

# Analyzed of Nurse Compliance an Application of Nosocomial Infection Prevention Standards in the Care Covid-19 Patients at Hospital Royal Prima Medan

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**Abstract**— Nosocomial infections are infections that occur in hospitals that attack patients in the treatment process for 3 x 24 hours. Transmission of infection transmission occurs from contact, droplet, and airborne. Infection Prevention and Control (PPI) is the basic step in reducing the risk of transmission of microorganisms. Compliance with the application of these Standard Precautions reflects a nurse's behavior to prevent and control disease transmission. The purpose of the study was to determine the analysis of nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at the Royal Prima Hospital in Medan. This research is an analytic survey with a cross-sectional design, with a total sampling technique of 204 respondents. There is an influence between education, knowledge, training, supervision, management support, and facilities and infrastructure. In conclusion, there is a relationship between education, knowledge, training, supervision, management, and facilities and infrastructure on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at the Royal Prima Hospital in Medan. It is hoped that the hospital can carry out an analysis of nurse compliance in the application of standard precautions to prevent nosocomial infections to provide high-quality service results at RSU Royal Prima Medan.

**Keywords**— Nosocomial, Nurse Compliance, Standard Precautions.

## I. INTRODUCTION

Hospitals must have adequate accommodation and qualified experienced health personnel to provide services of good quality. Hospitals aim to heal the sick, but hospitals can also be a source of infection. Currently, infections related to health services are the main cause of death in some parts of the world (Irdan, 2017).

Nosocomial infection or what is currently referred to as infection related to health care services or HAIs is a serious problem that is now a concern in many countries. This infection causes 1.4 million deaths every day throughout Indonesia. Nosocomial infection is defined as an infection that a person acquires while in the hospital (Achmad, 2016).

In early 2020, the world was shocked by the outbreak of a new type of pneumonia that originated in Wuhan, known as COVID-19. The Global Corona Virus Disease (COVID-19) pandemic has changed the lives of people all over the world. The very high level of transmission causes this disease to have a much greater impact than diseases caused by previous coronaviruses, such as SARS and MERS. Several countries have managed to control the spread of COVID-19 well. China as the country that first reported this case managed to control the situation approximately 30 days after the first 100 confirmed cases occurred, while South Korea managed to control it within 20 days since the first 100 cases were reported. Meanwhile, countries that are known for their great health systems are powerless in the face of COVID-19.

Compliance in the implementation of standard precautions reflects a nurse's behavior which is determined by individual,

organizational and psychological factors. A study proves compliance is associated with a management role (Satiti, 2017). Nurses in carrying out health services act as organizers of nursing practice, nursing care providers, counselors and counselors for clients, managers of nursing services, and nursing researchers. Nursing services provided by nurses are based on knowledge and competence in the field of nursing science which is developed according to the needs of clients, the development of science, and the demands of globalization.

To ensure the protection of the community as recipients of nursing services and to ensure the protection of nurses as nursing service providers, comprehensive nursing arrangements are required which are regulated by law. Apart from being a legal requirement for nurses, this arrangement is also the implementation of a mutual recognition agreement regarding nursing services in the Southeast Asian region. This provides opportunities for foreign nurses to enter Indonesia and Indonesian nurses working abroad to participate in providing health services through Nursing Practice. This is done to fulfill the needs of world-class nurses so that the Indonesian nursing system can be recognized by the destination country and this condition is also part of the image and can raise the dignity of the Indonesian nation in the health sector (UU RI, 2019).

According to Riani's 2019 research on the relationship between motivation and nurse compliance in implementing Hand hygiene as a preventive measure for nosocomial infections in the inpatient ward of the AH Hospital in 2019. The results showed that ( $P = 0.003$  with a POR of 9.286 (CL = 2.225-38.750) Most Ha were accepted. which means that there is a significant relationship between motivation and nurses'

compliance in carrying out hand hygiene six steps moment as an action to prevent nosocomial infections in the room.

According to the 2017 government regulation concerning infection prevention and control guidelines in health care facilities, where Health Service facilities are a tool and/or place used to organize health service efforts, whether promotive, preventive, curative, or rehabilitative carried out by the Government, local governments, and/or society.

Infection Prevention and Control, hereinafter abbreviated as PPI, is an effort to prevent and minimize the occurrence of infections in patients, staff, visitors, and the community around health care facilities (PMK, 2017).

Nosocomial infections are hospital-acquired infections in patients who are treated for at least 72 hours (3x24 hours). The increasing prevalence of nosocomial infections is a threat to health services in hospitals. PPI or known as infection prevention and control in health services is an important quality standard of service for patients, health workers, and visitors. Infection control must be carried out by all health workers in hospitals to protect patients, health workers, and visitors from nosocomial infections by paying attention to cost-effectiveness (Kemenkumham, 2015).

According to Dachirin's 2019 research on the Analysis of Nurse Compliance in Performing Standard Precautions to Prevent Healthcare-Associated Infections (HAI's) at the NU Demak Islamic Hospital, the results of this study showed the partial effect of independent variables on standard precautions to Prevent Healthcare-Associated Infections (HAI's), namely education. getting a p-value of 0.000, on knowledge getting a p-value of 0.000, on training getting a p-value of 0.000, on means getting a p-value of 0.000, on support getting a p-value of 0.000, and on supervision getting a p-value of 0.000. These results indicate that all variables have a positive effect on nurse compliance in standard precautions to Prevent Healthcare-Associated Infections (HAI's) at RSI NU Demak. The effect of simultaneously getting a p-value of 0.000 means that there is a simultaneous effect of the independent variable on nurses' compliance in standard precautions to Prevent Healthcare-Associated Infections (HAI's) hospitalization at AH hospitals. It is recommended to related parties that a reward is needed and for nurses who carry out hand hygiene well and punishment for those who do not do hand hygiene well so that nosocomial infections can be prevented.

Based on Rahmatilah's 2020 research on the influence of nurses' behavior and adherence to the use of personal protective equipment in the prevention of nosocomial infections in the inpatient ward of RSUD Dr. R. M Djoelham Binjai in 2020, the results of the bivariate analysis showed that the p-values were knowledge (0.651), attitude (0.013), action (0.001), compliance (0.044) at RSUD DR. R.M Djoelham Binjai City 2020. Based on the results of multivariate variables the most influential on the use of personal protective equipment with a value of 25.824 which means that nurses who act well tend to use personal protective equipment 25.824 compared to nurses who act well, There are several private hospitals in the city of Medan that treat patients related to COVID-19 and one of them is RSU. Royal Prima Medan.

Based on the above background, researchers are interested in researching the analysis of nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan.

## II. LITERATURE REVIEW

### 2.1. Definition of Nurse

Nurse according to Law 26 of 2019 concerning Nursing, a nurse is someone who has passed higher nursing education, both at home and abroad which is recognized by the Government by the provisions of the legislation. Nursing is the activity of providing care to individuals, families, groups, or communities, both sick and healthy.

According to Dwi Agung Riyanto Tenaga (2016), professional nurses are part of the human resources in the hospital environment who provide health services to patients and have a direct interaction relationship with patients. The health condition of patients who experience health problems demands the need for nurses to get health service assistance so that it is likely that a nurse is often exposed to an environment that is at risk of disease and causes health problems due to contamination of the disease. Nosocomial infections are infections that often occur in health care facilities, including hospitals, nursing homes, nursing homes, and health clinics.

According to Potter and Perry in Octavia Chintami (2016), nursing care standard factors that influence the occurrence of nosocomial infections are the classification and number of personnel who can carry out and practice aseptic techniques, equipment, and drugs that are appropriate, ready to use and sufficient; adequate physical and hygienic treatment room aspects of workload in dividing the number of patients with nursing staff, and the number of patients being treated.

### 2.2. Nurse Function

The main function of nurses is to help patients or clients in sick or healthy conditions, to improve health status through nursing services. In carrying out its role, nurses will carry out various functions, namely:

The dependent function of the nurse, the independent function of the nurse, and the independent function of the nurse.

#### 1. Nurse's Independent Function

Independent function is an independent function and does not depend on others, where nurses in carrying out their duties are carried out independently with their own decisions in taking actions to meet basic human needs.

#### 2. Nurse Dependent Function

A dependent function is the function of nurses in carrying out their activities on or on instructions from other nurses.

#### 3. Nurse's Independent Function

The nurse's independent function is a function that is carried out in a team group that is interdependent with one another. (Nisya, 2018).

### 2.3. Nosocomial Infections (HAI's).

Infection is a condition caused by pathogenic microorganisms, with/without clinical symptoms. Health Care-Associated Infections, hereinafter abbreviated as HAIs, are

infections that occur in patients during treatment in hospitals and other health care facilities where when they enter there are no infections and are not in the incubation period, including infections in the hospital but appear after patients go home, also infections due to work in hospital staff and health workers related to the process of health services in health care facilities (Menkes, 2017)

Infection is the invasion of the body by a pathogen or microorganism capable of causing disease or tissue damage. Hospital nosocomial infections or known as Hospital-acquired infections (HAI) or Healthcare-Associated Infections (HAI's) are infections that are acquired while the patient is hospitalized, provided that at the time of admission to the hospital the incubation period for the disease is not ongoing. Nosocomial infection is defined if in a health care setting occurs more than 48 hours after the first time entering the hospital or health care place (Soedarto, 2016).

Nosocomial infections are infections that occur in hospitals that attack patients in the treatment process. A hospital is a place where patients seek healing related to the complaints they experience, and a place for the spread of infection because the population of these microorganisms lives and breeds in the hospital environment such as hospital floors, water, air, medical and non-medical equipment (Situmorang Easter, 2020).

Hospital nosocomial infections or known as Hospital-acquired infections (HAI) or Healthcare-Associated Infections (HAI's) are infections that are acquired while the patient is hospitalized, provided that at the time of admission to the hospital the incubation period for the disease is not ongoing. Nosocomial infection is defined if in a health care setting occurs more than 48 hours after the first time entering the hospital or health care place (Soedarto, 2016).

### III. METHODS

This research is an analytic survey research with a cross-sectional research design that aims to explain the influence between variables through hypothesis testing. Population according to Sugiyono (2013) is a generalization area consisting of objects or subjects that have certain qualities and characteristics that are determined by researchers to be studied and then drawn conclusions. The population in this study were all health workers (nurses and midwives) in the Covid isolation room of the RSU. Royal Prima Medan, totaling 204 people.

The sample in this study was 204 Covid nurses at Royal Prima Hospital Medan. Sampling is taken by the method of total sampling, where all samples are used as samples.

The data analysis method was carried out by compiling, discussing, and evaluating data and the results of interviews/observations regarding the analysis of nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan.

### IV. ANALYZED AND RESULT

Univariate analysis was conducted to obtain an overview of the distribution of education, knowledge, training, supervision, infrastructure, management support, and nurse compliance. The results of research conducted by researchers on "analysis of

nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan"

#### 4.1. Frequency distribution based on education, knowledge, training, supervision, infrastructure, management support, and nurse compliance.

The distribution of the frequency of education, knowledge, training, supervision, infrastructure, management support, and nurse compliance can be seen in the table below.

TABLE 1. Frequency distribution based on education, knowledge, training, supervision, infrastructure, management support, and nurse compliance with n = 204 people

No	Variables	Total	Percentages %
1	Study		
	DIII	148	72,5
	S1	56	27,5
	Total	204	100
2	Acknowledges		
	Good	146	71,6
	Enough	58	28,4
	Total	204	100
3	Training		
	given	145	71,1
	Not given	59	28,9
	Total	204	100
4	Supervision		
	Done	144	70,0
	Are not done	60	29,4
	Total	204	100
5	Facilities and infrastructure		
	There is	202	99,0
	There is not any	2	1,0
	Total	204	100
6.	Management Support		
	There is support	146	71,6
	No Support	58	28,4
	Total	204	100
7.	Nurse Compliance		
	Obey	194	95,1
	Not obey	10	4,9
	Total	204	100

Based on table 1 it can be seen that the education of DIII nurses as many as 148 people (72.5%) and education of undergraduate nurses as many as 56 people (27.5%), based on the knowledge of nurses who have good knowledge as many as 146 people (71.6%) and knowledgeable enough as many as 58 people (28.4%), based on training where nurses received training as many as 145 people (71.1%) and did not receive training as many as 59 people (28.9%), based on supervision where nurses stated that there was supervision carried out as many as 144 people (70.6%) and nurses stated that there was no supervision as many as 60 people (29.4%), based on facilities and infrastructure where nurses stated that there were 202 (99.0%) and there were not as many as 2 people (1.0 %), based on management support where there are 146 people (71.6%) and no support 58 people (28.4%) and based on nurse compliance where 194 obedient nurses (95.1%) and non-compliant as many as 10 people (4.9%).

#### 4.2. Bivariate Analysis

Bivariate analysis is to determine whether there is a relationship between the independent variable and the dependent variable using chi-square statistics. The influence of the level of nurse education on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan can be seen in the table below:

TABLE 2 Effect of nurse education level on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan

Education	Nurse Compliance				Total	df	X <sup>2</sup> values	
	Obey		Not-Obey					
	n	%	n	%				
<b>DIII</b>	142	(95,9)	6	(4,1)	148	(100)	1	0,831
<b>S1</b>	52	(92,9)	4	(7,1)	56	(100)		

Based on tables 2 above, it can be seen that as many as 148 people (100%), with a DIII education level where the majority of nurse compliance is 142 people (95.9%) obedient and the minority is not obedient as many as 6 people (4.1 %), with an undergraduate education level as many as 52 people (100%) where the majority of nurses compliance as many as 52 people (92,9%) obedient and minority non-compliant as many as 4 people (7,1%).

Statistically, it shows that the value of X2 count is 0.831 and X2 count is 0.455 with df = 1 where the significance value is 0.50 where X2 count > X2 table means Ha is accepted and Ho is rejected, meaning that there is an effect of nurse education level on nurse compliance in the application of standard precautions to prevent infection. nosocomial treatment for Covid-19 patients at RSU Royal Prima Medan.

#### 4.3. The effect of the level of nurse education on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan

Statistically, it shows that the value of X2 count is 0.831 and X2 count is 0.455 with df = 1 where the significance value is 0.50 where X2 count > X2 table means Ha is accepted and Ho is rejected, meaning that there is an effect of nurse education level on nurse compliance in the application of standard precautions to prevent infection. nosocomial treatment for Covid-19 patients at RSU Royal Prima Medan.

Based on the results of research conducted by researchers, researchers assume that the higher the level of education of nurses greatly affects the compliance of nurses in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan.

This is by Dactarin's 2019 research on Analysis of Nurse Compliance in Performing Standard Precautions to Prevent Healthcare-Associated Infections (HAI's) at the NU Demak Islamic Hospital. in education it gets a p-value of 0.000, on the knowledge it gets a p-value of 0.000, in training, it gets a p-value of 0.000, on means, it gets a p-score of 0.000, on the support it gets a p-score of 0.000 and in supervision it gets a p-value of 0.000. These results indicate that all variables have a

positive effect on nurse compliance in standard precautions to Prevent Healthcare-Associated Infections (HAI's) at RSI NU Demak.

The effect of simultaneously getting a p-value of 0.000 means that there is a simultaneous effect of the independent variable on nurse compliance in standard precautions to prevent Healthcare-Associated Infections (HAI's).

#### 4.4. The effect of the level of knowledge of nurses on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan

Statistically, it shows that the calculated X2 value is 0.692 and X2 table is 0.455 with df = 1 where the significance value is 0.50 where X2 arithmetic > X2 table means Ha is accepted and Ho is rejected, meaning that there is an effect of nurses' knowledge level on nurse compliance in the application of standard precautions to prevent infection. nosocomial treatment for Covid-19 patients at RSU Royal Prima Medan.

Based on the results of research conducted by researchers, researchers assume that the level of knowledge of nurses affects nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at Royal Prima Hospital Medan.

This is by Yusfar's 2017 research on the relationship between the level of knowledge of nurses about nosocomial infections with handwashing behavior in hospitals, where the results showed that most of the respondents had sufficient knowledge about nosocomial infections (60.5%). And most of the respondents have a nurse's handwashing behavior in the sufficient category (53.3%). The Spearman Rank results show that there is a positive and significant relationship. So it can be concluded that the better knowledge about nosocomial infections, the better the nurse's handwashing behavior, and vice versa. (Yusfar, 2017)

This is by the results of research by Wahyuni et al. in 2021 on nurses' knowledge and adherence to universal precautions as an effort to prevent nosocomial infections. It was found that from 100 nurses, 65% had good knowledge of universal precautions, 82% had good adherence rates. Conclusion: the better nurses' knowledge about universal precautions is likely to affect the level of adherence. Future studies can measure the strength of the relationship between the variables of knowledge and adherence to universal precautions. (Wahyuni et al, 2021).

This is by the research of Rahmatilah et al in 2020 on the influence of behavior and nurse compliance with the use of personal protective equipment in the prevention of nosocomial infections in the inpatient ward of RSUD Dr. R. M Djoelham Binjai in 2020 where the results of the bivariate analysis showed that the p-value <0.05, namely knowledge (0.651), attitude (0.013), action (0.001), compliance (0.044) at RSUD DR. R.M Djoelham Binjai City 2020.

Based on the results of the multivariate variable the most influential on the use of personal protective equipment with a value of 25.824 which means that nurses who act well tend to use personal protective equipment 25,824 compared to nurses who act well. With the results of this study, it is hoped that the management of RSUD DR. M Djoelham Binjai City to improve

behavior and compliance in the use of PPE in the prevention of nosocomial infections can be through training and discussions at meetings with nurses. (Rahmatillah et al, 2020).

This is by the research conducted by Permata et al in 2017 regarding the Effect of Knowledge, Attitude, and Compliance of Health Workers on the Implementation of Standard Precautions in the Prevention of Hospital-Acquired Infections at Hospital X Bantul, three things are assessed, namely knowledge, attitude, and compliance. All aspects are considered to affect the application of standard precautions where compliance is the most influential factor in the application of standard precautions in the prevention of hospital-acquired infections. (Permata et al, 2017).

#### 4.5. *The effect of nurse training on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan*

Statistically, it shows that the calculated  $X^2$  value is 0.628 and  $X^2$  table is 0.455 with  $df = 1$  where the significance value is 0.50 where  $X^2$  arithmetic  $>$   $X^2$  table means  $H_a$  is accepted and  $H_0$  is rejected, meaning that there is an effect of training on nurse compliance in the application of standard precautions to prevent nosocomial infections in children. Covid-19 patient care at RSU Royal Prima Medan.

Based on the results of research conducted by researchers, researchers assume that the training provided to nurses affects nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at Royal Prima Hospital Medan.

This is by Susiladewi's 2020 research on the effect of training and providing videos on nurses' knowledge of personal protective equipment during the 2019 coronavirus disease pandemic where the Wilcoxon test results obtained a p-value of 0.000, meaning that there was an effect of training and providing videos on nurses' knowledge of protective equipment. themselves during the 2019 Coronavirus Disease pandemic. Based on the results of this study, training and providing videos can be used as an effective program to increase nurses' knowledge about personal protective equipment during the 2019 Coronavirus Disease pandemic.

#### 4.6. *The effect of nurse training on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan*

Statistically, it shows that the calculated  $X^2$  value is 0.628 and  $X^2$  table is 0.455 with  $df = 1$  where the significance value is 0.50 where  $X^2$  arithmetic  $>$   $X^2$  table means  $H_a$  is accepted and  $H_0$  is rejected, meaning that there is an effect of training on nurse compliance in the application of standard precautions to prevent nosocomial infections in children. Covid-19 patient care at RSU Royal Prima Medan.

Based on the results of research conducted by researchers, researchers assume that the training provided to nurses affects nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at Royal Prima Hospital Medan.

This is by Susiladewi's 2020 research on the effect of training and providing videos on nurses' knowledge of personal protective equipment during the 2019 coronavirus disease pandemic where the Wilcoxon test results obtained a p-value of 0.000, meaning that there was an effect of training and providing videos on nurses' knowledge of protective equipment. themselves during the 2019 Coronavirus Disease pandemic. Based on the results of this study, training and providing videos can be used as an effective program to increase nurses' knowledge about personal protective equipment during the 2019 Coronavirus Disease pandemic.

## V. CONCLUSION

Based on the results of research on the analysis of nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan, the following conclusions were drawn:

1. There is an effect of the level of nurse education on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at Royal Prima Hospital, Medan
2. There is an effect of the level of knowledge of nurses on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan.
3. There is an effect of training on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan.
4. There is an effect of supervision on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan.
5. There is an influence of facilities and infrastructure on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan.
6. There is an influence of management on nurse compliance in the application of standard precautions to prevent nosocomial infections in the care of Covid-19 patients at RSU Royal Prima Medan.

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