THE EFFECT OF INFECTION PREVENTION AND CONTROL LINK NURSE SUPERVISION AND RESOURCE AVAILABILITY ON PARAMEDIC HAND HYGIENE AT HANAU HOSPITAL, SERUYAN DISTRICT, CENTRAL KALIMANTAN

Jhonferi Sidabalok[1)], Pujiyanto[2)]

[1)]Hospital Administration Studies Master Program,
Faculty of Public Health, Universitas Indonesia
[2)]Department of Health Administration and Policy,
Faculty of Public Health, Universitas Indonesia

ABSTRACT

Background: Hand hygiene was the most straightforward and most effective behavior to prevent nosocomial infection. Doing hand-hygiene in 5 moments must be endeavored to improve the quality of service in the hospital. Hospitals must have a PPI team where the Infection Prevention and Control Link Nurse (IPCLN) is part of the structure. The availability of facilities in the hospital is needed to support hand hygiene behavior. This study aimed to know the effect of IPCLN supervision and facilities availability on paramedical hand hygiene behavior at Hanau Hospital.
Subjects and Method: This was a cross-sectional conducted at Hanau Hospital, Seruyan District, Central Kalimantan. A sample of 83 paramedics at Hanau Hospital was selected for this study by total sampling. The dependent variable was the behavior of hand hygiene paramedic. The independent variable was IPCLN supervision and the availability of facilities. The data were collected by questionnaire. The data was analyzed by Chi Square.
Results: The respondents in this study were 67.5% women, 72.3% were under 30 years old, 74.7% had a Diploma-III education, and 69.9% worked less than 5 years. The supervision carried out by IPCLN (OR = 35.25; CI: 4.36 to 258.22), and the availability of facilities (OR = 24.35; CI: 5.10 to 116.26) was statistically significant (p <0.001). Variables that influence the behavior of paramedic hand hygiene at Hanau Hospital are supervision of the IPCLN towards paramedics (B = 2.86; OR = 17.42; 95% CI= 1.94 to 156.78; p= 0.011) together with the variable availability of facilities (B = 2.62; OR = 13.69; 95% CI= 2.62 to 71.49; p= 0.002).
Conclusion: The supervision of IPCN and the availability of facilities affect paramedics' hand hygiene behavior at Hanau Hospital.

Keywords: hand hygiene, IPCLN, Supervision, Facilities, PPI

Correspondence:
Jhonferi Sidabalok, Hospital Administration Studies Master Program, Faculty of Public Health, Indonesia University. Email: jfs.usu98@gmail.com. Mobile 082154643424

BACKGROUND

The PPI (Infection Prevention and Control) Program in Hospitals is an effort to implement patient safety with the hope of reducing the incidence of infections in hospitals. Hospitals must provide effective and efficient services but still pay attention to the quality of service to ensure patient safety which has become a government program. One indicator is that the incidence of nosocomial infections is less than 1.5%. One of the hospital accreditation assessment standards is the Nosocomial Infection Control Program (PPIRS, 1999).

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To support the PPI program in hospitals, adequate facilities and infrastructure, human resources and hospital organizational equipment are needed. PPI in hospitals was managed by a team determined by the Hospital Director Decree. Its structure consists of the PPI Committee, IPCO, *Infection Prevention and Control Nurse* (IPCN), and *Infection Prevention and Control Link Nurse* (IPCLN). What is meant by IPCLN in Perdalin are nurses who are given the authority to carry out the PPI program and liaise with IPCN in each hospitals service unit (Perdalin, 2010).

Some of the duties of the IPCLN itself include: 1) As a liaison with IPCN and implementing the PPI program every day, 2) Filling in the surveillance form for patients who enter the service unit including inpatient care and reporting to IPCN after the patient returns home, 3) Carrying out supervision and providing the warning to nurses in the hospital service unit regarding the implementation of PPI compliance 4) Report to IPCN if there are any suspicions of nosocomial infections and other potential outbreaks of infection, 5) Conducting counselling in the service unit to patients, visitors and nurses as well as other contact officers, and 6) Monitoring and evaluating the compliance of other health workers in carrying out the PPI program in the hospital service unit.

Charalambous (1995) revealed that an IPCLN officer should be a volunteer who has motivation and interest in infection control issues, enthusiastic, and diligent. Good skills and knowledge are necessary to motivate and encourage nurses and other health care workers in the health care unit to carry out the PPI program by the latest Operational Procedure Guidelines and Standards (Charalambous, 1995; Dawson, 2003). Dawson (2003) argues that IPCLN is a pioneer or *(opinion leader)* shown by providing understanding to colleagues and can provide an example in changing behavior in the hospital service unit.

Nurses who are the largest number of health workers in the hospital, namely 40% to 60%, have a critical role in PPI efforts (Gillies, 1994). Also, nurses interact directly with patients and infectious materials and fluids in their workplace. Patient safety in hospitals by preventing accidents, injuries, or other trauma, and preventing the spread of infection is also the responsibility of a nurse (Abdellah 1960 in Tomey, 1994). So nurses have a role that determines the success of implementing PPI (Anderson et al., 2014).

One of the nursing services that is also an act of PPI is handwashing behavior. "*Global patient safety challenge* with *clean care is safe care*", which WHO initiated, made an innovative policy strategy in applying *hand hygiene* for health workers. These innovations are five crucial times for a health worker to wash their hands to optimize hand hygiene was *five moments for hand hygiene*. 5 This time is when: before examining the patient, before performing sterilization, after coming into contact with the patients body fluids, and after coming into contact with the patients objects and environment (WHO, 2006). So according to WHO, "*hand hygiene is the main measure to reduce infection"*.

Data obtained from the Haji Adam Malik Hospital Medan in 2014, nurses compliance with washing their hands was 44.31%. Likewise, at Cipto Mangunkusumo Hospital (RSCM), nurses compliance with washing hands was only about 60%. Likewise, nurses level of compliance in handwashing in the United States and Australia is still around 50% and 65% (Perdalin 2010).

The PPI Committees target, hand-hygiene at Hanau Hospital, Seruyan District, and Central Kalimantan Province is 80%. From the IPCN report data to the PPI Committee at Hanau Hospital in 2019 and the January 2020 period based on the profession, the highest was specialist doctor, 67% on average and the lowest was the midwife profession, with an average of 58%. The Compliance Rate for *Hand Hygiene for*

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paramedics at Hanau Hospital in January 2020 was 58%, decreased from 2019, which was an average of 63% (Hanau Hospital, 2020).

Seeing this background, the author will research the Relationship between IPCLN Supervision and Availability of Facilities behaviour of *Hand-hygiene* paramedics at Hanau Hospital, Seruyan District, and Central Kalimantan Province. The problems that will be studied are how the PPI programs implementation and the target problems for implementing *hand-hygiene* paramedical that the PPI Committee has set are higher than the paramedic compliance report in implementing *hand-hygiene* Hanau Hospital. This research can later provide recommendations to Hanau Hospital Management to make a PPI Program policy.

SUBJECTS AND METHOD

1. Study Design

This study used a design *cross-sectional*

2. Population and Sample

A sample of 83 paramedics at Hanau Hospital was selected for this study by total sampling.

3. Study Variables

The dependent variable was the behavior of hand hygiene paramedic. The independent variable was IPCLN supervision and the availability of facilities.

4. Study Instrument

The instrument used for data collection was a questionnaire. Researchers used part of the questionnaire used by Sarifudin in his thesis entitled "Efforts to Improve Nurse Performance in Infection Prevention and Control with Motivation and *Employee Engagement Approaches* at Pamekasan Hospital" with a validity test with a limit value of 0.444 and a reliability test with an alpha value of 0.70. The results of the variable validity test for supervision were 0.515, and the results of the variable validity test for the availability of facilities were 0.495. The reliability test results for the variable availability of facilities were 0.767, and the reliability test for the supervision variable was 0.705 (Sarifudin, 2018). Data collection was carried out at Hanau Hospital for 2 weeks in February 2020.

5. Operational Definition of Variables

Supervision was monitoring activities carried out by IPCLN on respondents related to the application of *hand-hygiene*

Facilities was availability of supporting facilities needed by respondents in applying *hand-hygiene*

Behavior of hand-hygiene was activities or actions related to the application of *hand hygiene* according to the procedure

6. Data Analysis

The data was analyzed by Chi Square. The presentation of the data in this study uses a frequency distribution table accompanied by a narrative.

7. Research Ethics

The preparations to be carried out by researchers in the research phase to avoid ethical research problems are as follows:

1. Submit a request for permission to the Director of Hanau Hospital by conveying the aims and objectives and the research implementation mechanism.
2. Maintain all confidentiality relating to information provided by the Hanau Hospital.
3. The researcher introduces himself to the respondent and explains the data collection steps.
4. The researcher will ask the respondent for information as proof of agreement that the subject is willing to participate in the research. The researcher will explain that the respondent has the right to resign without being subject to sanctions.
5. Treat all respondents equally and well during and after the research.
6. Providing comfort to respondents by following the respondents wishes regarding data collection time (still on the research deadline for the 2nd and 3rd week of February 2020).

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RESULTS

Of the 83 respondents who were sampled in this study, it was found that 56 respondents (67.5%) were women, 60 respondents (72.3%) were under 30 years old, 62 respondents (74.7%) had a D3 education, and 58 respondents (69.9%) worked for less than five years. The characteristics of all respondents are presented in Table 1.

Distribution of frequency of IPCLN supervision, availability of facilities, and hand hygiene behaviour at the Seruyan District Hanau Hospital is shown in table 2 below.

`Based on table 2, it is known that IPCLN supervision at the Hanau Hospital, Seruyan District is generally good, which was answered by 67 (80.7%) respondents and only 16 (19.3%) answered Less. Likewise, facilities availability to support the PPI program was also generally complete, which were answered by 63 (75.9%) respondents and only 20 (24.1%) respondents who answered incompletely. But there were only 48 (57.8%) respondents whose behavior *had good hand hygiene,* and 35 (42.2%) respondents had terrible behavior in doing *hand-hygiene.*

Table 1. Characteristics of gender, age, years of service, and paramedics education at Hanau Hospital, Seruyan Regency.

Variable	Frequency	Percentage (%)	Mean	SD	Min - Max
Gender					
Male	27	32.5			
Female	56	67.5			
Age			28.77	5.39	22 – 45
<30 years	60	72.3			
> 30 years	23	27.7			
Education					
D 3	62	74.7			
S 1	21	25.3			
Length of work			4.51	4.39	1 - 19
<5 years	58	69.9			
> 5 Years	25	30.1			

Table 2. Frequency distribution of IPCLN supervision, availability of facilities and behavior of *hand hygiene* paramedics at Hanau Hospital, Seruyan District.

Variable	Frequency	Percentage (%)
IPCLN Supervision		
Good	67	80.7
Less	16	19.3
Availability of facilities		
Complete	63	75.9
Incomplete	20	24.1
Hand hygiene Behavior		
Good	48	57.8
Poor	35	42.2

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Table 3. Effect of characteristics, IPCLN supervision and availability of facilities on hand hygiene behaviour at Hanau Hospital, Seruyan Regency.

Independent	Behaviour *Hand hygiene*				OR (95% CI)	p
	Good		Bad			
	N	%	N	%		
Gender					0.577	0.371
Male	18	66.7	9	33.3	(0.22 – 1.50)	
Female	30	53.6	26	46.4		
Age					1.190	0.921
<30 Years	34	56.7	26	43.3	(0.45 - 3.17)	
> 30 years	14	60.9	9	39.1		
Education					1.254	0856
Nursing D3	35	56.6	27	43.5	(0.46 – 3.46)	
S1 Nursing	13	61.9	8	42.2		
Length of work					1.136	0.984
<5 years	33	56.9	25	43.1	(0.44 – 2.95)	
> 5 years	15	60.0	10	40.0		
IPCLN supervision					35.250	0.000
Good	47	70.1	20	29.9	(4.36 – 285.22)	
Less	1	6.3	15	93.8		
Availability of Facilities					24.353	0.000
Complete	46	73.0	17	27.0	(5.10 – 116.26)	
Incomplete	2	10.0	18	90.0		

Table 4 The results of the Logistic Regression Test for variables that affect the hand hygiene behavior of paramedics at Hanau Hospital, Seruyan Regency.

Variable	B	OR (Exp.B)	95% CI	P-value
Supervision IPCLN	2,857	17 417	1935-156784	0011
Facility Completed	2616	13 686	2620-71491	0002
Constant	-4216	0015		

Based on Table 3, the surveillance carried out by IPCLN (OR = 35.25; CI: 4.36 to 258.22), and the availability of facilities (OR = 24.35; CI: 5.10 to 116.26) are statistically considered to have a major impact on the conduct of paramedical hand hygiene at the Hanau District Hospital.

The results can interpret that paramedics who have been supervised by the IPCLN are likely to do 35.25 times better hand hygiene than paramedics who have not been supervised and the hand hygiene conduct of paramedics is likely to increase 24.35 times when the availability of facilities

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to help the PPI full appeal program is incomplete.

The results of multivariate analysis using logistic regression in table 4 show that the dominant variable affecting the behavior hand hygiene paramedicat Hanau Hospital, Seruyan Regency is the supervision of IPCLN on nurses (B = 2.86; OR = 17.42; 95% CI: 1.94 to 156.79; p = 0.011) together with the variable of the availability of supporting facilities for the PPI program (B = 2.62; OR = 13.69; 95% CI: 2.62 to 71.49; p = 0.002). The logistic regression model is stated as follows: Logit (behavior hand-hygiene paramedic) = -4.22 + 2.86 (supervision by IPCLN) + 2.62 (availability of facilities) + e.

DISCUSSION

In this study, 67.5% of respondents were women. This shows that nurses are in great demand by women. In contrast to research conducted by Yuliana (2012) at RSKO Jakarta on nurses compliance with standard precautions, that most respondents are men (65%) (Yuliana, 2012). This study revealed no significant differences between male and female respondents in behavior *hand-hygiene* (OR = 0.58; 95% CI: 0.22 to 1.50; p = 0.371). Gender did not have a significant relationship with behavior *hand-hygiene* paramedic (p = 0.371).

Yuniartas research (2011) states that performance in the application of correct standard operating procedures is closely related to the respondents age factor, where older workers tend to show more good working abilities. (Yuniarta, 2011). Likewise, this study shows that older people are more compliant in implementing *hand-hygiene* at the Seruyan District Hanau Hospital (60.9%) (OR = 1.19; 95% CI: 0.45 to 3.17; p = 0.921). These results are consistent with the study of Efstathiou *et al.,* In *"Compliance of Cypriot nurses with Standard Precautions to avoid exposure to pathogens"* which concluded that "the *standard of prevention for avoiding exposure to pathogens is related to age and frequency of nurse adherence where age is considered a determinant of frequency. Standard compliance with universal precautions*"(Efstahiou *et al.,*2011). But in this study, the respondents' age did not significantly affect the behavior of *hand hygiene* nurses (p = 0.921).

In this study, most of the respondents had a D3 education (74.7%), but respondents who had good behavior in implementing *hand hygiene* were more significant for respondents with an undergraduate education (61.9%) and 1.25 times better than those with a D3 education (OR = 1.25; 95 % CI: 0.46 to 3.46; p = 0.856). This result is in line with Gilmer's opinion in Suhaeni (2003) which states that "the *higher the level of education of a person, the better he behaves. Highly educated people will be more rational and creative and open to accepting various reform efforts*. But in this study, the level of education did not affect the behavior of *hand hygiene* nurses (p = 0.856).

In this study, 58 (69.9%) respondents had a working period of less than 5 years and 25 (30.1%) respondents who had more than 5 years. This is because the Seruyan District Hanau Hospital is also relatively new. The working period of this respondent is a relatively short time. Following Marnitas (2015) research conducted at PKU Muhammaddiyah Yogyakarta Hospital, it was found that most doctors worked in less than 10 (ten) years as much as 73.5%. The length of time worked is very short (Marnita, 2015).

The results of this study also found that respondents who had behavior *hand hygiene* good were more respondents who had a more extended working period (60.0%), namely, 1,136 times compared to respondents who had a service period of <5 years (56.9%) (OR = 1.14; 95% CI: 0.44 to 2.95). But the length of work did not significantly affect the behavior of *hand hygiene* nurses (p = 0.984). This is not in line with the research results conducted by Yuniarta in 2011, which stated that "the *length of work influenced respondents in providing hope and motivating respondents in serving patients. Doctors who have worked for more than ten years will influence the insights and patterns of health*

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service delivery, and also affect their knowledge, attitudes, needs and desires as well as their motivation in providing quality health services"(Yuniarta 2011).

The supervision carried out by IPCLN (OR = 35.25; CI: 4.36 to 258.22) significantly influenced *hand-hygiene* paramedical at Hanau Hospital, Seruyan Regency with p value <0.001. It can be interpreted that nurses who are appropriately supervised by IPCLN have a better chance of performing *hand-hygiene* 35.25 times than nurses who are not supervised. The results of this study are the same as the research that had been conducted at the Pertamina Central Hospital by Lindawati in 2001, namely that supervision influenced the perception of the nurse in charge of PPI efforts in the Inpatient Room of Pertamina Central Hospital Jakarta p (0.000) <0.05 (Lindawati 2001). Fuadi research in the Surgical Ward at Zainul Abidin Hospital Banda Aceh in 2009 also stated the same thing, namely that supervision had a significant relationship with the risk of infection p (0.000) <0.05 (Fuadi, 2009)

Supervision is a series of managerial activities that must be carried out by each leader. or managers of all service units for the implementation of work in their environment (Moenir, 2010). Moenir also said that a lack of management supervision could cause the infection. The lack of the number of programs and the lack of standards imposed in the program and the failure of paramedics to meet the standards of a program are the causes of the lack of management supervision (*Lack of control Management)* (Moenir HAS 2010).

Green (1980) revealed that nurses work according to their wishes, not according to standard operating procedures. Someone will obey when supervised, if supervision is lax, then someones behavior will tend to return to normal. This means that the paramedics will be less likely to prevent nosocomial infections (L. Green & C \ Kreuters 2006).

The results of a multivariate analysis using logistic regression showed that the dominant variable affecting the behavior of *hand hygiene* nurses at Hanau Hospital, Seruyan District was the supervision of IPCLN towards nurses (B = 2.86; OR = 17.42; 95% CI: 1.94 to 156.78; p = 0.011)

Availability of facilities (OR = 24.35; CI: 5.10 to 116.26) has a significant relationship with the behavior of *hand-hygiene* paramedics at Hanau Hospital, Seruyan Regency p-value <0.001. It can be interpreted that the behavior *hand hygienic* of nurses is likely to increase 24.35 times if the availability of facilities that support the PPI program is complete compared to the availability of facilities that support the PPI program is incomplete. In other words, the more complete the infrastructure in the hospital, the more nurses will be obedient to carry out *hand hygiene*. The same thing is also expressed by Green and Kreuters in their book that "*the supporting factors for the formation of new behavior for health workers, namely: the availability of infrastructure, facilities, human resources and skills"* (L. Green & C \ Kreuters 2006).

Efstathiou who examined the factors affecting nurses compliance with standard precautions to avoid exposure to microorganisms also revealed the same thing, namely: "*a Cypriot focus group study with the results that knowledge, time, equipment means, distance, tools, lack of training affected nurse adherence. Apply standard precautions for exposure to microorganisms* "(Efstathiou, 2011).

Multivariate analysis using logistic regression, also showed that the dominant variable influencing behavior *hand-hygiene* at Hanau Hospital, Seruyan Regency was the availability of supporting facilities for the PPI program (B = 2.62; OR = 13.69; 95% CI: 2.62 to 71.49; p = 0.002) with all the characteristics of the respondents as the independent variables being controlled for.

Based on the study results, it was concluded that the supervision by IPCLN of nurses and the availability of supporting facilities for the PPI program had a significant relationship with *hand-hygiene* paramedics at Hanau Hospital, Seruyan

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district. The most dominant factor was the supervision carried out by IPCLN for paramedics. The respondents characteristics did not have a significant behavior *relationship with the hand hygiene* paramedic at the Seruyan District Hanau Hospital. Several things that can be recommended related to this study results are 1) So that the PPI Committee at the Seruyan District Hospital of Hanau is more intense in carrying out tiered supervision, especially from IPCLN to paramedics in the service unit. 2) The management of Hanau Hospital still needs to complete the supporting facilities and infrastructure for the PPI program according to the Standards and SOPs signed by the PPI Committee and the Hospital Director. 3) Paramedics at the Seruyan District Hanau Hospital should always carry out *hand hygiene* at every opportunity to maintain hand hygiene when: before examining a patient, before acting, after coming into contact with body fluids and examining the patient, and after coming into contact with objects and around patients to become a work culture at the Seruyan District Hanau Hospital.

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