Analysis of The Relationship of Individual Commitment With Compliance Behavior in Using Personal Protective Equipment (PPE)

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Abstract—*Healthcare Associated Infections (HAIs) is one of risks for nurses in the hospital. Several diseases related to the HAIs, such as HIV and hepatitis. Compliance behavior in using PPE is one of prevention to control the hazards. Accident rates in Hospital X Surabaya for patient's body fluid and needle stick injury are 51.1% and 46.7%. Objective: This study was aimed to analyze individual commitment related to a compliance behavior in using personal protective equipment (PPE) on nurses in inpatient installation. Methods: This research was a quantitative with cross sectional study design and observational study. The data were collected on November 2015 with a questionnaire and observation checklist. The total sample technique was used to get the sample (n = 29). Conclusion: The correlation's of age (r =-0.170), sex (r = 0.336), work period (r = 0.051), employment status (r = 0.340), knowledge (r = 0.394), attitude (r = 0.215), individual commitment (r = 0.515), occupation factor (r = 0.378), work shift (r = 0.446). High Commitment caused the increased of the level compliance behavior. Ordinal regression test showed interaction variable of knowledge and individual commitment (p = 0. 000) became influenced variables to compliance behavior in using PPE. Based on the Pseudo R Square, the value of Nagelkerke is 0.483 , it means 48.3% that variables were able to explain variation in compliance behavior in using PPE. Recommended to hospital management to increase the commitment and knowledge with hold the workshop and discussed the forum about compliance behavior in using PPE to prevent healthcare associated infections (HAIs).*
Keywords— *Compliance Behavior, Personal Protective Equipment, Hospital.*

I. INTRODUCTION

RS X Surabaya has 14 units hospitalization with nursing work 3 shift times per day. Work accident Data the highest on nurses in Inpatient Installation RS X Surabaya is a liquid exposed patients and needle stick injury, i.e. Each of 51.1% and 46,7%. Compliance behavior data in using PPE of masks and gloves based on SOP are 17.8% and 57.8%. Based on these reasons then this research aims to elucidate the commitment individual factors related to the compliance behavior in using PPE on nurse.

II. RESEARCH METHODS

This research has a method of quantitative research approach with types of observational research and approach cross sectional. This research was conducted in installation of inpatient RS X Surabaya. Data collection research conducted on November 2015. The total sample technique was used to get samples (n=29).

The research consists of a Variable independent variable i.e. internal factors (age, sex, work period, employment status, individual commitment, knowledge, and attitude) and external factors (occupation factors (Standart Operating Procedures, supervision, and facilitation of PPE)) and work shift). The dependent variable is a compliance behavior in using PPE. Collecting data with the questionnaire, observation checklist, and documentation study on November 2015. Data analysis using the spearman correlation test to know the correlation coefficient and the ordinal regression test to know the relationship of independent variables with the dependent variables simultaneously.

III.   RESULTS AND DISCUSSION

The frequency distribution of an internal factors and external factors of the research varibles are each shown on a table 1 and table 2.

Table 1 . Distribution Variable Frequency Internal Factors in the installation of Inpatient Hospital X Surabaya, 2015.

Variable	Category	Total	Percentage (%)
Age	20-30 years old	17	58.6
	31-40 years old	8	27.6
	> 41 years old	4	13.8
Sex	Male	5	17.2
	Female	24	82.8
Working Period	< 6 years old	9	31.05
	6-10 years old	9	31.05
	> 10 years old	11	37.9
Employment Status	Government	15	51.7
	Honorary	14	48.3
Individual Commitment	Enough	23	79.3
	Good	6	20.7

Variable	Category	Total	Percentage (%)
Knowledge	Less	3	10.3
	Enough	20	69.0
	Good	6	20.7
Attitude	Enough	3	10.3
	Good	26	89.7
Total		29	100

Table 2. Distribution Variable Frequency External Factors and Compliance Behavior in Using PPE in the installation of Inpatient Hospital X Surabaya, 2015.

Variable	Category	Total	Percentage (%)
Occupation factors	Enough	9	31.0
	Good	20	69.0
Work shift	Morning	12	41.4
	Noon	8	27.6
	Night	8	31.03
Compliance behavior	Less	1	3.4
	Enough	18	62.1
	Good	10	34.5
Total		29	100

The relationship of Age with Complience Behavior in Using PPE

Table 3. The relationship of age with Compliance Behavior in Using PPE in the installation of Inpatient Hospital X Surabaya, 2015

Age	The Complience behavior Use Of PPE						Total		Correlation''s value
	Less		Enough		Good				
	n	%	n	%	n	%	N	%	
20-30 years old	0	0	11	64.7	6	35.3	17	100	-0.17
31-40 years old	0	0	4	50	4	50	8	100	
> 41 years old	1	25	3	75	0	0	4	100	

Based on table 3. showed the compliance behavior in using PPE has decreased with increasing age of the respondent.

The Relationship Of Sex with Compliance Behavior in Using PPE

Table 4 . The relationship of sex with the Compliance behavior in the installation of Inpatient Hospital X Surabaya 2015.

Sex	The Complience behavior Use Of PPE						Total		Correlation''s value
	Less		Enough		Good				
	n	%	n	%	n	%	N	%	
Male	0	0	5	100	0	0	5	100	0.336
Women	1	4.2	13	54.2	10	41.7	24	100	

Based on table 4 showed the level compliance behavior of female respondents better than than male respondents.

The Relationship of Working Period with The Compliance Behavior in Using PPE

Table 5. Relationship of Work Period with the Compliance behavior in Using PPE in the installation of Inpatient Hospital X Surabaya, 2015.

Working Period	Compliance Behavior						Total		Correlation's value
	Less		Enough		Good				
	n	%	n	%	n	%	N	%	
< 5 years	0	0	7	77.8	2	22.2	9	100	0.051
5-10 years	0	0	5	55.6	4	44.4	9	100	
> 10 years	1	9.1	6	54.5	4	36.4	11	100	

Based on table 5 showed the compliance behavior good and less category increased with the longer of the work period. While the compliance behavior enough category decreased with the longer of the working period.

The Relationship of Employment Status with Compliance Behavior In Using PPE

Table 6 . The Relationship of Employment Status with Compliance Behavior in Using PPE in the installation of Inpatient Hospital X Surabaya, 2015.

Employment Status	The Complience behavior n Using PPE						Total		Correlation''s value
	Less		Enough		Good				
	n	%	n	%	n	%	N	%	
Government	1	6. 7	11	73.3	3	20	15	100	0.34
Honorary	0	0	7	50	5	50	14	100	

 Based on table 6 showed the compliance behavior good category of the government status better than honorary status. While the government status respondents tend to have an enough compliance behavior.

The Relationship of Individual Commitment with the Compliance Behavior in Using PPE

Table 7 . The relationship of individual Commitment with Compliance behavior in the use of PPE in the installation of Inpatient Hospital X Surabaya, 2015.

Individual Comitment	Compliance behavior						Total		Correlation's value
	Less		Enough		Good				
	n	%	n	%	n	%	N	%	
Enough	1	4	17	74	5	22	23	100	0.515
Good	0	0	1	17	5	83	6	100	

Based on table 7 showed the value of compliance behavior is worth unidirectional with the level of individual commitment

The Relationship of Knowledge with the Compliance behavior in Using PPE

Table 8. The relationship of knowledge with the Compliance behavior in Using PPE in the installation of Inpatient Hospital X Surabaya, 2015.

Knowledge	The Complience behavior Use Of PPE						Total		Correlation's value
	Less		Enough		Good				
	n	%	n	%	n	%	N	%	
Less	0	0	2	66.7	1	33.3	3	100	0.394
Enough	1	5	15	75	0	4	20	20	100	
Good	0	0	1	10.4	5	83.3	6	100	

Based on table 8 showed the compliance behavior good category increased in a good knowledge. An enough knowledge increased in compliance behavior an enough category. Compliance behavior worth unidirectional with the level of respondent's knowledge.

The Relationship of Attitude with Compliance Behavior in Using PPE

Table 9 . Relationship of Attitude with the Compliance Behavior in Using PPE in the installation of Inpatient Hospital X Surabaya, 2015.

Attitude	Compliance behavior						Total		Correlation's value
	Less		Enough		Good				
	n	%	n	%	n	%	N	%	
Enough	0	0	3	100	0	0	3	100	0.215
Good	1	4	15	58	10	38	26	100	

Based on table 9 showed the compliance behavior good category increased with the accretion of value's attitude. Compliance behavior is worth unidirectional with the category attitudes of respondents.

The Relationship of Occupation Factors with Compliance Behavior in Using PPE

Table 10. Relationship Occupation Factors with Compliance Behavior in Using PPE in the installation of Inpatient Hospital X Surabaya, 2015.

Occupation Factors	Compliance behavior						Total		Correlation's value
	Less		Enough		Good				
	n	%	n	%	N	%	n	%	
Enough	1	11	7	78.0	1	11	9	100	0.378
Good	0	0	1 1	55. 0	9	45	20	100	

Based on table 10 showed the compliance behavior good and less category increased with the increase of occupation factors. The Compliance behavior less categories declined with the increase of occupation factors

Relationship Work shift with the Compliance behavior Use of PPE

Table 11 Relationship Work Shift with Compliance behavior in Using PPE in the installation of Inpatient Hospital X Surabaya, 2015.

Work Shift	Compliance behavior						Total		Correlation's value
	Less		Enough		Good				
	n	%	n	%	n	%	N	%	
Morning	0	0	5	41.7	7	58.3	12	100 0	0.446
Noon	0	0	6	75	2	25	8	100	
Night	1	11.1	7	77. 8	1	11.1	9	100	

Based on table 11 showed the compliance behavior good category good decreased in noon shift and night shift. Instead, the compliance behavior enough and less categories increased in noon and night shift.

Compliance behavior Observation Results Use of PPE

Based on table 12 showed 3 of highest inappropriate behavior in using PPE, they are don't check quality of PPE before used, don't change a new glove when doing nursing action to another patient, and don't use close shoes when working.

Table 12. Observation Result of Compliance Behavior in Using PPE in the installation of Inpatient Hospital X Surabaya, 2015

No.	Observation Result	Yes		No	
		N	%	N	%
1	Nurse use gloves If needed when doing nursing action with low risk	0	0	29	100
2	Nurse use suite APD with nursing action before contact with patients	18	62	11	38
3	Nurse wear gloves when doing the Act which allows the exposed blood but no splashes	26	90	3	10
4	Nurse use a closed shoes when working	12	41	17	59
5	Nurse check the quality before wearing thePPE	6	21	23	79
6	Nurses use an apropriate size of gloves to the nurse hands	29	100	0	0
7	Nurse change the glove to a different patient	10	34	19	66
8	Nurse using flip-flops or slippers when working	17	59	1 2	41
9	Nurse using masks correctly	29	100	0	0
10	Nurses use appropriate PPE when doing nursing actions with medium risk	16	55	13	45
11	Nurse put the PPE to nierbeken tools or basin kidney	27	93	2	7
12	The nurses keep gloves in troly action for easy reach	29	100	0	0
13	The nurses put the disposable of PPE after used in waste infectious	15	52	14	48

The Analysis of the Ordinal Regression

Ordinal regression analysis was conducted to know the relationship of the independent variables with the dependent variables simultaneously. All independent variables are made interacted in advance to prevent the correlations between independent variables (multicolinearity). Multicolinearity is one of the requirement before doing ordinal regression analysis test. Variables which have a multicolinearity will be a new variables serve as an interaction variable.

Table 13. Correlation Matrix of The Independent Variables in the installation of Inpatient Hospital X Surabaya, 2015

	A	B	C	D	E	F	G	H	I
A	x	-	✓	✓	-	-	-	-	-
B	-	x	-	-	-	-	-	-	-
C	✓	-	x	✓	-	-	✓	-	-
D	✓	-	✓	x	-	✓	-	-	-
E	-	-	-	-	x	-	✓	-	-
F	-	-	-	✓	-	x	-	-	-
G	-	-	✓	-	✓	-	x	-	-
H	-	-	-	-	-	-	-	x	-
I	-	-	-	-	-	-	-	-	x

Describe:
- : No correlation between variables
✓ : A corelation between variables
× : Not searchable the correlation between variables

A : Age   F : Attitude
B: Sex   G : Individual Coomitment
C: Work period   H : Occupation factors
D: Employment status   I : Work shift
E: Knowledge

Table 14. The Results of Ordinal Regression Test in the installation of Inpatient Hospital X Surabaya, 2015.

Variables	Estimates	Wald	Sig.	95% Confidence Interval	
				Lower Bound	The Upper Bound
Complience behavior = 1	-25.162	217,417	0	-28506	-21818
Complience behavior = 2	-20.273	273,976	0	-22673	-17872
Knowledge * commitment = 1	-20.924	148,769	0	-24286	-17561
Knowledge * commitment = 3	-22.321	241,721	0	-25135	-19507
Knowledge * Commitment = 4	-23.625	127,711	0	-27762	-19487
Knowledge * Commitment = 5	-19.574	-	-	-19574	-19574
Knowledge * commitment = 6	0[a]	-	-	-	-

Based on table 14, obtained the variable interaction of knowledge and individual commitment had the value < 0.05. The value of R Square which is used in this research based on the values of Nagelkerke, the value is 0.483. It was concluded that the interaction variable of knowledge and individual commitment able to explain variations in compliance behavior in using PPE amounted to 48.3%

DISCUSSION
The Relationship of Age with Compliance Behavior in Using PPE

The compliance behavior in using PPE has decreased with increasing age of the respondent. Often it is assumed that the increase of the age will an affect a prolonged saturation and lack of intellectual stimulation against the work (Robbins, 2007). This will contribute to a decrease of the level of a compliance behavior,that it related with decline in productivity of workers.

The Relationship of Sex with Compliance Behavior in Using PPE

Female respondents majority tend to have a good category in compliance behavior. All of male nurse tend to have a good category in complance behavior. This is due to total nurses the majority of woman is 80 (82.8%). Therefore difference level between the compliance behavior nurse's women and men has no signification. Based on smeth (1994) the level of compliance behavior better than men.

The Relationship of Working Period with Compliance Behavior in Using PPE

The working period is variables that have the weakest correlation compared to other variables. On the research, respondents with work time > 10 years tend to compliance behaviors decreased. It cause they are already accustomed to use a less appropriate PPE when performing the nursing action. It can happened because a nurse do not feel a health problem perceived with their bad habit in using PPE. The result opposite with the theory from Dirgagunarsa (1992), the longer of work period make workers have a better of level compliance behavior (Dirgagunarsa, 1992). Workers that have long experienced will know and understand the hazard of the work. So, they will do something more be careful and conscious to protect themselves, for example is compliance behavior in using PPE (Zayadi, 1979).

The Relationship of Employment Status with Compliance Behavior in Using PPE

Nurse with honorary status tends to behave more comply in using PPE than nursing with government employee. Based on the results of the research, obtained that the majority of the honorary status is young adults category. Young adult category tends to be flexible, adaptive, and overt. In addition, the nurse with honorary status have a feel worried about their working contract. It will be terminated if they exposed to serious infectious disease. Besides that, nurse with honorary status have lower salaries than nurses with government employee. However, according to research Badi'ah (2002) states that the nurse keep carrying out good job regardless for any insentive.

The Relationship of Individual Commitment with Compliance Behavior in Using PPE

Individual commitment is the strongest variables which related with compliance behavior. Cialdini and Martin (2004) one of base principal program which cause compliance behavior. A person who has a good individual commitment tends to have good behavior in performing the work. Workers with high commitment will work with not know tired nor time until the target is reached (Mowday, 1982). It occasionally makes workers forget about safety at the time of work. These conditions create opportunities become discompliance in nurses with high commitment will be greater. Robbins (2007) mentions the commitment is the level of someone identifying themselves with the organization and its goals and wishes to maintain the existing membership in the organization.

The Relationship of Knowledge with Compliance Behavior in Using PPE

Someone who has good knowledge tend to have good behavior in using PPE. In accordance with the theory of Green (1980) which states that knowledge is an important element that should be given to someone before doing anything. The theory of safety triad explained that knowledge has significant relationships with labor compliance in the use of the APD (Geller, 2001). Explained that the behavior based on knowledge, and then the behavior will last a long time (long lasting).

The Relationship of Attitude with Compliance Behavior in Using PPE

The majority of respondents choose to be positive attitude. This can be affected the data respondents is less open and the high level of its homogeneity. Carpenito (2000) states one of the factors associated with compliance is attitude. Based on Richard LaPiere in Suryanto (2012), attitude is not always positively correlation with a compliance behavior. Attitude is one of determinant of behavior, but many other determinant must be considered.

The Relationship of Occupation Factors with Compliance behavior in Using PPE

According to McLeod (2007), a person tends to adhere to something if it has legitimate authorities so as to make workers abide by the commandment and the existing rules. Ramdayana research results (2009) mention that the work includes supervision, rules and regulations related to the compliance level of nurses. According to Feldman (2011) compliance behavior can be change with the follow the orders of others regardless of the consent of person. This is in accordance with the results of the observations, which the respondents using PPE when observed. If the condition is sustainable, the nurse's awareness is low and effect to illness and an accident happened in workplace. According to Geller (2001), the rate of compliance in workers behave can be increased with an internalization. It means workers doing something cause of understanding and knowing the importance of these actions.

The Relationships of Work shift with Compliance Behavior in Using PPE

The respondent's compliance behavior in using PPE at the morning shift better than the respondents at noon and night shift. According to Nurmianto (2008) workers on duty at the night shift high risk to get a health problems. It can cause an errors and omissions that make a person be do not comply.

The Analysis of the Ordinal Regression of Research Variables

The Ordinal regression model equations are obtained based on table.13:

$$ln\left(\frac{P(Y=1)}{P(Y=1)}\right) = -25.162 - 20.924\,X1 - 22.321\,X2 - 19.574\,X3 - 19.574\,X4$$

$$ln\left(\frac{P(Y=2)}{P(Y=2)}\right) = -20.273 - 20.924\,X1 - 22.321\,X2 - 19.574\,X3 - 19.574\,X4$$

Description:
X 1 = Variable Interaction of knowledge * individual commitment (1)
X 2 = Variable Interaction of knowledge * individual commitment (3)
X 3 = Variable Interaction of knowledge * individual commitment (4)
X 4 = Variable Interaction of knowledge * individual commitments (5)

Knowledge and commitment is value's thing in an organization. Organization must be able to make an organization be a productive. It can be conducted with th workers who had knowledgeable and commitment (Iqbal, 2013). Based on the results of the Atmianto research (2014), a positive correlation between the knowledge with the individual commitment. Knowledge is a basic for a nurse to do their duty properly. The individual commitment related closely to responsibility to do the job. High Commitment and good responsibility can improve the work productivity. High commitment able to make the level of compliance behavior in using PPE increased be more comply

IV.   CONCLUSION

1. Good Individual Commitments will be able to increase the level of compliance behavior on nurses.

2. The level compliance behavior at morning shift better than the other work shift (noon and night(.the strongest correlation witth compliance behavior in external factors.

3. Individual Commitment is the strongest variable related to the compliance behavior on nurses.

SUGGESTION

Advices that can be given to the management of the hospital are:

1. Increase knowledge of nurses to be aware of the importance of the compliance behavior in using PP to prevent HAIs in hospital.

2. Hospital management expected to increase individual commitment of nurses by creating a comprehensive program:

    a. Nurse corporation in decision making to enhance the sense of owning to organizations

    b. Hold a workshop program and make teh evaluation of the participants who took part in that program, so the hospital management can be assess the effectifity

3. Need to conduct an eligibility test of for PPE before used

4. Improving the quality supervision about compliance behavior in using PPE

5. Do the dissemination about reports of compliance behavior in using PPE periodically to all nurses inpatient installation.

REFERENCES

[1] Atmianto (2014). Analysis of the Influence of Attitude, Knowledge, and Organization Commitment To a Nurse Commitment in RSUD DR Soehadi Prijonegoro. *Thesis*. Gadjah Mada University Postgraduate Pogram of Medicine Faculty.

[2] Badi'ah. (2009). The Correlation of a Nurse Motivation with Performance in Inpatient Installation in General Hospital in Panembahan Senopati Area, Bantul. *Journal of Nursing Services Management* Vol.12 No.2.

[3] Carpenito L.J. (2000), *Nursing Diagnose ; Application in Clinical Practice*, 6th Edn. Jakarta : EGC.

[4] Dirgagunarsa, S. (1992). *Introduction of Psychology*. Jakarta: Mutiara Sumber Widya.

[5] Cialdini R, Martin. (2004). *The Science of Compliance*. Arizona State University. United States of America.

[6] Feldman, R. (2011). *Understanding Psychology tent book.* New York: McGraw-Hill.

[7] Geller, E Scoot. (2001). *The Pshychology Of Safety Handbook.* USA: Lewis Publisher.

[8] Green, Lawrence (1980). *Health Education Planning a diagnostic Approach Baltimore.* The John Hopkin University, Mayfield Publishing Co.

[9] Iqbal, M. (2013). The Application of Knowledge Management and Job Satisfaction To Organization Commitment at Pleasant Hill Hotel, Lembang. *Undergraduate Thesis*. Indonesian Computer University of Management Faculty.

[10] McLeod, S. A. (2007). *Simply Pscyhology : Milgram Experiment*.

[11] Mowday, RT., Steers,RM. (1982). *Employee Organization Lingkages: The Psychology of Commitment, absenteeism, and Turnover*. London: Academic Press Inc

[12] Nurmianto, Eko. (2008). *Ergonomic: Basic Consept and Application 2th Edtion*. Surabaya: Prima Printing.

[13] Ramdayana. (2009). The Factors Related To Compliance Behavior Level on Nurse in Using Personal Protective Equipment in Inpatient Installation at Marinir Cilandak Hospital, South Jakarta. *Undergraduate Thesis.* University of National Development. Nursing Science Study Program.

[14] Robbins SP, dan Judge. (2007). *Organization Behavior*. Jakarta : Salemba Empat.

[15] Smeth, B. (1994). *Health Psychology.* Jakarta : PT Gramedia Indonesia

[16] Suryanto (2012). *Introduction of Social Psychology.* Suarabaya: Airlangga Universiy press

[17] Zayadi. (1979). *Pencegahan Kecelakaan Kerja.* Jakarta: Labour Of Department.