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Research Article

## Relationship of Occupational Safety and Health Knowledge to The Occupation of Paramedical Occupational Accidents

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### Abstract

Occupational health and safety is a fundamental issue. Work accidents, directly or indirectly, can cause losses to the company, among others, late completion of work, decreased productivity, and healing costs for employees. This study aims to determine the relationship between knowledge of occupational safety and health behavior with the occurrence of paramedic work accidents at UKI Hospital in 2018. This type of research is correlational, with a total of 30 samples. This study found a relationship between knowledge of occupational safety and health with attitudes and actions to prevent work accidents among nurses at UKI Hospital.

**Keywords:** Occupational Accident, Occupational Health and Safety, Paramedic.

## INTRODUCTION

Occupational health and safety is a very important issue. Work accidents, directly or indirectly, can cause losses to the company, among others, late completion of work, decreased productivity, and healing costs for employees<sup>1</sup>. The losses incurred are not only material losses for the company but can also cause casualties and suffering for workers who have accidents<sup>2</sup>.

The Indonesian government has issued various written regulations regarding occupational health and safety management efforts to ensure the safety of workers. Law No. 13 of 2003 Article 87 Paragraph 1 concerning Manpower states that "Every company is obliged to implement an Occupational Health and Safety Management System (OHSMS) which is integrated with the company's management system"<sup>3</sup>. Provisions regarding applying the occupational safety and health management system (OHSMS) are regulated in PP no. 50 of 2012 contains a hierarchy of laws and regulations related to the OHS management system: a) the 1945 Constitution, Article 27 paragraph 2, the Constitution no. 13 of 2003, Article 86 - Article 87<sup>4,5</sup>.

Hospitals are one of the places that are required to implement an occupational safety and health management

system (OHSMS) [6]. Occupational health and safety is an effort to provide safety guarantees and improve the health status of workers by preventing Occupational Accidents (OA) and Occupational Diseases (OD) through efforts to control workplace hazards, health promotion, treatment, and rehabilitation<sup>7</sup>. An occupational health and safety management system are important to implement, considering that hospital activities have the potential to cause physical, chemical, biological, ergonomic, and psychosocial hazards that can endanger the health and safety of both workers, patients, visitors, and the community in the hospital environment<sup>8</sup>.

Various activities in the hospital can cause accidents due to work. The 2013 Occupational Safety and Health Administration (OSHA) report shows that hospital work accidents are twice as large as in other industries<sup>9</sup>. Data from the Occupational Safety and Health Administration (OSHA) in 2013 showed the causes of injury to health workers include fatigue due to movements related to handling patients (48%), sprains or falls (25%), touching dangerous equipment (13%), acts of violence from patients (9%), exposed to hazardous substances (4%), and other causes (1%)<sup>10</sup>.

Research conducted at the Education Center Hospital of Obafemi Awolowo University Nigeria in 2002 showed that the most common hazards to nurses were stress (83.3%),

needlestick injuries (76%), blood contamination of unprotected skin (73%), sleep disturbances (42%), chemical skin allergies (37%), attacks from patients (24%), and hepatitis (9%). The study also revealed that 43.1% of nurses used sedatives to deal with work stress<sup>11</sup>.

Research conducted in 2009 on 655 nurses in the Philippines stated that 32% of nurses reported injuries 1 to 2 times a year, and 6% were injured at work at least three times a year. 41% reported their job as a nurse caused their illness worse, and 31% had to leave for more than two days a year due to illness/injury in their work. As many as 78% of nurses also complained of low back pain<sup>12</sup>. The work of bending and carrying patients is a nurse's job that is most at risk of causing low back pain. Slouching posture has 14 times more frequent complaints of low back pain than a non-slouched working posture<sup>13</sup>. In 2007, the number of Needle Stick Injury accidents in Indonesia reached 38%–73% of the total health workers<sup>14</sup>. The average risk of blood-borne virus transmission in needlestick accidents is 30% for hepatitis B and 3% for hepatitis C. C and 0.3% for HIV from 1984 to 2004. Among health workers, deaths from HIV/AIDS, hepatitis B and C, liver cancer, and cirrhosis accounted for 248,550 cases<sup>15</sup>. Hospital employees other than nurses who are often injured include kitchen nurses, equipment maintenance, laundry, cleaning services, and technicians<sup>11</sup>.

Occupational health and safety programs cannot run alone without a good company management system<sup>16</sup>. Research in 2006 explained that with the implementation of a good Occupational Health and Safety Management System (OHSMS), the incidence of Occupational Accidents (OA) and Occupational Diseases (OD) could be minimized<sup>17; 18</sup>. According to research at RSUD, dr. Soebandi Jember stated in 2010 that five variables statistically have a significant relationship and affect the occurrence of work accidents in nurses: education, participation in OSH training, knowledge, physical environment, and policies<sup>19</sup>.

Research conducted in 2009 in the Philippines stated that the way to improve the health and safety of Filipino nurses is for healthcare institutions to implement an occupational health and safety management system. First, there is a clear reporting flow on occupational diseases and injuries experienced by nurses at the hospital's occupational health and safety committee. Second, training and education facilitate nurses' understanding of the relationship between the workplace and the injuries and illnesses they may receive. Third, nurses must make programs or policies regarding occupational health and safety<sup>12</sup>.

Implementing a good Occupational Health and Safety (OHS) program is very important to ensure the health and safety of nurses. Research in 2009 revealed that hospitals need to minimize fatigue or work stress on nurses by conducting work shift exchange programs, outside work, or outbound activities for nurses [20]. Research in 2014 revealed that to minimize Occupational Accidents (OA) and Occupational Diseases (OD), the hospital must monitor and evaluate nurses on an ongoing basis. Training on Occupational Health and Safety (OHS) should be provided regularly and continuously for nurses to improve their performance, knowledge, and attitudes<sup>21</sup>.

East Jakarta UKI Hospital is a place that poses a risk of health hazards not only for visitors and patients but also for health workers in hospitals. A good occupational safety and health management system is needed to minimize the potential for accidents. Paramedics are health workers who have direct contact with patients either directly or indirectly. Due to the nature of their profession, providing medical services, and the hospital's equipment and amenities,

paramedics, have a right to protection against health issues or workplace accidents. Implementing Occupational Health and Safety (OHS) programs is important to prevent accidents and occupational diseases for nurses. Hospitals are required to carry out Occupational Health and Safety (OHS) efforts in an integrated and comprehensive manner so that the risk of Occupational Diseases (OD) and Occupational Accidents (OA) in nurses can be avoided. Noting this, the researcher feels the need to conduct research that explores the extent to which the implementation of occupational safety and health programs can reach nurses at the UKI Hospital in East Jakarta. The objectives of this study are a) To analyze the relationship of knowledge to the occurrence of work accidents at UKI Hospital in 2018; b) To find out the relationship between attitudes towards the occurrence of work accidents at UKI Hospital in 2018; c) To find out the behavior towards the occurrence of work accidents at the UKI Hospital in 2018.

## LITERATURE REVIEW

A work accident is an unwanted and unexpected event that can occur before, which causes losses for both employees and the company. There are two causes of work accidents, namely basic causes and direct causes<sup>22</sup>. Occupational health aims to improve and maintain the health status of workers physically, mentally, and socially for workers in all types of work. Also, to prevent workers' health problems caused by working conditions, protect workers in their work from risks due to factors that are detrimental to health, and place and maintain workers in a work environment that is adapted to their physiological and psychological conditions<sup>23</sup>. Occupational health is a specialization of health or medical science and its practices that aim to increase the degree of health, either physically, mentally, or socially through preventive and curative efforts against diseases or health problems caused by work factors and the work environment<sup>24</sup>.

Work safety is a condition free from accidents and damage when we work, including the condition of buildings, machines, safety equipment, and workers. Safety protects one's physical well-being against work-related injuries<sup>25</sup>. Law Number 1 of 1970 concerning Occupational Safety and Health, the requirements for work safety, namely<sup>26</sup>: a) prevent and reduce accidents; b) preventing, reducing and extinguishing fires; c) prevent and reduce the danger of explosion; d) provide an opportunity or a way to save oneself in the event of a fire or other dangerous events; e) provide assistance in accidents; f) provide workers with personal protective equipment; g) prevent and control the emergence or spread of temperature, humidity, dust, dirt, smoke, steam, gas, wind gusts, weather, sea rays or radiation, sound, and vibration; h) prevent and control the occurrence of occupational diseases, both physical and psychological, poisoning, infection, and transmission; i) obtain sufficient and appropriate information; j) maintain good air temperature; k) provide adequate air freshening; k) maintain cleanliness, health, order; l) obtain harmony between work processes; m) securing and facilitating the transportation of people, animals, plants, or goods; n) securing and maintaining all types of buildings; o) securing and facilitating loading and unloading work, treatment and storage of goods; p) prevent being exposed to electric current; and q) adjust and improve observations on jobs where the danger of accidents is increasing.

The Hospital Occupational Health and Safety Management System (HOHSMS) is an integrated effort of all hospital users, hospital workers, patients, and visitors to create a healthy, safe, and comfortable work environment for workers, patients, visitors, as well as the community and the surrounding hospital environment<sup>27</sup>.

The general objective of the Hospital Occupational Health and Safety Management System (HOHSMS) is the creation of a safe, healthy, and productive work environment for hospital human resources, patients, visitors, and the community and the environment around the hospital so that the hospital service process runs well and fluent. The specific objectives of the Hospital Occupational Health and Safety Management System (HOHSMS), namely: a) the realization of a work organization that supports the achievement of Occupational Health and Safety (OHS); b) increasing professionalism in terms of Occupational Health and Safety (OHS) management, program implementers and supporters; c) fulfillment of Occupational Health and Safety (OHS) requirements in each work unit; d) protecting workers and preventing the occurrence of Occupational Diseases (OD) and (OA); e) the implementation of an optimal and comprehensive Occupational Health and Safety (OHS) program; f) improvement of hospital quality, image, and productivity <sup>28</sup>. The hospital management system must be implemented in three stages: commitment and policy, plan, monitoring, and evaluation.

Leaders in a company must demonstrate a commitment to occupational safety and health so that the Occupational Health and Safety Management System (OHSMS) is successfully implemented. These commitments should be reviewed regularly and involve all workers and people in the workplace. Commitment to Occupational Health and Safety (OHS) can be realized by placing OHS organizations in strategic positions in determining company decisions, providing budget and quality workforce and other facilities in the field of OHS, and determining a member who is responsible, has clear authority and obligations in handling OHS, as well as performance appraisal and follow-up on the implementation of OHS <sup>29</sup>.

Companies must make effective plans with clear and measurable goals. The plan contains objectives, targets, and performance indicators that are implemented by considering the identification of hazard sources, risk assessment, and control, as well as the results of the initial review of occupational safety and health.

Companies must carry out hazard identification, assessment, and determination of appropriate controls. Identification of hazard sources is carried out by considering conditions and events that can cause potential hazards and the types of accidents and occupational diseases that may occur. Risk assessment is a process to determine the priority of control over the level of risk of accidents or occupational diseases. Control of the risk of accidents and occupational diseases in the engineering process must begin at the design and planning stage. Hospitals must establish and implement Standard Operating Procedures (SOPs) in accordance with applicable laws and regulations. SOPs must be evaluated, updated, and socialized to nurses or related parties.

The hospital must consider the laws and regulations, potential hazards, and OSH risks. Goals should be measurable; goals and timelines for achievement should also be considered. The hospital establishes and implements the Hospital OHS program to achieve the target; there must be monitoring and evaluation that will be reported <sup>30</sup>. The implementation of OHS in hospitals is very dependent on management. The officers of the implementing unit give the pattern of division of responsibilities. The main tasks of the hospital's OHS implementing unit include: providing recommendations and considerations to the hospital director regarding issues related to OSH, formulating policies, regulations, guidelines, and procedures, and making hospital occupational health and safety programs <sup>31</sup>.

The steps for implementing an occupational health and safety management system are <sup>29</sup>: a) stating a commitment; b) determining how to apply Occupational Health and Safety (OHS) in hospitals; c) the hospital must organize the implementation of the Health and Safety (OHS) hospital by empowering human resources that meet the requirements; d) establishment of organization/implementing unit; e) establish a working group on the application of OSH; f) determine the required resources.

OHS monitoring and evaluation in hospitals is one of the management functions that aims to identify and assess the process of OHS activities and evaluate the effectiveness and efficiency of program implementation in achieving the goals set. OHS recording and reporting are integrated into the hospital reporting system, which includes OHS recording and reporting, recording all OHS activities, OA recording, and reporting, as well as OD recording and reporting. Inspection and testing. The OHS inspection aims to assess the general condition of OHS, not in depth. OHS inspections must be carried out regularly so that the incidence of OD and OA can be prevented as early as possible.

OSH hospital efforts involve labor, work methods or methods, work tools, work processes, and work environment. These efforts include improvement, prevention, treatment, and recovery or rehabilitation. The workability or productivity of medical and non-medical officers in hospitals results from three OHS components: work capacity, workload, and work environment.

## RESEARCH METHOD

The type of research used is correlational, which is a study that involves collecting data to determine whether there is a relationship and the degree of relationship between two or more variables. The existence of a relationship and the level of an important variable, because by knowing the level of the existing relationship, the researcher will be able to develop it according to the research objectives. This study aims to determine the relationship between knowledge of occupational safety and health behavior with the occurrence of work accidents at UKI Hospital, East Jakarta, and was conducted for one day, with data collection carried out on Monday, 23 January 2019. The population is the whole or the totality of objects that become information that researchers want to know <sup>32</sup>. This study uses a proportional random sampling technique where the sample research is carried out randomly through groups but with the condition that all group members have the same characteristics <sup>32</sup>. The population was determined based on the inclusion and exclusion criteria obtained from 30 nurses. The sample size taken based on the above calculation is 30 people. Because the number of samples and population is almost the same, then in this study, the entire population was taken or used as a saturated sample. The instrument used in this study was a questionnaire. The questionnaire in this study was used as a data collection tool covering knowledge of work safety, attitudes, and accident prevention actions. An instrument is said to be valid if it can measure what is desired and capture the data of the variables studied appropriately <sup>33</sup>. With the help of the SPSS program, the product Moment Correlation technique from Pearson is used to test the validity (validity) of items. The Product Moment Correlation formula is:

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{(N \sum X^2 - (\sum X)^2) (N \sum Y^2 - (\sum Y)^2)}}$$

rx<sub>y</sub>: the magnitude of the validity of the question

$\Sigma XY$ : number of test takers

$\Sigma X$ : number of item scores

$\Sigma Y$ : total score

The criteria for the validity of the questions are said to be valid if the  $r$  count is greater than the  $r$  table. The calculated  $r$  price was then consulted with the  $r$  table criteria,  $r$  table equal to or greater in the 5% significance level, then the item is valid. If the value of  $r$  count is less than  $r$  table, then the item is invalid. Reliability refers to an understanding that an instrument is reliable enough to be used as a data collection tool because the instrument is already good<sup>33</sup>. A questionnaire is reliable if it gives a stable and consistent indication.

## RESEARCH RESULT

The questionnaire used as a data collection tool is first tested for validity and reliability. This test is intended to measure the feasibility level of the questionnaire as a data collection tool. The calculation is done by correlating each item score with the total score using the Pearson Correlation technique. The test criteria are if the correlation coefficient ( $r_{xy}$ ) is greater than the  $r$  table value of 0.3610, it means that the questionnaire item is declared valid and is declared valid as a data collection tool. The summary of the results of the  $r_{xy}$  calculation as the results can be seen in table 1.

**Table 1: Validity test results**

Variable	Item Number	Correlation coefficient	$r$ table	Description
Knowledge	1	0,518	0,361	Valid
	2	0,533	0,361	Valid
	3	0,508	0,361	Valid
	4	0,638	0,361	Valid
	5	0,447	0,361	Valid
	6	0,420	0,361	Valid
	7	0,530	0,361	Valid
	8	0,518	0,361	Valid
	9	0,420	0,361	Valid
	10	0,454	0,361	Valid
Attitude	1	0,494	0,361	Valid
	2	0,757	0,361	Valid
	3	0,396	0,361	Valid
	4	0,396	0,361	Valid
	5	0,581	0,361	Valid
	6	0,494	0,361	Valid
	7	0,428	0,361	Valid
	8	0,625	0,361	Valid
	9	0,396	0,361	Valid
	10	0,642	0,361	Valid
Action	1	0,488	0,361	Valid
	2	0,507	0,361	Valid
	3	0,623	0,361	Valid
	4	0,469	0,361	Valid
	5	0,509	0,361	Valid
	6	0,516	0,361	Valid
	7	0,542	0,361	Valid
	8	0,509	0,361	Valid
	9	0,517	0,361	Valid
	10	0,437	0,361	Valid

Based on the results of testing the validity of the instrument, it was found that all correlation values were greater than the  $r$  table value of 0.3610. Thus, the variable questions are declared valid and can be used as a data collection tool in this study.

The reliability test instrument is used to know the instrument's consistency as a measuring instrument so that a measurement can be trusted. Cronbach's alpha was used to test. An instrument will be more reliable if the alpha coefficient is more than 0.60. The summary of the questionnaire reliability test results in accordance with the SPSS output can be seen in table 2.

**Table 2. Reliability test results**

Variable	Cronbach Alpha	Cut Off	Description
Knowledge	0,644	0,6	Reliable
Attitude	0,683	0,6	Reliable
Action	0,671	0,6	Reliable

Table 2 shows that the values of all variables have Cronbach's Alpha, which is greater than 0.6, so the variable is declared reliable and feasible to be used as a data collection tool.

Before describing the results of hypothesis testing, this chapter will describe the results of the analysis of respondents' perceptions regarding the knowledge, attitudes, and actions of occupational safety and health.

**Table 3: Distribution of OHS Knowledge Respondents to Work Accidents for Nurses at UKI Hospital in 2018 (n=30)**

Variable	Frequency	Percentage (%)
Good	22	73,3
Sufficient	4	13,3
Weak	4	13,3
Total	30	100,0

Based on the results of the descriptive analysis in table 3, it can be seen that the calculation results show that of the 30 respondents, 73.3% of UKI Hospital nurses have good knowledge of occupational safety and health behaviors, and

UKI Hospital nurses have sufficient knowledge of occupational safety and health behaviors and weak respectively by 13.3%.

**Table 4: Distribution of OHS Attitudes of Respondents to Work Accidents for Nurses at UKI Hospital in 2018 (n=30)**

Variable	Frequency	Percentage (%)
Good	21	70,0
Sufficient	5	16,7
Weak	4	13,3
Total	30	100,0

Based on the results of the descriptive analysis in table 4, it was found that from 30 respondents, 70.0% of UKI Hospital nurses had good occupational safety and health behaviors, and UKI Hospital nurses had adequate occupational safety and health attitudes 16.7%. While the remaining 13.3% of UKI Hospital nurses still have poor occupational safety and health behaviors.

**Table 5: Distribution of OHS Action Respondents to Work Accidents for Nurses at UKI Hospital in 2018 (n=30)**

Variable	Frequency	Percentage (%)
Good	11	36,7
Sufficient	11	36,7
Weak	8	26,7
Total	30	100,0

Based on the results of the descriptive analysis in table 5, it was found that from 30 respondents, 36.7% of UKI Hospital nurses had good occupational safety and health behaviors, and 36.7% had adequate occupational safety and health behaviors. In contrast, the remaining 26.7% of UKI Hospital nurses still have poor occupational safety and health behaviors.

**Table 6. Results of Testing the Relationship between Knowledge and Attitude**

		Attitude							
		Good		Sufficient		Weak		Total	
		Total	%	Total	%	Total	%	Total	%
Knowledge	Good	18	85,7	3	60,0	1	25,0	22	73,3
	Sufficient	3	14,3	0	0,0	1	25,0	4	13,3
	Weak	0	40,0	2	40,0	2	50,0	4	13,3
Total		21	100	5	100	4	100	30	100
<b>P</b>		<b>0,014</b>							

Based on table 6, the results show that there is a relationship between knowledge and occupational safety and health behavior, and the relationship between knowledge and occupational safety and health behavior is quite strong. Based on the results of the chi-square analysis, the probability value is 0.014. < significant alpha 5% or 0.05. It shows a relationship between knowledge and attitudes toward occupational safety and health.

**Table 7: Results of Testing the Relationship between Knowledge and Action**

		Action							
		Good		Sufficient		Weak		Total	
		Total	%	Total	%	Total	%	Total	%
Knowledge	Good	10	90,9	9	81,8	3	37,5	22	73,3
	Sufficient	0	0,0	2	18,2	2	25,0	4	13,3
	Weak	1	9,1	0	0,0	3	37,5	4	13,3
	Total	11	100	11	100	8	100	30	100
<b>p</b>		<b>0,048</b>							

Based on table 7, the results show that there is a relationship between knowledge and occupational safety and health behavior to reduce workplace accidents, and the relationship between knowledge and occupational safety and health behavior is quite strong. Based on the results of the chi-square analysis, the probability value is 0.048. Probability value 0.048 < significant alpha 5% or 0.05. It shows a relationship between knowledge, occupational safety, and health behavior to reduce workplace accidents.

**Table 8: Results of Testing the Relationship between Knowledge and Behavior**

		Action							
		Good		Sufficient		Weak		Total	
		Total	%	Total	%	Total	%	Total	%
Knowledge	Good	2	85,7	3	60,0	15	25,0	20	73,3
	Sufficient	1	14,3	1	40,0	5	25,0	7	13,3
	Weak	1	40,0	1	0,0	2	50,0	4	13,3
	Total	4	100	5	100	21	100	30	100
<b>p</b>		<b>0,014</b>							

Based on table 8, the results show that there is a relationship between knowledge and occupational safety and health behavior, and the relationship between knowledge and occupational safety and health behavior is quite strong. Based on the results of the chi-square analysis, the probability value is 0.014. < significant alpha 5% or 0.05. It shows a relationship between knowledge and attitudes toward occupational safety and health.

The results of this study are in accordance with Notoatmodjo's opinion, which states that a person's practice is based on perceptions that lead to real action or attitude in behavior. Good or bad one's attitude can be influenced by how much one's level of knowledge. Therefore, a good attitude or action is needed in occupational safety and health to reduce workplace accidents. Because in achieving occupational safety and health, a fast and appropriate response is needed so that nurses can be more responsive to the surrounding environment and prevent accidents in the workplace<sup>32</sup>.

From the results of this study, some nurses still have not carried out the obligations of the OSH knowledge obtained at work. It can occur due to individual factors that do not pay attention to safety at work, so things that should be very important to do for their safety are ignored. It requires an in-depth review of how important it is to apply OHS at work. Although some nurses still have not fully paid attention to OHS while working, from all aspects, more than 50% of nurses have paid attention to OHS while working. With these data and supported by the results of data analysis regarding the knowledge and attitudes of students about OHS in the good category, it can be seen that the knowledge possessed by nurses regarding OHS has been addressed properly. However, the knowledge possessed by UKI Hospital nurses regarding OHS is still not implemented properly. It is indicated by the OHS action in the good category of less than 50%. Thus it can be concluded that more than 50% of nurses already have the awareness to behave by taking into account occupational health and safety at work, and UKI Hospital nurses also already know about the importance of occupational health and

safety. However, the real actions of occupational health and safety at work need to be improved.

What needs to be improved for UKI Hospital nurses in terms of knowledge is to provide understanding to nurses that UKI Hospital has implemented OHS while working and provide knowledge or counseling to nurses regarding infectious waste disposal procedures. Then in terms of the attitude that needs to be considered by nurses is the use of safety devices when operating the tool or examining patients. Meanwhile, nurses are advised to wear anti-slip shoes or not high heels, use an ampoule saw to break ampoules, use PPE, and not to use watches, rings, and other jewelry.

## CONCLUSION

Based on the results of the analysis and discussion in the previous chapter, the following conclusions can be drawn: a) There is a relationship between knowledge of occupational safety and health with the attitude toward preventing work accidents in UKI Hospital nurses; b) There is a relationship between knowledge of occupational safety and health with occupational accident prevention measures in UKI Hospital nurses. Thus, it is necessary to hold training and counseling on occupational safety and health regularly to increase knowledge and increase nurses' awareness about occupational safety and health at UKI Hospital. In addition, it is necessary to increase the provision of firm action for all nurses who violate the occupational safety and health regulations set by the UKI Hospital. In addition, there are posters or slogans on occupational safety and health, as well as warning signs of danger in workplaces, especially those with the potential for work accidents.

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