The Technical Guidance of Surveillance Infection System for Healthcare Workers at the Intensive Care Unit of Hospital X

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Abstract- Infection is currently a major problem in hospitals, especially infections acquired from hospitals. Surveillance or data collection on the problem of infection has currently become an important thing. If the infection data is known, it can be used as material for evaluating the performance of healthcare workers in infection prevention efforts. Surveillance is the task of healthcare workers consisting of nurses, doctors, pharmacists, and all other healthcare workers. Data collection on the current infection rate is often ignored and incomplete. This is due to the absence of technical guidance on the use of an effective and easy system for recording infection. Based on this, this program aims to provide technical guidance on the surveillance system for health officers in the ICU room of Hospital X. The methods used were a) identifying potential Infection Control Officers (PPIs) who could play an active role in the surveillance infection system, b) technical guidance for surveillance infection systems, c) providing technical guidance on the use of surveillance infection systems, d) evaluating the results of surveillance. The solutions offered are discussion and technical guidance on the use of surveillance infection systems. The result is the ability of health officers to carry out surveillance infection systems.

Keywords- Technical Guidance, Infection Control Officer, Surveillance Infection System

I. INTRODUCTION

Hospital (RS) is a place for treatment to achieve healing. However, even though the hospital functions as a place to get healing, the hospital is also a source of infection. Not infrequently, patients get additional infections acquired from the hospital. Infections that appear in a person after being admitted to the hospital within 48 hours or more or 30 days after receiving treatment are called Healthcare-associated Infections (HAIs) [1] where patients show no symptoms at the admission of a hospital. Healthcare-associated infection is an indicator of hospital quality. A good hospital quality has a track record of data, especially infection data, or what is known as surveillance, where the infection rate must always be zero or zero infection.

For more than two decades, HAIs have become a major safety issue affecting health care [2]. Healthcare-associated infections affect hundreds of millions of patients worldwide each year. The incidence of HAIs according to The US Center for Disease Control and Prevention shows that about 1.7 million hospitalized patients get HAIs infection when receiving treatment and about 1 in 17 patients die from HAIs [3]. Because they are vital public services, hospitals continue to improve themselves to improve their performance in various lines, one of which is the prevention of the spread of infection. Hospital-acquired infections can be transmitted through cross-infection or auto-infection.

According to the Ministry of Health [4], the Indonesian government pays special attention to this issue of HAIs. Some of the components that are of concern to the government in overcoming HAIs are surveillance, guidance, and supervision through advocacy, socialization, and technical guidance for Human Resources (HR) who are directly involved in efforts to control infection. The recording can produce an incident rate of infection so that when the data is recorded, action can be taken immediately if an incident rate is obtained. Currently, the registration of HAIs in Indonesia is still not effective. Several theories explain that recording can use a time-based method divided into continuous and periodic [5]. That matter, of course, provides the advantages and disadvantages of each. A continuous recording will give more valid results.

Every hospital in Indonesia already has an Infection Control and Prevention team at the hospital, but from previous research, members of the Infection Control Officer (PPI) team do not understand their duties and authorities well in infection control [6]. Because of that reason above, The Technical Guidance of Surveillance Infection System for Healthcare Workers at the Intensive Care Unit of Hospital X was needed to optimize the surveillance.

II. LITERATURE REVIEW

A. HAIs

The indicator of the infection prevention and control program in the hospital is to control the incidence of hospital-acquired infections, known as Healthcare-associated Infections (HAIs), which are the main indicators of the quality of hospital performance around the world. For more than two decades, Healthcare-associated Infections (HAIs) have been a major safety issue affecting health care [2]. HAIs affect hundreds of millions of patients worldwide each year [7]. According to Kleinpell [8] , HAIs are infections that occur as long as a person is hospitalized and begins to show a symptom of infection within 48 hours of starting hospital admission. This problem is a major issue considering the application of patient safety is the main focus of providing quality hospital services. The application of patient safety means providing services that emphasize patient safety so that if a patient gets an infection because of his presence in the hospital, the hospital must take responsibility by improving its service performance so that the quality of the hospital is maintained.

This infection continues to increase every year starting from 1% in several European and American countries, to more than 40% in Asia, Latin America, and Africa. According to the data from the World Health Organization (WHO), the incidence of HAIs in hospitals is around 3 - 21% and the average incidence is 9% [9]. Currently, HAIs are major concerns, the reported diseases due to HAIs in low to middle-income countries include surgical wound infections 29.1%, urinary tract infections 23.9%, primary bloodstream infections 19.1%, ventilator-associated pneumonia 14, 8%, and other infections 13.1% [10]. Surgical wound infection was reported as the highest number of HAIs disease.

B. Infection Prevention and Control

The guidelines created by the Massachusetts Hospital PPI Team which were adapted from the nationally accepted standards developed by the Centers for Disease Control and Prevention are as follows [11]: a) Recommendations related to Hospital Infection Prevention and Control Program, b) Hand hygiene recommendations, c) Universal precautions in hospitals, d) Contact precaution in hospitals, e) Prevention and management of Multi-drug Resistant Organisms, f) Prevention Ventilator-Associated Pneumonia, g) Prevention of Surgical Wound Infections, h) Prevention of polymer bloodstream infections, i) Prevention of catheter-associated urinary tract infections.

The cornerstone of efforts to reduce HAIs in hospitals is an effective infection prevention and control program. The primary objective of the hospital's infection prevention and control program is to protect patients, employees, and visitors from catching the infection [11]. Patients, healthcare workers, and visitors can also be partners in infection prevention and control. One of them is by improving hand hygiene in the hospital [2].

C. Surveillance System

Surveillance or epidemiological surveillance is an activity of systematic and continuous analysis of diseases or health problems and conditions that affect the increase and transmission of these diseases or health problems, to take countermeasures effectively and efficiently through the process of data collection, processing, and disseminating epidemiological information to health program administrators [12]. According to WHO [7], surveillance is the process of collecting, processing, analyzing, and interpreting data systemically and continuously and disseminating information to units that need to be able to take action. Based on the above definition, it can be seen that surveillance is an activity of observing disease continuously and systematically on the incidence and distribution of disease and the factors that affect it in society so that prevention can be carried out to take effective action. According to the CDC (Center for Disease Control), it is a systematic and continuous collection, analysis, and interpretation of health data, which is needed for planning, implementing, and evaluating public health efforts, combined with timely data dissemination to those who need to know.

III. PROGRAM ACTIVITIES

A. Problem Identification

Hospital X is a type C hospital with a large number of patients. RS X has facilities such as Emergency Care, VVIP, VIP, and Class 1 to 3 Ward, Hemodialysis, Outpatient Installation, and Intensive Care Unit. The Intensive Care Unit is a part of the hospital where it is a crucial place and a high risk of HAIs. This is because most patients who are admitted to the ICU have a port de 'entry as a consequence of the installation of medical devices such as infusions, catheters, central venous catheters, and endotracheal tubes. Hospital X is a hospital that is developing HAIs unit. According to officials at X Hospital, the surveillance of HAIs is still difficult to implement because there is no easy and practical system for conducting surveillance. The surveillance system already exists, but it is not yet suitable for use because it is not following the principles of HAIs itself. For example, not all healthcare workers are willing to document or record invasive actions, which is one of the principles of HAIs. The staff's busy hours cause them to be reluctant to take notes. The authority regarding who is obliged to do the recording is also unclear. Hospital X currently still uses IPCLN for recording and it is periodic. It is still not able to describe the incident rate immediately (at the moment). So that there is still a weakness. Based on this, this program will introduce a surveillance system that can record incident rates at any time by conducting technical assistance in the use of the surveillance system for healthcare workers.

Based on the results of observations and interviews with partners, the problems found are as follows: a) There is no clarity about who has the obligation to record HAIs. b) Formulating Standard Operating Procedures on who is obliged to record HAIs, c) There is no understanding of healthcare workers regarding HAIs recording standards, d) Conduct technical guidance on HAIs recording, e) Evaluate the results of technical guidance with indicators: orderly recording HAIs, obtain incident rate data.

B. Problem-solving

1) Identifying potential Infection Prevention Control Nurse (IPCN) officers who can play an active role in the surveillance infection system. IPCN has an important role in health care, social and public health services, especially in infection prevention procedures [13]. Patients in treatment increase the risk of infection due to their health condition or direct contact with treatment processes such as surgical procedures or the installation of medical devices. IPCN in this regard focuses on prevention and management strategies as well as controlling infection prevention in hospitals [13]. IPCN qualifications are all nurses who have the competence to supervise all infection prevention and control activities.

2) Creating Surveillance Infection System Technical Guide. The identification process is a result of Focus Group Discussion with nursing management and infection control. Another identification is with a literature review according to Sugarindra et al. [14] the things that need to be documented in the Infection Control Program are as follows: the nurse needs to write down the date and time of insertion and removal of the IV line, urine catheter, central venous catheter, endotracheal tube, the presence of infection in each medical device installed. Apart from that, patient data, culture data, bacterial data, and antibiotic data are also included (Table 1).

TABLE I. TECHNICAL GUIDELINES (THE ROLE OF THE OFFICERS) FOR IMPLEMENTING SURVEILLANCE SYSTEMS

Procedure	Output	Person In Charge
Log-in to the system	Access to the system	Nurse
Enter data of patients	Data of patients appear	Nurse
Enter the installation and release data from the medical device as follows: IV line, Urine Catheter,	Document data on the date, time of installation, and removal of medical devices and the nurses who perform them	Nurse
Enter the installation and the removal data from medical devices as follows: Central Venous Catheter, Endotracheal Tube	Document data on the date, time of installation, and removal of medical devices and the nurses who perform them	Doctor
Conducting observations on medical devices attached to patients (IV line, Urine Catheter, Central Venous Catheter, Endotracheal Tube)	There is documented infection on the medical device attached to the patient	Nurse
Record the results of bacterial cultures in patients who have experienced infections due to the installation of a medical device	Document bacterial culture results in infected patients	Nurse
Record the results of sensitive and resistant antibiotics in patients	There is documented result of sensitive and resistant antibiotics in patients	Nurse

3) Technical guidance on the implementation of the surveillance system. Healthcare workers, namely doctors and nurses, are healthcare workers whose job is to administer medication and care to patients. The doctors and nurses treat patients according to the fields of knowledge that have been studied during academic learning. However, the management of surveillance systems is part of information technology that healthcare workers need to study and is an additional knowledge or supplement. Not all healthcare workers are proficient in using information technology, especially when information technology is always developing. Therefore, technical guidance on the use of information technology is needed, especially for healthcare workers.

This technical guidance starts with determining the personnel involved in filling out the surveillance system. The surveillance system needed to be filled in by an officer who had been appointed and qualified as surveillance. The steps are shown in fig. 1.

IV. RESULT AND DISCUSSION

The implementation of this community service program resulted in the results of IPCN qualifications, namely all nurses who have the competence to supervise all infection prevention and control activities. Also, the formulation of technical guidelines on the flow of the surveillance system and the person in charge (Table 1) will make it easier for healthcare workers, especially nurses and doctors, in providing care to patients as well as documentation tasks. The use of applicable information technology, namely for surveillance systems, will help facilitate health workers in documenting data so that work will be more effective and efficient. Patients can be treated well, as well as infection data can be controlled well. By well-documented infection data by health workers, it will produce a controllable infection data output. With the control of infection data, it is hoped that the hospital can minimize the infection rate to zero infections.

This activity requires repeated mentoring because health workers need to adapt to the system. Also, the shift system and changes in health workers from time to time are obstacles as well. In addition to that, the capacity of health workers to new information technology varies. Some can adapt quickly and become capable quickly, but some need a long time to master information technology.

Figure 1.   The algorithm of surveillance steps.

V.   CONCLUSION

Information technology is very important for hospitals to improve services, but not all healthcare workers can use it properly, therefore it is necessary to develop an acceptance model of the hospital information system.

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[14] Sugarindra M, Risdiana N and Rosa E M 2019 Analysis and information system designs of surveillance infection control system i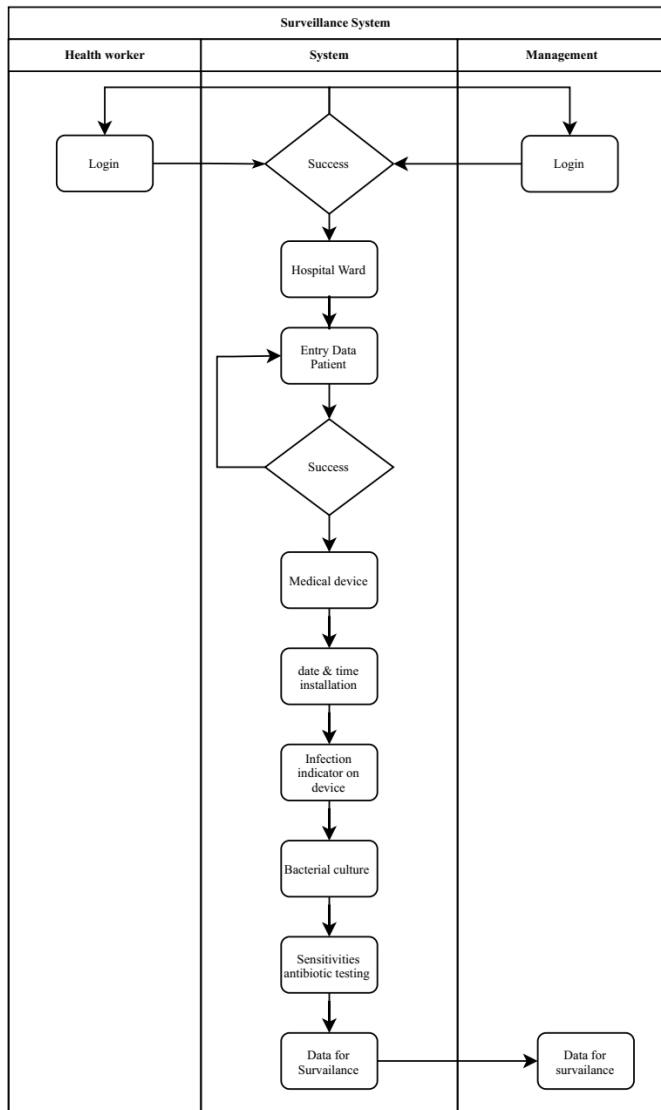n the hospital *IOP Conf. Ser. Mater. Sci. Eng.* 673