constituting a significant proportion of cases. The urinary tract remains the most frequently affected site of nosocomial infections, impacting approximately 600,000 patients annually and accounting for nearly 40% of all reported healthcare-associated infections (1). A major contributing factor to hospital-acquired UTIs is the use of indwelling urinary catheters, with nearly 75% of cases linked to prolonged catheterization (2). Despite their preventability through proper hygiene practices, hydration, and catheter care, UTIs continue to impose a considerable burden on healthcare systems worldwide. Catheter-associated urinary tract infections (CAUTIs) are of particular concern, as they are prevalent among hospitalized patients with indwelling catheters. Studies suggest that more than 50% of patients with prolonged catheter use develop CAUTI symptoms, often due to inadequate adherence to evidence-based infection prevention strategies (3). Beyond the hospital setting, UTIs are also common in community-dwelling populations, particularly among women, the elderly, and individuals with compromised immunity. Symptoms of UTIs can range from mild discomfort to severe complications, including fever, abdominal pain, urgency, and painful urination. In older adults, UTI presentations may be atypical, with symptoms such as nausea, vomiting, confusion, or lower abdominal tenderness, which can sometimes lead to misdiagnosis or delayed treatment (4). Additionally, adolescent females have a higher susceptibility to UTIs due to factors such as poor hydration, infrequent urination, and improper menstrual hygiene, particularly in boarding school environments where access to sanitary facilities may be limited (5).

The etiology of UTIs involves a variety of gram-positive and gram-negative bacterial pathogens, with *Escherichia coli* being the most frequently implicated organism. Regional studies have identified variations in bacterial prevalence, with some areas reporting up to 22.3% of UTI cases being caused by *E. coli* (6). Furthermore, UTIs disproportionately affect older women, with incidence rates ranging between 45–55% in women aged 65 and above, compared to 33–46% in men of the same age group (7). Risk factors contributing to UTI development include diabetes, inadequate fluid intake, frequent antibiotic use, sexual activity, spinal cord injuries, and prolonged catheterization (8). Given the widespread nature of these infections, there is a pressing need for effective educational interventions targeted at both healthcare providers and the general population. Nursing students, as future frontline healthcare professionals, play a critical role in UTI prevention through patient education, hygiene promotion, and adherence to best practices in clinical settings. However, gaps persist in their knowledge and application of UTI prevention strategies, particularly in areas such as catheter management, hydration recommendations, and proper hygiene practices. Research indicates that educational programs tailored to nursing students can significantly improve their ability to prevent and manage UTIs in both hospital and community settings (9). Studies examining the impact of structured training programs have shown that interventions focusing on catheter insertion protocols, timely catheter removal, and aseptic techniques lead to substantial reductions in CAUTI rates (10). Furthermore, general awareness campaigns aimed at improving hydration habits and toilet hygiene have been found effective in reducing UTI incidence, particularly among high-risk populations such as pregnant women and the elderly (11).

Despite the available evidence supporting preventive strategies, many nursing students exhibit limited awareness of UTI risk factors and proper management approaches. Research conducted in various healthcare institutions has demonstrated that while the majority of nursing students recognize UTIs as a significant health concern, their understanding of specific preventive measures remains insufficient (12). This highlights the necessity of incorporating targeted educational programs into nursing curricula to enhance knowledge, improve adherence to infection control practices, and ultimately reduce UTI prevalence. Addressing these knowledge gaps is essential for ensuring that nursing students are adequately prepared to deliver optimal patient care and minimize UTI-related complications. Given the importance of UTIs in clinical practice and the need for well-informed healthcare professionals, this study aims to assess nursing students' knowledge of UTI prevention strategies. Specifically, it seeks to determine their level of understanding regarding hygiene practices, hydration, catheter care, and other preventive measures. Additionally, the study aims to explore associations between students' demographic characteristics, such as age, gender, and marital status, and their knowledge levels. The findings will contribute to the development of targeted educational interventions aimed at equipping nursing students with the necessary skills to prevent and manage UTIs effectively in healthcare settings.

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

METHODS

A quantitative descriptive cross-sectional study was conducted to assess the knowledge of nursing students regarding preventive measures for urinary tract infections (UTIs) at the Lahore School of Nursing, University of Lahore. The study aimed to evaluate students' understanding of UTI prevention strategies and identify associations between demographic characteristics and knowledge levels. The study population comprised third-year Bachelor of Science in Nursing (BSN) students, with participants selected using a convenience sampling technique. The inclusion criteria required students to be enrolled in the third year of the BSN program and aged between 20 and 30 years. First-year, second-year, and fourth-year BSN students, as well as individuals unwilling to participate, were excluded (13). The sample size was determined using Slovin's formula, considering a population size of 78 and a 5% margin of error, resulting in a final sample size of 65. The study was conducted over a four-month period from September 2024 to December 2024. Data collection was carried out using a structured questionnaire, which included demographic information and knowledge assessment items based on a five-point Likert scale. The questionnaire consisted of ten statements designed to evaluate students' knowledge of UTI prevention. Participants rated their responses on a scale from 1 (strongly disagree) to 5 (strongly agree). Knowledge was categorized into three levels based on participants' scores: poor (<20%), fair (≥20% to 30%), and good (>30% to 50%) (14).

To ensure the validity and reliability of the instrument, content and external validity were established through expert review by two specialists in the field. Reliability was assessed using the test-retest method, yielding a reliability coefficient of 0.81, indicating acceptable consistency. The questionnaire was administered in an ethically private manner, with all participants providing informed written consent before participation. The study objectives and significance were clearly explained to the participants, and they were assured of their right to withdraw at any stage without consequences (15). Data collection involved distributing the questionnaire to nursing students present at the time of data collection. Completion of the questionnaire took approximately 10–15 minutes. Responses were collected anonymously, and confidentiality was maintained throughout the study. Ethical approval was obtained from the Ethics Committee of the University of Lahore. All procedures adhered to ethical guidelines, ensuring that participants faced no harm or risks (16).

Data analysis was performed using SPSS version 25.0. Descriptive statistics were used to summarize demographic characteristics and knowledge levels. Relationships between study variables were analyzed using appropriate statistical tests. The independent variables included gender, age group, marital status, and educational level, while knowledge served as the dependent variable. The findings from this study are expected to contribute to nursing education by identifying gaps in students' knowledge and guiding targeted educational interventions to improve UTI prevention practices among future healthcare professionals.

RESULTS

The study included a total of 65 participants, comprising 21 (32.3%) males and 44 (67.7%) females. All participants were within the age range of 20–25 years. The majority were single, accounting for 61 (93.9%) participants, while only 4 (6.1%) were married. All participants were enrolled in the Bachelor of Science in Nursing (BSN) program at the University of Lahore. The assessment of knowledge regarding urinary tract infection (UTI) prevention was conducted using a structured questionnaire consisting of ten Likert-scale-based questions. The results demonstrated variability in knowledge levels among participants. When asked whether emptying the bladder every four hours prevents UTIs, 22 (33.8%) agreed, while 16 (24.6%) disagreed. Regarding the association between wearing tight underwear and UTIs, 27 (41.5%) agreed, whereas 13 (20.0%) disagreed. The role of estrogen vaginal cream in increasing resistance to bladder infection was uncertain, with 31 (47.7%) selecting the neutral response, 14 (21.5%) agreeing, and 12 (18.5%) disagreeing.

A notable proportion of students, 20 (30.8%), agreed that washing with soap predisposes individuals to UTIs, whereas 14 (21.5%) disagreed. Regarding the impact of excessive caffeine intake on UTI risk, 17 (26.2%) disagreed, 15 (23.1%) agreed, and 19 (29.2%) remained neutral. The notion that wearing dirty underwear causes UTIs was supported by 19 (29.2%) of participants, whereas 12 (18.5%) disagreed. When asked whether douching predisposes individuals to UTIs, responses were mixed, with 20 (30.8%) neutral, 18 (27.7%) agreeing, and 14 (21.5%) disagreeing. The preventive measure of urinating after sexual intercourse was agreed upon by 15 (23.1%) participants, while 14 (21.5%) disagreed, and 19 (29.2%) remained neutral. Increased fluid intake as a preventive strategy was agreed upon by 16 (24.6%) participants, while 9 (13.8%) disagreed. The majority of participants, 23 (35.4%), agreed that washing the vagina from front to back helps prevent UTIs, whereas 16 (24.6%) disagreed. The overall knowledge assessment revealed that 5 (7.7%) participants had poor knowledge (<40%), 21 (32.3%) demonstrated fair knowledge (40–60%), and 39 (60.0%) exhibited good knowledge (>60%).

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Table 1: Demographic characteristic of participants:

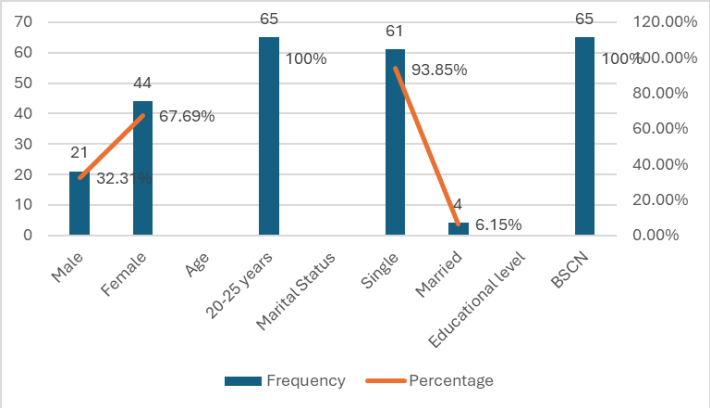
Gender	Frequency	Percentage
Male	21	32.31%
Female	44	67.69%
Age		
20-25 years	65	100%
Marital Status		
Single	61	93.85%
Married	4	6.15%
Educational level		
BSCN	65	100%

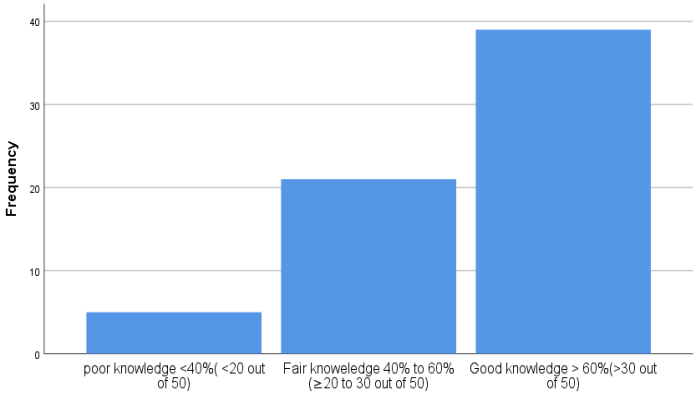
Table 2: UTI Awareness Questionnaire Responses: Frequency and Percentage

Questionnaire	Strongly Disagree (Frequency %)	Disagree (Frequency %)	Neutral (Frequency %)	Agree (Frequency %)	Strongly Agree (Frequency %)
Emptying the bladder every 4h prevents UTI.	10 (15.4%)	16 (24.6%)	9 (13.8%)	22 (33.8%)	8 (12.3%)
Wearing tight underwear is a risk factor for UTI.	7 (10.8%)	13 (20%)	11 (16.9%)	27 (41.5%)	7 (10.8%)
Application of estrogen vaginal cream increases resistance to bladder infection.	3 (4.6%)	12 (18.5%)	31 (47.7%)	14 (21.5%)	5 (7.7%)
Washing with soap predisposes to UTI.	8 (12.3%)	14 (21.5%)	16 (24.6%)	20 (30.8%)	7 (10.8%)
Excessive caffeine intake increases risk of UTI.	8 (12.3%)	17 (26.2%)	19 (29.2%)	15 (23.1%)	6 (9.2%)
Wearing dirty underwear causes UTI.	3 (4.6%)	12 (18.5%)	18 (27.7%)	19 (29.2%)	13 (20%)
Douching predisposes to UTI.	12 (18.5%)	14 (21.5%)	20 (30.8%)	18 (27.7%)	1 (1.5%)
Urinating after sexual intercourse prevents UTI.	7 (10.8%)	14 (21.5%)	19 (29.2%)	15 (23.1%)	10 (15.4%)
Increased fluid intake prevents UTI.	5 (7.7%)	9 (13.8%)	19 (29.2%)	16 (24.6%)	16 (24.6%)
Washing vagina from front to back can help to prevent UTI.	1 (1.5%)	16 (24.6%)	18 (27.7%)	23 (35.4%)	7 (10.8%)

Table 3: Overall sum of participants

Variable	Frequency	Percentage
Poor knowledge <40% (<20 out of 50)	5	7.7%
Fair knowledge 40% to 60%(≥ 20 to 30 out of 50)	21	32.3%
Good knowledge > 60% (> 30 out of 50)	39	60%
Total	65	100%





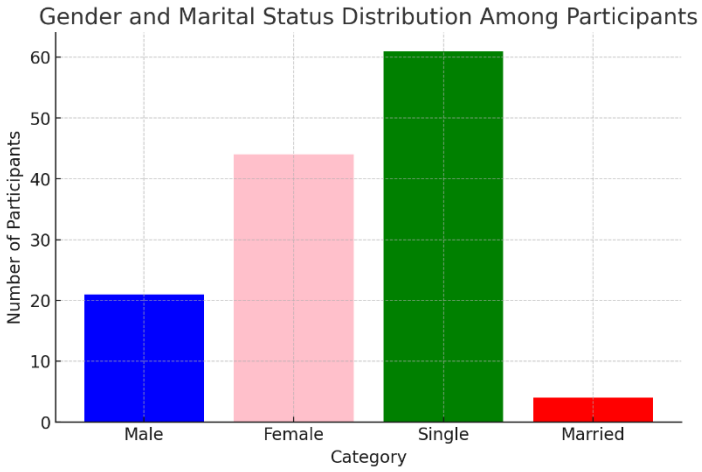


Figure 2 Gender and Marital Status Distribution Among Participants

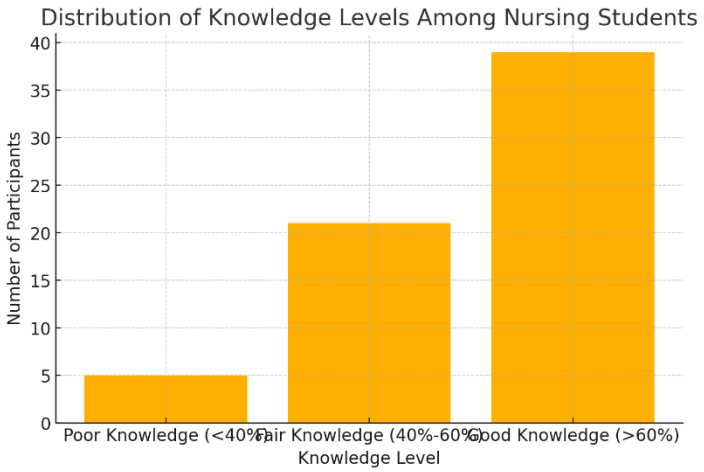


Figure 1 Distribution of Knowledge Level Among Nursing Students

DISCUSSION

The study assessed the knowledge of undergraduate nursing students regarding the preventive measures of urinary tract infections (UTIs) using a descriptive cross-sectional design. The findings revealed that among the 65 participants, 7.7% had poor knowledge, 32.3% demonstrated fair knowledge, and 60% exhibited good knowledge of UTI prevention. The results indicate that a considerable proportion of nursing students possess a satisfactory understanding of preventive strategies, reflecting the effectiveness of targeted education in healthcare settings. However, despite this awareness, gaps remain in specific areas of UTI prevention, highlighting the need for continuous education and reinforcement of best practices (17,18). Findings from previous research have indicated that general awareness of UTIs among the public varies significantly. A study conducted in a community setting reported that while a majority of participants had basic knowledge of UTIs, misconceptions regarding risk factors and prevention remained prevalent. In contrast, the present study demonstrated a comparatively higher level of knowledge among nursing students, suggesting that healthcare education plays a pivotal role in improving awareness and adherence to preventive measures. A notable discrepancy between public and healthcare professionals' understanding of UTIs underscores the necessity of targeted educational programs that extend beyond healthcare institutions to reach broader populations (19-22).

Studies focusing on pregnant women have also shown that while awareness regarding UTIs and their prevention is relatively high, the incidence remains significant due to inconsistent preventive behaviors and inadequate screening. Education level has been identified as a crucial factor influencing knowledge and preventive practices. Similarly, the present study indicates that structured academic training contributes to better understanding among nursing students. However, knowledge alone does not necessarily translate into appropriate

clinical practices, emphasizing the need for practical implementation strategies that reinforce preventive behaviors (23-25). Despite the strengths of this study, including its focus on an essential healthcare concern and its contribution to understanding knowledge levels among nursing students, certain limitations must be acknowledged. The cross-sectional study design restricts the ability to establish causality between educational exposure and knowledge levels. Additionally, the relatively small sample size limits the generalizability of the findings to a broader population, and the exclusive inclusion of nursing students prevents the application of these results to other healthcare professionals. Furthermore, the study primarily focused on preventive measures, without exploring the depth of knowledge regarding UTI management and treatment protocols, which could provide a more comprehensive assessment of awareness levels (26-28).

Future studies should address these limitations by adopting a longitudinal approach to examine changes in knowledge over time and its impact on clinical practice. Expanding the sample size to include a diverse group of healthcare students and professionals would enhance the generalizability of the findings. Incorporating interactive learning methods, hands-on training, and real-time case discussions could further strengthen knowledge retention and application. Educational workshops, curriculum expansion, and awareness campaigns should be implemented to reinforce evidence-based practices. Encouraging the adoption of healthy habits and promoting health education programs would also contribute to reducing the burden of UTIs, ensuring better healthcare outcomes.

CONCLUSION

The study demonstrated that nursing students possessed a strong understanding of urinary tract infection (UTI) prevention, emphasizing the role of structured health education in enhancing awareness. Findings highlighted the effectiveness of formal medical training in equipping future healthcare professionals with the knowledge necessary to implement preventive measures. Compared to broader populations, where misconceptions and gaps in knowledge are prevalent, nursing students exhibited a higher level of competence, reinforcing the impact of targeted educational programs. Demographic factors, including educational background and exposure to healthcare curricula, appeared to contribute to their awareness of UTI prevention strategies. The study underscores the importance of continuous education and training in ensuring that healthcare professionals are well-prepared to promote effective UTI prevention practices, ultimately contributing to improved patient outcomes and overall healthcare quality.

AUTHOR CONTRIBUTIONS

Author	Contribution
Aleena Arooj*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Madiha Mukhtar	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Suriya Jamil	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Qubra Bibi	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

REFERENCES

1. Abdelbadee Abdallah, S., Mohamed, H., Hasab Allah, M., & Soliman, H. (2024). Knowledge and Habitual practice Regarding Prevention of Genito-urinary Tract Infection among Adolescent Nursing Girls Students. Minia Scientific Nursing Journal, 015(2), 21–30. https://doi.org/10.21608/msnj.2024.282231.1118

2. Almaghlouth, A. K., Alkhalaf, R. A., Alshamrani, A. A., Alibrahim, J. A., Alhulibi, B. S., Al-Yousef, A. Y., Alamer, A. K., Alsuabie, S. M., Almuhanna, S. M., & Alshehri, A. D. (2023). Awareness, Knowledge, and Attitude Towards Urinary Tract Infections: An Appraisal From Saudi Arabia. Cureus. https://doi.org/10.7759/cureus.49352

3. Assessment of Nursing Students' Knowledge toward Preventive Measures of Urinary Tract Infections in Mosul Teaching Hospitals. (2021). Medico-Legal Update. https://doi.org/10.37506/mlu.v21i1.2458

4. Bibi, A., Khan, R. A., Bilal, U., Abbas, Z., Ali, D., Noman, K., & Aziz, A. (2023). Knowledge of Nursing Students on Catheter-Associated Urinary Tract Infection Prevention: Catheter-Associated Urinary Tract Infection. Pakistan Journal of Health Sciences, 182–186. https://doi.org/10.54393/pjhs.v4i05.756

5. Dessie, Z., Gela, D., & Yusuf, N. T. (2024). Knowledge, Attitude, Practice, and Associated Factors Toward the Prevention of Catheter-Associated Urinary Tract Infection Among Nurses in Ethiopia: Cross-Sectional Study. SAGE Open Nursing, 10, 23779608241281317. https://doi.org/10.1177/23779608241281317

6. Jagtap, S., Harikumar, S., Vinayagamoorthy, V., Mukhopadhyay, S., & Dongre, A. (2022). Comprehensive assessment of holding urine as a behavioral risk factor for UTI in women and reasons for delayed voiding. BMC Infectious Esan, D. T., Sokan-Adeaga, A. A., Bello, C. B., Olabisi, O. I., Odugbume, B., & Ajayi, P. O. (2023). Knowledge, attitude and practice of antenatal mothers toward urinary tract infection in selected health facilities in Ekiti state, Nigeria. Journal of Public Health Research, 12(3), 22799036231197180. https://doi.org/10.1177/2279903623119718

7. Safwan, M., Dias, B., & Dilhari, A. (2024). Degree of awareness and practices on urinary tract infections: A study of Sri Lankan school teachers selected from a chronic kidney disease high-prevalent setting. Urologia Journal, 91(3), 574–581. https://doi.org/10.1177/03915603241237563

8. Thulasi, P., Jamadarakhani, S., Rajani, Kr., & Sujatha, M. (2024). Awareness Regarding the Disease and Its Prevention amongst Women with Recurrent Urinary Tract Infection: A Cohort Study. Kerala Surgical Journal. https://doi.org/10.4103/ksj.ksj_48_24

9. Zolotov Y, Grinstein Cohen O, Findley PA, Reznik A, Isralowitz R, Willard S. Attitudes and knowledge about medical cannabis among Israeli and American nursing students. Nurse Educ Today. 2021;99:104789.

10. Unsar S, Özdemir Ö, Erol Ö, Bıkmaz Z, Yenici Bulut E. Evaluation of nursing students' epilepsy-related knowledge and attitudes. Epilepsy Behav. 2020;111:107167.

11. Bahçecioğlu Turan G, Dayapoğlu N, Özer Z. Evaluation of nursing students' health fatalism, knowledge, and attitudes toward patients with epilepsy. Epilepsy Behav. 2022;127:108497.

12. Cheng WL, Kam MK, Liong YY, Tang TC, Tse EHL, Tse HK, et al. Factors Influencing Nursing Students' Knowledge of and Attitudes Toward Urinary Incontinence. J Wound Ostomy Continence Nurs. 2022;49(2):168-73.

13. Dag Sucu G, Firat Kilic H. Knowledge and attitudes of Turkish nursing students towards pressure injury prevention. J Tissue Viability. 2022;31(1):16-23.

14. Qaraman AFA, Elbayoumi M, Kakemam E, Albelbeisi AH. Knowledge, Attitudes, and Practice towards Occupational Health and Safety among Nursing Students in Gaza Strip, Palestine. Ethiop J Health Sci. 2022;32(5):1007-18.

15. Uaamnuichai S, Chuchot R, Phutrakool P, Rongkapich R, Poolkumlung R, Santibenchakul S, et al. Knowledge, Moral Attitude, and Practice of Nursing Students Toward Abortion. Inquiry. 2023;60:469580231163994.

16. Myakava LHK, Santos MAD, Püschel VAA. Knowledge, skills, and attitudes of nursing students on evidence-based practice. Rev Esc Enferm USP. 2021;55:e20200428.

17. Amiri H, Peiravi S, Rezazadeh Shojaee SS, Rouhparvarzamin M, Nateghi MN, Etemadi MH, et al. Medical, dental, and nursing students' attitudes and knowledge towards artificial intelligence: a systematic review and meta-analysis. BMC Med Educ. 2024;24(1):412.

18. Wang W, Wu C, Bai D, Chen H, Cai M, Gao J, et al. A meta-analysis of nursing students' knowledge and attitudes about end-of-life care. Nurse Educ Today. 2022;119:105570.

19. Martínez-Vázquez S, Hernández-Martínez A, Peinado-Molina RA, Martínez-Galiano JM. Nursing students' attitudes towards sexuality before training in sexual and reproductive health. Nurs Open. 2023;10(10):7038-47.

20. Korkmaz Aslan G, Kılınç İşleyen E, Kartal A. Nursing students' knowledge and attitudes about dementia: A cross-sectional study. Nurse Educ Pract. 2023;72:103800.

21. Eltyeb E, Basheer R, Ahmed A, Al-Makramani A, Mahfouz MS, Mohamedali A, et al. Nursing Students' Knowledge and Attitudes toward Danger Signs in Neonatal Illnesses. Medicina (Kaunas). 2023;59(11).

22. Alshehri FA, Levett-Jones T, Pich J. Nursing students' knowledge of and attitudes towards pain management: An integrative review. Nurse Educ Today. 2024;139:106207.

23. Shaqiqi W, Cuthill F, Brennan G. Nursing students' knowledge, attitudes, preparedness and practice towards intimate partner violence against women: a scoping review and thematic synthesis. Nurse Educ Today. 2022;116:105452.

24. Alshehry AS, Cruz JP, Bashtawi MA, Almutairi KO, Tumala RB. Nursing Students' Knowledge, Competence and Attitudes towards Vital Signs Monitoring during Clinical Practice. J Clin Nurs. 2021;30(5-6):664-75.

25. Gök F, Yıldızeli Topçu S. Pain Management Knowledge and Attitudes for Surgical Nursing Students. Pain Manag Nurs. 2023;24(4):e61-e7.

26. Patel KM, Metersky K. Reflective practice in nursing: A concept analysis. Int J Nurs Knowl. 2022;33(3):180-7.

27. Shdaifat E, Al-Shdayfat N, Sudqi A. Saudi nursing students' pain management knowledge and attitudes. Nurs Open. 2020;7(6):1833-9.

28. Aljezawi M, Al Qadire M, Suliman M, Al Omari O, Khalaf A. Undergraduate nursing students' knowledge of and attitudes toward people with alzheimer's disease. BMC Geriatr. 2022;22(1):691.