

**THE INFLUENCE OF DETERMINANT BEHAVIOR ON NURSE
COMPLIANCE USING PERSONAL PROTECTIVE EQUIPMENT (PPE) AT
PRIVATE HOSPITAL IN YOGYAKARTA**

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ABSTRACT

WHO has determined the importance of the application of precaution standards to health workers in every action to prevent an increase in Healthcare Associated Infections (HAIs). The use of personal protective equipment (PPE) is one of the important problems in the medical health service that so often being overlooked. The purpose of this research is to determine the effect of behavioral determinants on nurses' compliance with personal protective equipment at private hospital in Yogyakarta. This study uses a mixed method method with Sequential Explanatory design. Quantitative research was carried out in advance by distributing questionnaires to assess behavioral determinants and observations to assess compliance with PPE use (using total sampling, $n = 34$). Then proceed with qualitative research using indepth interviews. Data analysis using multiple logistic regression analysis and constant comparative method. Statistical results show the factors that influence the use of PPE are knowledge $p = 0.038$; OR = 2.119, supervision $p = 0.044$, OR = 4.050 and motivation $p = 0.046$; OR 1.022. The dominant factor that most influences compliance with PPE is supervision. This is also supported by the results of qualitative research which explains that the use of PPE is related to support management where one of them is supervision. The use of PPE by nurses must continue to be improved. Management can develop various approaches to improve the health care workers behavior through increasing knowledge, motivation and supervision.

Keyword: *Behavior, Personal Protective Equipment, Compliance*

BACKGROUND

Healthcare Associated Infections is a serious problem in health services because it can lead to an increase of nursing time and can even lead to high morbidity and mortality rates for inpatients, including health care workers. It will have impact on treatment fees both patients and hospitals. High HAIs also leads to decrease hospital service quality and poor hospital image, with an estimated 20-40% of hospital infections occurring as a result of cross infection from health workers (Chow et al, 2012).

Disease contamination occurs due to the transmission of blood-borne microorganisms, air both droplet and airborne, and also direct contact. Infection can occur between patients, from patients to health workers, among health workers, and from health workers to patients. Disease contamination can be risk occurring on a nurse or doctor if they do not pay attention to precautions (standard precautions) by using personal protective equipment during interactions with patients (Efstathiou et al, 2011).

WHO has determined the importance of the application of precaution standards to health workers in every action to prevent an increase of nosocomial infections. The application of the precaution standard includes several types of procedures, one of which is by applying the procedures for the use of PPE. PPE needs to be used by nurses in every PPE action including the use of gloves, protective goggles, masks, aprons, dresses, shoes, and head covering. The use of PPE on nurses is one part of the nurse's effort to provide an infection-free environment as well as an effort of self and patient protection against disease transmission (Potter & Perry, 2005).

The incidence of HAIs according to data from WHO is 9% in UK 2006, in Italy 2005 6.7%, 6.7 - 7.4% in France. While the incidence of HAIs in Indonesia is taken from 10 General Hospital that held active surveillance, the figure is 6-16% with a mean of 9.8%. The prevalence of HAIs in developing countries is higher than in developed countries (10.1% vs. 7.6%).

Southeast Asia has a high level of hospital infection. The incidence of nosocomial infections in European countries and the Middle East is 8.7% while Southeast Asia is about 10% higher. The prevalence of nosocomial infections in Indonesia in 2007 shows a figure of 9.1% with a variation of 6.1% -16% (WHO,2010).

Professional nurse is a big portion of human resources in the hospital environment who provide health services to patients and have direct interaction to patients. The health condition of patients who are experiencing health problems requires very good by nurse that has high possibility to be affected by environment that is at risk of illness causes the disease and even mortality from disease contamination. Nosocomial infections are infections occurred in health services including hospitals, nursing homes, and health clinics. But in general with any reason the health workers are less obedient in using personal protective equipment (Rohani & Setio, 2010)

Based on reports of the PPE use at one of Private Hospital in

Yogyakarta, it is stated about the compliance of PPE use but limited to the use of masks and gloves. In PPI report for the period of July - September 2017 also states that compliance of PPE use decreases by 4.17%. The purpose of this research is to determine the effect of behavioral determinants on nurses' compliance with personal protective equipment.

The type of research used in this study is mixed method research namely sequential explanatory. Quantitative research is conducted by a survey approach and conducting closed observations (using a checklist) while the qualitative method is done by using in-depth interviews to interview informants to confirm the results of quantitative research and explore the response of informants based on research objectives. The populations in this study were all nurses at one of the private hospital in Yogyakarta, which amounted to 34 nurses. The sample in quantitative research used total sampling while the samples for qualitative methods were 4 members of PPI team.

The variables of the research consisted of independent variables including (1) knowledge (2) attitude (3) availability of PPE (4) information (5) supervision (6) motivation and dependent variable was compliance with the use of PPE.

In this research, quantitative data were analyzed using multiple logistic regression method which aims to determine whether the variables of knowledge, attitudes, availability of PPE, information, supervision and motivation are related to compliance of PPE use. For qualitative data analyzed using the Constant Comparative Method .

RESULT

This research was conducted in January - February 2018 in the Private Hospital in Yogyakarta. The following is a description of the research results that the researcher shows in table form.

Table 1: Overview of respondents' characteristics

Characteristics	Frequency	Percentage (%)
Ages	21-30 years	29 85.29
	31-40 years	5 14.71
Gender	Female	22 64.70
	Male	12 35.30
	1-2 years	19 55.88

Work Period	3-5 years	9	26.47
	>5 years	6	17.65
Last education	Diploma III of Nursing Bachelor of Nursing (NERS)	30	88.20
		4	11.80

Based on table 1, it can be seen that most respondents are at the age range of 21-30 years with a total of 29 people (85.29%), the most gender is women with a total of 22 people (64.70%), the most part of respondents' work period in the time span is 1-2 years of 19 people (55.88%), and most of the last education of respondents is Diploma III of Nursing which is 30 people (88.20%).

Table 2: Overview of frequency distribution of independent variables (knowledge, attitude, availability of PPE, information, supervision and motivation) at Private Hospital in Yogyakarta

Variables	Category	Frequency	Percentage (%)
Knowledge	Good	30	88.2
	Adequate	4	11.8
Attitude	Positive	34	100
	Negative	0	0
Availability of PPE	Complete	31	91.2
	Incomplete	3	8.8
Supervision	Available	34	100
Information	Available	34	100
Motivation	Strong	30	88.2
	Weak	4	11.8

Based on table 2, it can be seen that the majority of respondents' knowledge is in the good category as many as 30 people (88.2%), all respondents have a positive attitude as many as 34 people (100%), 34 respondents (100%) states the availability of complete PPE, information available, and supervision. For motivation, most respondents have a strong motivation of 30 people (88.2%).

Table 3 Results of observations of compliance of PPE use

Category	Frequency	Percentage (%)
Non-Compliance	10	29.4
Compliance	24	70.6

Based on table 3, the findings of PPE use are mostly included in compliance category as many as 24 people (70.6%).

Table 5 Logistic Regression Test Results

Variables	P Value	Odds Ratio	B	Confidence Interval 95%	
				Lower	Upper
Knowledge	0.038	2.11	0.751	0.697	6.446
Attitude	0.186	0.18	-1.68	0.038	0.912
Availability of PPE	0.138	0.37	4.05	0.144	0.974
Supervision*	0.044	4.05	1.39	0.637	25.742
Motivation	0.046	1.02	0.08	0.073	3.384
Information	0.474	0.18	-1.69	0.035	0.973

The results of logistic regression test shows the influence of knowledge, attitude, availability of APD, supervision, motivation and information on adherence in using PPE at Private Hospital in Yogyakarta using the Nagelkerke test is accepted. The test results of the coefficient of determination in the table above the R Square value of 0.748 and Cox & Snell R Square 0.525 which indicates that the ability of the independent variable in explaining the dependent variable is 0.748 or 74.8% influence together. This means that 74.8% of the behavioral factors that become the variables of this study consist of knowledge, attitude, availability, supervision, motivation and information, while the remaining 25.2% is explained by other factors not included in the model. This shows that there are still other factors beyond the variables used in this study that can influence the nurses' compliance in using PPE at Private Hospital in Yogyakarta.

DISCUSSION

One of the infection prevention and control strategies implemented by hospitals for nurses and medical support employees is by emphasizing more on Personal Protective Equipment (PPE) that is used when working in accordance with indications of action, what personal protective equipment they should use when taking action or adjusting with risk management.

PPE is special equipment used by medical workers to protect themselves from infectious agents. PPE has two functions, namely for the benefit of patients and at the same time for the medical officers themselves. PPE aims to protect contacting with blood, all types of body fluids, secretions and mucous membranes. In addition, PPE also serves to reduce the spread of infections from patients (Pratama, 2014).

Behavioral determinants that influence compliance in the use of personal protective equipment are divided into 3, namely predisposing factors, enabling factors and reinforcing factors. From the results of statistical analysis tests using logistic regression, there are 3 variables that have a significant and positive correlation with nurses' compliance in using PPE at private hospital in Yogyakarta, namely knowledge, supervision and motivation.

Knowledge is one of the factors in the components of predisposing factors that will influence compliance. Based on the Safety Triad theory, knowledge should have a significant correlation with compliance. Knowledge or cognitive is a very important component of the formation of individual actions. Therefore, behavior based on knowledge will last longer than behavior that is not based on knowledge. Furthermore Lawrence Green also states that knowledge is one of the predisposing factors that can form an individual's behavior. So that it is

expected that the higher someone's knowledge about PPE, the more compliant implementing PPE.

From the results of statistical analysis using multiple logistic regression test results, it obtains that there is a significant and positive correlation between the levels of nurses' knowledge and compliance in using PPE at Private Hospital in Yogyakarta. Where nurses who have good knowledge are more than 2 times more likely to be compliant than nurses who have adequate or low knowledge. The correlation is statistically significant (OR = 2.119; p = 0.038).

The results of this study are supported by a statement from one of the IPCLNs stating that "all of our employees are smart, so they might not harm himself "they will implement PPE themselves then other people, protect themselves first" (P3). The statement describes that in general, all employees at Private Hospital of Yogyakarta included to the nurses who have a good level of knowledge.

This is in line with the study of K Vaz et al (2010) at the University Teaching Hospital of West Indies, Jamaica, which states that knowledge has a significant correlation with PPE use behavior (p <0.0001) and in line with the results of Fauzi's research (2017) which states that the level of knowledge is a variable that influences the behavior of PPE use with p-value = 0.005 and OR = 37.263.

The results of the statistical analysis for the control variables are p-value <0.05, which is 0.044 with an OR value of 4.050 which means that nurses are more compliant 4.050 times due to supervision compared to no supervision. The value of B = Natural logarithm from 4.050 = 1.399. Because the value of B is positive, supervision has a positive correlation with compliance.

Supervision is all forms of law enforcement efforts that must be followed and one of the ways to improve work safety. The main objective of supervision is to seek feedback which can then be carried out for improvement or evaluation.

One who has an important role in monitoring the implementation of compliance in the use of PPE in the hospital is the head of the room. The head of the room has the authority to supervise the performance of nurses. The head of the room is responsible for supervising (monitoring and evaluating) nursing services provided to patients in the treatment room he leads.

Supervision of the personal protective equipment (PPE) use is one part of Health and Safety Executive (HSE) activities as stated in the Decree of the Minister of Health No. 66 Tahun 2016. Therefore, the hospital has implemented periodic supervision related to the implementation of PPE, this is supported by statements from interviews obtained from the PPI Committee stating that:

"there is a PPI team meeting every 3 months to evaluate monthly reports, review work programs, if there is a problem, it will also be delivered there " (P1)

" there is a coverage report every month, then it is analyzed as a form of monitoring or monitoring and evaluation which is done every 3 months " (P3).

From this statement, it can be concluded that in the implementation of PPE use at hospital, monitoring and periodic and ongoing evaluations have been carried out, namely quarterly.

Based on the results of research Noviandry (2013) states that good supervision by the management / management of an institution will influence

the compliance of workers in using personal protective equipment.

Motivation variables with p-value 0.046 and OR 1.022 and $B = \log_{\text{Natural}} = 0.079$, which means nurses are more compliant 1.022 times due to strong motivation compared to those who have weak motivation and have a positive correlation with compliance.

Motivation will urge to do something good that comes from within (internal) or from outside the respondent's self (external). So if the respondent has a strong motivation to do a job or action for example in using personal protective equipment, although there are obstacles in the implementation, but because of the motivation, the respondent will try to find the possibility of how to do what is desired and vice versa, if motivation to do something is weak so efforts to achieve what is expected will be less especially if obstacles and obstacles arise. This is supported by the statement:

"For motivation, it is indeed returned to the personalities of each person. The matter relates to the personal matters of each person, so re-socialization is like a reminder, for example, how important the PPE is, then why should it be used. It might increase their motivation again if they have been reminded of the importance of the PPE for themselves, right?"(P3).

CONCLUSION

1. Observations result about nurses's compliance is about 70,6%.
2. Knowledge, supervision and motivation are the variables that most influence the nurses' compliance of implementing

PPE use at private hospital in Yogyakarta.

3. The dominant factor that most influence compliance of PPE is supervision. This is also supported by the results of qualitative research which explains that the use of PPE at one of Private Hospital in Yogyakarta is related to support management one of which is supervision.

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