

APPLICATION OF COOPERATIVE LEARNING METHODS FOR INCREASING HAND HYGIENE KNOWLEDGE AND ACCURACY AT EMERGENCY INSTALLATION OF WONOSARI STATE HOSPITAL, YOGYAKARTA, INDONESIA

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Abstract: *Hand washing with soap is the cheapest and most effective health intervention to reduce the risk of transmission of Healthcare Associated Infections (HAIs). However, the implementation of hand hygiene (HH) usually low. This study aims to improve the knowledge and accuracy of the HH procedure improvement by using cooperative learning methods at the Emergency Installation of Wonosari Regional Hospital. This research is a quantitative research with Quasi-Experiment by pre-test and post-test design. There were 30 healthcare workers (HCW) obtained with the total sampling technique. Univariate and bivariate data analysis using paired t-test analysis. The results showed that there were differences in knowledge before and after being given training with a significant value of 0.002 ($p < 5\%$). There were differences in the accuracy of HH procedure before and after being given training at emergency installation with a significant value of 0.002 ($p < 5\%$). Our study suggests the need for continuity evaluation and innovative activities to refresh the knowledge and skills of HCW in order to improve their behavior on HAIs prevention.*

BACKGROUND

HAIs existing throughout the world reach 9% - 21% or mentioned more than 1.4 million inpatients in hospitals in the world that contain HAIs in them. While. There are 8.7% of the HAIs from 55 hospitals in 14 countries from the Middle East, Europe, Asia Pacific and the Southeast Asia region as much as 10.0% .⁴⁷ Indonesia is one of countries with the highest numbers in HAIs incident. Data of Hais incidents in Indonesia which we can see based on surveillance data carried out by the Republic of Indonesia Health Department in 1987 in 10 education hospitals obtained that HAIs according to the Ministry of Health of Republic of Indonesia which is 6-16% with an average value of 9.8% and there were research conducted at 11 hospitals in DKI Jakarta in 2004, which showed that 9.8% of inpatients received new infections during hospitalization (Balaguris, 2009).

Infections that occur due to triangular epidemiological interactions that we often know as epidemiological trias are: host (host), environment and agent (micro organism/bacteria). All microorganisms including bacteria, viruses, fungi and parasites that can cause HAIs. HAIs can be caused by microorganisms from patient's body or caused by the normal flora of the patient (Maryani & Muliani, 2010). The majority of hospital-acquired infections are caused by external factors, namely the transmission of microorganisms through objects that are contaminated with microorganisms or not sterile, including from the hands of health workers who are less clean due to not implementing hand hygiene guidelines properly (WHO, 2009).

We know that there are germs in the soil, air, objects, water and in the body of every human being which is found on the palms, fingertips and under nails for example *Salmonella sp*, *E.coli*, *Clostridium perfringens*, *Shigela sp*, *Giardia lamblia*, and *hepatitis A virus*

(Synder, 1988). The normal flora microorganisms that are not pathogens are often found in the skin such as *Staphylococcus epidermis*, *Staphylococcus coagulase*, *Corynebacterium* (Trampuz & Widmer, 2004), while the normal flora that are pathogenic are *Staphylococcus aureus* (Synder, 2001). The presence of invisible or micro-sized germs often makes us not aware of the negative effects of various diseases that can be caused (Rachmawati & Triyana, 2008). As for some of the most common bacteria that cause HAIs are *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsiella pneumonia*, and *Enterobacter spp*. Based on these data the most common pathogenic causes of HAIs are *Escherichia coli* and *Staphylococcus aureus* (Zulkarnain, 2009).

Infectious diseases can also spread in medical practice areas, namely the spread of indirect contact from tools, medical materials and medical service places with individuals or direct contact between humans and humans (Wibowo, et al., 2009). Prevention and control of infections in hospitals and other health care facilities is a service quality standard and is important for patients, health workers and hospital visitors. Infection control must be carried out by all hospitals and other health facilities to protect patients, health workers and visitors from the incidence of infection.

Infection prevention and control is absolutely necessary for nurses, doctors/dentists including prospective doctors and all people involved in patient care. One way/effort that can be done to prevent the occurrence of HAIs is by decontaminating the hands where transmission of the disease through the hands that can be minimized by maintaining hand hygiene though washing hands (MOH, 2007). Hand-washing or hand hygiene treatment is an effective disease transmission prevention measure to break the chain of spread of infection, so that the incidence of HAIs can be reduced.

One of the standard components of awareness and effort to reduce HAIs is to use the correct hand hygiene guidelines and implement them correctly and effectively (WHO, 2002). The habit of washing hands does not arise spontaneously, but must get used to it from childhood. In childhood is the best time to educate themselves and their environment while teaching a clean and healthy lifestyle (Batanao, 2008).

The role of hands as an intermediary medium for the spread of pathogenic germs, good and right hand-washing behavior is expected to provide good feedback, namely in preventing transmission of germs through individual hands. Several studies have suggested that doctors and medical staff perform medical services that clean their hands with hand-washing behavior to prevent the transmission of pathogenic germs when before and after the examination and medical services to patients can reduce the number of hospital HAIs (Teare, 1999). Hand-washing behavior is the simplest act that we usually do everyday but has good benefits. The behavior of hand-washing can remove impurities contained in the hands so that hand-washing behavior can reduce the number of pathogenic germs in the hands (Girou, et al., 2002).

The behavior of hand-washing with soap is the cheapest and most effective health intervention compared to the results of health interventions in other ways in reducing the risk of transmission of various diseases (Fewtrell, et al., 2005). Therefore hand hygiene by washing hands needs to be given high priority, because washing hands with soap as a cleanser, rubbing, and rinsing with running water will wash away dirt particles that contain lots of microorganisms (Fatonah, 2005).

Based on the results of the Water and Sanitation Study Program on Hygiene Behavior explained that the behavior of Hand-washing with Soap (CTPS) has not become generally applied (USAID, 2006), and also stated that the national prevalence

rate on correct behavior in hand-washing reached 23.2% (MOH RI, 2008). The habit of Indonesian people in washing hands with soap is still relatively low, the indication can be seen with the high prevalence of diarrheal diseases (MOH, 2008) and an average of only 12% of people who wash their hands using soap (Ministry of Health, 2010). Of the 99.6% medical students know the correct hand-washing procedure, in reality only 52.9% of them consider it to be the most important preventive measure for controlling infection (Huang, et al., 2013). Hand-washing is a simple act, but the lack of appropriateness of health care providers is a problem throughout the world (WHO, 2009).

Another study that conducted research on the level of appropriateness of hand-washing of health workers in the intensive care unit (ICU) of Pantai Indah Kapuk Hospital in North Jakarta where the results showed that the highest level of appropriateness of hand-washing behavior was nurses 43%, doctors 19% and other health workers 28% (Jamaluddin, et al., 2012), while the results of the study of differences in compliance rates and the appropriateness of hand-washing of health workers in Kariadi General Hospital Semarang resulted in 31.31% compliance with hand-washing, 21.22% resident and 21.69 Co Ass. % (Suryoputri, 2011). The level of compliance and appropriateness of hand-washing among students of the medical profession education program at the Faculty of Medicine Denpasar Udayana University is also still low, as showed by data from Sanglah General Hospital Denpasar shows the level of hand-washing compliance in April - June 2014 was 24.32%, the period July - September 2014 was 44, 83%.

Infection can occur in all people who come into contact with patients including medical personnel at the Emergency Unit (IGD) of RSUD Wonosari, Gunungkidul, Yogyakarta. This

is because medical personnel always contact both directly and indirectly with microorganisms in the patient's saliva and blood. The spread of infection can be spread through the transmission of microorganisms from blood serum and from unclean hands. This can cause the service in the ED is very high risk, especially in dangerous infectious diseases / HAIs (Healthcare Associated Infection) caused by pathogenic and viral germs from patients and vice versa when performing their duties in the Emergency Unit (IGD) of RSUD Wonosari, Gunungkidul, Yogyakarta.

With the aforementioned problems, it encourages researchers to conduct research on the implementation of cooperative learning methods in increasing knowledge and appropriateness of hand-washing in the Emergency Unit (IGD) of the RSUD Wonosari. This research will be realized by cooperative learning method, which is a method in which the researcher will conduct monitoring which later the results of the monitoring will be intervened with several treatments, one of which is counseling. This method is expected to be able to increase the knowledge and appropriateness of hand-washing in the environment of medical personnel using 6 steps according to WHO (2013).

RESEARCH RESULT

1. Univariate Analysis

a. Frequency Distribution Knowledge of Health Workers on Hand-washing

1) Knowledge of Health Workers Before Counseling (Pretest)

Frequency distribution for knowledge of health workers before being given Hand-washing Counseling can be seen in Table 4.1 below:

Table 4.1. Results of Frequency Distribution Knowledge of Health Workers before Counseling

No.	Category	Total (f)	Percentage (%)
1.	Good	23	76,7
2.	Adequate	7	23,3
Total		30	100

Resource: Primary Data processed, 2018

Of the 30 health workers, knowledge of health workers before hand-washing was mostly in the good category as many as 23 respondents (76.7%) and adequate category as many as 7 respondents (23.3). These results can be concluded that the knowledge of health workers before being given hand-washing is good but there are still some respondents who are still knowledgeable enough.

2) Knowledge of Health Workers After Counseling (Posttest)

Frequency distribution for knowledge of health workers after being given Hand-washing counseling can be seen in the following table 4.2:

Table 4.2. Results of Frequency Distribution Knowledge of Health Workers After Counseling

No.	Category	Total (f)	Percentage (%)
1.	Good	29	96,7
2.	Adequate	1	3,3
Jumlah		30	100

Resource: Primary Data processed, 2018

Of the 30 health worker, the Knowledge of Health Workers after being given counseling washing hands the majority were in the good category as many as 29 respondents (96.7%) but there was still 1 respondent (3.3%) in the adequate category.

b. Frequency Distribution Accuracy Of Health Workers Level on Hand-washing

1) Accuracy Of Health Workers Before Providing Counseling (Pretest)

Frequency distribution for accuracy of health workers before being given Hand-washing counseling can be seen in table 4.3 below:

Table 4.3. Results of Distribution of Frequency Accuracy of Health Workers Before Providing Counseling

No.	Category	Total (f)	Percentage (%)
1.	Appropriate	9	30,0
2.	Inappropriate	21	70,0
Total		30	100

Source: Primary data processed, 2018

Of the 30 health workers, the accuracy of health workers before being given hand-washing was mostly in the inappropriate category as many as 21 respondents (70.0%) and the appropriate category was 9 respondents (30.0%). These results can be concluded that the accuracy of health workers before being given Hand-washing counseling is not appropriate.

2) Accuracy of Health Workers After Counseling (Posttest)

Frequency distribution for the accuracy of health workers after being given Hand-washing counseling can be seen in Table 4.5 below:

Table 4.4. Results of Distribution of Frequency Accuracy of Health Workers After Counseling

No.	Category	Total (f)	Percentage (%)
1.	Appropriate	30	100

Total

30

100

3. Bivariate analysis

Source: Primary data processed, 2018

Of the 30 , the accuracy of health workers being given counseling all respondents were in the appropriate category of 30 respondents (100%). These results can be concluded that the accuracy of health workers after being given Hand-washing Counseling is appropriate.

2. Normality test

Before conducting a different test analysis, the normality test is done first using Shapiro-Wilk (data amounting to less than 50) to test whether the data distribution is normal or not. The results of the normality test can be seen based on the following table 4.5:

Table 4.5. Normality Test Results

Variable	P value	Info
Pretest knowledge	0,011	Abnormal
Posttest knowledge	0,000	Abnormal
Pretest Appropriateness	0,000	Abnormal

Source: Primary data processed 2018

Shapiro-Wilk results obtained the P value of pretest knowledge as of 0.011 <0.05, posttest knowledge of 0.000 <0.05 and pretest compliance of 0.000 <0.05 so that the data is said to be abnormally distributed. The results of pretest and posttest were abnormally distributed, so the hypothesis test analysis used the Wilcoxon Signed Ranks Test.

The results of the pretest and posttest knowledge on hand-washing are seen in the table below:

Table 4.6 Test Table of Wilcoxon Signed Ranks to Test Level of Knowledge on Hand-washing

Variable	Mean Rank	Sig	Ket.
Pretest knowledge	11,83	0,002	Significant
Posttest knowledge	13,17		

Source: Primary data processed 2018

Table 4.6 shows that the comparison picture of posttest < pretest score is 3 people, posttest score > pretest is 20 people and posttest = pretest is 7 people with mean rank score at the time of pretest knowledge is 11.83 while at posttest is 13.17 . So that the posttest score is higher than the pretest with a significant gain of 0.002 (p <0.05), it can be seen that there are significant differences in the results of pretest and posttest on the level of knowledge on hand-washing by conducting counseling. These results prove that after the intervention, Ho's hypothesis is rejected and Ha is accepted. This means that there is a difference in the knowledge of health workers in the implementation of hand-washing before and after being given counseling at the Emergency Unit (IGD) of RSUD Wonosari.

Table 4.7 Wilcoxon Test Table Signed Ranks Test Appropriateness on Hand-washing

Variable	Mean Rank	Sig	Ket.
Pretest Appropriateness	0,000	0,000	Significant
Posttest Appropriateness	11,00		

Source: Primary data processed 2018

The results of the analysis showed that there was no posttest <pretest value, but overall the appropriateness score after counseling was higher than the pretest as many as 21 people with a mean rank value at the time of pretest hand-washing appropriateness of 0,000 while at posttest was 11.00. Significant value obtained 0,000 ($p < 0,05$), it can be seen that there are significant differences in the results of pretest and posttest on the level of nurses' appropriateness about washing hands by conducting counseling. These results prove that after the intervention, Ho's hypothesis is rejected and Ha is accepted. This means that there is a difference in the accuracy of health workers in the implementation of hand-washing before and after being given counseling at the Emergency Unit (IGD) of RSUD Wonosari.

DISCUSSION

1. Knowledge of Health Workers Before and After Hand-washing Training at Emergency Unit (IGD) of RSUD Wonosari.

Counseling on hand-washing was carried out at the Emergency Unit (IGD) of RSUD Wonosari with pretest and posttest measurements known as

knowledge of health workers had increased. The results of the analysis of knowledge variables showed a significant value of 0.002 ($p < 0.05$). This research is in accordance with the research conducted by Indrawinata (2015) showing that there is a difference between pre and post on the provision of health education for hand-washing on knowledge and behavior of hand-washing in Dr. Soedirman Kebumen.

The results of the study proved that after intervention, there were differences in knowledge of health workers before and after being given Hand-washing Counseling at the Emergency Unit (IGD) of RSUD Wonosari. Knowledge of health workers at the Emergency Unit (IGD) of RSUD Wonosari after counseling showed that most respondents had good categories of knowledge as many as 23 people (76.7) and the level of knowledge of health workers was known to 7 people (23.3%) had sufficient knowledge.

There are several nurses who still have sufficient knowledge about the implementation of hand-washing supported by the acquisition of the lowest trend value of 0.23 is in question number 4, namely "I do not need a clean and dry cloth to dry my hands after doing hand-washing. Based on the answers of respondents, 23 people answered wrongly. This shows that nurses still do not understand the implementation of hand-washing and additional education is needed regarding hand hygiene according to the recommended steps.

After intervention or counseling in the Emergency Unit

(IGD) of RSUD Wonosari, Gunungkidul, Yogyakarta, it was known that out of 30 respondents who followed the counseling the results of the posttest showed that almost all of the nurses' knowledge was in the good category. The results of this study are in accordance with research conducted by Sharif et.al (2015) that most nurses (195, 74.5%) have good knowledge about hand hygiene. Because of the type and period of relationship between health workers and patients, hand hygiene knowledge is needed by health workers.

Hand hygiene is the behavior of cleaning hands using antiseptic soap by hand-washing or by using hand rubbing with steps according to the sequence, so as to reduce the number of bacterial colonies in the hand (WHO, 2009). Hand-washing is the process of strongly rubbing both surfaces of the hand simultaneously using suitable cleaning agents and rinsing with running water with the aim of removing as many microorganisms as possible (Keevil, 2011). In order to control bacteria, awareness is needed in doing hand hygiene according to the steps that have been recommended.

Awareness program which is meant here is a program to improve hand-washing knowledge and skills which in turn is expected to improve the compliance and appropriateness of hand-washing of medical staff in the RSUD Wonosari, Gunungkidul, Yogyakarta with changes in health behavior developed to explain and predict behaviors related to health or Health Belief Models. With the process of socialization of good and right hand-washing through the

process of counseling to increase knowledge, through training (demonstration and practice) to improve the hand-washing skills of health workers in the Emergency Unit (IGD) of RSUD Wonosari, Gunungkidul, Yogyakarta.

2. Accuracy Of Health Workers Before and After Hand-washing Training held at the Emergency Unit (IGD) of RSUD Wonosari.

The results of the study revealed that the accuracy of hand-washing or hand hygiene of nurses before being given counseling showed that most of them were inappropriate as many as 21 people (70.0%) and the exact category of 9 people (30.0). After being given counseling the level of accuracy of health workers regarding hand hygiene showed that all nurses were in the appropriate category of 30 people (100%). The results of this study indicate that there is an increase in the accuracy of health workers before and after counseling about hand hygiene.

The results of research conducted by Marfu'ah (2018) show that nurses in performing hand hygiene SOPs are appropriate but some do not have 80% percentage. The accuracy of health workers in the appropriateness of hand hygiene based on five principles when it was found that nurses in implementing moment 1 was 66.7% and when 2 was 73.4%, the percentage was categorized as minimal appropriateness. This can be caused by a lack of socialization of the correct way to wash your hands and requires counseling about how to wash your hands according to the procedure.

In Act No. 36 of 2009 stated that health education was held to increase the knowledge, awareness, willingness and appropriateness of individuals to live healthy and actively participate in health efforts (MOH, 2010). The purpose of health education is to achieve changes in individual behavior, in fostering and maintaining healthy behaviors and a healthy environment, as well as playing an active role in efforts to realize an optimal degree of health. Health education programs, can be done by using teaching aids to make it easier for both parties in counseling activities, namely those who are counseling and those who are counseled, such as lectures.

Counseling on hand-washing was carried out at the Emergency Unit (IGD) of RSUD Wonosari with pretest and posttest measurements known as the accuracy of health workers had increased. The results of the analysis of the compliance variable showed a significant value of 0,000 ($p < 0,05$). After the intervention, there was a difference in the accuracy of health workers before and after being given hand-washing training at the Emergency Unit (IGD) of RSUD Wonosari. After being given counseling, it was known that the accuracy of health workers had increased by 30 people (100%) nurses were right and carried out all stages of hand-washing according to 6 steps according to WHO.

The accuracy of hand-washing is the main action in controlling nosocomial infections. Hand-washing is an activity with running water plus antiseptic soap or soap which aims to cleanse the hands of dirt and

microorganisms (Rohani, 2010). Hand-washing is cleaning your hands from all dirt, starting from the tip of your finger to your elbows and arms in a certain way according to your needs. Hand-washing needs to be done by everyone who is in the hospital environment, both health workers and patients. The function of hand-washing is to minimize or eliminate microorganisms in the hand, preventing the movement of microorganisms (cross infection) from the environment to the patient and from the patient to the officer (Rohani, 2010).

Infection can be largely prevented by strategies that are already available, namely by washing hands or hand hygiene. Hand-washing is an activity with running water plus antiseptic soap or soap which aims to cleanse the hands of dirt and microorganisms (Rohani, 2010). Hand hygiene is an effective step to break the transmission chain of infection so that the incidence of nosocomial infections can be reduced.

Good and correct appropriateness in doing hand hygiene can reduce transmission of germs and viruses. Washing your hands is very useful for killing germs in the hands. Clean hands will prevent transmission of diseases such as diarrhea, cholera dysentery, typhus, intestinal worms, skin diseases, acute respiratory infections (ARI), and bird flu. By washing hands, the hands become clean and free of germs (Proverawati and Rahmawati, 2012).

Based on the results of theoretical research and previous research it can be stated that there are differences in the accuracy of hand

hygiene nurses before and after health education. The existence of such counseling is expected to improve the accuracy and ability of nurses to live healthily and actively participate in health efforts.

CONCLUSION

1. There is a difference in knowledge of health workers before and after being given hand-washing training at the Emergency Unit (IGD) of RSUD Wonosari as evidenced by the results of the Wilcoxon test analysis of significant values of 0.002 ($p < 0.05$), respectively.
2. There is a difference in the accuracy of health workers before and after being given hand-washing training at the Emergency Unit (IGD) of RSUD Wonosari as evidenced by the results of the Wilcoxon test analysis of significant values of 0,000 ($p < 0.05$).

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