Identifying Clinical Competencies Among Nursing Students: A Case of Thar Institute of Nursing & Allied Health Sciences

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Abstract

To assess the knowledge, attitude, and practice regarding catheter-associated urinary tract infection prevention among undergraduate nursing students, a cross-sectional descriptive study was conducted; 103 participants were selected through a convenient sampling method. A well-structured questionnaire was used based on Catheter-associated urinary tract infection-related questions. The study is necessary to prevent CAUTIs through nursing education programs to tailor their curricula and training better. It also ensures that nursing students must be equipped with the most relevant and practical skills and knowledge. The majority of the respondents (100) were aged 20-25 years, and male students constituted a majority of 85.4%. Only 63.1% of participants had adequate knowledge of CAUTI prevention. Most 100 (97.1%) of the students correctly responded that wearing a pair of surgical gloves during the procedure handling decreases the risk of infection. At the same time, 94 (91.3.%) know hand washing before handling urinary catheterization decreases catheter-associated urinary tract infection. The recent study findings indicate that the majority of the student nurses studying at Thar Institute of Nursing and Allied Health Science Umerkot possess sufficient knowledge, attitude, and practice regarding the prevention of catheter-associated infections.

Keywords: Urinary Tract Infections, Clinical Competency, Knowledge, Nursing, Prevention.

Introduction

A catheter-associated urinary tract infection (CAUTI) is a type of urinary system infection that occurs within 48 hours of either inserting or removing a urinary catheter. The CDC (Centers for Disease Control and Prevention) revised the criteria for diagnosing CAUTI in 2018 (Huang et al., 2023). The CAUTI is present when an indwelling urinary catheter has been in place for more than two days. The best preventive measures involve avoiding unnecessary catheterization and removing catheters as soon as possible. Optimizing aseptic technique, hand hygiene, proper insertion, and maintaining a closed drainage system with risk reduction (Abd Elbaky et al., 2023). Urinary Tract Infections (UTIs) can affect any part of the urinary system (urethra, bladder, ureters, and kidney) and occur mostly in the lower urinary tract. Although UTIs affect both sexes, females

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are more prone than males. Higher susceptibility in females could be due to various anatomical and physiological features such as short urethra, absence of prostatic secretion, pregnancy, and fecal contamination of the urinary tract (Khatoon et al., 2023). The majority of urinary tract infections are bacterial, with approximately 80% attributed to gram-negative organisms such as E. coli, around 5% to Klebsiella, and about 2% to Enterobacteriaceae like Proteus. Trichomonas vaginalis and Neisseria gonorrhoeae are among other less common causative agents (Miah & Islam, 2023). Catheter-associated urinary tract infections (CAUTIs) represent a significant healthcare challenge globally, comprising roughly 40% of all infections associated with healthcare settings. Individuals with urinary catheters in place face an elevated risk of contracting CAUTIs, which can result in severe complications like sepsis, pyelonephritis, and potentially fatal outcomes. Implementing measures to prevent CAUTIs not only enhances patient well-being but also lowers healthcare expenditures (Bibi et al., 2023). Urinary tract infections (UTIs) stand as the prevalent infections globally, posing a significant healthcare challenge affecting more than 150 million individuals each year (Khasal, 2022). The Center for Disease Control and Prevention (CDC) devised a multi-interventional strategy for preventing Catheter-Related Urinary Tract Infections (CRUTIs). These measures encompass maintaining a closed drainage system, practicing hand hygiene before and after procedures, cleansing the meatus, ensuring unobstructed urinary flow, securing the catheter, and managing the drainage system (Nure et al., 2022). Individuals admitted to Intensive Care Units (ICUs) face the highest risk of developing urinary tract infections (UTIs) due to the prolonged and frequent use of indwelling urinary catheters (IUCs). The likelihood of a patient acquiring a Catheter-Associated Urinary Tract Infection (CAUTI) upon admission to an ICU is notably greater compared to patients admitted to other hospital units (Alqarni, 2021). Nurses play a crucial role in healthcare, being responsible for both the insertion and maintenance of urinary catheters, as well as ensuring desired outcomes by adhering to established protocols, regulations, and standards (Majid et al., 2023). Using indwelling catheters is a typical medical approach for addressing acute urine retention. However, it heightens the likelihood of catheter-associated urinary tract infections (CAUTIs), potentially resulting in unfavorable patient consequences(Shehata et al. Abdelfatah, 2023). Certainly, CAUTI poses a significant concern, emphasizing the need for prioritizing prevention efforts. Various strategies for CAUTI prevention have been investigated, with particular attention to three key areas: insertion, maintenance, and cessation or prevention of catheter insertion. These prevention recommendations are outlined in The Association for Professionals in Infection Control and Epidemiology's "Guide to Preventing Catheter-Associated Urinary Tract Infections" (Fisher, 2015). The passage underscores the significance of healthcare professionals staying abreast of contemporary research concerning the management of patients requiring urinary catheters. It stresses the importance of employing correct insertion methods, maintaining catheters appropriately, and considering the duration of their use, along with exploring alternatives to catheterization when possible. Remaining informed about such research empowers healthcare providers to mitigate risks and deliver the best possible care to patients (Shehab, 2017). According to data from the National Healthcare Safety Network (NHSN), urinary tract infections (UTIs) are the most prevalent form of healthcare-associated infections (HAIs), with around 75% of cases linked to the use of indwelling urinary catheters (UC) (Ravi & Joshi, 2018). According to a previous study, numerous healthcare providers fail to adhere to the latest recommendations for diagnosing and treating urinary tract infections associated with catheter use (Arifin et al., 2022).Nurses should possess sufficient expertise regarding the insertion, upkeep, and removal or prevention of catheter placement. This knowledge enables them to safeguard patients' lives and thwart infections. Despite catheters serving therapeutic aims, their excessive

utilization has become widespread, heightening the likelihood of infections (Teshager et al., 2022). Catheter-associated urinary tract infections (CAUTIs) are a prevalent issue in healthcare, often leading to increased patient morbidity and healthcare costs. Nursing students, as future frontline healthcare providers, play a crucial role in CAUTI prevention. This literature review aims to explore existing research on the knowledge, attitudes, and practices (KAP) regarding CAUTI prevention among nursing students. Catheter-associated urinary tract infections (CAUTIs) pose a significant healthcare challenge worldwide, with approximately 75% of healthcare-associated urinary tract infections attributed to indwelling urinary catheters. Nursing students, as future frontline healthcare providers, play a crucial role in CAUTI prevention. Therefore, understanding their knowledge, attitude, and practice regarding CAUTI prevention is vital for effective patient care and infection control (Withanagamage, 2020). According to one research-based study conducted in March 2021, urinary tract infections (UTIs) are the most common bacterial infections in Pakistan. Among the 459 analyzed samples, 160 (34.8%) were negative, whereas 299 (65.1%) had positive urine cultures (105cfu/mL). The overall prevalence rate of UTI was 65.1%, and the prevalence of infections in females and males was 201 (67.2%) and 98 (32.75%), respectively(Khatoon et al., 2023). Several studies have examined the knowledge levels of nursing students regarding CAUTI prevention. For instance, a study found that while nursing students had a basic understanding of CAUTI risk factors and preventive measures, there were gaps in knowledge related to catheter insertion techniques and maintenance protocols. Similarly, Smith and Jones reported that nursing students demonstrated limited awareness of evidence-based practices for CAUTI prevention, highlighting the need for targeted educational interventions(Al et al., 2019).These occupations require strong mutual respect and collaboration among team members. The stereotype of nurses as subservient to doctors can lead to significant barriers in communication, as doctors may struggle to receive patient updates from nurses. The dynamic between doctors and nurses highlights the need for nurses to be assertive and proactive in making important recommendations while also projecting a passive demeanor (Thangarajoo et al., 2021).

Methodology

A cross-sectional study was conducted in Thar Institute of Nursing & Allied Health Sciences (TINAHS) Umerkot. It included 103 participants selected through convenient sampling methods. The duration of the study ranged from 2nd February to 30th April 2024; a well-defined consisting of three sections, Knowledge regarding CAUTI prevention, Attitude toward CAUTI prevention, and Practices followed in CAUTI prevention, was used as a data collection tool. Data was analyzed through the SPSS 23.0 version. Written informed consent was taken from all participants. Written permission for data collection is taken from the authority of Thar Institute of Nursing & Allied Health Sciences (TINAHS) Umerkot.

Results

Table 1: Demographic characteristics n=103

Variables	Categories	Frequency	Percentage
Age	20-25	100	97.1
	26-30	3	2.9
Gender	Male	88	85.4
	Female	15	14.6
Year of Study	2nd Year	40	38.8
	3rd Year	41	39.8
	4th Year	22	21.4
Ward Name	Medical Ward	88	85.4
	Gynecology ward	15	14.6
Total		N=103	100.0%

Table 1 shows the result of demographic characteristics from the findings. Regarding age of the total sample size of 103 participants, the majority of the respondents (97.1%) were aged of 20 and 25 years and only 2.9% were aged 26 and 30 years. This indicates that the study sample had a relatively young age profile, with most participants in their 20s and 30s. Moreover, among the participants, (85.4%) were males and 14.6% were females. This indicates that the study had a higher proportion of male students. Concerning their study years 39.8% were in 3rd year, 38.8% were in 2nd year and 21.4% were in 4th year. This suggests that the study had a relatively balanced distribution in 2nd & 3rd year while slightly lower in 4th year of the participants. However majority of the participants 85.4% were in the medical wards and 14.6% were in gynecology ward. This indicates that the study sample had a higher ratio of male students then female.

Table 2: Clinical competency regarding CAUTI among nursing students (n=103)

Variables	Category	Frequency	Percentage
Have you idea about the term CAUTI?	Yes	65	63.1%
	No	38	36.9%
Are you aware that CAUTI is one of the most common health care associated infection	Yes	66	64.1%
	No	37	35.9%
Routine use of antiseptic lubricants decreases the risk of infection during urinary catheterization	Yes	91	88.3%
	No	12	11.7%
Maintaining urinary catheters is important to use closed drainage system	Yes	89	86.4%
	No	14	13.6%
Hand hygiene before handling catheterization is important to prevent catheter associated infection	Yes	94	91.3%
	No	09	8.7%
Wearing pair of the surgical gloves during the procedure handling decrease the risk of infection	Yes	100	97.1%
	No	03	2.9%
Hygiene of the uretheral meatus is important before inserting catheterization	Yes	93	90.3%

	No	10	9.7%
Securing an indwelling catheter properly after insertion can prevent moment and urethral traction	Yes	77	74.8%
	No	26	25.2%
During catheterization adequate fixation is important	Yes	82	79.6%
	No	21	20.4%
Bladder irrigation,installation,or washout using an antiseptic or antimicrobial agent is beneficial to prevent catheter related UTI	Yes	85	82.5%
	No	18	17.5%

Table 2 presents the results of a knowledge assessment regarding CAUTI prevention among respondents, based on ten questions. The assessment categorized responses as either Yes-1 or No-2. Graph-2 illustrates that out of 103 students surveyed, 65 (63.1%) demonstrated adequate knowledge about CAUTI. The majority of students (97.1%) correctly identified that wearing surgical gloves during procedures reduces the risk of infection, and a significant portion (91.3%) knew that hand washing before urinary catheterization decreases the risk of CAUTI. Additionally, 88.3% of respondents agreed that the routine use of antiseptic lubricants decreases the risk of infection during urinary catheterization. These findings indicate that the majority of students possess a good knowledge of CAUTI prevention measures.

Discussion

In the current study 63.1% of study participants had adequate knowledge of CAUTIs prevention. This study also supported when compared with a study conducted in Kenya which reported that 71.6% participants had adequate knowledge of CAUTIs prevention(Latief, Kurniawati, & Pratiwi, 2020).Another study conducted in India which also reported that 71% of participants had adequate knowledge of CAUTIs prevention (Balu et al., 2021). However, the study conducted in Egypt which reported only 37.23% participants had knowledge regarding CAUTIs prevention (Algarni, Sofar, & Wazqar, 2019). Nursing students are responsible for caring of patients with indwelling catheters and play a key role in preventing CAUTIs (Ahmed & Usmani, 2022). Training is very effective to improve nurse's knowledge and practice of infection prevention that help to fight against the spread of infection in the healthcare setting (Farotimi et al., 2018). The current study highlighted a positive trend in participants' practice towards preventing Catheter-Associated Urinary Tract Infections (CAUTIs), with 92.2% demonstrating good practices. Interestingly, this aligns closely with findings from a study conducted in Nepal, where 64.38% exhibited good practices (Rashmi & Dhakal, 2021). However, it's notable that our study's figure is notably higher than the reported 33.3% from research conducted in Iloilo city, Philippines (Opiña & Oducado, 2014). Such a variation could stem from several factors, including differences in the study settings, timeframes, and socio-economic profiles of the study populations. According to this study attitude and practice were assessed of nursing student's majority of them which highlight a positive attitude & practice toward preventing CAUTIs. Moreover, training serves as a fundamental element of infection prevention and control initiatives, with trained nurses playing an effective role in mitigating healthcare-associated infections (WHO, 2016).

Conclusion

This study concluded that majority of the student nurses studying in Thar Institute of Nursing and Allied Health Science Umerkot possess sufficient knowledge, attitude & practice regarding the

prevention of catheter-associated infections. However, nearly two-thirds of the participants demonstrate inadequate practices in this regard. Study also suggested that continuous nursing education programs must be conducted to aware the students regarding infection control practices through which students and patients can be prevented from infections.

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