RELATIONSHIP BETWEEN KNOWLEDGE, WORK LOCUS, AND HANDWASHING PRACTICE AMONG EMPLOYEES IN A SELECTED HOSPITAL

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Abstract. Hand washing is one of the effective and efficient efforts to reduce the risk of disease transmission in the hospitals. This study aimed to analyze the relationship between education level, work locus, and level of knowledge with handwashing practice among hospital employees. This was quantitative research with a cross-sectional approach. It was conducted from July-November 2021 by collecting data from 62 respondents using a questionnaire which was developed based on the regulation of Indonesian Ministry of Health Number 27 issued in 2017. The respondents chosen based on the inclusion criteria which were having been working in the hospital for the last 6 months and agreed to participate in the study. The data were then analyzed using the cross-tabulation and chi-square tests. The results showed that employees' educational backgrounds and handwashing knowledge had no significant relationship with handwashing practice (p=0.528 and p=0.831, respectively). Moreover, 94.7% of employees who work in a high-risk area showed good handwashing practices. Only work locus risk has a significant relationship with handwashing practice (p=0.003). It can be concluded that the higher the risk at the employee's workplace, the higher the employee's compliance with washing their hands.

Keywords: handwash, working locus, knowledge, hospital

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INTRODUCTION

Infectious disease related to health services also known as healthcare associated infections (HAIs) is one of the serious issues nowadays, especially during the coronavirus disease 2019 (COVID-19) pandemic. Transmission of COVID-19 can take place everywhere, such as in hospitals that are regularly visited by various types of patients, both with and without confirmed COVID-19. Hospitals must ensure that patients, employees, and hospital visitors can avoid the risk of HAIs. Hospital employees are one of the main carriers of nosocomial infection transmission in hospitals (Aledeilah *et al*, 2018).

The spread of COVID-19 infection in hospitals has been reported worldwide, so hospitals should develop plans to trace and supervise healthcare workers who were infected by COVID-19 (Patel *et al*, 2021). The incidence of HAIs at hospitals can be prevented if hospital employees consistently implement the Infection Prevention and Control (IPC) program. There are 11 elements that must be implemented and adhered to in standard precaution: hand hygiene, personal protective equipment (PPE), sterile instruments and devices, clean and disinfected environmental surfaces, safe disposal of waste, safe management of linen, health protection for officers, patient placement, respiratory hygiene/ cough etiquette, safe injection practices, and sharp safety (Indonesia Ministry of Health, 2017).

The World Health Organization (WHO) introduced "My Five Moments for Handwashing" to minimize problems related to handwashing. The five-time handwashing is practiced before handling a patient, before any aseptic procedures, after being exposure to body fluids, after handling a patient, and after touching surfaces on the patient's

surroundings (WHO and WHO Patient Safety, 2009). Some hospitals have also developed more complete handwashing rules for their employees based on this 2009 WHO and WHO Patient Safety' guideline. Proper handwashing should be carried out when employees arrive and leave the hospital, during the transfer between patients, when their hands look stained, before eating, before and after performing invasive procedures, and after using contaminated utensils. The length of time to wash hands varies according to the risks involved. Hospital employees who work in high-risk areas are advised tso wash their hands for about two minutes. Handwashing is the simplest but most effective way to prevent infection (Jemal, 2018; Létourneau *et al*, 2018).

Poor hand hygiene behavior is one of the main factors that increases morbidity, mortality, and health costs that must be paid by patients (Jemal, 2018). A study at a hospital in Istanbul explains that although the procedure for washing hands is very simple, some health workers still do not comply with the right procedures. The employees' lack of motivation and rush is said to be the reason why the handwashing procedure is poorly practiced (Karaaslan *et al*, 2014).

The handwashing practice among hospital employees is very important to prevent and control infectious diseases. It is one of the effective and efficient efforts to reduce microorganisms and the risk of disease transmission at hospitals. IPC program is needed to reduce the risk of infection and ensure the safety of patients, health employees, and hospital visitors (Aledeilah *et al*, 2018; Asmawi, 2019).

This study aimed to analyze the relationship between educational backgrounds, work locus, and level of knowledge about handwashing with handwashing practices performed by hospital employees.

MATERIALS AND METHODS

This study is a quantitative study with a cross-sectional approach. It was conducted from July to November 2021. Data collection was carried out using a questionnaire which developed based on the Regulation of Minister of Health Republic of Indonesia Number 27 in 2017 about infection prevention and control in healthcare facilities (Indonesia Ministry of Health, 2017)

Respondents in this study were hospital employees that meet the inclusion criteria which were (1) having worked for at least six months and (2) willing to participate in this research. In this study, information on the employees' educational backgrounds, work locus, knowledge about handwashing, and handwashing practices was collected. The educational background was divided into 2 categories, high and low education. High level education referred to Diploma, Bachelor or Post Graduate while low level education was high school graduate or below. The work locus was divided into that with a high risk of infection and with a low risk of infection. High risk loci refer to area with high chemical and biological contamination (such as pharmacy, emergency room, laboratories, operation room, death body room, *etc*) while low risk loci refer administration or other office room which low risk with chemical and biological contamination. As for knowledge about handwashing, the respondents were asked to fill out a questionnaire and the assessment was grouped into good and poor knowledge. Responses from the questionnaire were scored and the respondents with the score equal or higher than mean score would be categorized as having good knowledge while those with the score lower than mean score was categorized as having poor knowledge. Meanwhile, handwashing practice is divided into two categories: good and poor categories. Similar with knowledge

of handwashing, the handwashing practice category also based on the mean score. It would be categorized as good when the score was equal or higher than mean score, and poor if it's lower than mean score.

Data analysis was performed using the cross-tabulation and chi-square tests.

This research has been approved by Health Research Ethics Committee Faculty of Public Health Universitas Diponegoro (KEPK FKM UNDIP) number 303/EA/KEPK-FKM/2021. This research also has been approved by the hospital.

RESULTS

We were able to recruit 62 respondents from various work areas in the selected hospital. Table 1 shows that 96.8% of employees are highly educated, 61.3% work in a locus with a high risk of infectious diseases transmission, 77.4% have good knowledge about handwashing, and 83.9% have implemented good handwashing procedures.

The results showed that employees' educational backgrounds and handwashing knowledge had no significant relationship with handwashing practice (p=0.528 and p=0.831, respectively). Only the work locus showed a significant effect on handwashing practices (p=0.003). Most of the employees, both with high and low levels of education, had good handwashing behavior. Moreover, employees with both good and poor knowledge about handwashing also practiced good handwashing behavior.

Based on Table 2, it is known that 94.7% of employees who work at a locus with a high risk of infectious disease transmission have practiced good handwashing behavior. Meanwhile, 33.3% of employees who work

Table 1

Distribution of educational backgrounds, work locus, knowledge about handwashing, and handwashing practice of hospital employees (N = 62)

Variable	Frequency *n* (%)
Educational background[1]	
High	60 (96.8)
Low	2 (3.2)
Work locus[2]	
High risk	38 (61.3)
Low risk	24 (38.7)
Knowledge about handwashing[3]	
Good	48 (77.4)
Poor	14 (22.6)
Handwashing practice[4]	
Good	52 (83.9)
Poor	10 (16.1)

[1]High educational background refers to Diploma, Bachelor or Post Graduate while and low educational background refers to high school graduate and below.

[2]Work locus is categorized as high-risk area where there is a high risk of chemical and biological contamination such as operation room, death body room, laboratories, laundry room, *etc* while the low risk areas have low contamination such as administration room, office room, *etc.*

[3]Good knowledge is when the score received is equal or higher than mean score and poor when the score is lower than mean score.

[4]Handwashing practice is categorized as good when the score received is equal or higher than mean score and poor when the score is lower than mean score.

Table 2

Cross-tabulation of educational backgrounds, work locus, knowledge about handwashing, and handwashing practice of hospital employees (N = 62)

Variable	Hand washing practices			*p*-value*
	Good	Poor	Total	
Educational background[1], *n* (%)				0.528
High	50 (83.3)	10 (16.7)	60 (100)	
Low	2 (100)	0 (0)	2 (100)	
Work locus[2], *n* (%)				0.003
High risk	36 (94.7)	2 (5.3)	38 (100)	
Low risk	16 (66.7)	8 (33.3)	24 (100)	
Knowledge about handwashing[3], *n* (%)				0.831
Good	40 (83.3)	8 (16.7)	48 (100)	
Poor	12 (85.7)	2 (14.3)	14 (100)	

[1]High educational background refers to Diploma, Bachelor or Post Graduate while and low educational background refers to high school graduate and below.

[2]Work locus is categorized as high-risk area where there is a high risk of chemical and biological contamination such as operation room, death body room, laboratories, laundry room, *etc* while the low risk areas have low contamination such as administration room, office room, *etc*.

[3]Good knowledge is when the score received is equal or higher than mean score and poor when the score is lower than mean score.

*Statistically significant when *p*-value <0.005

at a locus with a low risk of infectious disease transmission have poor handwashing practices. The riskier the employee's work locus, the better the practice of handwashing.

DISCUSSION

Hand hygiene is carried out by washing hands using soap and running water if hands are stained or exposed to body fluids or using alcohol if hands already look clean. Handwashing behavior has a significant influence during the COVID-19 pandemic. Handwashing is one of the main topics that often appear in health education agenda (Alzyood *et al*, 2020). Handwashing practice at hospitals has become a normal thing for the employees to control infectious diseases. However, during the COVID-19 pandemic, hospital employees need to improve their handwashing behavior as it is proven as one of the effective efforts to reduce the risk of COVID-19 transmission.

Employee's educational background and handwashing practice are not related, which is similar to a previous study at Central General Hospital Dr. Kariadi which also mentions no significant relationship between the employees' educational background and handwashing practice (Amalia *et al*, 2016).

Although 77.4% of hospital employees have implemented handwashing behavior, the procedure needs to be improved to encourage employees who still did not wash their hands regularly. Handwashing behavior must be implemented properly to reduce the risk of infectious disease transmission at hospitals, especially during the COVID-19 pandemic (Jemal, 2018; Létourneau *et al*, 2018). However, the result of chi-square test between work locus and handwashing practices shows good results. About 94.7% of employees who worked in a locus with a high risk of infection practiced good handwashing behavior. This is in line with a previous study that showed employees who worked in areas with a high risk of infection (*eg* surgical unit) tended to be more obedient to practice handwashing and maintain hand hygiene (Létourneau *et al*, 2018).

Most employees, with both high and low levels of education, showed good handwashing practices. It suggests that their awareness and understanding about handwashing are good. This is in line with a previous study in which almost everyone who worked at hospitals had a good understanding of handwashing. This is reasonable since health workers are equipped with training and education on the importance of handwashing (Létourneau *et al*, 2018).

Another study at a hospital in South Korea also showed similar results. In that study, the hospital monitored the handwashing compliance of their employees and analyzed them based on their educational backgrounds. It showed that after continuous handwashing campaigns held by the hospital, almost all employees demonstrated good handwashing behavior despite different educational backgrounds. Therefore, it can be concluded that the level of education is not significantly related to the handwashing practice. The study then suggested that good handwashing behavior can be improved with continuous and ongoing education and promotion (Lee *et al*, 2014).

The work locus is divided into two categories: work locus with a high risk of infection and work locus with a low risk of infection. Although the work locus of each employee is different, there is no exception for all employees to skip washing their hands regularly to avoid infectious disease transmission at the hospital.

The result of this study showed a significant relationship between the employee's work locus and handwashing practices. Employees who work at work loci with a high risk of infection tend to have good handwashing behavior. This shows that employees are aware that the higher the risk of infection in the workplace, the more routine and obedient to handwashing practice. A previous study in Australia suggests that hospital employees perceived that handwashing is a natural thing to do.

The employees would continue to wash their hands, whether under supervision or not because it is mandatory to take care of themselves, their co-workers, and patients (Sendall *et al*, 2019).

A previous study at hospitals in Turkey also showed that the employee's work area was one of the factors that could increase employee compliance with handwashing behavior. In a work locus with high risk, more reminders are given both in the work area and between colleagues. Hence, employees who work at a loci with a high risk of infection show better handwashing behavior (Teker *et al*, 2015).

In this study, knowledge about handwashing is divided into good and poor knowledge. The results showed no significant relationship between knowledge about handwashing and handwashing practices. There were 83.3% of employees with good knowledge and 85.7% with poor knowledge who showed good handwashing practices. It indicates knowledge about handwashing is not the main factor influencing handwashing practices. Other studies have shown that hospital employees are generally aware that their job requires them to maintain hand hygiene. Most of them already understood and had awareness of handwashing as professionalism in their work (Gwarzo, 2018; Létourneau *et al*, 2018).

A study in India showed that general knowledge about handwashing was not a major factor in increasing awareness and behavior among hospital employees. They would be more aware of having good handwashing behavior through continuous training and motivation (Bhagawati, 2018). Other studies also demonstrated that in addition to training, supervision, and continuous feedback, policymakers who made rules about handwashing needed to emphasize the importance of handwashing behavior (Kingston *et al*, 2017; Teker *et al*, 2015).

In conclusion, the results of this study show that work locus at the hospital has a significant relationship with handwashing practice. On the other hand, educational background and knowledge about handwashing do not have a significant relationship with handwashing practices. This shows that the higher the risk of work locus, the more aware and obedient to handwashing practice according to PCI guidelines. There is a need for continuing education and rules enforcement to improve handwashing compliance among all hospital employees. It is important that all employees who work at both low and high-infection risk locus comply with good handwashing practices so that the risk of infectious disease transmission can be avoided.

ACKNOWLEDGMENTS

The authors would like to thank all of the participants in this research.

CONFLICT OF INTEREST DISCLOSURE

All of the authors declare that there is no conflict of interest in this research.

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