# The Influence of Health Workers' Knowledge, Attitude and Compliance on the Implementation of Standard Precautions in Preventions of Hospital-Acquired Infections at PKU Muhammadiyah Bantul Hospital

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Abstract

Prevention of infection is a form of efforts to maintain patient safety in health services in hospitals. However, the large number of health workers with low knowledge, inappropriate attitudes and non-adherence in the implementation of standard precautions makes increase the number of infections acquired in hospitals. Analytical observational research with cross-sectional design. Knowing the knowledge, attitudes and compliance to 99 health workers consisting of nurses and midwives in the application of standard precautions in the inpatient room, intensive care unit and delivery room of PKU Muhammadiyah Bantul Hospital during July to August 2017. Data analysis using multiple logistic regression. There are three things that are assessed in the application of standard precautions namely knowledge, attitude and compliance. All aspects were assessed to have an effect on the implementation of standard precautions in PKU Muhammadiyah Bantul Hospital. Attitude is the most influential with p value 0,038 and OR value is 3,701. From the analysis, it is known that the percentage of all variables is 36.8% toward the implementation of standard precautions. Knowledge, Attitudes and Compliance has an effect of 36.8% on the application of standard precautions with the attitude having the greatest influence.

Keywords: Knowledge; Attitude; Compliance; Standard precautions; Hospital-acquired infections

Introduction

Good service is an important factor in the implementation of health services in hospitals. Some developed countries change quality to quality-safety, this shows not only quality but patient safety is also important in the implementation of health services [1]. Health services are a place for interaction between patients and hospitals that involve patients, doctors, nurses and other healthcare professionals in sensitive relationships concerning satisfaction, quality of care and image of the hospital [2]. Hospitals are institutions that provide full-scale private health services that provide inpatient, outpatient and emergency unit and are based on human values, ethics, professionalism, benefits, equity, equality, anti-discrimination, equity, protection, patient safety and social functions [3]. Prevention of infection is a form of efforts to maintain patient safety in health services in hospitals.

The World Health Organization (WHO) describes hospital-acquired infections as an infected patient during hospitalization that is absent or incubated at admission And there after the patient is discharged from the hospital and the infection obtained by health workers while working in the hospital [4]. The 2013 study in Europe was found to be a 50% prevalence of hospital-acquired infection, consisting of 29% wound infections, 26% gastrointestinal infections, 19% pneumonia, 16% urinary tract infection and 4% sepsis [5]. High incidence rates of hospital infections serve as an indicator of the quality of health services, therefore infection prevention measures Nosocomial is very important for health personnel in hospitals [6].

All levels of hospital management play an important role in the spread and control of infections especially health workers, because health professionals make direct contact with patients while providing health services to provide an opportunity to transmit infection to patients [7]. The precautions may be made by applying the standard precaution to the patient in the hospital by health workers. Standard precautions are basic precautions that should be applied in all patient care [8]. Hospital-acquired infections can be prevented by various measures, such as maintaining hand hygiene and the use of personal protective equipment. Hand hygiene is widely acknowledged as the most important activity to reduce the spread of disease, but evidence suggests that many health workers do not do as often as they need or use the correct technique [9]. Personal protective equipment is used to protect themselves and patients from the risk of cross-infection, includes items such as gloves, aprons, masks, eye protection, hats and footwear [8].

Research conducted in Korea on prevention of hospital-acquired infections showed 9.48% of nurses did not wash their hands and did not use personal protective equipment. The study was conducted to assess the awareness, compliance, attitudes and self-efficacy of the nurses for the control of HAIs [10].

Methods

An observational analytic study with cross-sectional design conducted at PKU Muhammadiyah Bantul Hospital, consisting of: inpatient room, intensive care unit and delivery room from July to August 2017. The sampling was conducted by random sampling through surveys and questionnaires to 99 health workers consisting of nurses and midwives who perform health services.

Prior to data collection, questionnaires were used to measure the assessment conducted validity and reliability test. Validity and reliability test in this research use 30 respondent health workers at Hospital PKU Muhammadiyah Bantul. The validity test is intended to determine whether the instrument has validity. The results of validity test can be known to what extent the measuring instrument is appropriate as a desired measuring instrument using correlation product moment test, this research R table value used is 0,361. From the data analysis, knowledge consisting of 18 statements tested there are 15 valid items and 3 invalid items. The attitude questionnaires of the 12 statements tested there are 12 valid items and no invalid items. This explains that all statements tested in the attitude are valid. And on the compliance questionnaire consisting of 12 statements tested there are 11 valid items and 1 invalid item. The statement is valid if the R value is greater than R table or have positive result.

After the data obtained is valid then the data continued with the reliability test. Test reliability in this study using Cronbach Alpha formula. If the Cronbach Alpha value is greater than the constant (0.6), then the question is declared to be reliable. Reliability test results with the number of respondents 30 people have a value of Cronbach's Alpha greater than 0.6 on all variables studied. It can be concluded that the whole item statement on the questionnaire has a good index of trust.

Results

At the age, it was seen that 9.1% were 20-25 years old, 19.2% were 26-30 years old, 36.4% were 31-35 years old, 24.2% were 36-40 years and 11.1% were 41-45 years. From the description, the largest number of respondents of this study came from the age group 31-35 years. In the gender, 12.1% were male and 87.9% were female. The largest number of respondents of this study was women amount. At the education level, 70.7% have **associate's degree** education background and 29.3% with **bachelor's degree** education background. From the description, in this study the largest respondents came from the background of **associate's degree** education. In the type of work, the number of respondents who have job as nurse is 82.8% and midwife is 17.2%. From the description, the nurse is the most types of work. In the period of work, 31.3% have been working for less than 5 years, 38.4% have worked for 5-10 years, 19.2% have worked for 10-15 years, 10.1% have been working for 15-20 years and 1% have been working for more than 20 years. From the description, respondents in this study at most are health workers who have worked for 5-10 years. In marital status, 83.8% were married and 16.2% were unmarried. In the employment status, 75.8% were permanent employees, 13.1% were honorary employees and 11.1% were apprentice **(Tables 1 and 2)**.

In knowledge, health workers at PKU Muhammadiyah Bantul Hospital have poor knowledge of 54.5% and 45.5% have good knowledge. This shows the knowledge of health workers on the application of standard precautions in prevention of hospital-acquired infections is lacking. In attitudes, health workers in those who have negative attitudes of 55.6% and 44.4% have a positive attitude. This shows the attitude of health workers to the implementation of standard precautions in preventing hospital-acquired infections is still lacking. In compliance, health personnel have a dutiful level of 49.5% and non-compliance rate of 50.5%. This shows that health personnel compliance with the application of standard precautions is lacking. In the standard precautions, 54.5% were not good in the application of standard precautions and 45.5% were good in the application of standard precautions. This suggests that the application of standard precautions by health workers is lacking **(Table 3)**.

The knowledge shows that health workers with bad knowledge and poor standard practice precaution are 70.4%, while health workers with bad knowledge and good standard precaution application are 29.6%. Health workers with good knowledge and poor standard practice precaution were 35.6%, while health workers with good knowledge and good standard precaution were 64.4%. From result of analysis of fisher's exact test between knowledge and application of standard precaution obtained p value 0,001, hence there is correlation between knowledge with application of standard precaution.

In attitudes of health professionals who have negative attitudes and poor implementation of standard precaution are 74.5%, while health workers who have negative attitude and good standard precaution application are 25.5%. Health workers who have positive attitude and poor standard precaution implementation

Table 1 Characteristic of respondents.

Characteristics	Frequency	Percent (%)
Age		
20-25 years old	9	9.1
26-30 years old	19	19.2
31-35 years old	36	36.4
36-40 years old	24	24.2
41-45 years old	11	11.1
Gender		
Male	12	12.1
Female	87	87.9
Education Level		
Associate's degree	70	70.7
Bachelor's degree	29	29.3
Type of Work		
Nurse	82	82.8
Midwife	17	17.2
Period of Work		
<5 years	31	31.3
5-10 years	38	38.4
10-15 years	19	19.2
15-20 years	10	10.1
>20 years	1	1.0
Marital Status		
Married	83	83.8
Unmarried	16	16.2
Employment Status		
Permanent	75	75.8
Honorary	13	13.1
Apprentice	11	11.1

Table 2 Univarate analysis results.

Variable	Frequency	Percent (%)
Knowledge		
Poor	54	54.5
Good	45	45.5
Attitude		
Negative	55	55.6
Positive	44	44.4
Compliance		
Not Obey	50	50.5
Obey	49	49.5
Standard Precautions		
Not Good	54	54.5
Good	45	45.5

are 29.5%, while health workers have positive attitude and good standard precaution application is 70.5%. From the results of fisher's exact test analysis between attitudes with the application of standard precaution obtained p value 0,000, then there is a relationship between attitudes with the application of standard precaution.

The compliance showed that the health personnel were not adhered and the application of bad standard precaution was 76.0%, while the non-compliant health personnel and the application of good standard precaution were 24.0%. Compliance of health personnel and poor implementation of standard precaution were 32.7%, while adherent health personnel and the application of good standard precaution were 67.3%. From the results of fisher's exact test analysis between compliance with the application of standard precaution obtained p value 0,000, then there is a relationship between compliance with the application of standard precaution **(Table 4)**.

Multivariate analysis in this study using multiple logistic regression test with p value <0.25, this research all variables have an influence on the application of standard precautions. Attitudes become the most influential variable in the application of standard precautions with p value 0.010 and OR value of 3,701, which means health workers with positive attitude tend to apply standard precautions 3,701 times than health workers who have negative attitude. Compliance becomes the second influencing variable with p value 0.025 and the value of OR 3.152 which means obedient health personnel tend to apply standard precautions 3,152 times compared to non-compliant health worker. Knowledge becomes the third influencing variable with p value 0,038 and value of OR 2,735 which means health worker with good knowledge tends to apply standard precautions 2,735 times compared to health worker who do not have good knowledge. Based on analysis it is known that the percentage of all variables is 36.8%, which means knowledge, attitude, and compliance can affect the application of standard precautions of 36.8%.

Table 3 Bivariate analysis results using Chi-Square test.

Variable	Standard Precautions				P
	Not Good		Good		
	F	%	F	%	
Knowledge					
Poor	38	70.4	16	29.6	0.001
Good	16	35.6	29	64.4	
Attitude					
Negative	41	74.5	14	25.5	0.000
Positive	13	29.5	31	70.5	
Compliance					
Not Obey	38	76.0	12	24.0	0,000
Obey	16	32.7	33	67.3	

Table 4 Multivariate analysis result using multiple logistic regression test with p value <0.25.

Variable	P	OR	Percent (%)
Knowledge	0,038	2,735	
Attitude	0,010	3,701	36.8
Compliance	0,025	3,152	

Discussion

Influence knowledge of implementation of standard precautions in prevention of hospital-acquired infections

Based on the research, it is known that health workers who have bad knowledge and poor standard precaution implementation are 38 respondents (70,4%), while health workers with bad knowledge and good standard precaution application are 16 respondents (29.6 %). Health workers with good knowledge and poor standard practice precaution were 16 respondents (35.6%), while health workers with good knowledge and good standard precaution were 29 respondents (64.4%). Result of analysis of fisher's exact test between knowledge and application of standard precaution obtained p value 0,001, hence there is correlation between knowledge with application of standard precaution.

Some health workers at PKU Muhammadiyah Bantul Hospital have good knowledge. The knowledge of good health workers influences the application of standard precautions. There are other factors, research entitled Description of Nurses Knowledge about Standard Precautions in RSUD Raden Mattaher Jambi explained there are other factors that can affect compliance, such as education and period of work. High education and long service life can affect the knowledge of health personnel in the implementation of standard precautions [11]. In this study, health workers at PKU Muhammadiyah Bantul Hospital have **associate's degree** and bachelor's degree education with the most working period is 5-10 years that is equal to 38.4%.

The knowledge of health personnel on the application of standard precautions is also influenced by the availability of information about standard precaution which includes the availability of references or information and the accessibility of previous journals or research on standard precaution. Knowledge affects the application of standard precaution; a person with good knowledge tends to apply standard precautions in the Hospital [12]. The study also explains the role of educational institutions to teach the principles of standard precautions that can provide knowledge about the application of standard precautions that can be applied at work.

Increased knowledge of health personnel on the implementation of standard precaution to prevent HAIs can be done by conducting training for health workers. Most health workers who are not trained in the prevention of hospital-acquired infections have low knowledge in infection prevention. Training is useful to improve the knowledge of health personnel in practice while working [13].

According to the researchers, in this study the relationship between knowledge with the implementation of standard precaution caused by some health workers still have a lack of knowledge in the application of standard precaution. Knowledge and skills on standard precaution can be enhanced through regular training to better the knowledge of health workers and prevent hospital-acquired infections.

Influence of attitudes toward implementation of standard precautions in hospital-acquired infections prevention

Based on the research, it is known that health workers who have negative attitude and bad standard precaution application are 41 respondents (74,5%), while health workers have negative attitude and good standard precaution application is 14 respondents (25,5%). Health workers who have positive attitude and poor standard precaution implementation are 13 respondents (29.5%), while health workers have positive attitude and good standard precaution application is 31 respondents (70,5%). The results of fisher's exact test analysis between attitudes with the application of standard precaution obtained p value 0,000, then there is a relationship between attitude with the application of standard precaution.

A person's attitude is a precipitating factor for the formation of actions against a particular object. Attitude is a reaction or response to the stimulus or objects and is an emotional reaction to social stimulus. Attitude is not an action or activity but it can affect actions or behavior [14].

In this study, there are some health workers have a negative attitude towards the implementation of standard precaution. Negative attitude of health workers at PKU Muhammadiyah Bantul Hospital influenced by the habit that formed in hospital environment. The negative attitude of health personnel is also influenced by the lack of reference in the application of standard precaution and the lack of facilities provided by the hospital so that the implementation of standard precaution is not in accordance with the recommended procedure. Implementation of inappropriate precaution standards becomes one of the risks of spreading infection in hospitals.

In this study, there are some health workers who are negative do not apply standard precautions. Attitudes relate to the application of standard precautions consisting of the application of hand hygiene and the use of personal protective equipment [15]. Someone who has a negative attitude is less likely to implement standard precautions and someone with a positive attitude tends to apply standard precautions in serving patients.

There is a relationship between attitude and the application of standard precautions. Negative attitudes of respondents are due to a limitation in interaction with patients and its application procedures that take time [16]. But in this study, most health professionals said they did not feel the use of personal protective equipment limits the interaction and application of hand hygiene does not require much time.

According to the researchers, increased attitude is needed by health workers to prevent the spread of hospital-acquired infections. Increased attitudes of health personnel can be done by getting used to apply standard precautions in health services in hospitals. Usually the implementation of standard precautions can be realized if a good cooperation is established from the hospital with health workers in the form of provision of facilities and supervision of the hospital so that health workers always apply standard precautions.

Effect of compliance with the application of standard precautions in prevention of hospital-acquired infections

Based on the research, it is known that health personnel are not obedient and the application of standard precaution is not good as 38 respondents (76.0%), while health personnel are not complied and good standard precaution application is 12 respondents (24.0%). Adherent health personnel and poor implementation of standard precaution were 16 respondents (32.7%), while adherent health personnel and the application of good standard precaution were 33 respondents (67.3%). From the results of fisher's exact test analysis between compliance with the application of standard precaution obtained p value 0,000, then there is a relationship between compliance with the application of standard precaution.

Non-compliance in the application of standard precautions can be caused by many factors. The drive for a person to take precautions depends on a health belief that is perceived threat of injury or illness and consideration of benefit and cost. The perceived threat of injury or illness refers to the extent to which a person thinks illness or illness is a threat that will have a negative impact on him, if the perceived threat increases then prevention behavior will increase as well [17]. Health workers who feel themselves at risk and are easily infected are more likely to adhere to standard practice guidelines or procedures [18].

Occupational safety factors are another factor that can affect compliance. Occupational safety hospitals have health workers 2.9 times more adherence to run standard precautions and health workers who are trained in standard precautions 5.7 times more adept during practice [19].

Lack of time is the cause of non-compliance [20]. In order for better time management, training on time management for health personnel should be provided. The training aims to help individuals become aware and understand about how to use the time organized and can make priority in the implementation. With time management, work can be done effectively and efficiently with the results of work obtained will be more qualified.

According to the researcher, the compliance of health personnel at the hospital is caused by the lack of awareness of individuals to always apply standard precautions procedure.

Conclusion

Based on the results of research and discussion, it can be concluded that knowledge, attitude and compliance have an effect on the application of standard precautions of 36.8%, where attitudes have the greatest influence on the application of standard precautions.

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