

Urinary Catheter in Urinary Tract Infections with the Infection Control Risk Assessment method on aspects of action in the Hospital

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INDEXING

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CAUTI;
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ABSTRACT

Catheter-associated Urinary Tract Infection (CAUTI) accounts for nearly 40% of all nosocomial infections. This reflects the poor quality of health services. This study aims to analyze the use of urinary catheters for CAUTI with the Infection Control Risk Assessment (ICRA) method in Indonesian hospitals. The design of this research is descriptive quantitative. The population in the study were all nurses who worked in the hospital. The sample used in this study to determine the aspects of action on nurses related to urinary catheter placement were all nurses who worked in the Internal Medicine, Surgery, Geriatrics and Emergency Units at Panembahan Senopati Hospital Bantul, totaling 61 respondents. The sampling technique used is random sampling. Inclusion criteria are: nurse working period 1-year, minimum education D3. The exclusion criteria were respondents who did not fill out the questionnaire completely. Informants in this study were IPCN, IPCLN, internal medicine specialists, emergency room nurse coordinators, and nurses in the inpatient ward. The majority of the procedures from all stages were according to the SOP, at the pre-interaction stage of placing a urinary catheter in male patients, the majority did not wash their hands with running water. At the working stage of installing a male patient urinary catheter and the installation stage of a female patient's urinary catheter between actions that are in accordance with the SOP and those that are not in accordance with the balanced SOP. Conclusion: 1. Majority of actions from all stages according to SOP. 2. At the pre-interaction stage, male urinary catheter was inserted, the majority did not wash their hands with running water.

Kata kunci:

CAUTI;
ICRA;
Tindakan.

Infeksi Saluran Kemih Terkait Kateter (CAUTI) menyumbang hampir 40% dari semua infeksi nosokomial. Hal ini mencerminkan buruknya kualitas pelayanan kesehatan. Penelitian ini bertujuan untuk menganalisis penggunaan kateter urin pada CAUTI dengan metode Infection Control Risk Assessment (ICRA) di rumah sakit Indonesia. Desain penelitian ini adalah deskriptif kuantitatif. Populasi dalam penelitian ini adalah seluruh perawat yang bekerja di rumah sakit. Sampel yang digunakan dalam penelitian ini untuk mengetahui aspek tindakan perawat terkait pemasangan kateter urin adalah seluruh perawat yang bekerja di Unit Penyakit Dalam, Bedah, Geriatri dan IGD RSUD Panembahan Senopati Bantul yang berjumlah 61 responden. Teknik pengambilan sampel yang digunakan adalah random sampling. Kriteria inklusi adalah: perawat masa kerja 1 tahun, pendidikan minimal D3. Kriteria eksklusi adalah responden yang tidak mengisi kuesioner dengan lengkap. Informan dalam penelitian ini adalah IPCN, IPCLN, spesialis penyakit dalam, koordinator perawat ruang gawat darurat, dan perawat di ruang rawat inap. Sebagian besar prosedur dari semua tahapan sudah sesuai SOP, pada tahap pra interaksi pemasangan kateter urin pada pasien laki-laki mayoritas tidak mencuci tangan dengan air mengalir. Pada tahap kerja pemasangan kateter urin pasien pria dan tahap pemasangan kateter urin pasien wanita antara tindakan yang sesuai dengan SOP dan yang tidak sesuai dengan SOP seimbang. Kesimpulan: 1. Mayoritas tindakan dari semua tahapan sesuai SOP. 2. Pada tahap pra interaksi dilakukan pemasangan kateter urin laki-laki, sebagian besar tidak mencuci tangan dengan air mengalir

INTRODUCTION

The use of indwelling urinary catheters is very common in clinical practice. At least 15.0%-25.0% of hospitalized patients have urethral catheters, mostly short term. Urinary catheters provide some information about physical function, but they also increase the chance of infection. Approximately 40.0% of nosocomial infections originate from the urinary tract, and 80.0% occur after urinary catheter insertion. Approximately 20.0%-50.0% of patients whose urinary catheter remained in place for more than 1 week were found to have bacteriuria, and prolonged use of a urinary catheter increased bacteriuria by 3.0%-10.0% per day. The most important risk factor for the use of a catheter-associated urinary tract infection (CAUTI) is the use of a catheter that remains for a long time. This increases the risk of infection and the medical costs associated with treating the infection, prolongs the patient's hospital stay, and is potentially life threatening. The Centers for Disease Control recommended in 2015 that urinary catheters should only be used for appropriate indications and should be removed as soon as they are no longer needed (Wang et al, 2016).

ICRA is an infection control process planning, whose main subject is setting its basic program and its development based on continuous monitoring and implementing regulatory changes if challenges change in the field. Lardo, et al (2016) describe that ICRA is an important complement in planning, development, monitoring, evaluation, and efforts to consider the various stages and levels of infection risk, namely VAP (Ventilator-Related Pneumonia), BSI (Primary Blood Flow Infection), Tract Infection Catheter-related urinary tract (CAUTI), and SSI (operation area infection) in each service area (Elsye et al, 2019).

Efforts to prevent the incidence of nosocomial infections, especially urinary tract infections related to catheters, require a documented approach. The method developed by the Centers for Disease and Control, namely ICRA is a documented process in the identification and prevention of infection events in hospitals as an effort to reduce the risk of infection transmission among patients, staff, health professionals, and hospital visitors (Subhan, 2015).

Cauti is still a burden in health services, especially in increasing morbidity and service costs. The most efficient way is to avoid unnecessary catheterization and remove the catheter as soon as possible. The implementation of a reminder system in removing the catheter was effective in reducing the number of catheter-related UTIs (Tenkea et al, 2014).

According to the guidelines of the Center for Disease Control and Prevention in 2019, CAUTI must meet at least one of the following criteria: 1) Inpatients who have an indwelling urinary catheter inserted for more than 2 consecutive days and remain in place at the time of UTI or removed one day before UTI occurs. 2) The patient has at least one of the following signs and symptoms; fever (>38.0 C); suprapubic tenderness; costovertebral angle tenderness; frequent urination; unable to hold urination; dysuria 3) In urine culture, no more than two species of organisms are identified, at least one of which is a bacterial culture with a colony number of 100,000 colony forming units (cfu/ml) (CDC. 2019).

RESEARCH METHOD

The design of this research is descriptive quantitative and qualitative. The population in this study were all nurses who worked in the hospital. The sample used in this study to determine the aspects of action on nurses related to urinary catheter placement were all nurses who worked in the Internal Medicine, Surgery, Geriatrics and Emergency Units at Panembahan Senopati Hospital Bantul, totaling 61 respondents. The sampling technique used is random sampling.



Inclusion criteria are nurse working period 1 year, minimum education D3. The exclusion criteria were respondents who did not fill out the questionnaire completely. Informants in this study were IPCN, IPCLN, internal medicine specialists, emergency room nurse coordinators, and nurses in the inpatient ward.

RESULTS AND DISCUSSION

Characteristics of Respondents Action Variables

Table 1. Characteristics of Respondents Behavioral Variables

Identity	Carakteristik	Frekuensi	
Respondent	Respondent	n	%
Age	20-29	4	23,5
	30-39	10	58,9
	40-49	2	11,8
	50-59	1	5,9
Gender	Male	11	64,8
	Famale 6		35,2
Last Education	Diploma 3	14	82,3
	Diploma 4	1	5,9
	S1	1	5,9
	Profesion	1	5,9
Length of Working	<1 Year	0	0
	1-2 Year	1	5,9
	2-3 Year	3	17,7 0
	4-5 Year	0	76,4
	>5 Year	13	
Total		17	

Source: primary data

Based on data collection in the field, it can be seen that the characteristics of the respondents seen from the aspect of age are the most, namely the age range of 30-39 years as many as 10 people (58.9%). In this study, the majority of respondents were male (64.8%). When viewed from educational background, almost all respondents with D III Nursing education are as many as (82.3%). Meanwhile, when viewed from the length of work of respondents in the hospital, the majority of respondents have worked for > 5 years (76.4%).

Observation results of the Pre-interaction stage of Urine Catheter Installation in Male and Female Patients

The diagram above shows the results of observations on urinary catheter placement in the pre-interaction stage. Almost all the steps have been carried out according to the SOP, but the steps for washing hands with running water and soap or alcohol handrub are not carried out by most of the respondents. In contrast to the orientation stage, the results of observations show that at this stage all stages have been carried out in accordance with the provisions.



Table 2. Frequency of Observation Results of Pre-interaction Stage of Urinary Catheter Installation in Male and Female Patients

No	Step	Frequency (n)	
		Yes	No
1	Verify the therapy program	17	
2	Washing hands with running water	1	16
3	Prepare drugs according to regulations	17	
4	Carry the device near the patient properly	17	

Source: primary data

Results of Observation of the Orientation Stage of Urinary Catheter Installation in Male and Female Patients

No	Step	Frequency (n)	
		Yes	No
1	Giving greetings as a therapeutic approach	17	0
2	Explain the purpose and procedure of action to the patient and family	17	0
3	Asking the patient's preparation before the activity is carried out	17	0

Source : primary data

The table above shows that in the orientation stage, all respondents have carried out the stages according to the SOP. The actions taken include greeting as a therapeutic approach, explaining the purpose and procedure of the action to the patient and family, and asking about the patient's preparation before the activity is carried out. However, unlike the previous stages, the results of observations at the working stage have not been fully carried out by the respondents. The working stage is divided into two categories, namely the work stage for male patients and the working stage for female patients. The following is a diagram showing these results.

Observation results of the male patient's urinary catheter insertion work stage

The table above shows the results of observations at the work stages of installing urinary catheters in 10 male patients. It can be seen that some of the stages of work have been carried out by the respondents, but some of the stages of work have not been carried out. The steps that have not been carried out include washing hands with running water and soap or handrub, installing mats / mats, cleaning genitalia with warm water, removing clean gloves, washing hands again with water and soap or handrub, installing sterile drapes, and removing drapes. At the stage of wearing sterile gloves, almost all respondents have followed the procedure and at the stage of fixing the catheter, some have done it and some have not done that stage. While the working stages of urinary catheter installation in female patients can be seen in the following diagram.

Table 4. Frequency of Observation Results in the Work Stage of Urinary Catheter Installation in Male Patients

No	Working Step	Frequency(n)	
		Yes	No
1	Install	10	
2	Preparing the patient	10	
3	Washing hands		10
4	Installing a dress		10
5	Wearing gloves	10	
6	Clean		10
7	Take off gloves		10
8	Hand washing		10
9	Wearing gloves	9	1
10	Installing sterile drapes		10
11	Lubricating	10	
12	Pointing the penis	10	
13	Insert the Cateter	10	
14	Connecting the catheter	10	
15	Fixing the Ballons	10	
16	Fixing the Cateter	6	8
17	Take the duk		10
18	Take of the Sheath	10	

Source: primary data

Working Stage of Female Patient Urinary Catheter Installation

Table 5. Working Stages of Urine Catheter Installation in Female Patients

No	Working Step	Frequency	
		Yes	No
1	Installing sampiran	7	
2	Preparing the patient	7	
3	Washing hands		7
4	Installing a dress		7
5	Wearing gloves	7	
6	Clean area	2	5
7	Take off gloves	2	5
8	Hand washing		7
9	Wearing gloves	7	
10	Installing sterile drapes		7
11	Clean the vulva	2	5
12	Lubricating	7	
13	Insert the catheter	7	
14	Connecting the catheter	7	
15	Filling balloons	7	
16	Fixing the catheter	4	3
17	Take off the duk		7
18	Take off the sheath	7	

Source: primary data



The table above shows the results of respondents' observations in the installation of urinary catheters in 7 female patients. As can be seen in the table above, 5 of the 18 stages of work have not been carried out by all respondents. These stages are: washing hands with running water and soap or handrub, installing mats or mats, washing hands again with running water and soap or handrub, and installing and removing sterile drapes. At the stage of cleaning the perineal and vulvar areas and removing clean gloves, there were 2 out of 7 respondents who had carried out these stages. Meanwhile, there were 4 out of 7 respondents who carried out the stages of fixing the urinary catheter.

Various studies have shown that the incidence of CAUTI can be reduced. Despite advances in infection prevention and control, CAUTI remains a problem. Evidence suggests that reducing bacterial colonization around the meatal or urethral area has the potential to reduce the risk of CAUTI. Evidence on the use of antiseptic solutions for meatal cleaning is available and mixed. Previous studies have also identified a lack of documentation and knowledge regarding meatal cleaning solutions used prior to catheter insertion. There is variation in practice in Australian hospitals with respect to catheter insertion and, in particular, the material used to clean the meatal area prior to catheter insertion (Mitchell et al., 2017).

A urinary catheter is usually left in place even if it is no longer needed. In most hospitals, there are four steps required to remove a urinary catheter: (1) the doctor recognizes that the catheter has been inserted; (2) the doctor recognizes that the catheter is no longer necessary; (3) the doctor writes an order to remove the catheter; and (4) the nurse removes the catheter. Hours or days may pass before the catheter is not still in place and has not been removed. Each additional day of urinary catheter use increases the patient's risk of infectious complications, and interventions that facilitate unnecessary prompt removal of the catheter can have a strong impact on other possible complications (Medding et al., 2013).

There has been a growing desire to conduct new research to reduce the incidence of CAUTI, especially in the United States, following the introduction of no-pay for preventable hospital complications, including Cauti. An evaluation of interventions to reduce CAUTI has been carried out. Among them, it was found that interventions to reduce the use of Cauti were carried out by reducing the use of unnecessary catheters, in addition to the need for timely catheter removal (Parker et al., 2017).

It is estimated that 17%–69% of CAUTI, or 380,000 incidences of infection and 9000 deaths each year, can be prevented by using appropriate infection prevention strategies. The most effective and consistent is the removal of the catheter or avoidance of its use. It has been recommended and identified throughout the guidelines as the removal of the catheter or the avoidance of its use (Tambyah and Oon, 2012).

The use of a persistent urethral catheter is associated with an increased frequency of symptomatic urinary tract infections, bacteremia, and additional morbidity from non-infectious complications. The infection control program should develop, implement, and monitor policies and practices to minimize infections associated with the use of these devices. The main focus of this program should be to limit the use of persistent urethral catheters and immediately remove the catheter when it is no longer needed (Nicolle, 2014).

The use of catheter removal reminder devices has increased since 2008. Previously reported use of these devices was 10%. In 2010, NICHE hospital respondents reported that the use of this strategy had increased to 56%. Overall, 56% of hospitals have such a program. Although this

interval is a 44% increase over the previous one, the hospital still does not have an early release strategy and there is no strong evidence to support the use of the device (Fink et al., 2012).

The most common infection treated in primary care is uncomplicated lower UTI. Urinary tract infection is a common occurrence as an infection in children and infants. UTI also often occurs in children 2 years old, both in the community and in the hospital. During the first six years of life, UTIs are more common in boys. UTI complications can include scarring of the kidneys. Kidney scarring can lead to adult complications such as hypertension, proteinuria, kidney damage, and even chronic kidney failure requiring dialysis (Tan et al., 2016).

Urinary tract infections can be asymptomatic, acute, chronic, complicated or uncomplicated, with or without clinical symptoms. The manifestation of a UTI depends on the tract involved, the organism, the etiology, the severity of the infection, and the level of immunity of the patient. Both asymptomatic and symptomatic UTIs pose a serious threat to patients and society, reducing quality of life and resulting in absenteeism from work. Several factors, such as gender, age, race, HIV sufferers, diabetes, use of urinary catheters, abnormalities of the genitourinary tract, pregnancy, conditions in infants, parents, and hospitalization status, have a significant risk for recurrent UTIs (Odoki et al., 2019).

UTIs are divided into lower UTI (cystitis) and upper UTI (pyelonephritis). Several risk factors are associated with cystitis, including female gender, previous UTI, sexual activity, vaginal infections, diabetes, and obesity. Complicated UTI is defined as UTI caused by factors that compromise the urinary tract or host defenses, such as urinary tract obstruction, caused by neurological disease, immunosuppression, renal failure, transplantation, pregnancy, and the presence of foreign bodies such as stones, indwelling catheters, or other drainage devices. In the United States, 70-80% of complicated UTIs are caused by indwelling catheters, accounting for 1 million cases per year. Bacteria usually live around the entrance to the urinary tract and allow colonies of microorganisms to develop in both men and women. Infection occurs when these colonies do not wash away during urination and reach the bladder before urinating. UTIs are more common in women than in men, and about 81% of all UTIs are reported in women. The chances of bacteria reaching the bladder before being expelled with urination are greater in women because the space between the urethral opening and the bladder is shorter. The possibility of the development of bacterial colonies is greater in women because of the presence of the vaginal cavity adjacent to the rectum to the urethral opening (Kaur and Kaur, 2020).

The immune system weakens the phagocytosis of neutrophils, which affects the physiological role of the bladder in bacteria, makes it easier for bacteria to enter the bladder and ureters, and the development of organs in the reproductive and reproductive systems can cause infection. Bacterial biofilm formed by bacteria on the surface of the urethra increases the resistance of bacteria to antimicrobial agents and the host immune function, causing fever, urethral stimulation, inflammation of the bladder, and even urethral-related infections. Thus, urine is internal, and although catheters can prevent and treat various diseases, they are more likely to cause CAUTI (Juanjuan et al., 2021).

UTIs are the leading cause of nosocomial infections worldwide and have been estimated to cause approximately 30% of HCAs in the acute care setting in the United States. Approximately 75% of these are associated with indwelling urinary catheters. CAUTI's impact is likely to be greater in Asia. The surveillance study was carried out for 6 years by the International Consortium for Nosocomial Infection Control in ICUs from 36 countries in Latin America, Asia,

Africa, and Europe, 57% of which were in Asia. The study found developing countries had a 6.3 CAUTI rate per 1000 urinary catheter days, compared with 3.3 per 1000 catheter days in a comparable US ICU. CAUTI in developing countries is also associated with higher rates of antibiotic resistance in microbiology (Chuang and Tambyah, 2021).

Urinary tract infection (UTI) is one of the most common bacterial infections in women and elderly individuals. This type of infection although it can lead to a less severe life threatening infection but the patient experiences significant suffering. UTI is responsible for 7 million outpatient clinics every year. Except among infants and the elderly, infection is more common in women than in men and it is estimated that about 40-50% of women experience one episode in their lifetime and 20-30% of them have another. For women between 1 year and up to 50 years, UTI and recurrent UTI (rUTI) are the main disease (Bazzaz et al, 2021).

Urinary tract infections are common in both outpatient and inpatient settings. Clinical entities covered by the term "UTI" include asymptomatic bacteriuria, uncomplicated acute cystitis, recurrent cystitis, catheter-associated UTI (CAUTI), prostatitis, and pyelonephritis. These categories are further differentiated by the presence or absence of urinary tract symptoms and patient gender, comorbid conditions, and genitourinary history, including the presence of stones, stents, or catheters. Since acute cystitis is the most common manifestation of UTI and most commonly occurs in women, most of the clinical studies on UTI have been conducted in women (Gupta et al, 2017).

CAUTI is one of the HCAs in hospitalized patients, including ICU. Nearly 75% of hospitalized patients undergo urinary catheterization during their stay in the hospital, making prevention and control of CAUTI difficult. In the ICU, 95% of UTIs are CAUTI, many efforts to reduce the incidence of CAUTI have been carried out, but CAUTI in the ICU remains the second most important HCAs. The incidence of CAUTI will increase the risk of complications and these complications will reduce the efficiency of providing care to patients. Other types of complications that can arise include cystitis, acute or chronic pyelonephritis, bacteremia, and urosepsis (Bezuayehu et al, 2022).

CONCLUSION

From the description above, it can be concluded as follows: Majority of actions from all stages according to SOP. At the pre-interaction stage of placing a urinary catheter in male patients, the majority did not wash their hands with running water.

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