

## Implementation of Infection Prevention and Control Programs in dr. R. Sosodoro Djatikoesoemo Hospital, Bojonegoro

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### Abstract

The incidence of infection is related to health services in dr. R. Sosodoro Djatikoesoemo Hospital, Bojonegoro is still above the standard set in the Hospital Minimum Service Standard of  $\leq 1.5\%$ , namely Phlebitis 2.57% and Decubitus 1.7%. This study aims to find out the description of the implementation of the Infection Prevention and Control (PPI) program in dr. R. Sosodoro Djatikoesoemo Hospital, Bojonegoro. This type of research was descriptive with observational approach. Data were obtained from interviews with nurses implementing Infection Prevention and Control (PPI) or Infection Prevention Control Nurse (IPCN) in dr. R. Sosodoro Djatikoesoemo Hospital, Bojonegoro, PPI committee report and literature review. The results showed that the incidence of infection related to health services (HAIs) in 46.2% (6) rooms in the inpatient installation is still above 5%. Compliance of handwashing officers 75% and 19.9% of officers who were not correct in using Personal Protective Equipment (PPE) in dr. R. Sosodoro Djatikoesoemo Hospital, Bojonegoro. Increase the frequency of hand hygiene socialization to new nurses and doctors, students who will carry out field practices, young doctors who will practice, cleaning service personnel, non-medical personnel, patients and families and hospital visitors.

**Keywords:** Infections, Health services, PPI, Hospital

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### 1. INTRODUCTION

Healthcare Associated Infections (HAIs) are an important health care problem throughout the world because HAIs infection will cause several problems, such as increased morbidity and mortality, additional days of care, increased costs of care and dissatisfaction for both patients and their families (Darmadi, 2008). In the forum of the Asian Pacific Economic Committee (APEC) or the Global Health Security Agenda (GHSA), infectious diseases related to health services have become the agenda discussed. This shows that the resulting HAIs directly impact the country's economic burden. Infection Prevention and Control Program (PPI) is important to be implemented in hospitals as a measure of quality and to protect patients, officers, visitors and families from the risk of infection. The PPI program activities include planning, implementation, supervision, guidance, education and training as well as monitoring and evaluation. The implementation of PPI in hospitals must be managed and integrated between the structural and functional aspects of all departments/installations/divisions/units from hospitals and other health care facilities in accordance with the philosophy and objectives of the PPI (Kemenkes RI, 2008).

The incidence of infections related to health services in Indonesia is still a serious problem. Education Ten General Hospital (RSU) in 2010 noted that the incidence of infections related to health services occurred around 6-16% with an average of 9.8%. Infections that often occur in hospitals are phlebitis infections, Operassi (ILO) and Decubitus (Nugraheni, 2012). While the standard indicator of infection related to health services in hospitalized patients is 1.5% (Kemenkes RI, 2008). The incidence of infection is related to health services in dr. R. Sosodoro Djatikoesoemo Hospital, Bojonegoro is also still a problem. Based on the report of the Infection Prevention and Control (PPI) committee in 2017, the incidence of infections related to health services in the dr. R. Sosodoro Djatikoesoemo Hospital, Bojonegoro is still above the standards set out in the Hospital Minimum Service Standard of  $\leq 1.5\%$ , namely Phlebitis 2.57% and Decubitus 1.96%. This study was purpose to determine the description of the implementation of the Infection Prevention and Control program (PPI) in the dr. R. Sosodoro Djatikoesoemo Hospital, Bojonegoro.

### 2. METHODS

This type of research was descriptive with observational approach. The research was carried out in dr. R. Sosodoro Djatikoesoemo Hospital, Bojonegoro in September 2018. Data obtained from interviews with nurses implementing PPI or Infection Prevention Control Nurse (IPCN) in dr. R. Sosodoro Djatikoesoemo Hospital, Bojonegoro, PPI committee report and literature review.

### 3. RESULTS

Infection Prevention and Control (PPI) is an effort to prevent and minimize infection in patients, officers, visitors and the community around health care facilities (Kemenkes RI, 2017). The PPI Guidelines in Health Service Facilities aim to improve the quality of services in health care facilities, so as to protect health human resources, patients and communities from infectious diseases related to health services. The scope of hospital infection prevention and control programs includes awareness of isolation, the application of PPIs related to health services (HAIs) in the form of steps that must be taken to prevent HAIs (bundles), surveillance of HAIs, education and training and the use of wise anti-microbes. Besides that, monitoring is carried out through Infection Control Risk Assessment (ICRA), other regular audits and monitoring. In implementing PPI hospitals, health centers, clinics, independent practices are required to implement all PPI programs while for other health care facilities the application of PPI is tailored to the services carried out at these health service facilities.

The implementation of the PPI in health care facilities is carried out through the establishment of a PPI Committee or Team. The PPI committee or team is a non-structural organization in health care facilities that has the main function of running the PPI and developing infection prevention and control policies including prevention of infections originating from the community in the form of Tuberculosis, HIV, and other infectious infections. The PPI Committee or Team was formed to organize good PPI governance so that the quality of medical services and the safety of patients and workers in health care facilities is guaranteed and protected. The PPI Committee or Team is tasked with carrying out the activities of assessment, planning, implementation, monitoring and evaluation, and guidance which results must be reported to the head of the health care facility periodically at least 2 (two) times a year, or according to needs (Kemenkes RI, 2017). The implementation of PPIs in health care facilities aims to protect patients, health workers, visitors who receive health services and communities in their environment by breaking the cycle of transmission of infectious diseases through standard and transmission-based vigilance. For patients who need isolation, isolation awareness will be applied which consists of standard vigilance and alertness based on transmission.

#### 3.1 Standard Precautions

Standard precautions are the main precautions designed to be applied routinely in the care of all patients in hospitals and other health care facilities, whether diagnosed, suspected to be infected or colonized. The purpose of implementing standard precautions is to prevent cross transmission before the patient is diagnosed, before the results of laboratory tests and after the patient is diagnosed. In addition to patients, health workers such as laboratory staff, households, CSSD, garbage disposal and others are also at greater risk of being infected. Therefore it is necessary to understand and adhere to the officer to apply standard precautions so that they are not infected. According to Minister of Health Regulation Number 27 of 2017 concerning Infection Prevention and Control Guidelines in Health Service Facilities, there are 11 (eleven) main components that must be implemented and adhered to in standard precautions, namely:

1. **Hand hygiene:** Hand hygiene is done by washing hands using soap and running water if the hands are clearly dirty or exposed to body fluids, or using alcohol (alcohol-based handrubs) if the hands do not look dirty. Wash hands with regular / antimicrobial soap and rinse with running water, done when:
  - a) If the hands appear dirty, contact with the patient's body fluids is blood, body fluids secretions, excretions, skin that is not intact, replace the verband, even after wearing gloves.
  - b) If the hand switches from the contaminated area of the body to another clean area, even in the same patient. Indications for hand hygiene:
    - i. Before patient contact;
    - ii. Before aseptic action;
    - iii. After contact with blood and body fluids;
    - iv. After patient contact;
    - v. After contact with the environment around the patient
2. **Use of Personal Protective Equipment (PPE):** Personal protective equipment is special clothing or equipment used by officers to protect themselves from the dangers of physical, chemical, biological / infectious materials. The purpose of using PPE is to protect the skin and mucous membranes from the risk of exposure to blood, body fluids, secretions, excreta, non-intact skin and mucous membranes from patient to officer and vice versa. The types of PPE are gloves, mask/Particulate Respirator, eye protection (goggle), shield/ face shield, hood head cover, protective gown / apron, sandals/closed shoes (Boots). An indication of the use of PPE is to take action that allows the body or mucous membrane to be exposed to or splashed with blood or body fluids or the possibility of a patient being contaminated by an officer.

3. **Decontamination of patient care equipment:** In decontamination of patient care equipment, management of used equipment for patient care is contaminated with blood or body fluids (pre-cleaning, cleaning, disinfection, and sterilization) in accordance with the Standard Operating Procedure (SPO).
4. **Environmental control:** Environmental controls in health care facilities, including efforts to improve air quality, water quality, and environmental surfaces, as well as the design and construction of buildings, are carried out to prevent the transmission of microorganisms to patients, officers and visitors.
5. **Waste management:** Hospitals and other health care facilities as health service facilities are a gathering place for sick and healthy people so that they can become a source of disease transmission and enable environmental pollution and health problems. Hospitals also produce waste that can transmit disease so that waste management is needed in health care facilities to avoid these risks. Health care facilities must be able to minimize waste, namely efforts made to reduce the amount of waste produced by reducing material (reduce), reusing waste (reuse) and recycling waste (recycle).
6. **Management of linen:** Linen is divided into dirty linen and contaminated linen. Contaminated linen is linen that is exposed to blood or other body fluids, including sharp objects. Care must be taken of the linen that has been used carefully. This caution includes the use of appropriate PPE equipment and regular hand cleaning according to standard precautionary guidelines.
7. **Health care officers:** Health care facilities must carry out periodic health checks for all officers both health workers and non-health workers. Besides that, it must also have a policy for management due to needle puncture or sharp objects used by patients, which includes among others who should be contacted during an accident and the examination and consultation needed by the officer concerned. The clerk must always be vigilant and careful at work to prevent trauma when handling needles, scalpels and other sharp instruments used after the procedure, when cleaning instruments and when removing needles. Do not recap the needle that has been used, manipulate by hand, bend, break or remove the needle from the syringe. Dispose of other needles, syringes, knives, scalpels, and sharp consumables into a special puncture-resistant / opaque container before being inserted into the insenerator. When a special container is filled  $\frac{3}{4}$  it must be replaced with a new one to avoid being spilled.
8. **Patient placement**
  - a) Place separate infectious patients with non-infectious patients.
  - b) The placement of patients is adjusted to the pattern of transmission of the patient's disease infection (contact, droplet, airborne) should be a separate room.
  - c) If there is no separate room, it is permissible to be treated with other patients whose type of infection is the same as applying a cohorting system. The distance between beds is at least 1 meter. To determine patients who can be put together in one room, consult the PPI committee or team first.
  - d) All cohorting-related rooms must be alerted based on the type of transmission (droplet, airborne contact).
  - e) Patients who cannot maintain personal hygiene or their environment should be separated separately.
  - f) Mobilization of infectious patients with airborne types so that they are restricted in the environment of health care facilities to avoid unnecessary transmission of disease to others.
  - g) HIV patients are not allowed to be treated together with TB patients in one room but TB-HIV patients can be treated with fellow TB patients.
9. **Respiratory hygiene / ethics of coughing and sneezing:** Health care facilities must provide hand washing facilities such as sinks with running water, tissue, liquid soap, infectious trash cans and surgical masks. Officers, patients and visitors with symptoms of respiratory infections, must implement and comply with the following steps:
  - a) Cover your nose and mouth with a tissue or handkerchief or upper arm.
  - b) Wipes are discharged into infectious waste bins and then wash hands.
  - c) There are hospital health education / counseling (PKRS) and other health care facilities that are carried out through audio visuals, leaflets, posters, banners, videos via TV in the waiting room or by the officers.

10. **Practice safe injections:** Using sterile syringes and syringes for each injection also applies to the use of multidose vials to prevent microbial contamination when the drug is used in other patients. Don't forget to throw used syringes and syringes into their right place.
11. **Practice lumbar safe functions:** All officers must wear surgical masks, clean gowns, sterile gloves when performing lumbar puncture actions, spinal / epidural anesthesia / install a central venous catheter. The use of surgical masks on officers is needed so that there is no droplet of oropharyngeal flora that can cause bacterial meningitis.

### 3.2 Precautions Based on Transmission

Transmission-based alertness as an additional standard of alertness is carried out before the patient is diagnosed and after being diagnosed with the type of infection. This type of vigilance based on transmission is as follows:

1. **Alertness of Transmission Through Contact:** This precaution aims to reduce the risk of the emergence of Healthcare Associated Infections (HAIs), especially the risk of microbial transmission which is epidemiologically caused by direct or indirect contact.
  - a. Direct contact includes contact with exposed skin surfaces with infected skin or colonization. For example when the officer turns the patient's body, bathes, helps the patient move, changes the bandage, treats the oral patient of the Herpes Simplex Virus (HSV) without gloves.
  - b. Transmission of indirect contact is contact with the secretion fluid of an infected patient that is transmitted through an employee's hand that has not been washed or dead objects in the patient's environment, such as instruments, needles, gauze, toys, and gloves that are not replaced.
  - c. Avoid touching other environmental surfaces that are not related to patient care before carrying out hand hygiene activities.
  - d. Officers must refrain from touching their eyes, nose, mouth while still wearing contaminated gloves/without gloves.
2. **Transmission Precautions through Droplets:** Droplet transmission occurs when  $> 5 \mu\text{m}$  droplet particles are released during coughing, sneezing, vomiting, talking, during the suction, bronchoscopy procedure, floating in the air and falling within  $< 2 \text{ m}$  and regarding the mucosa or conjunctiva, for which PPE is needed or adequate mask, if possible with a 4-layer mask or containing germ killer (germ decontaminator). This type of spark transmission can occur in cases including common cold, respiratory syncytial virus (RSV), Adenovirus, H5N1, H1N1.
3. **Vigilance of Air-Borne Precautions:** Epidemiological transmission via air can occur if a person breathes sparks of nuclei particles  $15 \mu\text{m}$  ( $< 5 \mu\text{m}$ ) in diameter which contain microbes that cause infection. These microbes will be carried by air flow  $> 2 \text{ m}$  from the source, can be inhaled by vulnerable individuals in the same space or far from microbial sources. It is important to seek air exchange  $> 12 \text{ x / hour}$  (12 Air Changes per Hour / ACH).

*Efforts to reduce the incidence of infections related to health services (HAIs) in dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro namely:*

1. **Surveillance of infection events related to health services:** Implementation of HAIs surveillance in *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* is conducted by IPCLN (Infection Prevention Control Link Nurse) in each inpatient room by filling in daily bundles data. If there is an indication of an infection, IPCLN coordinates with IPCN (Infection Prevention Control Nurse) and IPCD (Infection Prevention Control Doctor) to determine whether the infection includes infection related to health services or not. Infection incidence data is analyzed by IPCN every month, then reported to the PPI committee every three months and reported to the hospital director every six months. The incidence of infection related to health services in the *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* can be seen in the following table.

Table 1. The incidence of infections related to health services (HAIs) in the inpatient room of *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* in January-June 2018

Number	Rooms	Infection Type							
		Phlebitis				Decubitus			
		Infusion	n	%	Target	Bed rest	n	%	Target
1	Anggrek	1079	6	5.6	< 5 %	279	3	10.8	<1%
2	Wijaya Kusuma	851	0	0	< 5 %	5	0	0	<1%
3	ICCU	491	1	2	< 5 %	490	1	2	<1%
4	Birthing Room	472	0	0	< 5 %	0	0	0	<1%
5	ICU	467	0	0	< 5 %	467	0	0	<1%
6	Internal Disease	4835	10	2.1	< 5 %	669	24	35.9	<1%
7	Surgery	619	5	8.1	< 5 %	46	3	65.21	<1%
8	Nicu	771	25	32.4	< 5 %	1030	0	0	<1%
9	Child	2286	7	3.06	< 5 %	17	0	0	<1%
10	Obgyn	682	6	8.8	< 5 %	0	0	0	<1%
11	Lungs	1907	0	0	< 5 %	60	0	0	<1%
12	Heart	384	10	26	< 5 %	97	0	0	<1%
13	Neurology	2727	1	0.4	< 5 %	354	0	0	<1%

Source: Report of the PPI Committee, *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* in January-June 2018

Based on table 1, information is obtained that there were 6 rooms (46.2%) in the inpatient installation of *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* who has a number of HAIs above the standards set out in PMK Number 27 of 2017 concerning Infection Prevention and Control Guidelines in Health Service Facilities.

- 2. Hand hygiene:** Hand hygiene activities are carried out by disseminating hand hygiene and hand hygiene audits. Hand hygiene outreach was carried out on new nurses and doctors in the inpatient and outpatient care department of *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro*, students who will practice in the field, young doctors who will practice in the field, cleaning service personnel, non-medical personnel (registration, canteen) and to patients, visitors and patient families. Based on the PPI committee's report on the dissemination of hand hygiene carried out twice a year. Besides that, there have been posters about hand washing SPOs that have been posted in the inpatient room or in the nursing room. Hand hygiene compliance monitoring is carried out every day by IPCLN in each room, then reported monthly to IPCN. Based on the results of interviews with IPCN and PPI committee reports, information was obtained that the compliance of hand hygiene officers at the *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* at 75%. This is not in accordance with the target set at 80%.
- 3. Personal Protective Equipment (PPE):** There is an SPO for the use of PPE and SPO socialization and training on the use of PPE have been carried out for medical and non-medical personnel. Compliance monitoring for the use of PPE is carried out by IPCLN in each room (unit) of the *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro*. Based on the PPI committee report, information was obtained that 93% of the officers had attended the PPI in house training, 80.1% had used PPE correctly and 19.9% had not been correct in using PPE. Errors in using PPE include the use of masks used not as indicated, finishes are not immediately discarded and are still hung on the neck.
- 4. Environmental Control:** Activities carried out in the environmental control program at the *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* includes; environmental hygiene, solid waste management, liquid waste management, insect and mouse control and compliance of officers. According to the PPI committee report, it was found that a sharp waste box of more than  $\frac{3}{4}$  has just been discarded and more than new non-infectious waste were disposed of. This is not in accordance with the established SPO for waste management.



5. **Management of Linen:** Activities carried out in the context of running a linen management program at *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* is the socialization of linen management which includes; groove or design of laundry, laundry management system, use of PPE on laundry staff, handling linen to prevent cross contamination, washing, folding and distribution of linen. Based on the PPI committee report there are still officers who do not use PPE, especially in clean rooms and there are still food and drinks in the washing area.
6. **Ethics of Coughing and Sneezing:** The activities carried out on the ethics program of coughing and sneezing were to carry out socialization regarding the ethics of coughing and sneezing to doctors and nurses both in outpatient and inpatient installations, students who would practice, young doctors who would practice, cleaning service staff and non-medical personnel, patient and family of patients or visitors. Based on observations and PPI committee reports there are no posters regarding the ethics of coughing and sneezing in all rooms.
7. **Decontaminate Patient care Equipment:** Based on the PPI committee report, it was found that the processing of patient equipment was carried out by nurses, first by stabilizing it with running water, then washing and sterilizing it using autoclave and then packing and storing it. Nurses who do the washing are nurses who wear personal protective equipment such as gloves, plastic aprons and masks, this is in accordance with the SPO regarding the processing of patient equipment. The processing of patient equipment is preceded by pre-cleaning using detergent or brush then cleaning stage, which is to wash and drain, then sterilize or disinfect depending on the equipment.
8. **Patient Placement:** *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* already has an SPO regarding the placement of patients. The placement of patients has separated between infectious and non-infectious patients, has been adapted to the pattern of transmission of disease infection patients and does not treat HIV and TB patients in one room. This is in accordance with the SPO of patient placement.
9. **Practice Safe Injections:** The activities carried out on the safe injection practice program were the dissemination of safe injections for outpatient installation officers and inpatient installations at the *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro*. Based on the PPI committee report, it was found that there were still officers who had not washed their hands before and after the injection. Monitoring of safe injecting practices carried out by IPCLN in each room is then evaluated by IPCN. The evaluation results were reported to the PPI committee and hospital director.
10. **Protection of Health Workers:** *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* already has a policy for management due to needle punctures or sharp objects used by patients. The clerk has recapitulated the needle that has been used, does not manipulate by hand, bend, break or remove the needle from the syringe. Needles, syringes, scalpel blades, and other sharp consumables are disposed of in special puncture-resistant / opaque containers before being inserted into the insenerator. This is in accordance with the SPO regarding the protection of health workers.
11. **Lumbar Puncture Practice:** According to the PPI committee report, it was found that all officers had used surgical masks, clean gowns and sterile gloves when they were going to carry out lumbar puncture actions.

#### 4. DISCUSSION

The results showed that the incidence of infection was related to health services in 46.2% (6) inpatient rooms of *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* is still above the standard set in PMK Number 27 of 2017 concerning Infection Prevention and Control Guidelines in Health Service Facilities.

Compliance with handwashing on officers at *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* at 75%. This still does not meet the set target of 80%. The hand washing habits of officers are very basic behavior in an effort to prevent cross infection. This is because hospitals are a gathering place for all kinds of diseases, both contagious and non-infectious. Improving hand hygiene has the potential to prevent infection and danger, by reducing time and health care costs (WHO, 2009).

Use of PPE on officers at the *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro*, there are still some who are not really familiar with sanitarian and laundry officers. Errors in the use of PPE including masks used are not as indicated and after they are finished they are not immediately discarded and are still hung on the neck. This is not in accordance

with the SPO using PPE. One of the causes of errors in the use of PPE is the lack of knowledge of officers about the use of PPE, therefore it is necessary to conduct socialization and training to improve staff knowledge. This is in accordance with the research of Fashafsheh *et al* (2015) which states that nurses' knowledge regarding prevention and control of infections is related to the implementation of infection prevention and control. Organizing education and training is one of the efforts to improve the quality of human resources (Farooq *et.al*, 2011).

In environmental control there are still more than  $\frac{3}{4}$  newly disposed of sharps waste and more than new non-infectious wastes  $\frac{3}{4}$  are disposed of. This is not in accordance with the established SPO for waste management. Hospitals must establish and carry out routine procedures for cleaning, disinfection of environmental surfaces, beds, equipment in addition to beds and edges, surfaces that are often touched and make sure these activities are monitored. Lack of monitoring (monitoring) from management, will affect the discipline of employees in carrying out their respective duties. This is in accordance with the study of Borer *et.al* (2001) which states that periodic monitoring is a tool to achieve a reduction in infection with a tremendous impact on morbidity, cost, and quality of care.

## 5. CONCLUSION

1. Occurrence of infection related to health services (HAIs) in 46.2% (6) rooms in inpatient facilities at *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* is still above the standards set by PMK Number 27 of 2017 concerning guidelines for infection prevention and control in health care facilities.
2. Compliance with handwashing officers at the *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro* has not met the set targets.
3. There were still officers who are not correct in using Personal Protective Equipment (PPE).
4. The environmental control program has not run according to the Ministry of Health's infection prevention and control guidelines.
5. Decontamination of patient care equipment, placement of patients, protection of staff and lumbar practices of safe functioning were in line with the Ministry of Health's infection prevention and control guidelines.

## 6. SUGGESTION

1. Increase the frequency of hand hygiene socialization to new nurses and doctors, students who will carry out field practices, young doctors who will practice, cleaning service personnel, non-medical personnel, patients and families and hospital visitors.
2. Increasing socialization and training in the use of Personal Protective Equipment (PPE) to officers.
3. Improving monitoring of the implementation of infection prevention and control programs in *dr. R. Sosodoro Djatikoesome Hospital, Bojonegoro*.

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