Personnel Characteristics and Comprehensiveness of Hospital on Handwashing Compliance

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Abstract: The results of the 2018 prevention of infection control (PIC) committee regarding compliance with the application of hand washing by doctors 53.3%, nurses 47.9% and other health workers 35.6% against a minimum service standard of 85%. This condition is thought to be caused by individual characteristics and hospital completeness (the role of PIC, and completeness of facilities and infrastructure). The purpose of this study was to analyse the relationship between individual characteristics, the role of PIC and the completeness of facilities and infrastructure to nurse compliance in the application of hand washing. This research was conducted through a cross sectional survey approach with a population of 113 nurses with simple random sampling technique. Data were collected through questionnaires and analysed with univariate, bivariate and multivariate (using multiple logistic regression) methods. The results of the study of nurses less adherent to washing their hands 64.6% and 35.4% obedient. Individual characteristics (knowledge p = 0.003 and attitude p = 0.002), the role of PPI (p = 0.002), and completeness of facilities and infrastructure (p = 0.017) were related to the compliance of nurses washing hands. It can be concluded that individual characteristics, the role of PPI, and the completeness of facilities and infrastructure were an essential factors in improving compliance with the implementation of hand hygiene.

1 INTRODUCTION

Healthcare Associated Infections (HAIs) are infections in patients who have not been seen or are not incubating when the patient first enters or occurs during a patient being hospitalized for more than 48 hours, which does not appear at the time of hospital admission or health care others (WHO, 2010).

The results of surveillance of infectious diseases resulting from health services namely Healthcare Associated Infections (HAI's) in US hospitals in 2013 reached 721,800 cases from 183 hospitals studied and as many as 75,000 patients died while receiving treatment at the hospital (CDC, 2014).

The Indonesian Infection Control Association conducted a prevalence point survey of 11 hospitals in Jakarta's Capital Region in 2010, showing the HAI's incidence rate, namely surgical injury Infection of 18.9%, infection that occurred in the urinary canal of 15.1%, infection in primary blood flow of 26.4%, pneumonia 24.5% and infections in other airways 15.1%, and other infections 32.1% (Perdalin, 2010).

Hospitals in the city of Medan, among others, Haji Adam Malik Regional Hospital, have clean surgical post-operative wound infections with a prevalence rate of 5.6% (Nirbita, 2017). The high incidence of HAI's indicates that transmission is still quite high and is a threat to hospital services.

The lack of quantity and quality of hospital infection control is closely related to compliance with hand washing. According to the World Health Organization (WHO) that compliance with hand washing of health workers can control or control the incidence of infection (WHO, 2014).

The level of compliance with hand washing in developed countries such as the United States has not been as expected, reaching 50%. The level of compliance of nurses' hand hygiene did not differ greatly at the Marmara University Hospital in Istanbul reaching 43.2% (Karaaslan, et al, 2014).

Damanik Research (2012) and Pratama (2015) at two hospital locations in Indonesia, Imanuel Hospital Bandung and RSUD dr. Iskak, where the level of compliance of nurses carrying out hand washing did not reach half of the proportions of 48.3% and 36%.

The level of nurse compliance adheres to hand hygiene is influenced by three factors: first, the individual characteristic factors consist of

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understanding, response, being busy due to heavy workload. Second, organizational support factors consist of standard operating procedures, rewards, sanctions, training activities and adequate facilities / infrastructure support, third, behavioral factors consist of trust, confidence and other social support. Another important thing is the role of the prevention of infection control (PIC) committee in increasing understanding to improve nurse compliance in the application of hand washing for hand hygiene (Pittet, 2001; David, 2010; Turnip et al, 2020; Wijaya et al, 2019).

Karadag Research (2016); Jemal (2018); White (2019); and Gon (2020) state knowledge, friend suggestions, perceptions and beliefs, practices, and consumables as determinants of hand hygiene. Furthermore Shobowale research (2016); Kupfer (2019): that the availability of facilities (easy access) can improve hand washing hygiene.

Sands (2010), using the Behavior Centered Design (BCD) theory related to behavioral change interventions in improving hand washing compliance, namely reporting hand hygiene, implementing hand washing by peers, increasing interaction with patients and other staff members, reducing stress, busyness, and burdens cognitive related to the task.

Farhaoudi (2016) reviewed the WHO Multimodal Hand Hygiene Improvement Strategy consisting of: 1) system changes to ensure access of health care workers to hospital facilities with an approach to the availability of alcohol-based hand washing facilities in the service rooms, 2) training and continuing education, 3) evaluation and feedback, 4) reminders at work, and 5) providing safety climate through IPC agencies. After intervention by carrying out and providing a Strategy to Improve Hand Hygiene in the service room, where the proportion of hand rubbing behavior (18.1%) and hand washing (11.5%), there was an increase in hand rubbing (18.1%) and hand washing 11.5%) was much better among health workers (p 0.001 <0.05). Zhao (2018) examines 5 aspects of the theory of Diffusion of Innovation Theory (DIT): relative advantages, compatibility, simplicity, testability, and observability significantly influence hand washing practices.

A similar study by Boyce and Pittet (2011) states that one of the obstacles in non-compliance with washing hands is the difficulty of accessing a place to wash hands or other tools used to wash hands. Ease of accessing supplies of tools for washing hands, sinks, soap or alcohol jell is very important to make compliance according to standards. Other research was conducted by Shobowale (2016); and Kupfer (2019): stating the availability of hand washing

facilities or the ease of gaining access to hand washing affects the cleanliness of hand washing.

Nurse hand washing compliance audit results at the Royal Prima Hospital Medan in 2018 by the PIC Committee with 53.3% doctor compliance, 47.9% nurses and other health workers 35.6%.

Compliance is not in accordance with Minimum Service Standards> 85%. Research is important because hand hygiene is the duty and responsibility of nurses and is cheap and easy to do to avoid infection in hospitals, it only takes a strong desire and willingness to implement. But in reality, this habit has not gone according to expectations.

Previous studies generally used quantitative research designs or types, mix methods, semi-experiments with cross sectional accuracy. Theory used by Behavior Centered Design (BCD) by Sands (2010); Diffusion of Innovation Theory (DIT) by Zhao (2018); Multimodal Hand Hygiene Improvement Strategy by Farhaoudi, 2016) and other behavioral theories. Statistical tests use correlation and comparison (t-test) with intervention.

This research is a quantitative research. In this study the focus is more on the determinants of hand washing hygiene developed by Pittet. The study results have contributed a lot to WHO and certainly to different loci. This study uses a survey with a cross sectional approach (data collection uses a questionnaire and a checklist) which the observations were simultaneously carried out. The variables were measured after data collections. The data were analyzed with univariate, bivariate and multivariate (multiple logistic regression) methods to prove the hypothesis.

2 METHOD

The study was conducted using inpatient nurses as respondents in Royal Prima Hospital Medan as many as 319 people and a sample of 113 nurse respondents using a different hypothesis test proportion of one sample. The sample technique uses simple random sampling through lottery. Data collection by distributing closed questionnaires and observations for 30 days in March 2020.

The questionnaire using the Guttman scale consists of knowledge totalling 10 with alternative answers (true or false) grouped (good = 2 and not good = 1), attitudes of 10 questions (agree and disagree) categorized (positive = 2 and negative = 1), roles PIC 15 statements (yes and no) are grouped (support = 2 and less support = 1). Observation of the completeness of facilities and infrastructure with a

checklist of 7 items, alternative answers available and absent, consisting of: sink, liquid soap, paper towels, antibacterial liquid, free of inappropriate equipment, bins, and posters are grouped (complete = 2 and incomplete = 1). Observation of hand washing hygiene 5 moments and 6 steps are grouped (obedient = 2 and disobedient = 1). Before the data was processed, the instrument validity and reliability tests were performed.

The results of the validity test obtained the value of the calculated r coefficient in the range 0.472-0.913 is greater than r table, (0.361), it is assumed that the data is normally distributed. Cronbach alpha value count 0.929, 0.950, 0.950, 0.955, 0.902 and 0.854 greater than 0,700 (determination), it is assumed that the questionnaire is said to be reliable.

After the data is collected, it is processed by collecting, checking, coding, entering and processing. Furthermore the data were analyzed through univariate (descriptive), bivariate with chi square and multivariate tests using multiple logistic regression tests at the 5% level. The Research procedure is shown in Figure 1.
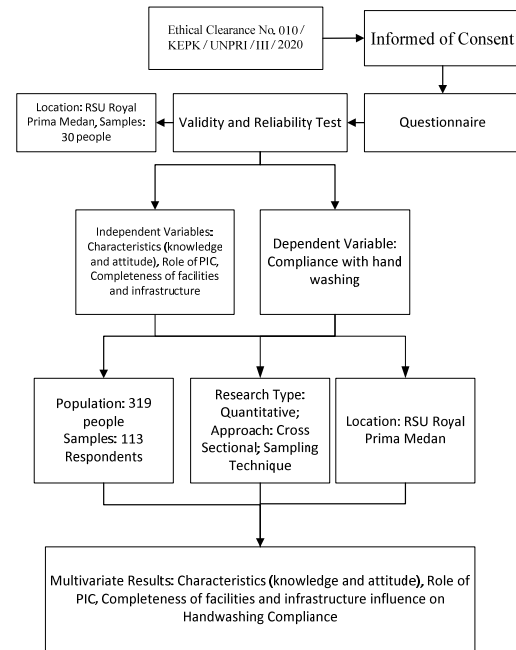
3 RESULTS AND DISCUSSION

Analysis of the research questionnaire based on the category is dummy (2 groups) with a mean or average = 1.5, where the variable above the average is knowledge (1.54), the role of PPI (1.58), while below the average is the attitude variable about hand washing hygiene (1.45%), completeness of facilities and infrastructure (1.44) and compliance with the application of hand washing (1.35%). Measurement results of the research variable questionnaire. The results of data analysis are described as follows.

3.1 Univariate Analysis

Respondents with good prioritization knowledge (54%), being negative about washing hands (54.9%), supporting PIC's role (58.4%), incomplete facilities and infrastructure (55.8%) and poor compliance with hand washing (64) , 6%).

Figure 1: Scheme of Research Procedure.

3.2 Bivariate Analysis

In Table 3, the results of the bivariate analysis explain the variables of knowledge (0.006), attitude (0,000), the role of PIC (0,000) and the completeness of facilities & infrastructure (0.002) having a p value less than 0.05. This means that the knowledge, attitude, role of PIC and the completeness of facilities & infrastructure are related to compliance with hand washing.

Table 2: Distribution of Research Variables.

Knowledge	n	%
Not good	52	46,0
Good	61	54,0
Attitude		
Negative	62	54,9
Positive	51	45,1
Role of PIC		
Not supported	47	41,6
Supported	66	58,4
Facilities & infrastructure	n	%
Not Complete	63	55,8
Complete	50	44,2
Compliance washing hands		
Not Obedient	73	64,6
Obedient	40	35,4

3.3 Multivariate Analysis

Table 3, Multivariate analysis results explain the variables of knowledge (OR 5.149; p 0.003), attitude (OR 5.176; p 0.002), the role of PIC (OR 6.156; p 0.002) and the completeness of facilities & infrastructure (OR 3.293; p 0.017) p was smaller than 0.05. This means that the knowledge, attitude, role of PIC and the completeness of facilities and infrastructure have a positive effect on the compliance of nurses' washing hands. Based on the OR value, the PIC role variable was 6.156, which means that the support role of the PIC tends to 6.156 times that nurses obey wash their hands rather than the role of PIC less supportive.

Table 3: Bivariate and Multivariate Analysis Results.

Variables	Bivariat	Multivariat	
		OR	Sig
Knowledge	0,006	5,149	0,003
Attitude	0,000	5,176	0,002
Role of PPI	0,000	6,156	0,002
Infrastructure	0,002	3,293	0,017

Based on the research results in the table 3, the findings can be analysed as follows. The relationship of knowledge to nurse compliance in the application of hand washing. There was a link between knowledge and compliance with the application of hand washing. Based on the OR value of 5.149 which means that the support role of PPI tends to 6.156 times nurses obediently wash their hands rather than the role of PPI is less supportive.

In line with the results of Khairiah's research (2012); Ananingsih and Rosa (2016) explained that knowledge influences the level of compliance of nurses in using personal protective equipment including washing hands. The minimal moment of hand washing is caused partly by the lack of knowledge about the importance of hand washing and hand washing techniques. Other similar studies by Karadag (2016); Jemal (2018); White (2019); and Gon (2020) state that knowledge influences the hygiene of the hands of health workers. In the study it can also be explained that nurses with good knowledge are more obedient in washing their hands. However, it is also possible for nurses who have good knowledge but are not compliant to apply good hand washing due to busyness or workload that is quite a lot so that without deliberate neglect of washing hands before and after touching patients.

3.4 Attitudes of Hand Washing

There was a relationship between attitudes towards compliance with the application of hand washing. Based on the OR value of 5.176 which means that a positive attitude tends to 5.176 times the nurse submissive to washing hands rather than the negative attitude.

A similar study by Ernawati (2014) said nurses before and after providing health services to patients, nurses have not complied with hand washing in the inpatient room. Karadag (2016) said that moderate perceptions and beliefs in nurses and students can improve hand hygiene to avoid infectious diseases. To increase nurses ability to apply hand washing, the head of the Inpatient Installation instructs each head of the room to reprimand the nurse who is not compliant to wash hands. In addition, learning models need to be carried out through a 5-moment hand washing campaign and 6 steps of hand hygiene throughout the inpatient room held every 6 months.

3.5 Role of PPI on the Application of Hand Washing

It was obtained a link between the role of PIC on compliance with the application of hand washing. Based on the OR value of 6.156 which means that the role of PIC that supports tends to 5.176 times nurses obediently wash their hands. From the role of PIC was less supportive as a dominant factor because the OR value was greater than other variables. According to Boyce and Pittet (2011) that nurses in hospitals have not complied with the precautions of HAI influenced by the provision of Educational activities or training has not been continuous as a form of PIC's role.

The role of PIC in improving nurses' ability to apply handwashing hygiene through training activities. Farhaoudi's research (2016) explains that ongoing training and education can affect nurses hand hygiene compliance. In this study also explained that nurses stated that the role of PIC was supportive so that it could cause nurses to obediently wash their hands. However, there were nurses who stated that the role of the PIC committee was supportive, but nurses did not obediently wash their hands. These was because nurses have attended training so that understanding and response to hand hygiene appropriately with 6 stages. The need for a hospital management to implement training for nurses who have not yet attended training, especially a new nurses.

3.6 Facilities and Infrastructure

There was a correlation between the completeness of facilities and infrastructure to the compliance of the application of hand washing. Based on OR value of 3,293 which means that complete facilities and infrastructure tend to be 3,293 times nurses obediently wash their hands rather than incomplete facilities and infrastructure. A similar study by Boyce and Pittet (2011) states that one of the obstacles in non-compliance with hand washing is the difficulty of accessing a handwashing area or other supplies used for washing hands. Ease of accessing supplies of tools for washing hands, sinks, soap or alcohol jell is very important to make optimal compliance according to standards.

Other research was conducted by Shobowale (2016); and Kupfer (2019): stating the availability of hand washing facilities or the ease of gaining access to hand washing affects the cleanliness of hand washing.

The results of these observations can explain that PIC's efforts to provide handwashing equipment such as washbasins have not been optimal, so that the completeness of hand washing facilities was incomplete due to PPI supervision in monitoring nurses who in charge of providing hand washing facilities in the sink. This factor can prevent nurses from doing hand washing of 5 moments and 6 stages which recommended by the hospital.

The availability of complete facilities in the sink, can't guarantee the implementation of 5 moments running well. Facts in the field, there were nurses who have not washed their hands in accordance with the SOP in the hospital. The need to monitor the performance of nurses implementing hand washing by placing Closed Circuit Television (CCTV) in each inpatient room to assess and monitor the hand washing program.

4 CONCLUSIONS

Statistically the individual characteristics (knowledge $p = 0.003$ and attitude $p = 0.002$), the role of PPI ($p = 0.002$), and the completeness of facilities and infrastructure ($p = 0.017$) correlate to the compliance of handwashing nurses. It is recommended that hospital management increase nurses' awareness through socializing 5 moments with 6 stages and completing facilities and infrastructure and applying administrative sanctions or verbal reprimands to health workers if 3 times are not compliant.

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