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Relationship Between Nurses' Hand Washing Compliance by Fuerbringer and The Incidence of Nosocomial Infection in Surgical Room

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ABSTRACT

Introduction: Surgical site infection (SSI) is an infection that often occurs in post-surgery patients, this occurs because nurses' handwashing compliance is still not perfect according to the Fuerbringer handwashing principle, especially before performing surgical assistance. The impact of SSI causes serious complications, prolongs hospitalization, and increases health care costs.

Methods: This study used a cross-sectional approach. The population was all nurses in the surgical room. The sampling technique used a non-probability purposive sampling type of 25 respondents. Data collection was carried out using a compliance questionnaire and observation of SSI infections. The independent variable is compliance with Fuerbringer handwashing. The dependent variable is the incidence of nosocomial infections. This study was analyzed using the Spearman Rank Rho test with a significance level of $\alpha < 0.05$.

Results: The Spearman rank analysis test obtained a value of 0.000 (p-value < 0.05) which means that there is a relationship between Nurses' handwashing compliance with Fuerbringer and the incidence of nosocomial infections in the surgical room.

Conclusion: High handwashing compliance helps prevent cross-contamination between patients and nurses, which can reduce the risk of infection that can be obtained during hospital care.

Keywords: Fuerbringer, Handwashing compliance, Nosocomial Infection

INTRODUCTION

Nosocomial infections or often known as Healthcare Associated Infections (HAI) are one of the serious problems in the healthcare industry. This topic is a central issue in patient safety studies because it is identified as a cause of increased morbidity and mortality of

patients in healthcare services. Low compliance with Fuerbinger handwashing in nurses will have an impact on health problems, namely transmitting to other patients, increasing nosocomial infections, increasing length of care, high hospital costs and the risk

of becoming a barrier or carrier of germs for patients or themselves (Pundar, 2019).

The phenomenon that occurred in surgical room in May-July 2024 found that some nurses' compliance with handwashing was still not perfect in accordance with the principle of Fuerbringer handwashing, especially before performing surgical assistance actions, as evidenced by the large number of nurses who washed their hands that did not comply with the SOP (Standard Operating Procedure) in the Operating Room. Indications for hand washing in "My 5 Moments for Hand Hygiene", namely: before touching the patient, before performing aseptic procedures, after exploring the patient's body fluids, after touching the patient and after touching objects around the patient (WHO, 2009).

Factors that contribute to the low compliance of nurses in carrying out Fuerbringer hand washing are due to limited hand washing facilities and awareness in carrying out nurses' hand washing procedures which is still very lacking. Failure to perform hand hygiene properly and correctly is the main cause of nosocomial infections (Rodyah, 2015). However, the relationship between nurses' compliance with Fuerbringer hand washing and the incidence of nosocomial infections has not been explained.

The prevalence of HAIs (Health Care Associated Infections) infections in patients in developed countries varies between 3.5% and 12%, while in developing countries including Indonesia the prevalence of HAIS infections is 9.1% with a variation of 6.1% -16% (WHO, 2021). In the world, health workers' compliance in washing their hands is generally around 40%, this figure varies widely from 5% to 81% (Khan, H. A., Baig, F. K., & Mehboob, R, 2017). Various studies conducted in Indonesia also show that the level of compliance in washing hands among health workers is around that number. In East Java, the incidence of HAIs at the Haji Regional Hospital, East Java Province in 2017 was

0.24% in 2015 to 0.21% in 2016, then to 0.13% in 2017.

Based on data reported by the Hospital Infection Prevention and Control Committee (PPIRS), there were 2 cases of post-operative infection in 2020 until June with an achievement of 0.6% of the total number of 1368 patients who were operated on. From the results of observations that have been carried out for 3 months in 2024, the last in May of 27 nurses, 25 nurses were obedient to washing their hands and 2 nurses were not obedient to washing their hands. In June, out of 17 nurses, there were 13 nurses who were obedient to washing their hands and 4 nurses who were not obedient to washing their hands. In July, out of 27 nurses, 24 were obedient.

Pre-surgical nurses' compliance with hand hygiene is one of the factors that significantly influences the health of nurses and patients by preventing nosocomial infections. Non-compliance with hand hygiene by nurses can lead to increased disease due to nosocomial infections, increased length of hospital stays resulting in patient death, infecting others after leaving the hospital, becoming carriers of germs, for nursing staff, the quality of hospital services decreases, causing operational permits to be revoked and revoking the hospital's operational permit (Jama and Yuliana, 2020).

Washing hands before contact with patients is to prevent patients from being exposed to dirt and germs carried on the hands of nurses from other patients, while washing hands after contact with patients aims to clean dirt on their hands when examining patients and minimize the transmission of germs and infections to others (Anugrahwati & Hakim, 2019). This hand washing action is an important routine in infection control, and is the best method to prevent transmission of microorganisms in postoperative patients. Research on nurses' compliance in washing their hands before surgery is still limited even though various scientific evidence has shown the impact of hand washing compliance.

Therefore, this study will examine the relationship between Nurses' hand washing compliance in Fuerbringer and the incidence of nosocomial infections in surgical room.

METHOD

This study used a cross-sectional research design, namely with a single observation (Nursalam, 2020). The study population was all implementing nurses in surgical room, totaling 27 people. The sampling technique used a non-probability purposive sampling type, include 25 respondents according to the inclusion criteria. This study was conducted from November 25 to December 25, 2024 in surgical room. The independent variable is compliance with hand washing using Fuerbinger, the dependent variable is the incidence of nosocomial infections. Data collection was carried out using a compliance questionnaire using the Fuerbinger hand washing hospital standart operational procedure (SPO) and observation of ILO infections based on Septiari's research (2012). The data were then analyzed descriptively by displaying frequencies and percentages. After that, a bivariate analysis was carried out with the Spearman rank test to determine the relationship between compliance with hand washing by nurses using Fuerbringer and the incidence of nosocomial infections in surgical room.

RESULTS

This data will display the characteristics of respondents based on age, gender, educational level, and lenght of service.

The table above shows that most respondents are aged 31-60 years (76.0%), most are male (72.0%), most respondents as a professional nurse (92.0%), most respondents have a working period of >3 years (88.0%).

Table 2. showed that 23 nurses (92%) had high handwashing compliance and 96% no infection in patients. The results of data processing using the Spearman rank obtained a

Tabel 1. Respondent characteristics

Respondent characteristics	f	%
Age		
20-30 years	6	24.0
31-60 years	19	76.0
Total	25	100
Gender		
Man	18	72
Woman	7	28
Total	25	100
Educational level		
Vocational Nurse	3	12
Professional Nurse	22	88
Total	25	100
Length of service		
1-3 years	3	12
>years	22	88
Total	25	100

value of 0.000 (p-value <0.05) so it can be concluded that there is a relationship between nurses' handwashing compliance according to Fuerbringer with the incidence of nosocomial infections in surgical room.

Table 3 shows that out of 25 respondents, the respondents with Fuerbringer's handwashing compliance with the incidence of nosocomial infections in surgical room, found low handwashing compliance for 1 respondent (4.0%) and moderate handwashing compliance for 1 respondent (4.0%).The results of data processing using the Spearman rank obtained a value of 0.000 (p-value <0.05) so it can be concluded that there is a relationship between nurses' handwashing compliance according to Fuerbringer with the incidence of nosocomial infections in surgical room.

DISCUSSION

The results of the study showed that the compliance of nurses' hand washing according to fuerbinger, most respondents had high compliance. High compliance with nurses' hand washing according to Fuerbinger shows that most nurses are aware of the importance

Table 2. The frequency distribution of research variable

Variable	f	%
Nurses's handwashing compliance		
High	23	92
Moderate	1	4
Low	1	4
Total	25	100
Incidence of Nosocomial Infections		
No infections occurs	24	96
Infection occurs	1	4
Total	25	100

Table 3 Analysis of the relationship between nurses' handwashing compliance according to Fuerbringer and the incidence of nosocomial infections at surgical room

Nurses' hand washing compliance according to Fuerbringer	No infection occurs		Infection occurs		Total	
	n	%	n	%	n	%
High	23	92	0	0	23	92
Medium	1	4	0	0	1	4
Low	0	0	1	4	1	4
Total	25	98	0	4	25	100

Spearman rank value is obtained 0,000 (p-value < 0,05)

of hand hygiene in preventing the spread of disease and infection.

This high compliance rate reflects a good understanding of the role of hand hygiene in infection control, so increasing knowledge can encourage the public to comply with all established health protocols (Pratiwi, 2021). According to Hartono (2015) cognitive abilities and behavioral abilities are greatly influenced by the stage of age development so that nurses comply with Fuerbinger hand washing by considering the impact of nosocomial infections that can be on patients. This study found that most respondents had a length of service > 3 years (88.0%) officers who have a long work period tend to have experience that will improve nurses' skills and it is hoped that nurses' self-confidence can increase so that motivation and work performance displayed will be better (Azwar, 2010).

This study still found respondent with low handwashing compliance, the respondent

had a D3 Nursing education. According to Burke (2003) stated that the factor that inhibits health workers from washing their hands is a lack of understanding in washing hands. Addressing nursing staff shortages and workloads and making some environmental modifications to allow easy access to sinks and hand sanitizers may facilitate nurse hand hygiene compliance in this setting (Sadule-Rios, N., & Aguilera, G, 2017).

This study found that the incidence of nosocomial infections was mostly not infected. The high percentage of respondents who did not experience nosocomial infections indicates that infection prevention efforts implemented in the health facility may be running well. Practices such as proper handwashing, use of personal protective equipment (PPE), sterility of medical devices, and strict hospital policies in infection control can contribute greatly to reducing the risk of nosocomial infections. Understanding the complex interplay of factors that contribute to nosocomial infection

is a necessary first step to improving patient outcomes. (Jenkins, 2017).

The incidence of surgical wound infection was still found, which could be caused by patient factors. According to Potter and Perry (2015) wound infection is an infection that is often found in relation to health services. Surgical wounds are acute wounds that occur suddenly on the skin area and healing according to the estimated time and can be cured well if complications occur (Ekaputra, 2013). This is in accordance with the statement (Septiani, 2016), which states the susceptibility of the host, and virulence (the degree of pathogenicity of a microorganism is measured by the degree of progress in causing disease). The occurrence of infection in one patient is due to the patient himself, such as poor nutrition, improper wound care and other factors, there may be other unknown diseases that cause infection in the surgical wound.

There is a relationship between nurses' handwashing compliance according to Fuerbringer and the incidence of nosocomial infections in surgical room. The higher the nurse's handwashing compliance, the lower the incidence of nosocomial infections. This indicates that better hand hygiene care by nurses plays an important role in preventing the spread of nosocomial infections. High hand hygiene compliance helps prevent cross-contamination between patients and caregivers, which in turn reduces the risk of infections that can be acquired during hospital care. Proper hand hygiene protocols are essential in nursing practice because clean hands can reduce the risk of cross-contamination and infections that are harmful to patients, healthcare workers, and the hospital environment (Bezerraa, et all, 2020).

CONCLUSION

Based on the results of the study, it was found that there was a relationship between Nurses'

handwashing compliance according to Fuerbringer and the incidence of nosocomial infections in surgical room. Handwashing in surgical room is very important because if we do not comply with handwashing according to existing rules, it will result in patients getting nosocomial infections. Compliance with Fuerbinger handwashing in surgical room nurses should be improved because they are one of the health workers who are at risk of transmitting pathogens through their hands. Observation of handwashing compliance should be carried out regularly to monitor the effectiveness of efforts to improve handwashing compliance.

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