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THE LEVEL OF COMPLIANCE BEHAVIOR IN USAGE OF PERSONAL PROTECTIVE EQUIPMENT ON NURSE IN THE HOSPITAL

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ABSTRACT

Healthcare Associated Infections (HAIs) is one of the risks for nurses in the hospital. Several diseases related to the HAIs, such as HIV and hepatitis. The level of compliance behavior in using PPE is one of the solutions in controlling the hazards caused by illnesses and injuries (accident). Hospital X is one of the general hospitals in Surabaya. Accident rates for patient's body fluids and needle stick injury are 51.1% and 46.7%. **Aims:** This research aim is to analyze the level of the compliance behavior in usage of personal protective equipment (PPE) on nurses at inpatient installation.

Methodology and Results: This research using quantitative method with cross sectional design. The total sample technique was used to get sample (n = 29). The result of this study is the correlation coefficient of employment status (r = 0.340), working shift (r = 0.446), knowledge (r= 0,394), attitude (r= 0,215). From the result of correlation test, it is shown the work shift has stronger correlation than knowledge with the level of compliance behavior. From the result of regression test simultaneously, it is shown the variables of working shift and knowledge have significant values. Furthermore, the value of Pseudo R-Square, the variables of working shift and knowledge is about 46.9%. **Conclusion, significance and impact study:** Work shift and knowledge have a correlation to the level of compliance behavior in usage of PPE, both in bivariate and multivariate test.

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- Hospital
- Level of compliance behavior
- Personal protective equipment

1. INTRODUCTION

Occupational health and safety programs in hospitals should be able to ensure a good health and safety for workers, patients, visitors, and also communities. Occupational health and safety programs should be conducted, which is must integrated and holistic manner to prevent and reduce the incidence of occupational diseases and occupational accidents in the hospital. Hazards and risks that exist in the hospital should be minimized by the risk control which has been done effectively by the hospital.

Since there the high risk of Healthcare Associated Infections (HAIs) in hospitals, hence the danger control efforts in the form of use of PPE is needed to be done. The compliance behaviour of using PPE is one of the control for nurse to avoid the hazards in the hospital when doing nursing actions. This could prevent the occupational diseases and accidents, like needle stick injury. It is based on the spread of infectious diseases that can be transmitted through the medium of blood and body fluids from the patient to environment (Depkes, 2008).

Hospital X Surabaya is one of the Type B educational hospitals in Surabaya which has 10 inpatient rooms with nursing time of 3 shifts per day. The highest occupational accident data on nurses at Inpatient Installation of Hospital X Surabaya was in the form of patient fluid exposition and needle stick injury. An accident of exposed of the patient fluid is equal to 51.11%, while of needle stick injury is equal to 46.7%, from the preliminary study who conducted by researcher before. The result of the preliminary study also concluded that the level of compliance behavior in using of masks and gloves is still low about 17.8% and 57.8%. Therefore, this study aims to examine more deeply the level of compliance behavior in using PPE on nurses.

The level of compliance behavior on nurses in using PPE is important to d, since nurse as a personnel who conducted the nursing actions directly and indirectly. When a nurse doing nursing actions with an appropriate PPE, direct contact as a precaution programs for nurses will be occur (Perry, 2005). Uncompliance in using PPE based on Standard Operating Procedure will harm for nurse, others, and hospital (Depkes, 2008).

2. RESEARCH METHODOLOGY

This research was conducted at inpatient installation of Hospital X Surabaya. The research has a quantitative method with cross sectional approach. Cross sectional approach is a study to know the correlation between risk factors and effects, which the observation or data collection is

conducted in a certain period of time. In this method, each subject is observed only once and measurements are made on the status of characters or subject variables at the time of examination. Populations and samples are 29 nurses with total population techniques. This is often done when the population is relatively small, less than 30 people, or for research that wants to make generalizations with a very small error (Sugiyono, 2007). The samples were taken from nurses who worked in the morning, noon, and night shift. As an effort to protect the human rights and welfare of the research subjects, a previous ethical test has been conducted by Ethics Committee.

This research concept uses ABC model (Antecedents, Behavior, and Consequences) (McSween, 2003). Antecedents are the trigger factors for behavior that consist of internal factors (knowledge, attitude, and employment status) and external factors (work shift) (Notoatmodjo, 2014). Independent variables of the research are knowledge and attitude variables which are divided into 3 categories, based on the highest and lowest score of each question item in the questionnaire. Dependent variable of the research is the level of compliance behavior in using PPE. Data collection techniques used questionnaires to measure the independent variables. sheets of research questionnaires. Data of the Dependent variable was used observations with checklist form. Compliance behavioral variables in using PPE is categorized into three parts, there are less, enough, and good. Categorization in each part based on the class interval from the lowest score and the highest score calculation from the observation result based on checklist form.

Data analysis divided into two sections that are correlation test and multivariate test. Correlation test in this paper using Spearman correlation test to know the correlation coefficient, while multivariate test using linear regression test to know the relation of independent variable with dependent variable simultaneously.

3. RESULTS AND DISCUSSION

Hazards in the Inpatient Installation requires to be prevented from the workers during work. Nurses must obey the regulation about using personal protective equipment based on Standard Operating Procedures (SOP). If the nurse performs a nursing action not using the appropriate PPE, it will potentially cause work accidents or occupational diseases.

Hospitals have made a programs to make a compliance behaviors in using PPE, so it can

prevent and control an infection for workers and patients. Infection Prevention and Control Committee has incorporated a program to conduct monitoring and evaluation of compliance in using PPE. One of Committee’s program is integrated supervision in every installation in the hospital, including in the inpatient installation. The hospital has provided PPE facilities for nurses with the appropriate amount so that the needs of PPE in the inpatient installation space has been fulfilled. PPE provides surgical mask, gloves (clean and sterile), N95 mask, goggle, protective gown, head protection, and shoes.

Table 1 Frequency distribution of independent variables at inpatient installation of Hospital X Surabaya, year 2015

Variable	Category	Number	Percentage
Employment Status	PNS*	15	51.7
	BLUD**	14	48.3
Work Shift	Morning	12	41.4
	Noon	8	27.6
	Night	9	31.0
Knowledge	Less	3	10.3
	Enough	20	69.0
	Good	6	20.7
Attitude	Enough	3	10.3
	Good	26	89.7
The Level of Compliance Behavior	Less	1	3.4
	Enough	18	62.1
	Good	10	34.5
Total		29	100

Note : * Government Employees ** Regional Public Service Agency Employees

Table 2 Correlation of employment status with the level of compliance behavior in using ppe in installation inpatient Hospital X Surabaya, year 2015

Employment Status	The level of compliance behavior			r
	Less	Enough	Good	
PNS*	1	11	3	0.340
BLUD**	0	7	5	

Note : * Government Employees ** Regional Public Service Agency Employees

Based on table 2 it is known that the level of compliance behavior with good category on respondents for BLUD status is higher than PNS status, that is 50%. While the behavior of respondent with respectable category of respondents with PNS status is higher than respondents with BLUD status, that is equal to 73.3%.

3.1 Correlation of Employment Status and Level of Compliance Behavior in Using PPE

Nurses with employment status BLUDs tend to behave more compliably in using PPE compared than PNS status. Based on the results of the study it is known that the majority of BLUD nurses aged 20-30 years (70.6%). Increased age will tend to make the level of compliance behavior in the use of PPE is decreasing. Nurses with BLUD status tend to have a level of the level of compliance behavior in better use of PPE. That's because they have concerns if their employment contract will be terminated if known to get infectious diseases. Therefore they are more compliance in using PPE.

This is not in line with Nugroho (2004) study where nurses with PNS status have higher adherence levels than contract nurse adherence. Based on the theory of motivation and job satisfaction by Herzberg (1966) in Wijono (2012) which stated that salary is one hygiene factor that does not work as a motivator, so it can only reduce the feeling of dissatisfaction. Salary is not one of motivation factor, so salary can not increase one's satisfaction. Therefore salary is not the only one that determines the behavior of nurses in the hospital. In line with the study of Badi'ah (2002) which states that the nurses still carry out the job well regardless of incentives.

The results showed that nurses with employment status of BLUD tend to behave more compliably in the use of PPE compared with PNS who tend to behave quite compliably in the use of PPE. Based on the observation, it is found that nurse with BLUD status majority is nurse with age 20-30 years old (70,6%) which is classified as young adult age.

In line with Peaget's theory in Armwar (2007) that young adulthood will tend to be more adaptive, flexible, and open. Any information obtained by nurses in young adulthood will be more easy to accept and respond, so apply them properly and correctly. Therefore, nurses with BLUD status tend to pay more attention to appropriate PPE when performing nursing actions compared with PNS nurses. This is related to the financial factor which is also explained by Nursalam (2011), that the financial factor (salary) can improve staff performance.

According to Cialdini and Martin (2004), there are six basic principles of compliance, including commitment, scarcity, social relations, social validation, reciprocity, and authority. Based on the results of the interview also obtained information that the nurse with BLUD status of their contract of work will be extended by the hospital with one of the health status requirements, where if known they suffer from infectious diseases, they fear the contract will

be terminated or not extended again. In contrast to nurses with PNS status who if known to suffer from infectious diseases, it is possible to apply early retirement. However, the enforcement of the policy will remain through a series of stages that have been determined by the hospital in accordance with applicable rules. One of the decisive things in the BLUD employment contract is the attitude value. If the employee has a good attitude, then it will be considered by the hospital management to continue the contract work.

Correlation of Work Shift and the Level of Compliance Behavior in Using PPE.

Table 3 Correlation of work shift with the level of compliance behavior in using ppe at inpatient Installation Hospital X Surabaya, year 2015

Working Shift	The level of compliance behavior			R
	Less	Enough	Good	
Morning	0	5	7	0.446
Noon	0	6	2	
Night	1	7	1	

Based on Table 3, respondents with morning shift predominantly have the level of compliance behavior category both in using PPE, that is equal to 58.3%. In the afternoon shift obtained dominant data has a fairly adherent behavior in the use of PPE, which is equal to 75%. While at night shift obtained dominant data have behavior well enough also in the use of PPE. Good category adherence behaviors experienced a decrease in day and night shifts. In contrast, the adherence behavior of categories is quite increasing in day and night shifts.

The correlation test results show a fairly strong relationship between working shift and nurse behavior during do nursing action. Behavior of use of PPE on respondent on the morning shift tends better than respondent with day and night shift. According to Nurmianto (2008) workers who served at night shift tend to have a higher risk of health problems, causing errors and omissions. This can make a person discompliance to work.

Working shift is one factor that causes differences in the level of level of compliance behavior in the use of PPE. Behavior of APD usage on nurse with morning shift tends to be better / compliance than respondent with day and night shift. The level of compliance behavior tends to decrease during day and night shifts.

According Nurmianto (2008) nurses on duty at night shift tend to have a higher risk work accident compared with workers who served on the normal shift (morning shift). Workers on

duty at night shift will experience health problems such as disturbance of sleep patterns, fatigue, hypertension, and gastrointestinal disorders.

Based on the observation result, the level of compliance behavior in the use of PPE is only found at night shift. This can be caused by the fatigue factor experienced by the nurse as it works during the hours that are required to sleep. Nurses who experience sleep disorders will cause health problems. Nurses who experience health problems will be able to cause errors and negligence when working so will tend to disobey in work. The impact will increase the risk of accidents and occupational diseases. Workers working on night shifts will also experience disturbances in the circadian system, so that workers can reduce the ability of individuals in doing the job. Decrease in ability will lead to work accidents and decreased work productivity (Monk, 2009).

Correlation of Knowledge and the level of Compliance Behavior in Using PPE is shown in Table 4.

Table 4 Correlation of knowledge with the level of compliance behavior in using ppe at inpatient installation Hospital X Surabaya, year 2015

Knowledge	The level of compliance behavior			R
	Less	Enough	Good	
Less	0		1	0.394
Enough	1	2	4	
Good	0	15	5	
		1		

Analysis results indicates that the compliance behavior of good category mostly found in good knowledge, that is as much as 5 respondents. Behavior of compliance category of sufficient enough with enough knowledge, that is as much as 15 respondents, whereas compliance behavior of less category that is less enough knowledge, that is as much as 1 respondent.

On table 4 it can be seen that correlation value is 0.394. This indicates that the knowledge variable has a strong enough positive correlation with compliance behavior in the use of PPE.

The nurse's knowledge level determines the level of compliance behavior in using PPE. Knowledge of PPE specifically makes the nurse aware of the use of PPE in every nursing action to prevent disease transmission. Adherence in the use of PPE in the workplace is expected to be well applied to reduce accident rates and occupational illness in hospitals. Based on the result of research conducted by Sharif (2012), there is a relationship between knowledge, attitude, and

motivation with nurse compliance. This is consistent with the Green (1980) theory which states that knowledge upgrading does not always cause behavioral change, but knowledge is an important element that must be given to someone before doing something. According to Milgram (1963) is an autonomous state in which a person takes responsibility for what he does according to his awareness of the behavior.

According to Carpenito (2013), factors that influence compliance include understanding of instruction, level of education, beliefs, attitudes and personality, and social support. According to Notoatmodjo (2010), behavior may be affected by internal and external factor. Knowledge and attitude classified in to internal factor. Knowledge is the result of human sensing, or the result of knowing to the object through his or her senses. While sensing produces such knowledge that strongly influenced by the intensity of attention and perception of the object. Much of a person's knowledge is acquired through the sense of hearing (ears), the sense of smell (nose), and the sense of sight from eye.

Without knowledge, person has no basic for making decisions and determines actions against problems encountered. Factors that affect one's knowledge are internal factors and external factors. A person's knowledge of a particular object has different intensities or levels.

Lack of worker knowledge about the state of the workplace can adversely affect the worker itself. The lack of knowledge by Bird (1985) is due to lack of experience, lack of orientation or poorly understood training. Broadly divided into 6 levels of knowledge, there are:

1) Know

Know is defined only as a recall (memory) of a pre-existing memory after observing something.

2) Understanding

Understanding an object does not just know the object, not just mentioning it, but the person must be able to interpret correctly about the known object.

3) Application

Application is defined when the person has understood the object in question can use or apply the known principle to another situation. For example, someone who has understood the planning process should be able to make health program planning in the workplace and will be able to make research proposal easily anywhere.

4) Analysis

Analysis is the ability of a person to describe separately then look for relationships between the components contained in a known problem or object. The indication of one's knowledge has reached the level of analysis is when the person able to distinguish, segregate, group, and make diagrams (charts) of knowledge of the object.

5) Synthesis

Synthesis shows a person's ability to encapsulate or put in a logical relationship of the components they possess. Synthesis process is formulating new formulations of existing formulations. For example, can create or summarize with words or sentences themselves about what has been read or heard so that could conclude about an article.

6) Evaluation

Evaluation relates to a person's ability to justify or judge a particular object. This judgment is by itself based on a self-determined criterion or a prevailing norm.

Behavior will be in accordance with knowledge if the individual receives a motivation signal strong enough to behave according to his knowledge. Another theory that in line is theory of safety triad described that knowledge has a significant relationship with labor compliance in using PPE (Geller, 2001). Knowledge is the result of knowing and this occurs after a person performs sensing of a particular object through the sense of sight, hearing, smell, taste, and touch. Knowledge is the domain that determines the formation of one's actions (Notoatmodjo, 2014). More explained that the behavior of someone who is based on knowledge, awareness and positive attitude then the attitude will be long lasting, otherwise if the behavior is not based on knowledge it will not last long. In this case the workers already have knowledge about the PPE and the dangers posed by the work it does. Thus it can be concluded that knowledge is a very important domain in shaping one's behavior, in this case is the behavior of the nurses adhere to the use of PPE.

Correlation of Attitude and the Level of Compliance Behavior is shown at Table 5.

Table 5 Correlation of attitude with the level of level of compliance behavior in using ppe at inpatient installation Hospital X Surabaya, year 2015

Attitude	The level of compliance behavior			R
	Less	Enough	Good	
Enough	0	3	0	0.215
Good	1	15	10	

3.2 Correlation of Attitude and Level of Compliance Behavior in Using PPE

Based on the theory Notoatmodjo (2014), attitude is a reaction or a closed response to the stimulus or object. Attitude can not be seen directly. Attitude is not yet a single action or activity, but it is a predisposition of an action or behavior. People who have a positive attitude tend to have a sense of enthusiasm and oppression. Conversely, people who have negative attitudes tend to be less enthusiastic and pessimistic. According to Richard LaPiere in Suryanto (2012) attitude is not always positively correlated with behavior. Attitude is one of the determinants of behavior, but there are still other determinants to be considered in the formation of a behavior.

Level of attitude based on intensity, that is (Notoatmodjo, 2010):

1) Receiving

Receiving means that the person or subject is willing to receive a given stimulus (object). For example, the attitude of a worker who uses PPE can be seen from the workers' willingness and attention to the counseling about the importance of using PPE.

2) Responding

Responding means to provide answers or responses to questions or objects faced. Providing answers when asked, working on, and completing a given task is an indication of an attitude. The existence of an attempt to answer a question or do a given task, regardless of the work is right or wrong, so that means the worker accepted the idea. For example, a worker who has followed the counseling on the importance of using PPE will respond if asked or asked questions by superiors.

3) Respect

Respect is defined as giving a positive value to the object or stimulus, in the sense of discussing with others, even inviting or influencing or encouraging others to respond. For example, the attitude of a worker who invites co-workers to use PPE is a proof that the worker has a positive attitude toward the importance of the behavior of the use of PPE.

4) Responsible

The highest level of attitudes is to be responsible for what he has believed with all the risks that he will receive. For example, a worker who wants to follow the counseling importance of the use of PPE while working despite the sacrifice of rest time.

According to Nursalam (2011), Age is one of the characteristics of individuals who are counted from birth date. According to the psychological theory of the development of workers, age can be classified into young adulthood, old adults, and old. Young adult age is age from 20-40 years old, old adult from 41-65 years old, and old age is over 65 years old (Haditono, 2000).

A good attitude does not show a change in the level of compliance behavior. In the filling questionnaires majority respondents chose to be positive in the use of PPE. This can be caused by the filling of data that is less open. This is in contrast to the fact at the time of the interview that they tend to be negative about personal protective equipment. This condition can occur because of the lack of awareness of the importance of being positive in the use of PPE in doing the work.

Observation Result of the Level of Behavior Compliance in Using PPE is shown in Table 6.

Table 6 Observation behavior result in using ppe in installation inpatient Hospital X Surabaya, year 2015

No.	Item	Percentage	
		Yes	No
1	The nurse uses gloves when needed when performing low-risk nursing actions	100	0
2	Nurses use PPE that corresponds to the action before contact with the patient	62	38
3	Nurses wear gloves when performing actions that allow exposure to blood but no splashes	90	10
4	Nurses use closed shoes when at work	41	59
5	Nurses check the quality of PPE before use	21	79
6	The nurse uses gloves that match the size of his hand	100	0
7	Nurses change gloves to different patients	34	66
8	Nurses use flip-flops while working	59	41
9	The nurse uses a mask right in the nose and covers the mouth	100	0
10	Nurses use appropriate PPE when taking action with moderate risk	55	45
11	The nurse places the used glove on the crooked tool	93	7
12	The nurse keeps the gloves on the action trolley for easy reach	100	0
13	Nurses dispose of APD that has been used in infectious waste bins	52	48

Table 6 shows the highest 3 types of behavior that are not appropriate in the use of PPE is not checking the quality of PPE before use (79%), not changing gloves to different patients (66%), and not wearing shoes at work (59%).

3.3 Linear Regression Analysis

Linear regression test is conducted to determine the effect of each dependent variables simultaneously, so the formula of the resulting equation can be applied to the real condition in the hospital. Based on Table 7 and Table 8, the results of the independent variables in the form of wrk shift and employment status have significance value <0.05. It means both of independent variables have an influence to the dependent variable.

The value of RSquared used in this study based on the value of 0.530, so it can be concluded that the variable status of employment and work shift able to explain the variation inthe level of compliance behavior in Using PPE is about 46.9%.

Table 7 Results of linear regression test analysis at inpatient installation public Hospital Haji Surabaya, year 2015

R	R Square	Std. Error The Estimate	Sig.
0.685	0.469	0.42620	0.003

Table 8 Table anova regression test

Model	B	Std. Error	T	Sig.
Constant	0.396	0.992	0.399	0.000
Employment Status	0.98	0.181	1.649	0.140
Work Shift	- 0.270	0.098	-2.761	0.023
Knowledge	0.326	0.151	2.149	0.042
Attitude	0.450	0.284	1.584	0.126

Regression Equation Model

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 \tag{1}$$

$$Y = 0,396 + (-0,27X2) + 0,326X3$$

Based on the results of linear regression equation, only the working shift variable (X2/Independent) and knowledge variable (X3/Independent) have an influence to the variable of the level of level of compliance behavior (Y/Dependent). The employment status variable (X1/Independent) and attitude variable (X4/Independent) have a significance value > 0.05. Therefore, the variable must be excluded from the equation. Only two variables that influence to the variable of the level of compliance behavior. There are the working shift

(X2/Independent) and knowledge (X3/Independent). Working shift variable has a significance and the value is negative. Negative value from working shift variable in the equation means that the value of the level of compliance behavior will be reduced. In other words, every 1 point decrease from the independent variable of employment status (X1 / Independent) will add value from the dependent variable, the amount is 0.7. Otherwise, positive value from knowledge variable in the equation means that the value of level of compliance behavior will be increased. Therefore, every 1 point increase from the independent variable of knowledge (X4/ Independent) will add value from the dependent variable, the amount is 0.326.

4. CONCLUSION

Working shift and knowledge are the variables that have a significance value with the level of compliance behavior in using PPE. Working shift is a variables that have a stronger correlation than the knowledge variables. Working shift and knowledge influence simultantly to the level of compliance behavior in using PPE, the amount is 46,9%

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