

Management Analysis of Infection Prevention: Nurses' Compliance in Implementing Hand Hygiene in the Inventories of Rantauprapat Hospital

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Abstract

Purpose: This study aims to analyze infection control prevention management on nurses' compliance in implementing hand hygiene in the in-patient rooms of Rantauprapat Hospital.

Methods: An analytical survey was employed with a cross-sectional design. The population included the nurses who served in the in-patient rooms of Regional General Hospital (RSUD) Rantauprapat with a sample of 64 participants. The data was collected using purposive sampling. For data analysis, univariate, bivariate analysis with chi square and multivariate logistic regression tests were used.

Results: The results showed that there is a relationship between infection control prevention management and nurses' compliance in implementing hand hygiene in the in-patient rooms of Rantauprapat Hospital in 2020 with the results of the chi-squares- $p = 0.0001$ test. In addition, there is a relationship between infection control prevention management based on policy / SPO on nurses' compliance in implementing hand hygiene in the in-patient rooms of Rantauprapat Hospital in 2020 with the results of the chi-square sig- $p = 0.001$. The most dominant variable that affects nurses' compliance in implementing hand hygiene is supervision because it has the greatest regression coefficient (B), which is 2.444 with an Exp (B).

Conclusion: Based on the results of the study, it is concluded that regular supervision and training serve as the most effective option in infection control prevention management. Moreover, nurses' compliance with the implementation of hand hygiene in the in-patient rooms of Rantauprapat Hospital has direct relationship with good infection control prevention management.

1. Introduction

Hand hygiene is an effort to prevent infection that is transmitted through the hands by removing dirt and debris and inhibiting or killing microorganisms on the skin that can be obtained from contact between the patient and the environment (DepKes, 2008). Contaminated hands are a major cause of transmission of infection. Failure to practice proper hand hygiene is a major cause of nosocomial infection and the spread of multi-resistant microorganisms in health care facilities (Trampuz et al., 2004; Tavolacci et al., 2008). Nurses have a considerable influence on the occurrence of nosocomial infections because nurses are health workers who have the most contact with patients and interact directly with patients for

24 hours. Efforts to prevent nosocomial infections that can be carried out by nurses are to increase the ability to apply standard precautions with its main component which is one of the most effective methods to prevent the transmission of pathogens related to health services by practicing hand hygiene (Manojlovich & DeCicco, 2008; Safety & World Health Organization, 2009).

Prevention and control of nosocomial infections in hospitals is very important because the incidence of nosocomial infections reflects the quality of hospital services. The risk of infection in the hospital can be minimized by planning, implementing, coaching, education and training, monitoring and evaluation. Infection prevention and control can be done by breaking the chain of transmission. The components of the infection transmission chain, namely starting from the infectious agent, reservoir, exit door, mode of transmission, entrance and host. Nurses are included in the components of the infection transmission chain and can be included in vulnerable hosts and places where the agent causing the infection grows (Beggs, 2003; Hinkle & Cheever, 2018; Suleyman et al., 2018). A nurse who is in a state of decreased immunity has the potential for infection while working, so the nurse needs to use personal protective equipment (PPE) when taking action on patients. One of the effects of not using personal protective equipment (gloves and masks) while working is getting a nosocomial infection.

The results of the preliminary study conducted by the researchers in the Intensive Care Unit of the Rantauprapat Hospital on November 28, 2019 to December 3, 2019 by observing the nurses who performed hand hygiene, found that 75% of the nurses had not performed hand hygiene according to the prescribed procedure and 70% of the nurses had their knowledge regarding hand hygiene is still not good. The socialization of hand washing has been carried out by IPCN and the management every day and at the morning apple every Wednesday, a hand washing demonstration was held in front of all Rantauprapat Hospital staff, only 35% were able to demonstrate correctly and correctly. The management has also facilitated tools such as sinks in each unit, which is 50% in good condition. Provision of a hand drub in each unit and in all waiting rooms, 45% are used by nurses when examining patients. Leaflets as information media and as a guide for nurses to perform hand hygiene, 35% of nurses who read the leaflets in their respective rooms.

Based on the incident data above and to maintain the safety of patients, visitors, nurses, other health workers in order to improve the quality of the hospital, the researchers are interested in analyzing infection control prevention management on nurse compliance in implementing hand hygiene in the inpatient room of Rantauprapat Hospital in 2020.

2. Methodology and Procedures

This study used an analytical survey with a cross sectional design. The population included the nurses who served in the in-patient rooms of Regional General Hospital (RSUD) of Rantauprapat with a sample of 64 participants. The data was collected using purposive sampling technique. A questionnaire was used as an instrument for collecting demographic data and information regarding infection control management (PPI). This instrument was tested using validity and reliability tests at the Dr. Pringadi Regional General Hospital, and it obtained valid results with > 0.444 . It was declared reliable with Cronbach negligent results > 0.944 .

Data collection was carried out after obtaining permission from the relevant authorities. The researchers looked for potential respondents with inclusion and exclusion criteria then explained to prospective respondents about the objectives, benefits, and assisted them on how to fill out the questionnaire. After obtaining informed consent, the respondents were allowed to fill out a questionnaire or read it by the researcher and give the respondents the opportunity to have questions. After all the data in the questionnaire were collected, analysis was carried out through several stages, starting from checking the completeness of the data (editing), providing code (coding), ensuring that the data was clean from errors (cleaning), and measuring each respondent's answer by looking for a percentage (tabulating) which is then presented in the form of a frequency distribution table.

3. Results and Discussion

Table 1. Frequency distribution based on the characteristics of respondents at the 2020 Rantauprapat Regional Hospital (n = 64)

Respondent Characteristics	(F)	(%)
Sex		
Male	12	18,8
Female	52	81,3
Age		
26-35 years	50	78,1
36-45 years	11	17,2
46-55 years	3	4,7
Education		
Diploma in Nursing	30	46,9
Bachelor in Nursing	34	53,1
Years of Service		
≤ 10 Years	44	68,8
11 – 19 Years	20	31,3

The results showed that the majority of respondents were female, namely 52 people (81.3%), age range 26-35 years as many as 50 people (78.1%), S1 Nursing education as many as 34 people (53.1%). working ≤ 10 years as many as 44 people (68.8%).

Table 2. Dfrequencydistributionbasedonthecharacteristicsofrespondentsat RSUD Rantauprapat 2020 (n = 64)

Variable	F	%
Infection Control Management		
Insufficient	29	45,3
Good	35	54,7
Regulation/SPO		

	Insufficient	29	45,3
	Good	35	54,7
Infection Prevention and Control (PPI)	Insufficient	31	48,4
	Good	33	51,6
Supervision	Insufficient	27	42,2
	Good	37	57,8
Training	Insufficient	15	23,4
	Good	49	76,6

The results of this study found that the infection control prevention management was in the poor category, namely 29 people (45.3%) and good, namely 35 people (54.7%), the regulation / SPO was in the poor category, namely 29 people (45.3%) and good namely 35 people (54.7%), Infection Prevention and Control (PPI) in the poor category, namely 31 people (48.4%) and good, namely 33 people (51.6%), the poor category of supervision, namely 27 people (42 , 2%) and good, namely 37 people (57.8%), and for the less category of training, namely 15 people (23.4%) and good, namely 49 people (76.6%).

Table 3. Relationship between Infection Control Prevention Management and Respondents' Compliance in Implementing Hand Hygiene

Obedience	PPI Management			P Value
	Insufficient	Good	Total	
Obedient	5 (17,2%)	28 (80%)	33 (51,6%)	0,0001
Not Obedient	24 (82,8%)	7 (20%)	31 (48,4%)	
Total	29 (100%)	35 (100%)	64 (100%)	

It was found that 82.8% of respondents who were not compliant stated that PPI management was not good and this percentage was greater than 80% of respondents who complied and stated that PPI management was good. The results of the chi-square test sig-p = 0.0001 or <value $\alpha = 0.05$ means that there is a relationship between infection control prevention management and the compliance of respondents in implementing hand hygiene in the inpatient room of Rantauprapat Hospital in 2020.

Table 4. Management Relationship of Infection Control Prevention Based on Regulation / SPO on Respondents' Compliance in Implementing Hand Hygiene

Obedience	PPI Management based on Regulation / SPO			P Value
	Insufficient	Good	Total	
Obedient	8 (27,6%)	25 (71,4%)	33 (51,6%)	0,001
Not Obedient	21 (72,4%)	10 (28,6%)	31 (48,4%)	

Total	29 (100%)	35 (100%)	64 (100%)	
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It was found that 72.4% of respondents who were not compliant stated that PPI management based on regulations / SPO was not good and this percentage was greater than 71.4% of respondents who complied and stated that PPI management based on regulation / SPO was good. The results of the chi-square test show that sig-p = 0.001 or <value $\alpha = 0.05$ means that there is a relationship between infection control prevention management based on regulations / SPO on the compliance of respondents in implementing hand hygiene in the inpatient room of Rantauprat Hospital in 2020.

Table 5. Relationship of Infection Control Prevention Management Based on Infection Prevention and Control (PPI) Against Respondents' Compliance in Implementing Hand Hygiene

Obedience	PPI management based on PPI			P Value
	Insufficient	Good	Total	
Obedient	6 (19,4%)	27 (81,8%)	33 (51,6%)	0,0001
Not Obedient	25 (80,6%)	6 (18,2%)	31 (48,4%)	
Total	31 (100%)	33 (100%)	64 (100%)	

It was found that 80.6% of respondents who were not compliant stated that PPI management based on PPI was not good and this percentage was smaller than 81.8% of respondents who complied and stated that PPI management based on PPI was good. The results of the chi-square test show that sig-p = 0.0001 or <value $\alpha = 0.05$ means that there is a relationship between infection control prevention management based on Infection Prevention and Control (PPI) to the compliance of respondents in implementing hand hygiene in the inpatient room of Rantauprat Hospital.

Table 6. Relationship Management of Infection Control Prevention Based on Supervision of Respondents' Compliance in Implementing Hand Hygiene

Obedience	PPI Management based on Supervision			P Value
	Insufficient	Good	Total	
Obedient	6 (22,2%)	27 (73%)	33 (51,6%)	0,0001
Not Obedient	21 (77,8%)	10 (27%)	31 (48,8%)	
Total	27 (100%)	37 (100%)	64 (100%)	

Table 7. Relationship Management of Infection Control Prevention Based on Training on Respondents' Compliance in Implementing Hand Hygiene

Obedience	PPI Management based on Training			P Value
	Insufficient	Good	Total	
Obedient	2 (13,3%)	31 (63,3%)	33 (51,6%)	0,001
Not Obedient	13 (86,7%)	18 (36,7)	31 (48,4%)	
Total	15 (100%)	49 (100%)	64 (100%)	

It was found that 86.7% of respondents who were not compliant stated that PPI management was based on poor training and this percentage was greater than 63.3% of respondents who complied and stated that PPI management was based on good training. The

results of the chi-square test show that sig-p = 0.001 or <value $\alpha = 0.05$ means that there is a relationship between infection control prevention management based on training on respondent compliance in implementing hand hygiene in the inpatient room of Rantauprapat Hospital in 2020.

Table 8. Step I Logistic Regression Test Results

No	Independent Variable	B	Sig	Exp(B)	95% C.I. for EXP(B)	
					Lower	Upper
1	Infection Control Prevention Management	-0.117	0.909	0.889	0.119	6.636
2	Regulation	1.631	0.070	5.110	0.873	29.909
3	Infection Control Prevention (PPI)	2.302	0.013	9.997	1.620	61.672
4	Supervision	2.092	0.032	8.104	1.204	54.563
5	Training	1.475	0.251	4.370	.351	54.331
	Constant	-4.319	0.002	0.013		

In step I logistic regression using the enter method it is known that infection control prevention management ($0.909 > 0.05$) and training ($0.251 > 0.05$) so that these two variables are excluded in step II. Therefore, step II logistic regression was carried out using the enter method with regulatory variables, Infection Control Prevention (PPI), supervision.

Table 9. Step II Logistic Regression Test Results

No	Independent Variable	B	Sig	Exp(B)
1	Regulation	1.384	0.088	3.990
2	Infection Control Prevention (PPI)	2.396	0.002	10.980
3	Supervision	2.444	0.002	11.520
	Constant	-3.256	0.000	0.039

From the results of the multivariate test using logistic regression using the enter method in step II which has the greatest effect is supervision because it has the greatest regression coefficient (B), which is 2,444 with an Exp (B) value of 11,520, meaning that the head of the room carries out category supervision. Good for the compliance of respondents in implementing hand hygiene 11,520 times the chance of respondents obeying in implementing hand hygiene compared to the head of the room who carried out supervision of the less category of respondents' compliance in implementing hand hygiene.

Discussion

The analysis of data reveals that there is an effect of infection control prevention management on nurses' compliance in implementing hand hygiene. This is because nurses in the hospital are guided to carry out infection control prevention management in the good category. Although the majority is good, there are nurses who are lacking in infection control prevention management. This is due to the compliance of nurses in implementing hand hygiene in the category of not obedient 85.2% and obedient 14.8%. The application of hand washing to nurses must also be supported by the nurses' awareness in protecting themselves and patients from infectious materials as well as awareness in carrying out the correct SPO. The habit of washing hands in the hospital is a fundamental behavior in the prevention of cross infection.

In addition, the results of the study indicate an effect of infection control prevention management based on Regulation / SPO on nurses' compliance in implementing hand hygiene. This is because the SOP for infection control prevention management is in the hospital which must be carried out by nurses in carrying out nursing care. Although the majority of infection control prevention management is based on Regulation / SPO is good. But there is also infection control prevention management based on Regulations / SPO category less. The application of washing hands to nurses must also be supported by the awareness of the nurses themselves in protecting themselves and patients from infectious materials as well as awareness of implementing the correct SOP. The habit of washing the hands of nurses in the hospital is a fundamental behaviour in an effort to prevent cross infection. Nurses must comply with hand hygiene as an effort to prevent nosocomial infections in hospitals so that they can improve the quality of service.

Moreover, there is an effect of infection control prevention management based on Infection Prevention and Control (PPI) on nurses' compliance in implementing hand hygiene. This is because the hospital has an Infection Prevention and Control (PPI) team that supervises nurses in implementing hand hygiene. Although the majority is good, there is also infection control prevention management based on the Infection Prevention and Control (PPI) category lacking. If the nurse does not do hand hygiene, there is no warning from the PPI team because the PPI team only looks for the main problem in hand hygiene. If the nurse does not practice hand hygiene, then the head of the ward is warned and told to repeat it again. Often the nurses are reminded to do hand hygiene during the morning meeting and are also required to take every action, both before contact and after contact.

The results of the multivariate analysis of this study indicate that the dominant variable of respondent compliance in implementing hand hygiene in the in-patient room of RSUD Rantauprapat based on infection control prevention management, regulation, Infection Control Prevention (PPI), supervision and training that has the greatest influence is supervision because it has the largest regression coefficient (B) is 2,444 with an Exp (B) value of 11,520, meaning that employees who carry out good category supervision of respondent compliance in implementing hand hygiene have a 11,520 times chance of implementing hand hygiene compared to employees who carry out poor category supervision of respondent compliance in implementing hand hygiene.

4. Conclusion

The present study aimed at analyzing infection control prevention management on nurses' compliance in implementing hand hygiene in the in-patient rooms of Rantauprapat Hospital. The results of the study indicate that regular supervision and training serve as the most effective option in infection control prevention management. Moreover, nurses' compliance with the implementation of hand hygiene in the in-patient rooms of Rantauprapat Hospital has direct relationship with good infection control prevention management. There is also a relationship between infection control prevention management based on training on nurses' compliance in implementing hand hygiene in the inpatient room of Rantauprapat Hospital in 2020 with the results of the chi-square sig-p = 0.001. The most dominant variable that affects nurses' compliance in implementing hand hygiene is supervision because it has the greatest regression coefficient (B), which is 2.444 with an Exp (B).

Conflict of Interest

We have no competing interests.

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References

- DepKes, R. I. (2008). *Panduan nasional keselamatan pasien rumah sakit (patient safety)*. Depkes RI Jakarta.
- Safety, W. P., & World Health Organization. (2009). *WHO guidelines on hand hygiene in health care: a summary (No. WHO/IER/PSP/2009.07)*. World Health Organization.
- Trampuz, A., & Widmer, A. F. (2004). *Hand hygiene: a frequently missed lifesaving opportunity during patient care*. In Mayo clinic proceedings (Vol. 79, No. 1, pp. 109-116). Elsevier.
- Tavolacci, M. P., Ladner, J., Bailly, L., Merle, V., Pitrou, I., & Czernichow, P. (2008). Prevention of nosocomial infection and standard precautions: knowledge and source of information among healthcare students. *Infection control and hospital epidemiology*, 29(7), 642-647.
- Manojlovich, M., & DeCicco, B. (2007). Healthy work environments, nurse-physician communication, and patients' outcomes. *American Journal of Critical Care*, 16(6), 536-543.
- Hinkle, J. L., & Cheever, K. H. (2018). *Brunner and Suddarth's textbook of medical-surgical nursing*. Wolters kluwer india Pvt Ltd.
- Beggs, C. B. (2003). The airborne transmission of infection in hospital buildings: fact or fiction?. *Indoor and built Environment*, 12(1-2), 9-18.
- Suleyman, G., Alangaden, G., & Bardossy, A. C. (2018). The role of environmental contamination in the transmission of nosocomial pathogens and healthcare-associated infections. *Current infectious disease reports*, 20(6), 1-11.