

ANALYSIS OF NURSING SKILLS IN PREVENTION AND CONTROL OF NOSOCOMIAL INFECTIONS

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ABSTRACT

Nosocomial infections are very influential on the patient's overall health condition and can increase morbidity and mortality. However, the incidence of nosocomial infections is still high. The problem in this study is the lack of nurses' ability to prevent and control nosocomial infections. The purpose of this study was to determine and analyze the ability of nurses related to this and its determinants at the Royal Prima Hospital Medan. This type of research is qualitative research with an interactive approach. There were 7 informants as nurses, 7 room heads and 1 PPI team. Methods of Data Collection by means of, In-depth Interviews, Observation and Documentation Studies. The study was conducted from February to March 2019. The results showed that the ability of nurses in the prevention and control of nosocomial infections was not maximal in accordance with WHO regulations. Determinants in its implementation include nurse education, lama work, place of assignment, HR needs and support tools, comfort of supporting facilities, training / outreach, *monitoring* and evaluation and coordination between units. The conclusion of the study is that the ability of nurses in the prevention and control of nosocomial infections at RSU Royal Prima Medan is already well established but there are some obstacles in its implementation.

Keywords: ability , prevention, control, nosocomial infection

INTRODUCTION

The quality of health services especially nursing services in hospitals can be assessed through various indicators, one of which is through the assessment of nosocomial infections. Nosocomial infection is an infection that the patient receives during treatment and lasts for 72 hours, where previously the patient did not show signs and symptoms of infection at the time of hospital admission. Nosocomial infections can increase morbidity and mortality.

In Indonesia, infection is still the main cause of death and illness in hospitals and other health care facilities. Nosocomial infections in 10 public hospitals in Indonesia are quite high, between 6-16% with an average of 9.8% in 2010. The most common nosocomial infection was Operation Wound Infection (ILO). The results of previous studies show that the incidence of ILO in hospitals in Indonesia varies between 2-18% of the entire surgical procedure.

In Medan City, postoperative clean surgical wound infections also occurred at Haji Adam Malik General Hospital in 2010 with a prevalence rate of 5.6% (Jeyamohan, 2010). In addition, it was also known that there was an ILO in Dr.Pirngadi Regional Hospital during the period June to December 2015 which was recorded at 20.39%. In addition, the results of surveillance of nosocomial infections in the inpatient room of Dr. Pirngadi Hospital also reported the incidence of Peripheral Blood Infection (IADP) of 9.62% (RSUD Dr. Pirngadi, 2015). According to WHO (2015) the

source of nosocomial infection can come from visitors, hospital staff, patients or the hospital environment. According to Darmadi (20 16), nursing staff as officers who always contact with sufferers (for 24 hours) are the foremost executors in efforts to prevent and control nosocomial infections.

To support the success of PPI programs in hospitals, PPI procedures and policies are also needed. Implementing nurses in preventing nosocomial infections require an integrated plan with management, monitoring and implementing programs by limiting the transmission of organisms from or between patients by washing hands and using gloves, actions septic and aseptic, sterilizing and disinfecting, and controlling the risk of environmental transmission. based on the background description above and the phenomenon of nosocomial infections, the authors are interested in conducting in-depth research on the analysis of nurses' abilities in the prevention and control of nosocomial infections in the Royal Prima General Hospital, Medan, North Sumatra.

Nosocomial infection or *Health Care-Associated Infection* (HCAI) is an infection that occurs as long as the patient receives services at a health facility, where no signs of infection or symptoms of the patient are incubated at the time of hospital admission. Types of nosocomial infections : surgical Injury Infection, urinary tract infection, bloodstream infections, decubiti, *associated Pneumonia Ventilator*.

Darmadi (2016) suggested several factors that play a role in the occurrence of nosocomial infections are: (1)External factors *or extrinsic factors* (medical service officer, medical equipment and materials, the environment consists of internal environments such as treatment rooms, delivery rooms and operating rooms, as well as external environments such as hospital yards and landfills or waste management, food and or drinks, other sufferers, visitors or family; (2)Factors that exist in patients (*intrinsic factors*); (3)Nursing factors; (3)Microbial factors such as the level of invasion ability and the level of tissue damage ability.

The hands can transmit infections in the hospital and can be minimized with proper hand hygiene. Washing hands often is not optimal. Handwashing requirements: (1)Water drive: a large sink that requires little maintenance, with *antisplash* and hand- *held* controls; (2)Product: soap or antiseptic depending on the procedure. Disinfect the hands with an alcohol washing liquid with antiseptic techniques to physically clean the hands; (3)Dryer facility without contamination (disposable towels if possible).

Barrier protection must already be available for nurses such as dresses, masks, gloves, and protective glasses (MOH, 2016), (1)Protective gown; (2)Mask, Masks made of cotton, gauze, or paper are less effective. Paper masks with synthetic materials for filtering are effective barriers against microorganisms.

Precautions for nosocomial infections using aseptic techniques can be seen in nosocomial infections that often occur as follows: (1)Urinary Tract Infections (UTI), UTI is a nosocomial infection that is more commonly found; 80% of these infections are related to catheter placement. Effective intervention in the prevention of infection due to the installation of a keteter; (2)Blood Flow Infection, Local infections and systemic infections can occur that require more intensive care; (3)Wound Infection., Another way to reduce the entry of microorganisms is the treatment of wounds with a sterile principle. To prevent the entry of microorganisms into the wound, the nurse must clean the area around the wound.

Certain patients may require special precautions to limit the transmission of potentially infecting organisms to other patients. Precautions for isolation are recommended depending on the

mode of transmission. Ability comes from the basic word "able" which in relation to work means that it can (adjective or condition) do the work so as to produce goods or services as expected (Moenir, 2014).

METHOD

This type of research is a qualitative study, the location of the study at RSU Royal Prima Medan, conducted from February to March 2019. Sources of data or sources of information in the study are those who are considered competent to provide internal information about Royal Prima Medan General Hospital regarding nosocomial infections, consisting of 15 people: (1)The head of each room is 1 person from each room = 7 people. (2)Team (Prevention and Control of Infection in the Hospital) of 1 person. (3)Each nurse is 1 person from each room = 7 people.

Procedure for implementing data collection is Maintain hospital hygiene, Implement handwashing, Use personal protective equipment, Perform aseptic techniques, Report to the doctor if there are signs and symptoms of infection, Perform isolation of patients with infectious diseases, Limit patient exposure to infections originating from visitors and Maintain the safety of equipment and treatment equipment for transmission of nosocomial infections.

RESULTS

1. Maintain Hospital Hygiene

Based on interviews with 14 nurses from 7 installations at RSU Royal Prima Medan, it is known that in maintaining cleanliness for the prevention and control of nosocomial infections, the ability of 12 out of 14 nurses (85.73%) at RS Royal Royal Medan has been classified as good. However, there are still 2 nurses who have not been able to carry out their role in maintaining hospital hygiene. This can be seen from the following statement:

In keeping the hospital clean, we only throw garbage in its place and sometimes we also clean it. That's all ... and there is a CS that helps (Informant 1).

As for the cleanliness of the room we are assisted by CS ... the most we do is just to dispose of trash according to its place ... that's all ... (Informant 5).

Table 1.
Observation matrix for nurses' ability maintain hospital hygiene routinely (n=14)

Informant	Implement	
	Yes	No
Polyclinic Executing Nurse	√	
Inpatient nurses	√	
PICU Executing Nurse	√	
Midwife Implementing Midwifery Room,	√	
Operating Room Nurse	√	
ICU Executing Nurse	√	
Emergency Nurse	√	
Head of Polyclinic	√	
Head of Hospital	√	
Head of PICU	√	
Head of Midwifery Room	√	
Head of Operating Room	√	
Head of ICU	√	
Head of Emergency Room	√	

Based on the matrix of observations from all nurses have the ability to prevent and control maintaining hospital hygiene.

2. Hand Washing

Based on interviews with 14 nurses from 7 installations at RSU Royal Prima Medan about the ways and stages of washing hands for the prevention and control of nosocomial infections, information was obtained that the ability of 12 of 14 nurses (85.71%) in the implementation of hand washing was classified as good.

However, there are still two nurses who have not been able to carry out hand

washing properly and correctly as the following statement:
I still often forget the stages of washing my hands even though there is always a response when overan at nursestation, I often forget ... (Informant 2).

If you use handrub, your hands are washed for 20-30 minutes ... eh seconds, with 30-40 seconds water ... ehm .. wrong .. 40-60 seconds, it means sometimes the forgetfulness is ... when it's called sus ... liquid the infusion runs out ... well, there is often forgetfulness to wash your hands because you want to hurry up...

Table 2.
Observation matrix on the nurse's ability to perform handwashing (n=14)

Informant	Implement	
	Yes	No
Polyclinic Executing Nurse		√
Inpatient nurses		√
PICU Executing Nurse	√	
Midwife Implementing Midwifery Room,	√	
Operating Room Nurse,	√	
ICU Executing Nurse,		√
Emergency Nurse		√
Head of Polyclinic,	√	
Head of Hospital,	√	
Head of PICU	√	
Head of Midwifery Room.	√	
Head of Operating Room	√	
Head of ICU	√	
Head of Emergency Room,	√	

3. Using Personal Protective Equipment (PPE)

Based on the results of interviews with 14 nurses from 7 installations / sections in RSU Royal Prima Medan about using protective equipment

for the prevention and control of nosocomial infections including how to use and stages of using them, information was obtained that the ability of 12 out of 14 nurses (85.71%) in using PPE has been classified as good. However, some

other nurses are less able to use PPE properly and correctly as the following statement:

Forgetting to use handscoen because the conditions suddenly like being called, it turns out that I was told to repair the IV line, want to go back again and take the handscoen sometimes, we don't have time ... which we are

forced to hold first ... then we wash our hands quickly .. (Informant 2).

Handscoen is used when measuring tension or contact with patients. It is very rarely used because of the many patient conditions and wasteful when changing handscoen (Informant 1).

Table 3.
Observation matrix on the nurse's ability to use protective equipment (n=14)

Informant	Implement	
	Yes	No
Polyclinic Executing Nurse		√
Inpatient nurses		√
PICU Executing Nurse	√	
Midwife Implementing Midwifery Room,	√	
Operating Room Nurse,	√	
ICU Executing Nurse,	√	
Emergency Nurse	√	
Head of Polyclinic,	√	
Head of Hospital,	√	
Head of PICU	√	
Head of Midwifery Room.	√	
Head of Operating Room	√	
Head of ICU	√	
Head of Emergency Room,	√	

4. Using Aseptic Techniques

Based on the results of interviews with 14 nurses from 7 installations at RSU Royal Prima Medan about using aseptic techniques including carrying out the techniques and stages of their implementation, information was obtained that the ability of 12 out of 14 (85.71%) nurses at RSU Royal Prima Medan was good. Some answer matrices include:

But we don't use sterile handscoens (for sewing wounds) ... because in my opinion, the wound comes when it's dirty so it's okay if you don't use non-sterile ones (Informant 7).

Put on a catheter used ordinary gloves because there are no sterile gloves, disinfected with water from the inside out. (Informant 2).

Table 4.
Observation matrix for nurses' ability to use aseptic techniques (n=14)

Informant	Implement	
	Yes	No
Polyclinic Executing Nurse	√	
Inpatient nurses		√
PICU Executing Nurse	√	
Midwife Implementing Midwifery Room,	√	
Operating Room Nurse,	√	
ICU Executing Nurse,	√	
Emergency Nurse		√
Head of Polyclinic,	√	
Head of Hospital,	√	
Head of PICU	√	
Head of Midwifery Room.	√	
Head of Operating Room	√	
Head of ICU	√	
Head of Emergency Room,	√	

5. Do Isolation

Based on interviews with 14 nurses from 7 installations at RSU Royal Prima Medan about

reporting to a doctor if there are signs and symptoms of infection including the ways and stages in their implementation, information was

obtained that in reporting to doctors if there were signs and symptoms of infection, the ability of 14 out of 14 nurses (100%) in Royal Prima Medan Hospital is classified as very good. There are also some statements are:

If there are signs and symptoms of nosocomial infection, usually the signs of infection are redness, swelling, sometimes wheezing and so

on ... usually when there are signs like that we report and ask the doctor to check ... (Informant 7).

If there is phlebitis with signs of wounds, redness, heat and pain, I report to my card first. If the permission is then I can replace it, can I or my card report to the doctor. (Informant 2).

Table 5.
Observation matrix on the nurse's ability to report a doctor if there are signs and symptoms of infection (n=14)

Informant	Implement	
	Yes	Yes
Polyclinic Executing Nurse	√	
Inpatient nurses	√	
PICU Executing Nurse	√	
Midwife Implementing Midwifery Room,	√	
Operating Room Nurse	√	
ICU Executing Nurse	√	
Emergency Nurse	√	
Head of Polyclinic	√	
Head of Hospital	√	
Head of PICU	√	
Head of Midwifery Room	√	
Head of Operating Room	√	
Head of ICU	√	
Head of Emergency Room	√	

6. Limiting Patient's Exposure to Infections Originating from Visitors

Based on the results of interviews with 14 nurses from 7 installations at RSU Royal Prima Medan about isolating patients with infectious diseases, how to do isolation and how stages are carried out, obtained information on the ability of 8 out of 14 (57.14%) nurses at RSU Royal Prima Medan still not good as seen from the following sample matrix:

Usually our infectious patients are treated in isolation rooms, kek TB patients ..

DM with gangrene, hepatitis ... umm ... it's contagious ...(Informant 6).

Patients who need isolation such as HIV AIDS, smallpox, and pulmonary TB patients are separated and treated in a special room ... (Informant 2).

Table 6.
Observation matrix on the nurse's ability to isolate patients with communicable diseases (n=14)

Informant	Implement	
	Yes	Yes
Polyclinic Executing Nurse		√
Inpatient nurses	√	
PICU Executing Nurse		√
Midwife Implementing Midwifery Room,		√
Operating Room Nurse	√	
ICU Executing Nurse	√	
Emergency Nurse		√
Head of Polyclinic		√
Head of Hospital	√	
Head of PICU		√
Head of Midwifery Room		√
Head of Operating Room	√	
Head of ICU	√	
Head of Emergency Room		√

7. Maintaining Equipment Safety and Treatment Equipment from Transmission of Nosocomial Infection

Based on interviews with 14 nurses from 7 installations at RSU Royal Prima Medan about limiting patient exposure to infections originating from visitors and the stages carried out in their implementation, obtained information that in limiting patient exposure to infections originating from visitors, the ability of 11 out of 14 nurses (78.57%) in RSU Royal Prima Medan classified as good, as summarized in the following matrix.

Um ... if we limit 2 visitors to 1 patient, if it is over we will tell you to go out first ... then replace it ... in addition we will apply visiting hours, which are at 10:00 to 12:00 and 17.00-20.00 (Informant 9).

Well, earlier ... the visitors were restricted. and educated not to touch the device and keep a distance from the equipment in this room so that the sterile tool is not contaminated ... (Informant 13).

Table 7.
Observation matrix for nurses' ability to limit patient exposure to infections originating from visitors (n=14)

Informant	Implement	
	Yes	Yes
Polyclinic Executing Nurse		√
Inpatient nurses		√
PICU Executing Nurse	√	
Midwife Implementing Midwifery Room,	√	
Operating Room Nurse	√	
ICU Executing Nurse	√	
Emergency Nurse	√	
Head of Polyclinic	√	
Head of Hospital		√
Head of PICU	√	
Head of Midwifery Room	√	
Head of Operating Room	√	
Head of ICU	√	
Head of Emergency Room	√	

DISCUSSION

1. Maintain Hospital Hygiene

It was found that only 12 of the 14 nurses at Royal Prima Medan Hospital had good abilities in maintaining the cleanliness of the room and hospital environment. guideline documents and SPO related to hospital waste management and cleanliness already exist, even already available in each installation / section, but their ability to maintain environmental hygiene is still not optimal. According to the researchers' assumptions, this condition occurs because of the tight working hours and the many actions taken by nurses.

According to Asmadi (2016), education influences the mindset of individuals, in other words the mindset of someone with low education will be different from the mindset of someone who is highly educated. Nursing education has a major influence on the quality of nursing services, so that a high education from a nurse will provide optimal service. According to Wilma (2016), there is a significant significant relationship between management support in the form of the

availability of supporting facilities and infrastructure and the implementation of nosocomial infection prevention by implementing nurses.

2. Hand Washing

Ability 12 of 14 nurses in public hospitals Royal Prima Terrain already quite good, Most nurses have a grasp of the hand washing procedure with *handrub* and *handwash* in the prevention and control of nosocomial infections. It's just that there are still 2 informants who sometimes forget the stages and duration of hand washing, even though the results of the observation of documents show that the guidelines and SPO regarding hand hygiene are actually available in each installation / section,

The biggest obstacle to the implementation of 6 steps and 6 times of washing hands is the busyness faced by each nurse due to lack of human resources. From the interview results it can be seen that *overload* of nurses workload due to comparison of the number of nurses and unsuitable patients is the main cause of non-compliance with hand washing.

In line with *WHO's statement (2015)* that hand washing is often not optimal. This is due to various reasons, for example the lack of suitable equipment, the high ratio of the number of nurses to patients, allergies to hand washing products, the lack of nurses' knowledge about risks and how to wash hands properly, too long and the recommended time to wash hands. According to *Darmadi (2016)*, in order to obtain professional nursing care, a personnel / personnel who have adequate technical and non-technical skills, classification and amount are needed / demanded.

3. Using Personal Protective Equipment (PPE)

From the observation 12 of 14 nurses have used PPE properly and correctly. However, there are still 2 nurses who have not been maximal in the use of PPE such as gloves in the inpatient, outpatient (polyclinic), infancy (PICU) and ICU sometimes not yet used per patient per action, whereas the availability of PPE according to each head of the room in every installation is always there and fulfilled. Another obstacle is that nurses feel uncomfortable about the PPE provided, especially gloves.

According to *the researchers' assumptions*, this was caused by the nurses' fear in using hospital resources. Nurses are afraid of hurting hospitals when they use large amounts of PPE. Aside from this, the lack of experience and busyness of nurses is also a major obstacle in using PPE. In the Inpatient Room because the number of implementing nurses is not balanced with the number of patients, the nurses tend to be busy so they do not have time to use PPE in an emergency condition.

This is contrary to *Masloman, Kondou and Tilaar (2015)* which states that one of the factors that influence health workers in using PPE in ensuring their safety before contacting patients and taking action can be influenced by the availability of PPE. *Wilma (2016)* also stated that the better management support in providing supporting facilities and infrastructure, the implementation of infection prevention conducted by implementing nurses the better.

4. Using Aseptic Techniques

From the results of the study note that in using aseptic techniques, 12 of the 14 nurses at the Royal Prima Medan General Hospital are already good in using aseptic techniques, but there are still 2 nurses who do not understand, both in terms of methods and stages. From the observations found 14 out of 14 nurses who reported to the doctor if found signs and symptoms of nosocomial infection were

classified as very good, because on average all nurses do their job well by reporting to the doctor if found signs and symptoms of nosocomial infection.

According to *Darmadi (2016)*, the number of nurses who have the ability to carry out and practice aseptic techniques is one of the standard factors for nursing care that affects the risk of nosocomial infection. This is in line with *Elhinne (2015)* which states that the ability of nurses is also influenced by their role in the assignment.

Based on the results of the document study, it turns out that SPO documents related to aseptic actions, such as infusion installation SPO, catheter installation SPO, and safe injection SPO have been prepared and are available in each section / installation. However, the socialization of the application of SPO has not been maximized.

5. Do Isolation

The survey results revealed k Capacity of 8 out of 14 nurses in public hospitals Royal Prima Medan is still not good, especially to categorize patients with infectious diseases that need to be isolated. Nurses' knowledge of isolation procedures against infectious diseases is also lacking.

The obstacle is the limited isolation room in the inpatient room and even the isolation room in the new emergency room is planned to be made. The waiting room at the clinic is still integrated with the waiting room of other patients. In addition, special masks and gowns (protective clothing) for isolation rooms are also incomplete available.

According to *the Ministry of Health (2016)*, so that implementing nurses can work optimally the leadership must be responsible for the provision and maintenance of clinical and non-clinical facilities needed for the implementation of general vigilance, including isolation room facilities. *Herpan's study in (2017)* showed that respondents with low levels of knowledge had the opportunity not to control nosocomial infections.

6. Limiting Patient's Exposure to Infections Originating from Visitors

There are still nurses who only assume that the way to prevent exposure to infections from visitors is only done by limiting the number of visitors and visiting hours. In fact, another important thing is education of visitors. Providing education to visitors such as how to wash hands could not be done due to busy nurses in serving patients. Obstacles in its

implementation, sometimes it collided with the culture of the local community which still requires the patient to be visited together in a mass when sick. In addition, visitors also sometimes reject the education provided by nurses.

Cimiotti (2015) concluded that reducing nurse workload is a promising strategy to help control the incidence of infection in care facilities. In addition, the results of Shang, Stone, and Larson's (2015) research also showed that the number of nurses was associated with an increased risk of nosocomial infections. So, to get professional nursing care, personnel / personnel who have the ability and sufficient numbers are needed.

7. Maintaining Equipment Safety and Treatment Equipment from Transmission of Nosocomial Infection

From the results of in-depth interviews, there are nurses who have not optimally known the tools that must be sterilized. Besides, there are other obstacles that also make it difficult for nurses to maintain the safety of equipment and treatment equipment from transmission of nosocomial infections. This occurs in conditions where the patient is very crowded in an installation / section at a certain time, for example, on the opening day of the surgical clinic and ENT, or when many patients need the use of *inspeculo* in the delivery room, it is necessary to reserve equipment that is ready to use in sterile conditions.

According to the authors of the above constraints cause the procedure in sterilizing hospital equipment and supplies is still not running optimally due to the dense nurses working hours. In addition, as for other obstacles that also make it difficult for nurses to maintain the safety of equipment and maintenance equipment from transmission of nosocomial infections is the limited number of equipment and equipment reserves.

CONCLUSION

In maintaining the cleanliness of hospital nurses have the ability to do it to the maximum. In carrying out hand washing nurses follow the rules of 6 steps and 6 time washing hands with the correct procedure, In using personal protective equipment, nurses use PPE appropriately and according to procedures, In using aseptic techniques, nurses' abilities are good and perform according to procedures, In reporting to a doctor if there are signs and symptoms of infection, nurses are generally good. From the observations of 100% of nurses who report to the doctor according to the procedure, In isolating patients with infectious

diseases, based on the results of in-depth interviews and observations, the ability of 57.14% of nurses was still not good. In limiting patient exposure to infections originating from nurse visitors who do so according to the procedure. In maintaining the safety of equipment and treatment equipment from nosocomial infections, nurses do it according to procedure.

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