Effectiveness of Bundle Care Management on Nurse Professional Competency in Managing Healthcare Associate Infections (HAI's)

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Abstract:- HAIs are problems that often occur in hospitals. HAIs have a negative impact on the quality of hospital services, so it is needed to prevent infection. One effort to prevent infection is by applying bundle care (VAP, UTI, IAD, and IDO). This study is aimed to see the effectiveness of bundle care management on the professional competence of nurses in managing HAIs. The study was conducted at two hospitals in the city of Padang. The research time span starts from December 2017 to July 2018. The research design was Quasy Experimental Pre-Post Test With Control Group, the sample was 80 nurses with purposive sampling technique. 40 respondents were the intervention group and 40 respondents were the control group. The instruments in this study were questionnaires, observation sheets, and modules. The statistical test used is paired t test. The results showed that there were significant differences in knowledge, attitudes and skills before and after being given bundle care training in the intervention group and the control group (p <0.05). The suggestion of this research is to investigate further with a different design that is randomized controlled trial. And examine the effectiveness and audit compliance of each element of the bundle care.

Keywords:- Effectiveness, Nursing Competence, Bundle Care.

I. INTRODUCTION

The problem which is often discussed in the forum of the Asian Pacific Economic Committee (APEC) or Global Health Security Agenda (GHSA) is an infection-related disease in health services or known as Healthcare Associated Infection (HAIs). According to Permenkes (2017) this HAIs are wider incidence of infection from nosocomial infections, but this HAIs is an incidence of infection that not only comes from the hospital but also obtained from other health care facilities, unlimited infections from infection to patients but can also to health workers and visitors.

Infections which are found at hospitals need to be prevented by implementing hospital infection prevention and control programs (PPI). In accordance with the 2017 PPI Guidelines, prevention of infection control includes vigilance of isolation, prevention with bundles, periodic audits and monitoring or HAIs surveillance, risk assessment of infection called Infection Control Risk Assessment (ICRA). Every health service facility must carry out the PPI. Prevention of infection is carried out through the application of standard precautionary principles and based on transmission, wise use of antimicrobials and bundles.

The most common types of HAIs in health care facilities, especially hospitals include 1) Ventilator associated pneumonia (VAP), 2) Blood Flow Infections (IADs), 3) Urinary Tract Infection (UTI), 4) Infections of Operational Areas (IDO) . To overcome these problems, HAIs bundle care management is carried out.

The incidence of HAIs according to data from the World Health Organizations (WHO) contained 9% in the United Kingdom in 2006, in Italy in 2005 as much as 6.7%, in France in 2006 around 6.7 - 7.4%. While the incidence of HAIs in Indonesia was taken from 10 General Hospital (RSU) Education that held active surveillance found the incidence rate of HAIs as much as 6-16% with a mean of 9.8% (Cahyo, 2014). HAIs are problems that occur in developing countries and continue to increase.

The picture of HAIs in Indonesia to date has not been very clear because national handling has just begun. Results of prevalence survey points from 11 Hospitals (RS) in DKI Jakarta conducted by Perdalin (Jaya Infection Control Association) and Infectious Disease Hospital Prof. Dr. SuliantiSaroso Jakarta found rates of nosocomial infections for surgical area infections (SSI) of 18.9%, urinary tract infections (UTI) 15.1%, primary bloodstream infections (IDO) 26.4%, pneumonia 24.5% and other respiratory tract infections 25.1% and infections another 32.1%. Regarding problems and the resulting nosocomial infections, it is necessary to improve control of nosocomial infections and environmental health.

HAIs can actually be prevented if health professionals consistently carry out prevention of HAIs by applying a bundle of ISK, IAD, VAP, IDO and plebithis including by applying a bundle. According to the Institute for Healthcare Improvement (IHI) (2005) VAP figures fell 45%. Sedwick (2012) explained that from 9.47 cases per day to 1.9 cases per day. According to Resar (2005) the VAP figure dropped to 58%, while the number of infections in the Operational Area (IDO) according to the CDC (2010) occurred 25-40% after surgery, and cost 30 million dollars per year or equivalent to Rp.411, 390,077,000. UTI is the first in several hospitals in the United States and Europe after

VAP, with an infection rate of 11%. Whereas for IAD data there is a number of infections as much as 20-26%. Infection in developing countries has increased which has an impact on hospital services.

According to various studies that is described the positive impact of implementing bundle care is to reduce mortality, maintenance costs and length of stay. According to several studies, prevention of VAP can reduce treatment costs, length of stay and reduce mortality. In Ali's research (2010) recommends to make clear protocols in the prevention of VAP as well as training programs and education for nurses in the application of VAP bundles.

Based on the initial survey on the implementation of bundle care at Siti Rahmah Hospital, the maximum number of phlebitis infections fluctuated and increased in October 2017 by 20.6% for the entire bundle was not optimal. While the VAP number is 3.6 K ISK, VAP and IAD have not obtained definite data from the results of PPI surveillance. Although the data are not quantitatively obtained by researchers, HAIs are iceberg phenomena that must be solved, meaning that the numbers are not visible but the impact is quite extraordinary which can lead to death. However, when viewed from observations of the implementation of the HAIs bundle at the Siti Rahmah Islamic Hospital, it has not been implemented well. This is also reinforced by the results of interviews with researchers with IPCN that charging surveillance HAIs is not optimal, this may be due to nurses' knowledge about the prevention of lack of HAIs.

Based on the interview results at the end of February 2018 to 10 inpatient nurses, 60% did not know the bundle care. From the problems outlined above, the researchers are interested in conducting research with the title Effectiveness of Bundle Care Management on Professional Nurses' Competence in Managing Healthcare Associated Infections at Islamic Hospital Siti Rahmah Padang, West Sumatera.

II. MATERIALS AND METHODS

This research is a quantitative research. The method or design used is Quasi Experiment with the pre-post test with control group approach and use independent t-test to find out effectiveness training. The population in this study were all nurses of RSI Siti Rahmah, Padang, West Sumatera in 2018 amounting to 157 people and RSU BMC, Padang, West Sumatera amounting to 137 people.. The sampling technique in this study was proportional random sampling.

As additional data to complete the data, a questionnaire will be carried out about the characteristics nurses consisting from age, long time of work, and education. To measure knowledge, the researcher use questionnaire. Every question with TRUE answer = 1 and FALSE answer =0

Validity test and reliability of the questionnaire was conducted at RSI Siti Rahmah, Padang, and West Sumatera with a total sample of 10 nurses. All questions of knowledge are valid with a calculated r value of 0.678. The results of known

reliability Cronbach Alpha value of 0.740 (≥ 0.700) which indicates that the variable performance of reliable.

III. RESEARCH RESULT

A. Nurse Characteristics in RSI Siti Rahmah Padang in 2018

Variable	Group	Mean	SD	Min-Max	95% CI
Age	Intervention	34,20	4,625	27 - 46	32,21-28,54
	Control	27,38	3,642	22 - 38	26,21
	Total	61,58	8,267		
Long of Work	Intervention	7,76	2,415	2 - 12	6,99-8,53
	Control	3,14	2,423	1- 12	2,36- 3,91
	Total	10,9	4,838		

Table 1. Average Characteristics of Respondents by Age and Duration of Work in Intervention Groups (n = 40) and Groups Control (n = 40)

Table 1. shows that the majority of respondents in the intervention group were aged 27-46 years with a working period of 2-12 years.

Variable	category	Intervention		Control	
		f	%	F	%
Education	SPK	1	2,5	0	0
	Diploma	35	87,5	24	60
	Bachelor	0	0	0	0
	RN	4	10	16	40
	Total	40	100	40	100

Table 2. Average Characteristics of Respondents Based on Education in Intervention Groups(n = 40) and Control Group (n = 40)

Table 1. shows that the distribution of respondents based on the education of the majority of respondents with D3 Nursing education background was in the intervention group (87.5%) and the control group (60%).

B. Average Knowledge of Respondents Before Treating to Intervention Groups and Control Groups

Variable	Group	Mean	SD	Min - Max	CI 95%
Knowledge	Intevention	10,85	2,214	7-16	10,14;11,56
	Control	10,73	2,320	6-15	9,98-;1,74

Table 3. Average Knowledge of Respondents Before Treatment in Intervention Groups (n = 40) and Control Group (n = 40)

Table 3 shows that the average characteristics of respondents based on knowledge in the intervention group when given pre-test is 10.85 and in the control group when given a pre-test that is 10.73.

C. Knowledge Equality Before Treatment in Intervention Groups and Control Groups

Equality of knowledge before treatment in the intervention group and the control group was analyzed using independent sample t test with the results in table 4.

Group	Mean	SD	t	df	P value	Mean diff 95% CI diff
Intervention	10,85	2,214	0,247	78	0,806 *	0,125 -0,884;1,134
Control	10,73	2,320				

*homogeneous at p> 0.05

Table 4 Knowledge Equality Analysis before Treatment between Intervention Groups (n = 40) and Control Group (n = 40)

Based on Table 1.4, the knowledge of the intervention group was 10.85, while in the control group 10.73. Based on the results of statistical tests concluded there were no significant differences in knowledge in the intervention group and the control group or the average knowledge of respondents before treatment in the intervention group and homogeneous control group (p> 0.05).

D. Average Knowledge of Respondents After Treatment at Intervention Groups and Control Groups

Knowledge	Mean	SD	Min - Max	CI 95%
Intevention	13,90	2,170	10-18	13,21;14,59
Control	11,35	1,819	7-15	10,77;11,93

Table 5 Average Knowledge of Respondents after Treatment in Intervention Group (n = 40) and Control Group (n = 40)

Table 5 shows that the average respondent's knowledge after treatment in the intervention group was 13.90 and in the control group was 11.35.

E. Differences in Knowledge of Respondents Before and After given Treatment to Intervention Groups and Control Groups

Knowledge		Mean	SD	t	DF	CI 95%	P value
Intevention	Before	10,85	2,214				
	After	13,90	2,170	-14,840	39	-3,466;-2,634	0,001*
	Difference	3,05					
Control	Before	10,73	2,320				
	After	11,35	1,819	-2,241	39	-1,189;-0,61	0,031*
	Difference	1,12					

*meaningful at p <0.05

Table 6 Respondents Knowledge Average Before and After Given Treatment in the Intervention Group (n = 40) and Control Group (n = 40)

Table 6 shows that there are significant differences in knowledge before and after being given Bundle Care training in the intervention group and the control group (p <0.05).

IV. DISCUSSION

A. Nurse Characteristics of RSI Siti Rahmah Padang in 2018

The characteristics of nurses in this study include: age, education and length of employment. The results showed that the average age of respondents in the intervention group was 34.20 years while in the control group 27.38. According to Notoatmodj (2007), one of the factors that influence one's knowledge is age,

because age influences the capture power and mindset of a person so that the knowledge gained is better. Based on research presented by Maryam Hanifah (2010) states that age affects a person in receiving knowledge. The age of nurses in the control group was younger than the age of nurses in the intervention group.

Judging from the average length of work in the intervention group, nurses have a longer working time than the control group. Based on Ermaliyawati's research, (2009) it was stated that nurses who worked longer than 3 years had higher skills than those who had only worked for one year.

Other characteristics of respondents are education. The results showed that the average nurse education was D3 Nursing, 35 people in the intervention group and 24 people in the control group while ners were more in the control group than the intervention group. According to Ranupandojo (2001: 89) education is an activity carried out to improve general knowledge of employees including the increase in mastery of theory and skills to solve problems to achieve goals. It is also contained in Law Number 20 of 2003 article 14 concerning the National Education System, meaning that education is an effort that is carried out consciously and planned so that students can develop their potential to improve their abilities and skills for the future.

In accordance with Hasmoko's research, (2008) that the performance of nurses can be improved by having age characteristics ranging from 24-34 years, working period of 1-9 years, and education is mostly DIII Nursing (94%).

B. Effect of Care Bundle Training on Knowledge
This study shows that the average characteristics of respondents based on knowledge in the intervention group before the bundle care training is 10.85 and after being given 13.90 training. There is a difference in knowledge differences before and after bundle care training that is 3.05.

There were significant differences in knowledge before and after being given bundle care training in the intervention group ($p = 0.001$). Whereas in the knowledge control group respondents before being given bundle care training is 10.73 and after being given training to 11.35.

This is the same as the intervention group, namely there is a difference of 1.12. There is a significant difference in knowledge before and after being given bundle care training in the control group ($p = 0.001$). This means that in the intervention group there is an increase in knowledge before and after training.

The knowledge of respondents in the intervention group and the control group was not much different, this had been done by the previous equality test with a p value of 0.806, meaning that before the intervention was in the form of bundle care training all intervention groups and control groups with almost the same level of knowledge. It is expected that the changes that

occur after the intervention are because the knowledge of respondents in both groups is homogeneous, meaning that the knowledge of respondents in the intervention group and the control group is the same.

The difference in knowledge before and after bundle care training in the intervention group was higher than in the control group. This happened because in the intervention group had been given bundle care training for one day and after that on the fifth day post test, whereas in the control group there was no bundle care training intervention, only assessing respondents' knowledge on the first day and post test on the fifth day.

The results of this study are in line with the research conducted by Yazici, (2017) that 83.3% of nurses' knowledge increased significantly after receiving Healthcare Associated Infections training. The same thing was also expressed by Sadli, (2017) stating that the success of intensive bundle care implementation depends on the level of knowledge of nurses in understanding bundle care, according to this study nurses' knowledge of bundle care 73.63%

V. CONCLUSION

Based on the results of this study it can be concluded that the characteristics of respondents in this study include the mean age in the intervention group 34.20 years and the control group 27.38 years. Based on the length of work in the intervention group 7.76 years and the control group 3.14 years. While data of the characteristics respondents based on education are mostly with Diploma Nursing education in the intervention group and the control group. The mean knowledge of respondents has increased before and after being given bundle care training in the intervention group and control group.

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