Analysis Factors of Nurse Behavior using Self-protective Equipment at Sembiring Hospital

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Abstract: The hospital is one place that has a much higher level of work relationships for accidents, injuries and occupational diseases compared to other institutions. Nurse professions have a higher risk of being involved in work accidents because they do physical business every day, have longer working hours and operate high-risk equipment. The results of a preliminary survey conducted at the Sembiring Hospital conducted a survey of interviews and direct observations conducted by researchers to several health workers in the Inpatient Room of ten nurses, six of whom did not carry out the procedures for using PPE properly such as not wearing gloves when going to infuse patients This study was to analyze the Factors Affecting Nurses' Behavior Not Using Personal Protective Equipment (PPE) in the Inpatient Room of Sembiring Hospital Deli Serdang Regency in 2018. This type of research is an analytic study using a cross-sectional design approach. The population in this study were all nurses in the inpatient ward of the Sembiring hospital. The sample of this study where 91 inpatients. Sampling was carried out by a stratified random sampling method in each inpatient room at Sembiring Hospital. The results of the study with multivariate analysis with logistic regression tests showed that the factors that influence the behavior of nurses not using PPE are knowledge ($p = 0.009 < 0.05$) and attitude ($p = 0.001 < 0.05$). The conclusion in this study is that there is an influence of knowledge and attitudes towards the behavior of nurses not using Personal Protective Equipment (PPE) in the Inpatient Room of the Sembiring Hospital Deli Serdang Regency. It is recommended to the hospital that nurses' knowledge be further enhanced by holding socialization and education in the form of regular and periodic training.

1 INTRODUCTION

In Indonesia, the probability of transmission of HIV to health care workers after an HIV-infected needle stick injection is 4: 1000. The risk of transmission of HBV after a needle stick injection wound contaminated with HBV is 27 -37: 100. The risk of transmission of HCV after a needle stick wound containing HCV is 3-10: 100. While in the central surgical installation of the Regional General Hospital (RSUD) Jakarta in 2008 there were 83.3% of workers suffering from lower back pain, 63.3% of them were aged 30-49 years (Kepmenkes RI, 2017).

Based on the results of recording from BPJS Employment Data Center (2018) the number of work accident cases in Indonesia from 2011 to 2017 experienced fluctuations, the highest rate in 2015 was 110,285 cases. In 2011 there were 9,891 cases, in 2012 there were 21,735 cases, in 2013 35,917, in 2014 there were 24,910 cases. In 2016 there were 105,182 cases and in 2017 from January-August there were 80,392 cases (OHS, 2017)

The study of Salawati et al (2017) related to the application of K3 to nurses revealed that before a person adopts a behavior, he must understand what the meaning and benefits of the behavior are for himself and others. If the nurse knows the importance of controlling nosocomial infections, compliance with SOPs and existing regulations will be created. Nurses with good knowledge will have good OSH actions because with a good level of knowledge knowing and understanding the negative effects of nosocomial infections so nurses will improve their performance in controlling nosocomial infections (Sandewa, 2017)

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Personal protective equipment is tools that are able to provide protection against the dangers of accidents. Personal protective equipment (PPE) is a tool that must be used when working in accordance with the danger and work risk to maintain the safety of the worker himself and those around him. The types of PPE needed include eye protection, ear protection devices, head protection, breathing, body, hands and arms and legs (OSHA,2017).

Following the hierarchy of controls outlined by the National Institute of Occupational Safety and Health (NIOSH) can reduce the risk of developing an occupational illness within this industry [11]. The hierarchy of controls are listed from most effective to least effective in the following order: elimination, substitution, engineering controls, administrative controls, and PPE. PPE is required by employers when elimination, substitution, and engineering controls do not work and when administrative controls are not feasible or do not provide adequate protection (Tamara, 2017)

According to Fuller &Vassie in Zanko (2017) states 80-90% of work accidents when traced to human factors.The wrong attitude or position in conducting nursing care to patients, the lack and attitude of careless nurses with their own safety by not using personal protective equipment (PPE) in carrying out their activities. Unsafe conditions (unsafe condition) is one of the causes of workplace accidents. Unsafe actions (unsafe actions) are actions that can endanger workers themselves and others that can cause accidents that can be caused by various things such as not using PPE, not following work procedures, not following work safety rules and not careful work , where out of every 300 unsafe actions, 1 (one) accident will occur resulting in loss of workdays (Maria, 2015).

Many workers do not feel wearing PPE is essential to their health, so PPE is often overlooked and not considered a main factor when the overall site safety is assessed (Efstathiou, G, 2017). In the wastewater industry, most companies mandate that employees wear safety glasses, steel toe boots, and nitrile gloves as their standard PPE while they are at work. The Occupational Safety and Health Administration (OSHA) does not mandate specific regulations for this industry, but the wastewater industry is expected to follow the regulations for "General Industry" (29 Code of Federal Regulations 1910) as they pertain to safety in the workplace (Mc Gaw, 2017)

Based on this background, the writer is interested in writing research entitled Analysis of Factors Affecting Nurses' Behavior Not Using Personal Protective Equipment (PPE) in the Inpatient Room of Sembiring Hospital, Deli Serdang Regency in 2018.

2 METHODS

This type of research is an analytical study using a cross-sectional design approach, which is a study by measuring independent variables and dependent variables at the same time, which aims to explain the influence, education, gender, knowledge, attitude, availability of PPE and supervision with behavior nurses do not use PPE in the Inpatient Room of the Sembiring Hospital in Deli Serdang Regency in 2018. This study was conducted in the Inpatient Room of the Sembiring Hospital in Deli Serdang Regency in 2018 with the entire research process carried out in November 2018-April 2019.

The population in this study were all nurse nurses with a minimum education level of D-III Nursing inpatient rooms in Sembiring General Hospital totaling 118 people and a sample of 91 nurses. Sampling was done by stratified random sampling method in each inpatient room at Sembiring General Hospital.

The research instrument was a questionnaire. Data analysis was performed using the chi-square statistical test as a bivariate data analysis and using the Logistic regression test as multivariate analysis.

3 RESULTS AND DISCUSSION

3.1 Univariate Analysis

The univariate analysis aims to find out the value of each independent and dependent variable. The univariate analysis is as follows:

The Table 1 shows the distribution of respondents based on the characteristics of age, sex, education and length of work.Based on research that has been done shows that for the age category, the proportion of respondents aged the most was aged 24-45 years by 95.5%, the most gender was 71.4% for women and 28.6% for men, the highest level of education was at DIII education level namely 50.5% and the most work mass in the group> 5 years is 79.1%.

Table 1: Nurse characteristics

characteristics	Frequaency	%
Age		
24-45 years (adult)	86	95,5
46-55 tahun (elderly man)	5	4,5
Gender		
Male	27	29,7
Female	64	70,3
Education		
DIII	46	50,5
S1	46	49,5
working eye		
>5 years	17	20,9
>5 years	72	79,1
Total	**91**	**100,0**

Based on the Table 1 the results of the study found that the majority of knowledge levels were 58 people (63.7%).The Table 2 shows the distribution of respondents based on the nurse's knowledge:

Table 2: Knowledge of nurses

Knowledge	Total	%
Eligible	58	63,7
Not Eligible	33	36,3
Total	**91**	**100,0**

Based on the results of the study found the majority of nurses with a positive attitude of 66 people (72.5%).The Table 3 shows the distribution of respondents based on Nurse's Attitude :

Table 3: The Attitude of nurses

Attitude	Total	%
Positive	66	72,5
Negative	25	27,5
Total	**91**	**100,0**

Based on the Table 3 the results of the study found that the majority of nurses stated that supervision in the good category was 53 people (58.2%). The Table 4 shows the distribution of respondents based on supervision:

Table 4: Supervision of hospital nurses

Utilizing	Total	%
Eligible	53	58,2
Not Eligible	38	41,8
Total	91	100,0

Based on the Table 4 the results of the study obtained the majority of nurses stated that there are 78 people with PPE. The Table 5 shows the distribution of respondents based on nurse's availability:

Table 5: Availability of PPE

Availibility	Respondents	%
Available	78	85,7
Not available	13	14,3
Total	91	100,0

Based on the research results obtained, the majority of nurses both in the behavior of PPE usage that is as many as 56 people (61.5%). The Table 6 shows the distribution of respondents based on nurse's behavior:

Table 6: Behavior of using PPE

PPEusage behavior	Total	%
Good	56	61,5
Not good	33	38,5
Total	91	100,0

3.2 Bivariate Analysis

The Table 6 shows that the results of the analysis test found that the value of p = 0.169> 0.05 which means that there is no significant effect between the level of education with the behavior of nurses not using PPE in Sembiring General Hospital. The bivariate analysis shows in Table 7.

Table 7: Influence of education level with PPE usage behaviour

Level off education	Utilizing PPE				P
	good		Not good		
	-	%		%	
DIII	32	69,6	14	30,4	0,169
S1	24	53,3	21	46,7	
Total	56	61,5	35	38,5	

The Table 7 shows that the results of the analysis test found that the value of p = 0.474> 0.05, which means that there is no significant effect

between sex with the behavior of nurses not using PPE in Sembiring General Hospital (Table 8).

Table 8: The effect of gender on PPE usage behaviour.

Level of education	Behavior PPE				p
	Good		Not good		
	-	%	-	%	
Male	14	53,8	12	46,2	0,474
Female	42	64,6	23	35,4	
Total	56	61,5	35	38,5	

The Table 8 shows that the results of the analysis test found that the value of p = 0.009 <0.05 which means that there is a significant influence between knowledge and behavior of nurses not using PPE at the Sembiring General Hospital (Table 9).

Table 9: Effect of knowledge on PPE usage behaviour.

Knowledge	Behavior PPE				p
	Good		Not good		
	-	%	-	%	
Good	42	12,4	16	27,6	0,009
Not good	14	42,4	19	57,6	
total	56	61,5	35	38,5	

The Table 9 shows that the results of the analysis test found that the value of p = 0.001 <0.05 which means that there is a significant influence between attitude and behavior of nurses not using PPE in Sembiring General Hospital (Table 10).

Table 10: Effect of attitude on PPE usage behaviour

Attitute	Behavior PPE				p
	Good		Not good		
	-	%	-	%	
Positive	48	72,7	14	27,3	0,001
Negative	8	32,0	17	68,0	
Total	56	61,5	35	38,5	

The Table 10 shows that the results of the analysis test showed that the value of p = 0.072> 0.05, which means that there is no significant effect between supervision with the behavior of nurses not using PPE at the Sembiring General Hospital (Table 11).

Table 11: Effects of oversight with PPE usage behaviour.

Oversight	Use off PPE				ρ
	Good		Not good		
	-	%	-	%	
good	48	72,7	14	27,3	0,072
Not good	8	32,0	17	68,0	
total	56	61,5	35	38,5	

The Table 11 shows that the analysis test results show that the value of p = 0.124> 0.05 which means that there is no significant effect between the availability of PPE and the behavior of nurses not using PPE in Sembiring General Hospital (Table 12).

Table 12: The influence of PPE availability with PPE usage behaviour.

Avaibility PPE	Use of PPE				ρ
	good		Not good		
	-	%	-	%	
Available	51	65,4	27	34,6	0,124
Not available	5	38,5	8	61,5	
total	56	61,5	35	38,5	

3.3 Multivariate Analysis

Multivariate analysis is used to explain the independent variables that most influence the dependent variable. In this study, the multivariate analysis used was a logistic regression test.

On the table above, the logistic regression test shows that the knowledge and attitude variables have a p-value of less than 0.05 (p-value <0.05). Multivariate analysis results can be concluded that the variables of knowledge and attitudes have a strong influence on the behavior of nurses not using PPE. The analysis results obtained the largest value of Exp (B) is attitude (5,780), meaning that attitude is the most dominant variable influencing the behavior of nurses not using PPE.The results of this analysis can be seen from the Table 13:

Table 13: Logistic regression analysis results

	B	S.E	Wold	Sig	Exp (B)
Knowladge	1.293	.469	6.805	.009	3.645
Attitude	1.754	.536	10.73	.001	5.780
Contents	-4.539	1.07	17.88	.000	.001

4 DISCUSSION

The results of the bivariate analysis using the Chi-Square statistical test showed that statistically there was no influence of the level of education on thebehavior of nurses not using PPE in the inpatient room of the Sembiring General Hospital. Of the 46 nurses with DIII education, who were not good in using PPE as much as 30.4% then out of 45 nurses with undergraduate education who did not use PPE as much as 46.7% so that statistically did not have too much difference between nurses and level DIII and S1 education because some nurses are equally less good at using PPE.

Then from the results of multivariate analysis, for education level variables entered into the candidate test variable for multivariate test because the value of p <0.25, but did not enter the final modeling stage of multivariate test with logistic regression because the value of p> 0.05 so that the level variable education does not affect the behavior of nurses not using PPE in the inpatient ward of Sembiring General Hospital. This is because there is no significant difference in nurses with DIII education level and S1 education level. Both of them showed the behavior of not using good PPE. Based on the results in the field, the research respondents are almost balanced between the number of DIII and S1 educators, so this difference in education level is less able to describe the behavior of nurses.

The findings of the aforementioned studies were in line with results of the present study. Behavioral changes may be influenced by various factors such as personal awareness and beliefs. In other words, people's awareness and beliefs have the main role on improving health behaviors. The findings of the present study indicated that the theory-based training led to increase the mean score of awareness and constructs of TPB framework in the intervention group. The study of Navidian et al. in Iran (2014) aimed to assess the impact of safety education on knowledge, attitude, and the use of PPE among workers employed in a glass industry. They found that safety training through motivational interview has resulted in significant difference in the mean score of knowledge, attitude, and behavior of using PPE in the intervention group compared to the control (Navidian, 2017)

From the results of the bivariate analysis using the Chi-Square statistical test showed statistically that there was no gender effect on the behavior of nurses not using PPE in the inpatient ward of Sembiring General Hospital. Of the 27 nurses with male sex, those who are not good in using PPE as much as 37% then of 64 nurses with female sex who are not good at using PPE as much as 39.1% so that statistically does not have too much difference between male nurses men and women because some nurses are equally unfavorable in using PPE. Then from the results of multivariate analysis, the sex variable did not enter the candidate test variable for the multivariate test because of the value of p> 0.25.

The absence of influence between sex on the behavior of nurses not using PPE in the Sembiring General Hospital in this study was because there were no significant differences between nurses and male and female genital sex. Some nurses, both male, and female showed the same behavior as not using a good PPE. Based on the results in the field, the number of female respondents in the study was very high, so the difference in the number of samples that too far could not describe the nurses' behavior.

Boys were at a significantly higher risk of exposure compared to girls, and boys engaged more frequently in risky behavior. Hearing and respiratory protection was used minimally and sporadically. Physical symptoms influenced use of hearing and respirator use, as did physician recommendation to use such protection. Of students who operated farm tractors, only half most frequently operated tractors with safety bars and seat belts. Sixty percent of the students reported using equipment with damaged or missing safety shields (Efstathiou, 2017)

From the results of the bivariate analysis using the Chi-Square statistical test showed statistically that there is an influence of knowledge on the behavior of nurses not using PPE in the inpatient room at Sembiring General Hospital. From 58 nurses with good knowledge, those who are not good in using PPE are only 27.6%, then from 33 nurses with poor knowledge, the use of PPE is not good, only 57.6%, so statistically it can be

concluded statistically that most nurses with knowledge not good enough to have poor PPE usage behavior. Then from the results of multivariate analysis, the knowledge variable entered into the candidate test variable for the multivariate test because the p-value <0.25, then entered the final modeling stage of the multivariate test with logistic regression because of the p-value <0.05.

The influence of knowledge on the behavior of nurses not using PPE in this study is that the majority of nurses have good knowledge. Of the majority of nurses with good knowledge, almost all of them use PPE well. Vice versa, nurses with poor knowledge also almost all have behaviors that do not use PPE properly.

From the results of the bivariate analysis using the Chi-Square statistical test showed statistically that there was an influence of attitudes on the behavior of nurses not using PPE in the inpatient room at the Sembiring General Hospital. Of the 66 nurses with a positive attitude, those who are not good in using PPE are only 27.3% then out of 25 nurses with a negative attitude almost all nurses use PPE that is not as good as 68.0% so that statistically it can be concluded that the majority of nurses negative attitude has the behavior of using PPE that is also not good. Then from the results of multivariate analysis, the attitude variable entered into the candidate test variable for the multivariate test because the p-value <0.25, then entered the final modeling stage of the multivariate test with logistic regression because of the p-value <0.05.

The influence of attitudes on the behavior of nurses not using PPE in this study is that the results obtained from all nurses who have negative attitudes are almost all do not use PPE properly. Nurse's attitudes related to the reaction or response of nurses to the use of PPE. Although the average nurses in this study stated that they agreed with the attitude to use PPE, there were still some nurses who had a negative attitude towards using PPE.

Regarding nurses' attitudes in carrying out their work related to occupational safety and health, efforts made by the hospital especially for hospitals, namely before doing their work or hours of duty or guarding nurses, nurses receive directives from both the head nurse or the head of the room to work carefully and optimally. Then also carried out related information about OSH in the hospital that the importance of good safety and work attitude in the inpatient room (OHSA, 2017)

A recent survey has shown that organizational factors including improved positive workplace safety climate, reduced patient work load (i.e., fewer number of patients per day), and fewer barriers to using PPE play an important role relative to the use of precautionary measures.[28] Similar findings were reported in another survey where the likelihood of chemotherapy drug exposure decreased when nurses reported adequate staffing, resources, and favorable working conditions (Fiese CR, 2018)

From the results of the bivariate analysis using the Chi-Square statistical test showed statistically that there was no influence between supervision on the behavior of nurses not using PPE in the inpatient ward of Sembiring General Hospital. From 53 nurses with good supervision, those who were not good in using PPE were 47.2%, then from 38 nurses with poor supervision, those who were not good in using PPE were 26.3% so it can be concluded that both nurses who received good supervision were also partially large still does not use PPE properly. Then from the results of multivariate analysis, for the surveillance variable into the candidate test variable for multivariate test because the p-value <0.25, but does not enter the final modeling stage of the multivariate test with logistic regression due to the value of p> 0.05.

The absence of influence between supervision on the behavior of nurses not using PPE in this study is due to the results that the majority of nurses get good supervision. Of the majority of nurses who get good supervision, not all of them use PPE well. Means it can be concluded that both nurses who get good supervision also mostly still do not use their PPE properly (Blais, 2016)

The purpose of the supervision for these nurses, according to them, is to find out the extent of the work done by the nurse, whether it is by standards or work plans, whether resources have been used by those set. If the supervision management system in a hospital is optimal, this is what makes them use PPE better.

From the results of the bivariate analysis using the Chi-Square statistical test showed that there was no statistically significant influence between the availability of PPE on the behavior of nurses not using PPE in the inpatient room at the Sembiring General Hospital. Of the 78 nurses who stated that PPE in Sembiring General Hospital was available, only 13 nurses stated that PPE in Sembiring General Hospital was available but even though the nurses stated that PPE was available but most nurses still

did not use PPE well. Then from the results of multivariate analysis, for the PPE availability variable entered into the candidate test variable for the multivariate test because the p-value <0.25, but did not enter the final modeling stage of the multivariate test with logistic regression because of the value of p> 0.05. the influence between the availability of PPE on the behavior of nurses not using PPE in this study was due to the result that the majority of nurses stated that PPE was available. Of the majority of nurses who stated that PPE was available, not all of them used PPE well. Means it can be concluded that both the availability of PPE in Sembiring General Hospital is complete even though most still do not use PPE properly.

The inconvenience is due to the use of PPE which is felt hot when using a mask because it is seen as a hot workplace condition and is found in the work area, especially in the production section. Because of the inconvenience sometimes workers choose to take it off not to wear it. Personal protective equipment should be used in certain circumstances in this case for workers because it is indeed the use of PPE as a last resort to prevent workplace accidents. Based on Green's theory that something inherent in someone as a predisposing factor in this case is the convenience of using PPE can affect a person's behaviour (JhonyKalasuat, 2019).

ICU HCWs report suboptimal levels of influenza PPE adherence. This finding in a high-risk setting is particularly concerning, given that it likely overestimates actual behavior. Both suboptimal adherence levels and significant PPE knowledge gaps indicate that ICU HCWs may be at a substantial risk of developing and/or transmitting nosocomial respiratory viral infection. Improving respiratory virus infection control will likely require closing knowledge gaps and changing organizational factors that influence behaviour (Daugherty, 2017).

Greater levels of management commitment to safety and perceived risk were also related to lower odds of adverse events. These results point to the value of implementing a comprehensive health and safety program that utilizes available hazard controls and effectively communicates and demonstrates the importance of safe handling practices. Such actions also contribute to creating a positive safety climate (DeJoy, 2017).

Findings from the present research regarding management commitment towards PPE enforcement is consistent with other research. Studies also encourage supervision to ensure that PPE is comfortable, and to always check, maintain, and replace PPE to improve the practice of wearing PPE [Tanko, 2017]. Research has also emphasized the importance of enforcing employees to comply with the use of PPE through disciplinary action, incentives, and education [Stephenson, 2018].

5 CONCLUSIONS

Based on the results of the discussion in this study that there is an influence between attitude and knowledge on the behavior of not using PPE on nurses because knowledge will provide reinforcement to a nurse in every decision and behavior. Nurses who have high knowledge will generally be able to work according to standards. Conversely, implementing officers who have low knowledge will tend to work in a hurry. A good attitude can be realized if it is based on responsibility for everything that has been chosen by the nurse with all the risks that exist when going to do the work. Occupational accidents caused by umans are greatly influenced by individual behavior or attitudes at work.

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