



The Implementation of Controlling in Nursing Care Management Regarding Ventilator-Associated Pneumonia Bundles on Post Heart Surgery Patient in Intensive Care Unit

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Abstract

Control in the nursing care management for Ventilator-Associated Pneumonia (VAP) bundles of post-cardiac surgery patients is related to using predetermined standards and actions taken to correct mismatches between standards and actual performance. The purpose of this study was to apply the identification of controls in the nursing care unit to the VAP collection in the intensive care unit. Design research using quasi-experiments before and after with the control group. The population in this study was nurses invited to pediatric Intensive Care Unit (ICU). The number of samples was 32 people, divided into two groups consisting of intervention and control, taken by purposive sampling technique and General Linear Model Repeat Measure (GLM-RM) analysis method. The results of this study were analyzed by the dependent t-test. Dependent t-test results obtained in the average VAP bundle before the intervention were 3.3462 and after the intervention were 3.8362 with an average change of 0.41707 and p-value $(0,000) < (0,05)$. The application of controls in the nursing care management to the VAP bundle in accordance with the Standard Operational Procedure (SOP) emphasizes better accountability in providing nursing care to patients who are fitted with work safety and improves the actual performance of officers. Implement the control of a part of a continuous improvement strategy in quality control of special health services in relation to pneumatic infections installed in mechanical facilities in the Intensive Care Unit.

Keywords: *Controlling, Nursing Care Management, VAP Bundles*

Introduction

Healthcare facilities, especially hospitals, implement strategies and innovations to realize competitive hospitals in providing an excellent quality of health services [1]. To realize excellent quality service, “controlling” as one of the management functions shall be implemented.

Quality control is the main thing that must be done on an ongoing basis, based on and ethics, morals, professional attitudes that comply with statutory regulations [2]. One of the health professionals who carry out the excellent quality of health service is in the nursing profession. Nursing profession, managed by Nursing Services Department, is a subsystem from health services in hospitals that has an important role to maintain

quality service; moreover, in a hospital that is synonymous with the quality of nursing services, and overall hospital services. Evaluation is an organized and systematic process in comparing achieved results with established benchmarks or criteria, followed by conclusions and preparation of suggestions, which can be carried out at each stage of the program [3].

Healthcare-associated Infections (HAIs) are infections that occur in patients during treatment at the hospital, when there is no infection and not in incubation time, including infections in the hospital but which appear after the patients' discharge, also infections due to health professionals' work at the hospital staff related to the health

service process in healthcare facilities [4]. According to data from the World Health Organization (WHO) in 2016, the incidence of HAIs from all inpatients is 15%, the incidence rate of HAIs in Southeast Asia and Sub-Saharan Africa is around 75% and the specific cause of neonatal death, around 4-56% due to HAIs [5]. Ventilator-Associated Pneumonia (VAP) is the second most common nosocomial infection and the main cause of death from nosocomial infection in critical patients.

The incidence range is from 5 % - 67 %, depending on the mixture of cases and diagnostic criteria that are used and the highest rates are immunocompromised, surgical, and elderly patients [6]. Controlling nursing care on post-cardiac surgery patients who use mechanical ventilation in the ICU is the responsibility of the unit head. A good controller, according to Johansson, must have three role dimensions, such as intention, knowledge, and courage [7]. Berggren and Severinsson add that the controller has a role as a role model and must have the intention, awareness, readiness, and knowledge to foster a good relationship with the nurse who is controlled [8].

Some requirements to be a controller must be fulfilled so that controlling can function in accordance with the objectives. The training activity is one of the ways to improve the ability of the unit head so that they can play their role as a manager. Proper control in the provision of nursing care on patients after cardiac surgery with mechanical ventilation will improve the quality of nursing care, which will ultimately prevent the occurrence of HAIs VAP infection, speed up the healing process, shorten the length of treatment, and can reduce treatment costs. This study aims at the identification of the effect of controlling application in the nursing care management on VAP bundles of post-cardiac surgery patients in the Intensive Care Unit (ICU).

Materials and Methods

The study used a quasi-experimental design with post and control group. This study was giving treatment to the intervention group.

The population in this study was all nurses on duty at Pediatric ICU A and B in the hospital in Jakarta. The sample size was 32 people, divided into two groups, intervention and control, each group consists of 16 people taken with purposive sampling technique. This research was conducted at the Pediatric ICU of the hospital in Jakarta. The consideration of choosing the location of this study is because it has sufficient nurse respondents so that it is possible to obtain samples according to the inclusion criteria.

This study was started from the preparation of research and proposal submitted in September 2018-February 2019, and data collection was done for four months, from March-June 2019. In this study, the process of selecting and collecting data was obtained from a questionnaire about nursing care management control and observation of measuring VAP bundles control. This study consists of an independent variable (nursing care management controlling) and dependent variable (VAP bundles).

The researcher conducted a training regarding VAP bundles controlling on intervention group, without being observed by the control group. The researcher and the controlling team observed both groups every 48 hours, about four times post-training measurements. Data analysis was carried out univariately with bivariate using the t-test which had previously been tested for the normality with the Shapiro-Wilks Test and multivariate using GLM-RM.

Results

Table 1 shows that, based on gender in the control group, respondents are 100% women and 93.8% respondents in the intervention group are women. Age range 26 – 35 is 75% in the intervention group and 56.3% in the control group. There are 62.5% in the intervention group and 62.5% in control group, categorized in diploma 3 nursing. And, based on the length of work in the intervention group, the more of the working period of 7-10 years is equal to 62.5% while the control group is more of the working period > 10 years which is equal to 50%.

Table 1: Respondent characteristics based on gender, age, education, length of employment (n=32)

Characteristics	Control		Intervention	
	n	%	n	%
	Gender			
Male	0	0.0%	1	6.3%

Female	16	100.0%	15	93.8%
Age	9	56.3%	12	75.0%
26 – 35 years	7	43.8%	4	25.0%
Education				
Nursing (Diploma 3)	10	62.5%	10	62.5%
Nursing (Bachelor Degree)	6	37.5%	6	37.5%
Length of Employment				
7 – 10 years	8	50.0%	10	62.5%
> 10 years	8	50.0%	6	37.5%

Based on Table 2, the result of 1-5 measurement shows positive change. In the intervention group, there is a significant positive, while, for the control group, there was slightly increase with a mean of 26.06

Table 2: Mean, Std Deviation and min-max implementation of controlling in nursing care management on VAP bundles in the control and intervention group (n=16)

Variable	Group					
	Control			Intervention		
	Mean	Std Deviation	Min - Max	Mean	Std Deviation	Min - Max
Controlling	122.94	19.094	84 - 140	132.75	10.273	112 - 140
VAP 1	25.75	5.961	16 - 32	26.75	3.376	20 - 32
VAP 2	26.06	5.285	17 - 32	27.38	3.138	20 - 32
VAP 3	25.94	6.329	16 - 32	28.19	2.713	25 - 32
VAP 4	26.06	6.434	16 - 32	29.25	2.569	25 - 32
VAP 5	26.06	6.434	16 - 32	30.69	1.957	26 - 32

To evaluate the effect of controlling implementation in nursing care management on VAP bundles implementation, a different mean test was implemented and conducted using a test of the average difference of two groups of pairs (dependent) where first

analytical normality of data was tested using the Shapiro-Wilks test. Because the data are normally distributed, the bivariate testing used Dependent and Independent T-tests. Before a bivariate analysis is carried out it is tested for equality (homogeneity).

Table 3: The analysis of average controlling implementation (n=16)

VAP Bundles	Mean	Standard Deviation	Average Change	T-count	95% CI	p-value
Before	3.3462	0.42166	0.41707	4.699	0.71224 -0.26776	0,000
After	3.8362	0.24432				

Table 4: intervention group

Group	Before		After	
	Mean	Min-Max	Mean	Min-Max
Intervention	3.3462	2.50 – 4.00	3.8362	3.25 – 4.00
Control	3.2206	2.00 – 4.00	3.2594	.00 – 4.00
Uji T Independent	P value = 0.562		P value = 0.010	

Intervention Group

VAP bundles before intervention 3.3462 and after intervention 3.8362, with average

change 0.41707. The result of Dependent T-test is p value (0.000) < (0.05) and count (4.699) > t table (1.74588) which showed a significant effect (Table 4).

Table 5: The average change of controlling average in nursing care management on VAP bundles (n=16)

Bundles VAP	Mean	Standard Deviation	Change Average	t-count	95% CI	p-value
Before	3.2206	0.74476	0.16840	-0,920	0.12848 - 0,05098	0,372
After	3.2594	0.80387				

The control group found that the average VAP bundle before the intervention was 3.2206 and after the intervention were 3.2594 with an average change of 0.16840.

Dependent T-test results obtained p value (0.372) > (0.05) and t-count (0.920) < t-table (1.74588) It means that there is no effect of

controlling in nursing care management on VAP bundles in the control group (Table 5).

Analysis of Differences in Average Application of Controlling in the Nursing Care Management to VAP Bundle

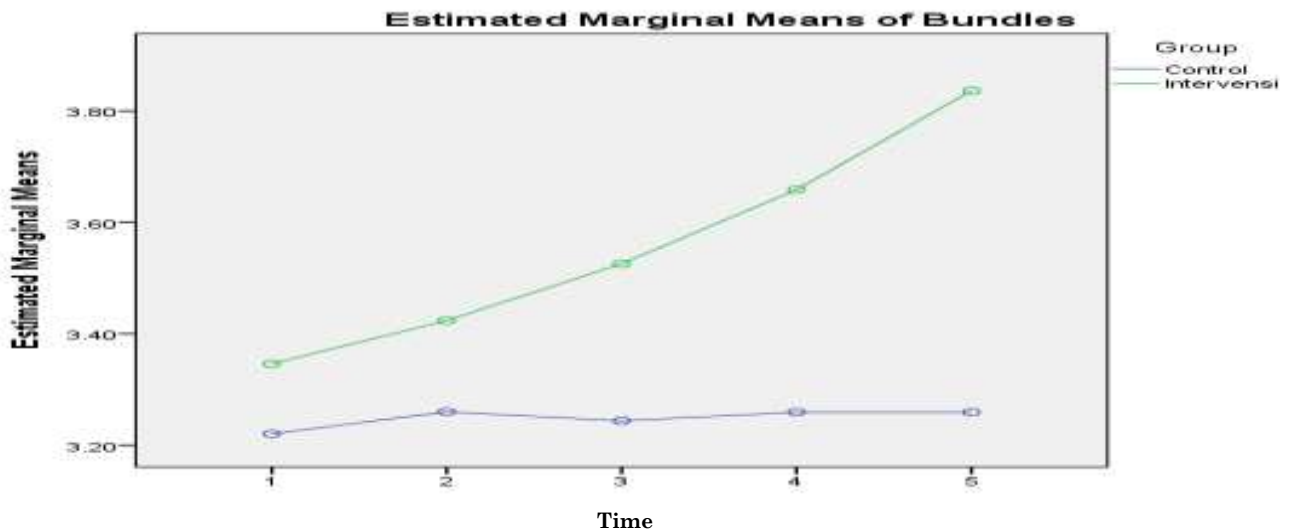


Fig. 1: Description of test results differences in controlling in nursing care management on the VAP bundles of the control group and the intervention group

Based on figure 1, the fifth measurement (implementation of the five controlling bundles of VAP in the intervention group), the difference in mean values is increasingly significant, where the average value of VAP bundles in the intervention group continues to increase, while, in the control group showed the opposite results. The intervention group stands at 3.80 while the control point stays at 3.20 to 3.40. Until the measurement of five intervention groups, the graphic images continued to rise and reached the optimum point.

The effective time used for the application of controlling in the nursing care management to the increase in VAP bundles occurs from the second measurement to the fifth measurement and the measurement of the VAP bundles has reached the maximum point.

Discussion

From the results of the analysis, it was found that there is an effect of the application of controlling in the nursing care management to the VAP bundles in the intervention group. This is in line with the research implementation of VAP prevention and control in the ICU room refers to the Ministry of Health regulation number 27/2017 with several innovations and adjustments [9]. Communication related to the implementation of the VAP bundle in the ICU room went well; nurses were given the

opportunity to update and refresh their knowledge, the facilities were very supportive, and coordination between professions went smoothly [4]. The existence of SOPs, the checklist of compliance with VAP bundle implementation, as well as competitions that are often held in the context of infection prevention and control, encourage implementers to continue to improve themselves. However, a reminder is needed to carry out the VAP bundle in accordance with the SOP, namely oral hygiene every eight hours.

The results of the analysis found that there was no difference in the average VAP bundles before (pretest) in the intervention group with the control group. This is in line with Handoyo research that has not been able to conclude the relationship between adherence to ventilator-bundle with the incidence of VAP [10]. This is due to the limited number of samples. This limited number of samples is due to the short research (four months) and the reduced ICU capacity due to preparations for the construction of new buildings.

Other factors that influence the occurrence of VAP will not be separated from the host, equipment and medicines used factors and factors involved in patient care. Host factors were such as disease; on the basis of the patient, serum albumin <2.2 g / dL, Acute Respiratory Distress Syndrome (ARDS),

Chronic obstructive pulmonary disease (COPD), burns, organ failure, disease severity, and gastric volume aspiration. Interventions were carried out related to equipment and drugs used such as endotracheal tubes, ventilator circuits and the presence of nasogastric or orogastric tubes, paralytic and sedation drugs, H2 antagonists, paralytic drugs, intravenous sedation, production of > 4 blood units, mechanical ventilation > 2 days, High Positive end-expiratory pressure (PEEP), nasogastric pipes [11, 13].

Communication, resource, disposition, and bureaucratic structure factors influence the implementation of the VAP bundle SOP besides looking at the comparison between Ministry decree 27/2017 and the implemented VAP bundle SOP, researcher found that in the implementation of the VAP bundle SOP as a guideline for VAP prevention and control, communication in the form of aspects of transmission, clarity, and consistency works effectively. The transmission aspect in the form of the submission of the VAP bundle SOP as a guide for VAP prevention and control has reached the implementing level in the ICU room. The ICU implementers know, understand and implement the VAP bundle SOP.

Communication from the Infection Prevention Control Link Nurse (IPCLN) and IPCN to the head of the room, as well as the service coordinator and the quality of Intensive Care Services, runs effectively.

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Communication from the head of the room and the service coordinator and IRIN service quality to the executors in the room went smoothly, including coordination between professions in the ICU room related to the VAP bundle. This is in line with Prevention and Controlling Infection (PPI) 1 standard in 2018 SNARS that states PPI Team coordinate all PPI activities involving hospital leaders, clinical and non-clinical staff according to size, as well as hospital complexity and legislation.

Conclusion

Significant differences in the intervention group and control group were implemented by controlling in the nursing care management after training for the intervention group. Increasing the achievement of the VAP score bundle in the intervention group was maximum, starting from the first measurement to the fifth measurement after training, while, in the control group, the achievement of the score remained stable at both the first and fifth measurements.

The application of controlling in the nursing care management to bundles associated with pneumonia (VAP) greatly affects the compliance of nurse in performing nursing care according to standard operational procedures (SPO). Predetermined standards and actions taken to correct mismatches between standards and performance are actually a form of controlling in the management of nursing care in improving the quality of services, especially nursing services.

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