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The Effect of Healthcare Infection Control Application Committee in Patients Using Urine Cateters on Cost Containtment

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Abstract

The high prevalence of HAIs (Healthcare-associated Infections) is a threat to hospital services. Implementation of infection prevention and control is the biggest challenge in the arrangement of health services, especially in hospitals. HICPAC is one of the CDC guidelines that is quite recommended in reducing the incidence of infections in hospitals. This study aims to assess the effect of implementing HICPAC with a reduction in hospital costs in patients using a urine catheter at Delia Hospital in Langkat District in 2019. The type of research is quantitative with a quasi-experimental approach conducted at Delia General Hospital in Langkat District with a population of 30 patients and analyzed using Paired T Test analysis. The analysis found that there were differences in treatment costs based on secondary diagnoses before and after the HICPAC guidelines were applied. This shows that the HICPAC guidelines can significantly reduce the cost of care for patients who use urine catheters at Delia Hospital in Langkat District. So it is recommended that the HICPAC guidelines can be used integrated with the medical record so that it is easily implemented by all medical personnel in the hospital.

Introduction

Certainty for the safety of every individual who comes in order to get health services is a very important challenge faced by hospitals or other health facilities. Several reports from developed countries show that a number of patients experience accidents while receiving health services. Accidents cause permanent injury, lengthy hospital stays, and even death. Every year, several individuals suffer injury or death due to unsafe and poor health services. Most of these injuries are preventable. Generally, if 1 patient out of 10 treated patients has an accident, then 50% of the incident can actually be prevented (World Health Organization, 2017). One of the patient safety targets based on the International Patient Safety Goals (IPSG) is to reduce infections related to health services (Healthcare-associated Infections / HAI). The incidence of HAI has an impact on length of stay, long-term disability, increased resistance to microorganisms, additional cost burdens for the health system, high costs for patients and their families, and unexpected deaths.

Infection prevention and control in hospitals is a program that needs to be supported by hospitals. In identifying the problem, it is necessary to analyze the risk management related to infection in the hospital first. Risk management is the basis for preventing and reducing harm arising from Health-care Associated Infections (National Health and Medical Research Council, 2010). HAIs (Health-care Associated Infections) are known as Nosocomial Infections or also known as infections in hospitals which are the most common complications in health

services. HAIs also have an impact on patients and their families losing income, harm, disability or death, increased length of stay, additional expenses for hospitals and can degrade the image of the hospital (Weston, 2013).

In the United States, nearly 5 million urinary catheters are inserted each year. Approximately 12-25% of all inpatients have a urinary catheter inserted during treatment with as many as 50% of them are not properly indicated. One study found that nearly 40% of physicians treating patients with urinary catheters were less concerned, increasing the duration of catheter use. Prolonged use of a catheter has been shown to have a direct impact on the risk of urinary tract infection. With a catheter in place, the risk of bacteriuria increases by about 3-7% per day. When the catheter is in place for more than one week, the risk of bacteriuria is 25%, and if one month the risk of bacteriuria is 100%. As a result of this bacteriuria, 10% will experience symptoms of a urinary tract infection (fever, dysuria, urgency, frequency, suprapubic pain) and nearly 3% will have bacteremia. CAUTI generally lead to unnecessary use of antibiotics, and the urinary drainage system is often a reservoir for multidrug-resistant bacteria and a source of transmission to other patients (Darmadi, 2014).

The National Healthcare Safety Network reports that in America it is estimated that 20,000 deaths occur due to nosocomial infections each year, while in Southeast Asia, nosocomial infections are as much as 10%. Based on these data, the highest nosocomial infections occurred in Malaysia as much as 12.7% and Taiwan as much as 13.8% (National Health and Medical Research Council, 2010). The high prevalence of HAIs is a threat to hospital services. Infection Prevention and Control (PPI) activities in health care facilities are a standard of service quality and are important for patients, health workers and visitors. Infection control must be implemented by all health care facilities to protect patients, health workers and visitors from the incidence of infection(Kemenkes RI, 2017).

Several efforts to implement cost containment for quality control and cost control have been carried out by Delia Hospital, such as standardization of drugs, application of clinical pathways (CP), and unit cost calculations using the activity based costing method. In general, Delia Hospital is able to reduce costs to be smaller than INACBG's claims, but the cost of health services in certain cases can increase, such as in conditions where CAUTI occurs in patients who receive urinary catheters. Therefore, this study will analyze the Infection Control Practices Advisory Committee on patients who use urinary catheters for cost containment at Delia Langkat Hospital in 2019.

Methods

The type of research in this research is quantitative with a quasi-experimental approach with the aim of assessing the magnitude of the change in cost containment to the reduction in the incidence of CAUTI after the application of HICPAC. The population in this study were all patients who used urinary catheters at Delia Hospital, Langkat Regency from February to June 2019 as many as 300 patients. The sample in this study was 90 respondents, which included 45 respondents before the HICPAC guidelines were applied and 45 other respondents after the HICPAC guidelines were applied.

Results and Discussion

Description of Respondent Characteristics

Table 1. Characteristics of Respondents at Delia Langkat Hospital in 2019

Characteristics of Respondents	n(%)
Gender	
Man	33 (36,7)
Woman	57 (63,3)
Total	**90 (100)**

Age	
< 20 years	3 (3,3)
20 - 40 years	17 (18,9)
41 - 60 years	48 (53.3)
> 60 years	22 (24,4)
Total	**90 (100)**

Table 1. presents a description of the characteristics of patients who are treated at Deliana Langkat Hospital using a catheter, namely there are as many as 90 respondents. Characteristically, most of the respondents were female, namely 57 respondents (63.3%), aged in the range of 41-60 years, namely 48 respondents (53.3%) with a duration of catheter use for more than 5 days, namely 38 respondents (42 ,2%).

The Effect of HICPAC Implementation on Cost Containment in Patients at Delia Langkat Hospital in 2019

Table 2. Results of Analysis of The Effect of HICPAC Implementation on The Cost of Care at Delia Langkat Hospital in 2019

HICPAC	n	Mean	SD	ONE	t	r	P *value*
Before HICPAC	45	9.73E6	7.096.550	1.057.891	3,697	0,972	0,001
After the implementation of HICPAC	45	8.71E6	6.077.000	905.905			

The results of the analysis in Table 2. show that the mean cost of patient care before the implementation of HICPAC was 9.73E6, while the mean value of costs after the implementation of HICPAC was 8.71E6. This means that there is a difference in patient care costs with the implementation of HICPAC at Delia Langkat Hospital, where the cost of care after HICPAC has decreased.

In addition, it can be seen that the t value is 3.697 > t table 2.197, so it can be concluded that there is a difference in the average cost of treatment before and after the implementation of HICPAC at Delia Langkat Hospital. Furthermore, it can be seen from the r value of 0.972 with a p value of 0.001. This means that there is a significant effect between the application of HICPAC on the cost of care at Delia Langkat Hospital with a very strong correlation level.

Analysis of CAUTI Incidence in Patients at Delia Langkat Hospital in 2019

Based on the results of the analysis, in table 3, it was found that there were several CAUTI cases at Delia Langkat Hospital during 2019. From 90 respondents who were observed there were at least 7 CAUTI cases or 7.8% that had occurred. More details can be seen in Table 4.6 below.

Table 3. Description of CAUTI Incidence in Patients at Delia Langkat Hospital in 2019

CAUTI incident	n(%)
There is a CAUTI	7 (7,8)
There is no CAUTI.	83 (92.2)
Total	**90 (100)**

Based on table 4 below, when viewed based on the duration of catheter use, it shows that the majority of CAUTI events occur when the catheter is used for 4 days or more. In 4-5 days of catheter use, 3 cases of CAUTI occurred, 3 cases were found in use for more than 5 days and 1 case was found in use for less than 3 days. On the other hand, the use of a catheter for 1 day did not find CAUTI events.

Table 4. Results of Analysis of the Effect of Duration of Catheter Use on CAUTI Incidence in Patients at Delia Langkat Hospital in 2019.

Duration of Catheter Use	CAUTI incident				Total	
	There is a CAUTI		There is no CAUTI.			
	n	%	n	%	n	%
1 Day	0	0,0	5	100,0	5	100,0
2-3 Days	1	5,3	18	94,7	19	100,0
4-5 Days	3	10,7	25	89,3	28	100,0
> 5 Days	3	7,9	35	92,1	38	100,0
Total	**7**	**7,8**	**83**	**92,2**	**90**	100,0

The results of the study in table 5 show that of the 90 respondents studied, most of the CAUTI cases occurred before the implementation of HICPAC, namely 6 cases (13.3%), while the remaining 1 case occurred after the implementation of HICPAC. On the results of the chi-square test, it was found that the p-value was 0.008. The p value means that there is an effect of applying the HICPAC method to the incidence of CAUTI in patients during treatment at Delia Langkat Hospital in 2019. Based on the odds ratio value, the results are 3.902 which means that the application of HICPAC can reduce the risk of CAUTI by 3.902 times compared to not applied.

Table 5. Results of HICPAC Implementation Influence Analysis on CAUTI Incidence in Patients at Delia Langkat Hospital in 2019

Implementation of HICPAC	CAUTI incident				Total		p *value*	OR
	There is a CAUTI		There is no CAUTI.					
	n	%	n	%	n	%		
Before HICPAC	6	13,3	39	86,7	45	100,0	0,008	3,902
After HICPAC	1	2,2	44	97,8	45	100,0		
Total	**7**	**7,8**	**83**	**92,2**	**90**	100,0		

The results of this study indicate that there have been several CAUTI cases at Delia Langkat Hospital during the period from February to April 2019. Of the 90 respondents who were observed there were at least 7 CAUTI cases or 7.8% that had occurred. CAUTI is one of the most common infections in health services, especially in hospitals. CAUTI generally lead to unnecessary use of antibiotics, and the urinary drainage system is often a reservoir for multidrug-resistant bacteria and a source of transmission to other patients (Darmadi, 2014).

The method of calculating the number of CAUTI events varies. The CDC uses the incidence rate from the calculation of the number of new CAUTI cases per number of catheter users per day in one month. Meanwhile, several other studies used a general incidence calculation based on the calculation of the number of new CAUTI cases per number of patients with catheters in a certain time unit. The incidence rate based on the CDC is more appropriate because the onset of CAUTI events can occur at any time during the use of the catheter or even after the catheter is removed (Gould et al., 2017).

When viewed based on the duration of catheter use in ICU patients at Delia Langkat Hospital, it shows that most of the CAUTI events occur with the use of a catheter for 4 days or more. In 4-5 days of catheter use, 3 cases of CAUTI occurred, 3 cases were found in use for more than 5 days and 1 case was found in use for less than 3 days. On the other hand, the use of a catheter for 1 day did not find CAUTI events.

The NHSN reports a higher incidence of CAUTI of 0.2-4.8 per 1000 catheter-days in hospitalized wards and in intensive care (ICU) patients, which is 1.2-4.5 per 1000 catheter-

days (Margaret et al., 2015). In addition, a cross-sectional study in several Australian hospitals showed a CAUTI prevalence ratio of 1.4% (Gardner et al., 2014). A fairly high incidence occurred in an Indian teaching hospital of 42.9% (Tillekeratne et al., 2014). A higher incidence also occurs in one of India's tertiary hospitals by 59% (Khan et al., 2016).

CAUTI events have a direct impact on length of stay, long-term disability, increased resistance to microorganisms, additional cost burdens for the health system, high costs for patients and their families, and unexpected deaths (World Health Organization, 2015). Cost is the problem that most patients complain about, the amount of treatment costs provided by the hospital is sometimes difficult for some patients to accept.

In Indonesia, the cost of hospital care tends to increase every year, which is caused by various factors, including the pattern of degenerative diseases, orientation to curative financing, out of pocket payments (fee for service) individually, services determined by the provider, advanced technology, development of (sub)specialization in medical science, and also the inflation rate. With the existing conditions and situations like this, the access and quality of health services is threatened, especially for people who can't afford it. This causes the level of public health to be lower. This condition is exacerbated by non-standard hospital rates, so that each hospital tends to set its own rates. Therefore, cost control in hospitals is needed to reduce the number of patient complaints.

Conclusion

Based on these results, it can be concluded that, with the application of HICPAC at Delia Langkat Hospital, it has been able to reduce the incidence of CAUTI and patient care costs, especially in ICU patients who use catheters. These results are also supported by several previous studies including, a study conducted by Wendy in 2019 regarding the application of HICPAC at Delia Langkat Hospital, getting results from 300 samples, there were 13 CAUTI events, with details of 11 cases (84.6%) occurring before the implementation of 2 cases (15.4%). Knowledge, attitudes, and actions of medical personnel regarding infection prevention in patients using urinary catheters were also reported to increase after the implementation of HICPAC. These results show that the application of HICPAC guidelines has a significant effect on reducing the incidence of CAUTI. Istianisa 2016 concerning Analysis of Cost Containment Implementation in Sectio Caesarea Cases with BPJS Guarantees at XY Government Hospital in Bogor City", shows that there is a decrease in the difference between INA-CBG's claims and total hospital bills in 2016 when compared to 2015. This is due to by the not yet optimal application of the Clinical Pathway in hospitals.

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