

## **The Relationship of Universal Nurse Knowledge Precautions with Precautions for Nosocomial Infections**

**Devi Ardila<sup>1</sup>, Siti Arofah Siregar<sup>2</sup>, Trionyta Debora<sup>3</sup>, Liani Br Ginting<sup>4</sup>, Dedek Sucahyo<sup>5</sup>, Intan Mutia Rahmi<sup>6</sup>, Rini Elvira Hutabarat<sup>7</sup>, Dian<sup>8</sup>**

<sup>1,2,3,4,5,6,7,8</sup>Faculty of Nursing and Midwifery, Universitas Prima Indonesia, Medan

---

### **ABSTRACT**

The low awareness of nurses to carry out nursing actions causes nurses to be very vulnerable to transmission of infection because nurses in providing nursing care to patients will have direct contact with blood and body fluids. Universal precautions require health workers to treat all patients equally using universal precautions regardless of the disease.

The purpose of this study was to determine the relationship between the knowledge of nurses about Universal Precaution and the prevention of Nosocomial Infections at the Royal Prima Prima Hospital in Medan. This type of research is analytic with a cross-sectional design. The population in this study were all nurses in the ICU, NICU, PICU, and inpatient disease rooms and postoperative rooms as many as 58 people. Sampling in this study was to use a saturated sampling of 58 people.

The results of the study with the results of the chi-square test with a degree of significance ( $\alpha$ ) = 0.05 and  $df = 4$  obtained the calculation results, namely  $X^2_{count} 16.948 > X^2_{table} 9.488$  and  $p\text{-value} = 0.002$ , then  $H_a$  is accepted, namely there is a relationship between nurses' knowledge about Universal Precautions and Nosocomial infection prevention measures.

In conclusion, there is a relationship between nurses' knowledge of Universal Precaution and Nosocomial Infection prevention measures in hospitals. It is expected that respondents will increase their knowledge about Universal Precautions so that preventive measures are carried out properly and in accordance with standards so that Nosocomial Infections can be prevented.

**KEYWORDS:** knowledge, nurse, universal precaution, nosocomial infection

---

### **ARTICLE DETAILS**

**Published On:**  
**24 January 2023**

**Available on:**  
<https://ijmscr.org/>

### **INTRODUCTION**

Infectious diseases are still the main cause of high morbidity and mortality in the world. One type of infection is nosocomial infection (Septiari, 2012). Nosocomial infections are infections that are acquired during the period of treatment during admission to the hospital and can also be referred to as healthcare-associated infections. Nosocomial infection is currently one of the causes of increased morbidity and mortality in hospitals. Nosocomial infection can occur through non-invasive measures, namely direct contact between patients who are suffering from infectious diseases and other patients, staff, visitors/family, hospital equipment, hospital environment, and so on so that they can transmit the disease they suffer (Chairani, Riza, & Putra, 2022).

The incidence of infections caused by viruses is reported to be at least around 1-5% (Sikora & Zahra, 2021). Nosocomial infection in developed countries is around 7%

and in developing countries is around 10% (WHO, 2011). Data on the incidence of nosocomial infections in hospitals around the world reach around 9% (variation 3 – 21%) or more than 1.4 million patients who are hospitalized in hospitals around the world who get nosocomial infections. As many as 8.7% of 55 hospitals in 14 countries originating from Europe, the Middle East, Southeast Asia, and the Pacific showed nosocomial infections and in Southeast Asia, around 10% had nosocomial infections in hospitals (Lestari et al., 2019). Based on the results of research conducted in the US, it was found that nosocomial infection is one of the 10 main causes of death (Haque et al., 2018). In 2015 and 2017,

Nosocomial infection is a serious problem that can directly or indirectly cause patient death. Several incidents of nosocomial infection may not cause the patient's death but cause the patient to be treated longer in the hospital. This

## The Relationship of Universal Nurse Knowledge Precautions with Precautions for Nosocomial Infections

means that patients pay more and are in an unproductive condition, while the hospital will also incur large costs. The hospital as a health facility that provides promotive, preventive, curative, and rehabilitative health services to the community has a very important message in improving public health status. For those who are in the hospital environment such as patients, health workers, visitors, and patient attendants are at risk of getting nosocomial infections or Health-care Associated Infections (HAIs) (Ministry of Health, 2011).

Nosocomial infections (NIs) and needle stick injuries (NSIs) are the most important agents that can increase the causes of disability, transmit infectious diseases, morbidity and mortality, increased hospitalizations, and high health problems in hospitals and health centers (Suksatan et al., 2022). Based on the results of research conducted by Suksata and the antibiotic resistance team, non-standard personal protective equipment, and closing needles can endanger human health and increase the risk of transmission of infectious diseases between exposed patients and health workers (Suksatan et al., 2022). One of the strategies used in controlling nosocomial infections is to use universal precautions (Ibrahim, 2019).

Universal Precautions are an infection control measure carried out by all health workers to reduce the risk of spreading infection and are based on the principle that blood and body fluids can potentially transmit disease, both from patients and health workers. Nurses are very vulnerable to infection transmission because nurses providing nursing care to patients will have direct contact with blood and body fluids. Efforts are made to reduce the risk of contracting an infection, using universal precautions. Because of the importance of this, nurses are required to have adequate knowledge (Nursalam, 2009).

## RESULTS AND DISCUSSION

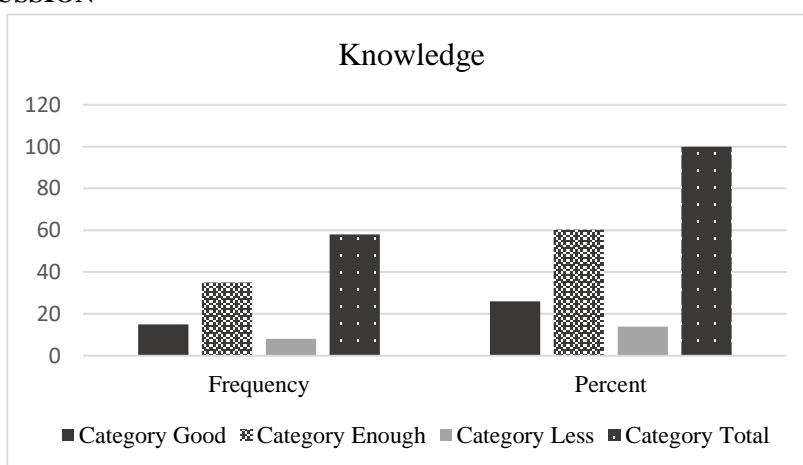


Image 1. Graph of Respondent Frequency Based on Nurse Knowledge About Nosocomial Infection Prevention

Based on the knowledge variable, the majority of nurses have sufficient knowledge as much as 60.3% and with less knowledge as much as 13.8%. The application of universal precautions aims not only to protect workers from exposure

to the risk of infection but also to protect clients who have a tendency to be susceptible to all kinds of infections that may be carried by officers. In addition to the prevention efforts carried out by hospital staff, they also have prevention and

## RESEARCH METHODS

Based on research conducted at the Royal Prima Hospital, the most common risk factors for sepsis in elderly patients based on age are > 70 years, around 53 people with endocrinological diagnoses around 23.5%, lung infections around 19.6%, length of stay from 3 to 7 days around 45.0% (Sanjaya et al., 2023). Therefore, universal precautions are needed to reduce and prevent nosocomial infections at Royal Prima Hospital, namely by assessing knowledge and measures to prevent nosocomial infections.

This research is analytical research with a cross-sectional study approach to the RSU. Royal Prima Medan February-May 2022. The research population is nurses in the ICU, NICU, PICU and inpatient disease rooms, and postoperative rooms in RSU. Royal Prima Medan has as many as 58 people. The sampling technique in this study used a saturated sampling technique. The samples taken in this study amounted to 58 people.

The type of data collection uses primary data, namely data that is directly obtained by researchers through questionnaires according to the literature review and secondary data obtained from hospital medical records. The research instrument was a questionnaire and was analyzed using SPSS.

Data analysis includes univariate and bivariate. The univariate analysis aims to explain or describe the characteristics of each research variable. Bivariate analysis was carried out on two variables that were suspected to be related or correlated. The data obtained from the two variables were categorical data using a statistical test, namely chi-square.

## The Relationship of Universal Nurse Knowledge Precautions with Precautions for Nosocomial Infections

promotion efforts to support the implementation of the universal precautions program (Marwati et al., 2016). Universal Precautions were carried out by nurses with good results 74 respondents (77.9%) and with unfavorable results 21 respondents (22.1%) (Supardi, Suyami, & Indarti, 2013).

Good knowledge is needed by nurses because as health service providers they are at higher risk of being exposed to various infections such as HIV, Hepatitis B, Hepatitis C, etc. These infections can be prevented if proper universal precautions are followed by healthcare providers consistently in their daily clinical work. Based on the results of research conducted by Solanky and team as many as 44.3% of nurses mentioned all correct universal precautions (Solanky et al., 2016).

All respondents are aware of the word universal precautions. But only 44.3% of nurses know all the correct steps for universal precautions. There are 45.5% of nurses know about hand hygiene as an important step in universal precautions. Most of the participants knew about personal protective equipment (Solanky et al., 2016). The findings of Udemba and Ezeama (2021) reveal that the majority of nurses have high knowledge of universal precautions. The overall average value of 3.26, ± 0.9 indicates that the majority of nurses have a high level of adherence to universal precautions.

But according to Solanky et al. (2016), about 51.14% of nurses did not know how to disinfect dirty linen

and 53.41% did not know how to clean floors affected by blood spills. There are still many nurses who do not have knowledge about this. Regarding the information provided by the respondents about the general prevention of HIV AIDS infection, it is known that more than half have knowledge. Respondents have good information with an average total score of 24.06. This shows that although there are many respondents who have not attended special training for infection control, in general respondents know the information may be in nursing training and work experience relatively recently this information is still easy to remember. In line with the development of science and knowledge, then keep abreast of the latest scientific developments needed to be able to do their job properly. It can be seen that the majority of respondents (57.8%) still do so with the correct answer to the question “The injection site must be closed first before throwing it in the trash” (Solanky et al., 2016).

Ignorance of infection control practices among nurses was found to prevent compliance with universal precautions. He went so far as to suggest that education related to health workers to reinforce universal precautions is recommended as a key tool for promoting adherence to universal precautions and protecting nurses and patients from shortages of materials, limited organizational support, and lack of services. knowledge caused by health risks of infection. nursing supervision is several factors that cause low adherence to general precautions (Udemba & Ezeama, 2021)

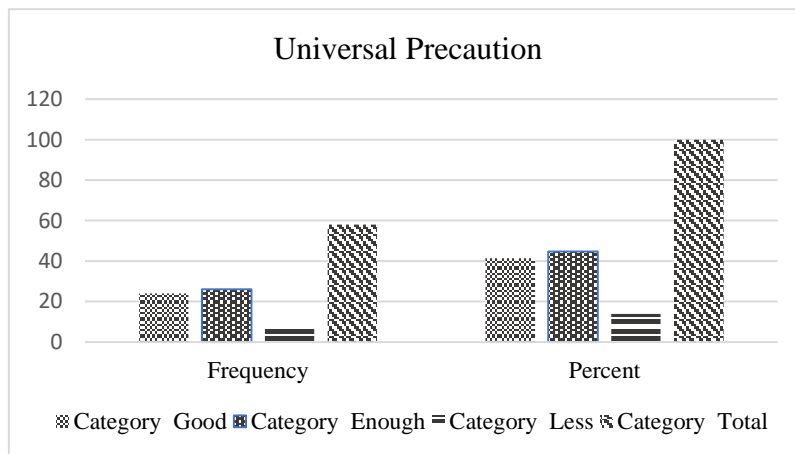


Figure 2. Graph of Frequency of Respondents Based on the actions of nurses in preventing Nosocomial Infections

Based on preventive measures, the majority of respondents had the ability to prevent with the sufficient category of 44.8% and the good category of 13.8%. Health workers are obliged to maintain the health and safety of themselves and others and are responsible for implementing the policies set by the hospital. Health workers are also responsible for using the facilities provided properly and maintaining facilities that are always ready to use and can be used as long as possible. The results of transmission prevention surveys at health centers or hospitals are still small. Officer actions have the potential to increase disease transmission to health workers (Marwati et al., 2016).

The low awareness of health workers in hospitals about the use of Universal Precautions can lead to an increase in nosocomial infections so the prevention of nosocomial infections that is less than optimal is a problem faced by hospitals to date.(Marwati et al., 2016). This is according to research where preventive measures are still lacking where the percentage is around 14%. This was also corroborated by other research, namely, for its application, it was found that there were no respondents who were lacking, as many as 80% of respondents were able to apply Universal Precautions in the sufficient category, and as many as 20% were able to

## The Relationship of Universal Nurse Knowledge Precautions with Precautions for Nosocomial Infections

properly apply Universal Precautions according to the criteria (Juniartha, 2015).

Based on the results of research from Ibrahim et al. (2014) the majority of respondents reported experiencing sharp injuries. More than half of the respondents have a good level of knowledge about universal precautions and transmission of HIV/AIDS and show a good attitude in caring for HIV/AIDS patients (Ibrahim, Mardiah, & Pratiwi, 2014).

In research conducted by Solanky et al., (2016) as many as 89.77% of nurses were aware of the health hazards of needle stick injuries but only 67.05% reported correctly about how to needle stick injuries could be prevented. 38.64% of nurses have experienced needlestick injuries at work and most (79.41%) follow proper guidelines (Solanky et al., 2016).

### Relationship of Nurse Knowledge of Universal Precaution with Nosocomial Infection Prevention Measures

**Table 1. Relations Knowledge of Nurses about Universal Precautions with Nosocomial Infection Prevention Measures**

Knowledge	Universal Precautions						Total	df	X <sup>2</sup> count	X <sup>2</sup> Table	p- value	
	Well		Enough		Not enough							
	f	%	f	%	f	%						
Well	1	6,7	3	30	11	73,3	15	100	4	16,948	9,488	0.002
Enough	7	20	21	60	7	20	35	100				
Not enough	0	0	2	25	6	75	8	100				

Based on the table, it was found that of the 15 people with good knowledge, the majority of preventive measures were lacking, as many as 11 people (73.3%), and a good minority, as many as 1 person (6.7%). As many as 35 people, the knowledge is sufficient, the majority of precautions are sufficient, 21 people (60%), the minority of preventive actions is good and less, as many as 7 people. As many as 8 people lack knowledge, the majority of preventive actions are lacking as many as 6 people (75%), and a minority of sufficient precautions is 2 people (25%).

The results of the chi-square test with a degree of significance ( $\alpha$ ) = 0.05 and df = 4 obtained the calculation results, namely  $X^2_{\text{count}} 16.948 > X^2_{\text{table}} 9.488$  and p-value = 0.002, then  $H_a$  is accepted. In conclusion, there is a relationship between nurses' knowledge of Universal Precaution and Nosocomial Infection prevention measures. This is reinforced by research conducted by Yazid (2014), namely, there is a relationship between nurses' knowledge about Universal Precautions and measures to prevent Nosocomial Infections, as well as research conducted by Supardi et al. (2018). The results of the correlation test showed that there was a significant positive relationship between knowledge scores and practice scores (Ibrahim, Mardiah, & Pratiwi, 2014).

The results of research conducted by Chairani, Riza, and Putra (2022) show that there is a relationship between knowledge and attitudes with nurses' compliance in washing hands. There is a relationship between the knowledge of the implementing nurse and compliance with hand washing using a hand sanitizer (Syarifah, 2021).

Another study conducted by Solanky et al. (2016) stated that the correct knowledge of universal precautions among nursing staff is still unsatisfactory. This shows that there are still many nurses who do not know how to prevent nosocomial infections. Even though nurses should have knowledge about universal precautions and preventive measures because health workers (health workers) are at risk

of various occupational hazards in hospitals, including exposure to blood-borne infections such as HIV and hepatitis B and C virus infections (HBV and HCV). from sharps injuries and contact with body fluids (Solanky et al., 2016).

Infection prevention includes hand washing. Nosocomial prevention through hand washing by health workers is very important. Nurses who are good at preventing nosocomial infections can improve behavior shown in universal precautions, while nurses' attitudes towards supporting universal precautions are often expressed in indifference and ignoring hand washing after treatment (Marwati et al., 2016).

### REFERENCES

- I. Chairani, R., Riza, S., & Putra, Y. (2022). Knowledge and about prevention of nosocomial infections with nurse compliance in handwashing in the integrated inpatient room of the Aceh Besar Regional Hospital in 2022. *Journal of Healthcare Technology and Medicine*, 8(2).
- II. Hussain, F., Khatoon, R., Sachan, B., & Srivastava, JP (2018). Knowledge and practice of the universal precautions among nursing students of Eras' Lucknow Medical College and Hospital, Lucknow. *International Journal of Community Medicine and Public Health*, 5(8), 3326–3329.
- III. Ibrahim, H. (2019). Control of nosocomial infections with general precautions in hospitals (integration of Islamic values in building health status). Alauddin University Press.
- IV. Ibrahim, K., Mardiah, W., Prawesti, A., & Priambodo. (2014). Nurses' knowledge, attitude, and practice of universal precautions against HIV/AIDS transmission. *Nursing Journal*, 9(1).
- V. Juniarta, IGN (2015). The relationship between the level of knowledge of nurses and the application of

## The Relationship of Universal Nurse Knowledge Precautions with Precautions for Nosocomial Infections

- universal precautions (up) in the IGD at Badung Mangusada Hospital. Essay.  
<http://erepo.unud.ac.id/id/eprint/5972/1/16538d077d2c823d4ca2a31c4cab97e7.pdf>
- VI. Indonesian Ministry of Health. (2011). Practical guide to hospital infection surveillance. Ministry of Health of the Republic of Indonesia.
- VII. Haque, M., Sartelli, M., McKimm, J., & Burn, M. A. (2018). Health care-associated infections – an overview. *Infection and Drug Resistance*, 11(2). 2321–2333.
- VIII. Nursalam, (2009). *Process and documentation of nursing concepts and practices*. Salem Medika.
- IX. Sanjaya, BD, Djuang, MH, Muniro, FD, & Chiuman, L. (2023). Sepsis risk factors in elderly patients at Royal Prima Medan General Hospital. *Jambura Journal of Health Sciences and Research*, 5(1).
- X. Septiari, B. B (2012). *Nosocomial infection*. Nuha Medika.
- XI. Sikora, A., & Zahra, F. (2021). *Nosocomial infections*. Pearls Publishing's stats.
- XII. Solanky, P., Baria, H., Nerulkar, A., et al. (2016). Knowledge and practice of universal precautions among nursing staff at a tertiary care hospital in South Gujarat, India. *International Journal of Community Medicine and Public Health*, 3(9):2373-2376.
- XIII. stiller. (2017). ICU ward design and nosocomial infection rates: A cross-sectional study in Germany. *Journal of Hospital Infection*, 4(2).
- XIV. Suksatan, W., et al. (2022). Assessment of effects and risk of nosocomial infection and needle stick injuries among patients and health care workers. *Toxicol Rep.* <http://doi:10.1016/j.toxrep.2022.02.013>. PMID: 35273903; PMCID: PMC8904184.
- XV. Supardi, S., Suyami, S., & Indarti, I. (2013). The relationship between the level of knowledge of nurses and the implementation of universal precautions. *TRIAGE Journal of Nursing*, 7(1).
- XVI. Marwati, T., et al. (2016). Nosocomial infection prevention through universal precautions in Yogyakarta Muhammadiyah Hospital. *International Journal of Public Health Science (IJPHS)*, 5(3):233-239.
- XVII. Udemba, N., & Ezeama, M. (2021). Knowledge and compliance with universal precautions amongst nurses in selected hospitals in Imo State, Nigeria. *Caring: Journal of Nursing*. 10(1):30-47.
- XVIII. World Health Organization (2011). *Report on the burden of endemic healthcare-associated infections worldwide*. WHO.
- XIX. Yazid, B. (2014). Relationship between nurses' knowledge about universal precautions and nosocomial infection prevention measures at dr. Djoelham city of Binjai. *Flora Journal of Nursing*, 7(1), 83–94.
- XX. Lestari, Y., Asyary, A., Attamimi, HR, Rustika. (2019). Evaluation of the implementation of the infection prevention and control program for health care-associated infections (HAIS) in the post-surgical room at the Sumbawa Besar Regional General Hospital (RSUD) in 2019. *Journal of Innovation and Knowledge*, 1(2).