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Research Paper

The Implementation of Nurses' Prevention of Healthcare-Associated Infections (HAIs) Against Phlebitis: A Case Study

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ABSTRACT: *Health care associated infections (HAIs) are infections that often occur while hospitalized. HAIs threaten hospital services because they can be seen as low quality. Therefore, there is a need for precautions to reduce the incidence of HAIs. Phlebosis is the most common infection in patients. Phlebitis is an inflammation of the vein due to the fact that the infusion is not carried out in accordance with standard operating procedures (SOPs). The purpose of the case study is to figure out of the implementation of phlebitis prevention in the dr. Zainoel Abidin hospital, Banda Aceh. In this case study, 12 nurses involved, and a checklist that included 18 statements related to the prevention and control of phlebitis in the hospital. This case study found that nurses at the ward were in the poor category in performing hand hygiene (83.3%), and nurses carrying out skin preparation was in the deficient category (58.3%). Nurses administer dressings and perfusion catheters at lower levels (75%). Nurses did not use the proper tools either (60%). It is necessary to educate the nurses of dr. Zainoel Abidin Hospital regarding the prevention of phlebitis in order to minimize the risk of phlebitis incidents.*
KEYWORDS: *Healthcare Associated Infections (HAIs), Phlebitis, Nurses*

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I. INTRODUCTION

Discharge planning is made since the patient enters the inpatient ward with a maximum of 1x24 hours until the action on discharge day. Discharge planning is carried out during treatment until the evaluation of the patient when he is prepared to discharge, by examining the possibility of the referral or further treatment at home according to needs [1]. Discharge planning for patients can provide motivation to achieve patient recovery, have an impact on shortening the length of patient care at the hospital, reduce the budget for needs, reduce recurrence rates, and allow interventions to plan discharge to be carried out on time [2]. In this case, the nurse's knowledge of discharge planning is needed to assess each patient by collecting and using relevant data to identify actual and potential problems. The nurse examines all changes in the patient's condition, and there must be evidence of the involvement of the patient and family in the discharge planning process because the patient needs to have the necessary information and resources to return home [3]. Nurse knowledge is also affected by internal factors, namely age, gender, education level, and length of work [4].

The services provided by the hospital must focus on patient safety so that the patient can recover without complications. As a health service facility, a hospital can be a place for the spread of infections that attack and occur in patients within approximately 72 hours. The infection was only discovered when the patient was admitted to the hospital or what is known as Nosocomial Infection [5].

Healthcare-Associated Infections (HAIs), also known as nosocomial infections, are one of the causes of increased morbidity and mortality rates in hospitals [6]. HAIs are infections that occur in patients during treatment in hospitals and other health care facilities, either appearing after the patient returns home or work for hospital staff and health workers related to the process of health services in health care facilities [7]. According to WHO , HAIs occur in 15% of all hospitalized patients [8]. The prevalence of HAIs infection in patients in developed countries varies between 3.5% -12%, while in developing countries, the prevalence of HAIS is 9.1% with a variation of 6.1% -16%. Based on data from the Ministry of Health of Indonesia, HAIs infections in Indonesia reached 15.74%, far above developed countries which range from 4.8 - 15.5%. Infection data in Indonesia at 10

General Teaching Hospitals in Indonesia in 2010, nosocomial infections have high rates, 6-16% with an average of 9.8% [7].

HAIs are a threat to hospital services because they can be interpreted as poor service quality, so prevention is necessary to reduce the incidence of HAIs. Prevention of infection must be carried out universally to protect patients from nosocomial infections, both health service staff and hospital users [7]. One of the nosocomial infections that are often encountered during patient care is an infusion wound infection or phlebitis. The phlebitis condition that occurs in patients is inflammation or inflammation of the blood vessels, characterized by swelling, redness, heat, and pain in the skin around the infusion site and the formation of prominent blood vessels [9].

WHO states that in 55 hospitals from 14 countries in Europe, the Middle East, Southeast Asia, and the West Pacific region, an average of 8.7% of patients at home experience phlebitis, namely 1.4 million people worldwide who acquire in the hospital [8]. The highest frequency of phlebitis is from hospitals in the Middle East and Southeast Asia region, 11.8% of 59 people with a prevalence of 7.7% of 385 people respectively from Europe and the West Pacific region. The phlebitis rate in Indonesia is 50.11% for government hospitals, while it is 32.70% for private hospitals [7].

The incidence of phlebitis will cause many losses such as death, both directly and indirectly, increase patient care days, and increase costs at the hospital [10]. Several factors can prevent the occurrence of phlebitis such as fluid or drug concentration, the balance of size and place where the cannula is inserted, the length of intravenous insertion, the installation technique, and intravenous care by nurses [11].

According to Ministry of health of Indonesia in 2017 states that infections such as phlebitis can be prevented if healthcare facilities consistently implement an infection prevention and control program (PCP) which is an effort to ensure everyone's protection against the possibility of contracting infections from the general public and when receiving health services at various health facilities [7]. The PCP program is an activity effort to prevent and minimize the incidence of infection in patients, officers, visitors, and the community around hospitals and other health facilities which includes assessment, planning, implementation, and evaluation [7]. Each hospital has a PPI Program which is compiled into Standard Operating Procedures (SOP) for every nursing action performed. SOP is made and implemented to prevent and minimize the occurrence of infection in that place.

To minimize the incidence of phlebitis in the inpatient ward, the main focus is the nurse. The nurse is a direct service provider in the inpatient ward 24 hours a day. The role of nurses in administering intravenous therapy has a significant influence on preventing the incidence of phlebitis. A nurse must have high competence and knowledge in all aspects of proper intravenous therapy to reduce the risk of phlebitis [12]. In addition to managing it, the incidence of phlebitis is related to procedures such as hand hygiene and personal protective equipment (PPE) [11].

Inpatient wards of RSUDZA Banda Aceh based on IPCN (Infection Prevention and Control Nurse) data, there were eight incidents of phlebitis out of a total of 633 days of infusion in November 2021 [13]. Meanwhile, data from the Tgk Chik Ditiro Hospital in Pidie, states that the number of phlebitis cases in the last three years has increased, where in 2018 there were 3,923 cases of phlebitis, in 2019 1,780 cases and 2020 the period from January to August 9,646 cases were recorded [14].

Based on IPCN, researchers found in the Aqsha 3 inpatient ward at RSUDZA Banda Aceh, the incidence of phlebitis was three incidents out of 303 days of installation in January-November 2022. Based on this phenomenon, researchers are interested in conducting research related to how the description of the implementation of prevention and control of phlebitis in the inpatient ward of dr. Zainoel Abidin Hospital in Banda Aceh.

II. METHOD

The purpose of this case study is to figure out the implementation of the Prevention of Healthcare-Associated Infections (HAIs) by nurses on the incidence of phlebitis at dr. Zainoel Abidin Banda Aceh. Quantitative descriptive research design with a sampling technique using the accidental side as many as 12 nurses participated in this case study.

III. FINDINGS

Based on table 1, it is known that as many as 8 (66.7%) of Aqsha 3 nurses are aged between 26 to 35 years. Meanwhile, there were 4 (33.3%) nurses aged between 36-45 years. As many as 6 (50%) Aqsha 3 nurses work less than five years. Those who worked over five years were 6 (50%) nurses. As many as 8 (60%) nurses have a diploma degree in Nursing.

Table 1. Frequency Distribution of Characteristics of Nurses in the dr. Zainoel Abidin Hospital (n=12)

No.	Chareacteristic	f	%
1.	Ages		
	26-35 (Early Adulthood)	8	66,7
	36-45 (Late Adulthood)	4	33,3
2.	Years of Service		
	> 5 Years	6	50
	< 5 Years	6	50
3.	Education Level		
	Nursing Diploma	8	66,7
	Nursing Profession	6	33,3

Based on table 2, it can be concluded that the implementation of hand hygiene by nurses at Aqsha 3 obtained dominant results in the deficient category, namely 10 nurses (83.3%).

Table 2. Distribution of Nurse Hand Hygiene Practices (n=12)

No.	Category	f	%
1	Good	2	16,7
2	Deficient	10	83,3

Based on table 3, it shows that the implementation of skin preparation by nurses, obtained dominant results in the deficient category, namely 7 nurses (58.3%).

Table 3. Distribution of Skin Preparation by Nurses (n=12)

No.	Category	f	%
1	Good	5	41,7
2	Deficient	7	58,3

Based on table 4 it shows that the closing of the infusion by the nurse obtained the dominant results in the good category, namely 10 nurses (83.3%).

Table 4. Distribution of Dressing Implementation/Closure of Infusion by Nurses (n=12)

No.	Category	f	%
1	Good	10	83,3
2	Deficient	2	16,7

Table 5 shows that the implementation of infusion catheter care by nurses at Aqsha 3 obtained dominant results in the deficient category, namely 9 nurses (75%).

Table 5. Distribution of Infusion Catheter Treatment by Nurses (n=12)

No.	Category	f	%
1	Good	3	25
2	Deficient	9	75

Table 6. Distribution of the Implementation of Proper Use of Equipment by Nurses (n=12)

No.	Category	f	%
1	Good	6	50
2	Deficient	6	50

Table 6 shows that the implementation of the use of proper equipment by nurses at Aqsha 3 obtained results in categories, namely as many as good and deficient (50%).

IV. DISCUSSION.

1 Implementation of Hand Hygiene

Contaminated hands from healthcare providers can be a source of infection for patients [15]. One of the most basic infection prevention strategies is proper hand hygiene using alcohol or soap. Indonesian Ministry of health in 2017 concerning guidelines for infection prevention and control in health care facilities implements 11 standard precautions for infection control and prevention, one of which is hand hygiene[7]. Several studies emphasize the importance of hand hygiene as a simple and effective step in reducing infection [16].

Based on the observations, in the hand hygiene implementation, 10 (83.3%) of the nurses were in the deficient category. As many as 12 (100%) nurses performed hand hygiene after the infusion, and 10 (83.3%)

nurses did not perform hand hygiene before giving care to the patient. The adherence to hand washing of ER nurses still tends to be low (72%). Hand washing is only done after carrying out the procedure [17]. Nurses usually do not wash their hands before the activity because they feel it is enough to use the hand-scoon and feel uncomfortable using the hand-scoon with wet hands, limited time to wash hands, and unavailability of tissues.

It is in line with the results of the CDC observations which were found during observations of infusions in the ER, including because handwashing agents caused irritation and dryness of nurses' hands, soap often ran out, and also lack of paper towels, nurses were very busy or lacked time to wash hands. The patient needs to take priority over handwashing behavior, low risk of contracting infections from patients, and wearing gloves.

2 Implementation of Skin Preparation Before Infusion

Based on the results of observations on nurses, it was found that the implementation of skin preparation was not good enough for 7 (58.3%) nurses. As many as 10 (83.3%) nurses did not use 70% alcohol correctly before insertion, namely by turning it out. Many nurses may still not know how to do proper skin preparation before placing an infusion on a patient. This is in line with research conducted by Rahayu and Kadri stated that the knowledge of practicing nurses about how to disinfect the insertion area before performing a venipuncture is not correct yet [12]. Cleaning the insertion site can use an antiseptic solution: providine-iodine, 70% alcohol, clorhexidine, or 2% tincture of iodine. Disinfecting the skin is done vertically, then horizontally, and ends with circular movements, from the center outwards with a diameter of 2 to 3 inches for 20 seconds. Then let the antiseptic liquid dry.

The Royal College of Nursing stipulates that nurses must have competence in all clinical aspects of intravenous therapy to install and provide intravenous therapy. Nurse knowledge is also needed such as understanding, the anatomy, and physiology of vascular access, goals, and indications for infusion therapy, pharmacology of intravenous fluids and drugs, principles of infection control, local and systemic complications, use of intravenous therapy equipment, prevention, and management of complications, procedures for installation and maintenance of intravenous therapy, and specific skills in inserting vascular access devices in particular patients [12, 13]. But there are still nurses who have not carried out these actions properly yet.

3 Implementation of Dressing

Based on the case study, as many as 9 (75%) of the nurses make the dressing poorly. But as many as 10 (83.3%) of the nurses did the IV dressing using a sterile transparent (Tegaderm) cover that can absorb to close the infusion catheter channel. Preventing phlebitis can use an aseptic dressing technique, a dressing technique for intravenous therapy that changed every day. There are two types of dressing, namely transparent dressing and gauze dressing. The advantages of transparent dressings are that they make it easier to identify phlebitis, they are not easily soiled or damp, and not need to be changed frequently compared to gauze dressings which changed every day. It is also impermeable to fluids, secretions, and bacteria moisture is more effectively removed, preventing fluid accumulation in the IV dressing [18].

The transparent form of dressing could make it easy to see the condition, color, and even texture of stressed skin so that it can help nurses take other nursing actions that can prevent infection [19]. The Centers for Disease Control and Prevention (CDC) recommends using a transparent dressing because it is sterile, besides being easy to install, it is also easy to observe the insertion area for signs of infection, and is waterproof to minimize the potential for infected [20].

However, as many as 9 (75%) nurses did not change the infusion dressings that looked dirty, loose, and wet. Based on the results of observations on patients, four patients with infusion dressings were wet, almost loose, and looked dirty. It is due to the lack of nurse supervision of the patient's infusion dressing condition. The workload makes nurses not have much free time to monitor patients regularly. The nurse will change the dressing at the same time when changing the infusion. The nurses only change it, if the patient's family reports it.

4 Implementation of Catheter-Flushing Care

Nurses play a crucial role in the prevention of infection in phlebitis. Most interventions and infection prevention strategies such as the stages of inserting, monitoring, and evaluating peripheral intravenous catheters are routine tasks of the nursing department [21]. Based on the study, the implementation of infusion catheter care by nurses in the Aqsha 3 ward was still not good, namely as many as 9 (75%) nurses. As many as 10 (83.3%) nurses did not rinse all vascular access devices with 0.9% NaCl to regulate infusion catheter patency. It is due to the workload and the number of actions in the ward that make nurses do not flushing or flushing infusion catheters for every action that requires vascular access. In addition, the nurse only does flushing or rinsing if the infusion catheter is jammed. This study in line by Azni, Rahmawati, and Wiedyaningsih that as many as 84 respondents (52.83%) stated that they had never flushed using 0.9% NaCl after administering drugs through an intravenous cannula [22].

Infusion Nursing Society (INS) to prevent the occurrence of phlebitis associated with the line, namely everything that passes through peripheral venous catheter access is the application of catheter irrigation with 0.9% sodium chloride. It aims to maintain catheter permeability, replace IV solutions at least every 24 hours, and replace all peripheral venous catheters, including heparin locators, at least every 72 hours. In addition, nurses maintain the sterility of the IV system when changing hoses, solutions, and dressings. According to the results of a study conducted by Keogh, rinsing peripheral venous catheter access using 0.9% sodium chloride as much as 3 ml before and after drug administration can prevent phlebitis [23].

5 Implementation of Proper Equipment Use

The length of time for inserting an intravenous cannula, the place or location for inserting an intravenous cannula, and the sterilization technique during infusion also really need attention as the replacement of the dressing [24]. On the observation sheet, the use of appropriate tools includes monitoring the infusion set attached to the patient, such as monitoring and replacing the infusion tube regularly, administering 70% alcohol before injecting, and changing the insertion site if inflammation occurs. Based on the results of the case study, as many as 6 (50%) of the implementation of the use of proper equipment by nurses was not good, and there were still 10 (83.3%) nurses who replaced infusion sets > 72 hours. There 14 out of 22 patients did not have an infusion date, and 12 (100%) nurses did not clean the injection canal with 70% alcohol before use.

Changing the IV therapy tube set can be maintained for 72 hours to maintain sterilization. The most effective change of location or injection site is for 72 hours unless there are already symptoms of phlebitis. The infusion must be replaced immediately even though it has not been 72 hours. This is following Demur's study, shows that out of 49 respondents, almost half of them had had an infusion for three days, namely 23 respondents (46.9%) [24].

According to Nurman's research (2019), nurses who work not following SOP principles, do not comply with work procedures that apply to the treatment unit, and use medical devices can be a factor in the occurrence of complications. According to Susanti stated that factors that influence compliance include knowledge, feelings, abilities, motivation, organizational characteristics, group characteristics, job characteristics, and environmental characteristics. This is following Jati's research (2017) which shows that the higher the motivation of the nurses, the higher the nurse's compliance with implementing SOPs [25].

In addition, there is a significant relationship between compliance with motivational factors. Kadir & Ratna's study shows that 28 respondents (45.9%) comply with the implementation of the Standard Operating Procedure (SOP) for infusions, while 23 respondents (37.7%) comply and 10 respondents (16.4%) do not comply which proves that there is a relationship between knowledge and nurse compliance in carrying out standard operating procedures for infusion.

V. CONCLUSION

Based on the results of a case study conducted regarding the description of the implementation of prevention and control of Nurse`s Healthcare-Associated Infections (HAIs) for the incidence of phlebitis in the inpatient ward, it can be concluded that:

1 The implementation of hand hygiene by the implementing nurse was in the deficient category, namely 10 (83.3%) respondents.
2 The implementation of skin preparation by the implementing nurse was in the deficient category, namely 7 (58.3%) nurses.
3 The implementation of the infusion dressing/closure by the implementing nurse ward was in the deficient category, namely 9 (75%) nurses.
4 The implementation of catheter-flushing care by the implementing nurse was in the deficient category, namely 9 (75%) nurses.
5 The implementation of the use of proper equipment by the implementing nurse is in the deficient category, namely 6 (60%) nurses.

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