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# Correlation Overview between Knowledge and Attitudes towards Occupational Safety and Health (K3) with Occupational Accidents

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**Abstract:** This paper was created as an overview of the level of knowledge and occupational safety and health (K3) concerning the incidence of work accidents. The aim is to determine the relationship between the level of knowledge of K3 with the incidence of work accidents. The method used for this research is a literature study, in the form of literature articles and books obtained through several search engines, including 4 from Google and 11 from Google Scholar. The review shows that the level of knowledge of K3 has a relationship with the incidence of work accidents where the higher the level of knowledge of K3 in workers in a workplace, the incidence of work accidents will also be lower. The conclusion obtained is that there is a relationship between the level of knowledge of occupational safety and health (K3) on the incidence of work accidents.

**Keywords:** Knowledge level, occupational safety, and health (K3), work accident.

## 1. Introduction

Awareness of the importance of implementing Occupational Safety and Health (K3) in Indonesia is still very minimal as this is one of the main causes of work accidents in Indonesia. There were 121 million workforces in 2015 who only learned about K3 problems after entering the workforce. As a result, 98 thousand to 100 thousand cases of work accidents have occurred every year in Indonesia. These accidents occur in formal and informal activities, including explosions or fires. Of the 98 thousand, 2,400 people died, with the number of workers experiencing permanent disabilities as much as 40 percent, anatomical and functional disabilities (Republika, January 9, 2016). According to 2016 Employment Social Security Administration Agency (BPJS) data, this figure indicates that work accidents in Indonesia are still high.

The essence of occupational health and safety includes two things. The first is as a tool to achieve the optimal health status of the workforce, especially for workers/laborers, farmers, fishermen, civil servants, entrepreneurs, managers, or casual workers in all sectors of formal and informal activities so that the welfare of the workforce can be achieved. The second is as a tool to increase productivity based on improving labor power and productivity of human factors in production (Alamsyah and Muliawati, 2013).

Occupational safety and health (K3) are a right for workers in the formal and informal sectors, as well as for fishermen. Fishermen are very vulnerable to work accidents. The reason is the lack of knowledge of fishermen about occupational health and safety. Types of fishermen can be divided according to the duration of fishing time, namely daily, weekly and monthly fishermen. Lack of knowledge and inappropriate attitudes about sanitation hygiene at sea is also the cause of many fishermen who experience work accidents (Ratri and Paskarini, 2014).

A safe work environment will encourage the performance of employees and the company in the long term perspective and is an investment of time and resources in employees where they will easily be loyal to the organization. If a company does not prevent the occurrence of work accidents, then an increase in work accidents may occur. Therefore, prevention to reduce the risk of work accidents is necessary. Ramli (2010) stated that Occupational Safety and Health (K3) is a science and application to prevent work accidents and occupational diseases. K3 is a protective effort aimed at ensuring that workers and other people in the workplace or company are always safe and healthy, and so that each product can be used safely and efficiently (Afrianto, 2014).

The ILO stated that the causes of the high incidence of work accidents are people, work, and the workplace environment. One of the human factors is the level of knowledge of Occupational Safety and Health (K3). Concerning this, (Irzal, 2016) reveals that creating a healthy, safe, not polluted and accident-free work environment, will increase the productivity and efficiency of the workers. The impact of this work accident can be in the form of direct costs, namely losses that can be calculated directly, such as the cost of first aid accidents, and indirect costs, namely losses that are not visible, such as the loss of time and workers who have an accident.

Human error is the main cause of accidents at sea that lead to death. As many as 80% of marine accidents are caused by human error, while the rest can be in the form of neglect by sea transportation operators and related agencies, as well as inadequate marine transportation safety equipment.

The phenomenon of accidents may also result from the interaction of the host (worker), including age, years of service, and education level, and agent (machine/job) in the form of work units and working time, and environmental factors including physical, chemical, and biological (Dauly, 2010). Whardani (2008) states that work accidents have different severity categories which are divided into mild, moderate, and severe levels (Siregar, 2014).

Related research conducted by M. Dita et al. in 2019 stated that there is a correlation between knowledge about work accidents and safe work behavior, where good knowledge can minimize workers' unsafe actions. This description is the purpose of this paper, which is a literature review to find out the relationship between the level of knowledge of occupational safety and health (K3) and the incidence of work accidents.

## 2. Method

The method adopted for this research is the study of literature or literature in the form of articles and literature books collected through several search engines, including 4 from Google, 11 from Google Scholar. The criteria are Sinta accredited national journals and Scopus and non-Scopus accredited international journals with the longest published year being 2014. Data collection is carried out by identifying the results of previous studies related to the title, namely the relationship between the level of knowledge of K3 workers on the incidence of a work accident. The journals obtained came from K3 journals of industrial engineering and public health journals.

## 3. Results and Discussion

Indonesia is one of the countries with a fairly high level of industrial development. This is reflected in the rapidly growing industry, which includes small-scale, medium-scale, and large-scale industries. The development of the industry and the rapid growth of the industry are certainly directly proportional to the emergence of challenges and problems in it. One of the challenges and problems that arise is how to overcome the risk of work accidents that may occur in the work environment/company that has the potential to cause harm to the company and reduce productivity.

In general, the issue of occupational safety and health (K3) in Indonesia is still often neglected. This is indicated by the still high number of work accidents which is very concerning. The level of concern in the business world for K3 is also relatively low, even though employees are a valuable asset in every company. K3 is related to all aspects of health and safety in the workplace where the main focus is as a form of preventing hazards in the workplace.

Safety in the workplace is likened to business investment, because if work safety reduces financial losses, there will be a positive effect on aspects of working conditions, namely a reduction in work accidents, thereby increasing the level of productivity and quality of life of workers. One of the important roles of K3 is shown in the agricultural sector as described in the research of Kolstrup & Ssali (2016). In the study, it was stated that agriculture is the main driver of Uganda's economy so increasing OSH knowledge will add value to the country through better working conditions, higher worker productivity, and a healthier agricultural population. K3 also plays a role in employee commitment where companies that have adequate OHS management will make their workers have a strong commitment to the company because they assume that their health and safety are guaranteed.

Research from Siregar (2014) found that there is a relationship between knowledge and work accidents at PT. Aqua Golden Mississippi Bekasi with $p < 0.000$. The knowledge measured in this study is the respondent's understanding of the causes of work accidents and OSH policies. Most of the respondents from Siregar's research (2014) have less knowledge about the causes of work accidents and OSH policies. This is evidenced by the results that 65 respondents (61.3%) of the 106 respondents have less knowledge related to work safety. This research is following Green's opinion which states that knowledge is one of the important factors in motivating someone to act. Someone's behavior based on knowledge will last longer than someone's behavior without knowledge. The more positive the behavior of the workers, the more they will be able to prevent them from unwanted incidents (Siregar, 2014).

Workers who have high knowledge can distinguish and know the dangers around them and can do work following existing procedures because they are aware of the risks that are accepted so that work accidents can be avoided. Workers who have high knowledge will try to avoid minor accidents considering they have the awareness that minor accidents will lead to more severe work accidents. If workers have good knowledge, then they will act positively and try to avoid work accidents. On the other hand, workers who have low knowledge tend to ignore the dangers around them and do not carry out work according to procedures because they are not aware of the risks they may accept.

Research by Aulia W.P. entitled "Identification of Potential Occupational Safety and Health Hazards in the Production Process" in CV. Citra Jepara in July 2019, found that the number of potential hazards obtained in 10 production processes was 82 potential hazards, including 46 potential physical hazards, 32 potential chemical hazards, and 4 potential ergonomic hazards. The most potential hazards occur in the Timber Conversion and Finishing work processes with a total of 12 and the least occur in the Packing work process, with 4 potential hazards. The main factor causing unsafe conditions in the company is a work environment that is far from hygiene. This is due to the absence of the company's Standard Operating Procedure (SOP) in implementing K3 in the company's workplace.

Workers who know about occupational health and safety tend to work in a hurry and want to get work done quickly to save time so they can enjoy rest time more quickly. This occurs as a result of workers' ignorance and unawareness of the importance of procedures and regulations at work to protect themselves. Therefore, workers' low knowledge of occupational health and safety can lead to minor accidents and the possibility of more severe work accidents. Westerman and Donoghue stated that the way to develop the knowledge and attitudes needed by a person to carry out his duties or work adequately is by conducting regular training (Siregar, 2014).

Knowledge plays an important role in every person's behavior. This is evidenced in Susanto's research (2019) entitled *"Implementation of Safe Work Behavior Improvement Using a Behavior-Based Safety Approach in the Batik Industry in Semarang City"* which was conducted on 25 respondents using the DO IT method (Define, Observe, Intervene, and Test) in linear regression multiple. Susanto's research found that safe work behavior was influenced by knowledge, communication, and personal protective equipment with t-values of -2.396; 3,408; and 9,955.20 respectively. Related to this, Rinawati et al. (2016) also explain in "The Influence of Knowledge Levels on the Implementation of the Use of Personal Protective Equipment as an Effort to Achieve Zero Accident at PT. X" against 55 respondents in the chi-square test has a p-value of 0.009. This indicates that respondents who have high knowledge will be more disciplined to use PPE.15 This finding is supported by the research of Oztas et al. (2018) entitled *"Knowledge Level, Attitude, and Behaviors of Farmers in Cukurova Region Regarding The Use of Pesticides"* which was conducted on 420 seasonal farmers in Karatas District,

Adana Province, Turkey, using a questionnaire with an interview method. The result is that inadequate knowledge about the safe use of pesticides and the use of personal protective equipment can reduce the safe working behavior of farmers so that they are more potentially exposed to pesticide risk.

This K3 knowledge can be honed in various ways. One of them is explained in Syaputra's research (2017) entitled "The Relationship of K3 Knowledge and Motivation with Work Accidents for Production Employees of PT. Borneo Melintang Buana Exports", namely through safety talks to all workers before starting work, explaining the Standard Operating Procedures (SOPs) repeatedly, and routinely providing training for workers. Safety talk is included in K3 communication between humans and humans directly and includes communication between several groups which is carried out through individual contact to shape one's behavior. As in the research "Relationship of Compliance and Knowledge of PPE with Safety Talk in the Maintenance Unit of the Cement Company" conducted by Gumelar and Ardyanto (2018) on 67 respondents through statistical tests using Pearson and chi-square, revealing a relationship between safety talk and knowledge of PPE with p-value 0.000. This reflects that workers who participate in safety talks effectively have positive adherence to the use of PPE and have a good level of knowledge about PPE. In other words, safety talk can be said to be effective in sharpening knowledge and forming obedient behavior in using PPE for workers in the cement company.

In addition to the safety talk, another effort to increase OHS knowledge is through OHS education and training. According to Rumchev et al. (2019) in *"Agricultural Dust Exposures and Health and Safety Practices Among Western Australia Wheatbelt Farmers During Harvest"* conducted on 29 farmer respondents, it was found that education and training can improve hazard identification skills, encourage the adoption of work processes and behaviors that will not only prevent workers from hazardous exposures but also able to identify other hazardous elements and situations, as well as remedial measures to reduce adverse outcomes. This study also explains that the majority of pond owners (36%) return to using their smartphones and mobile websites to obtain information related to K3 because they feel that they can provide far more significant benefits.

OSH-related education has been described by the research of Aluko et al. (2016), namely through the promotion of safe practices and minimizing exposure to hazards, such as providing safety equipment, routinely carrying out worker training related to safety, strengthening the capacity and ability of adequate workers through training in all facilities that are held mandatory. Once implemented properly, workers need to comply with all safety regulations and procedures so that work accidents can be minimized. This compliance can be optimized through monitoring of law enforcement related to safety in the workplace.

The relationship between the level of K3 knowledge and the incidence of work accidents has been proven by several studies. First, a quantitative study entitled *"Management Commitment, Knowledge, Behavior in Occupational Safety and Health and Occupational Accidents of Nurses in Private Hospitals in Yogyakarta"* conducted by Pratiwi et al., (2016) at a private hospital in Yogyakarta with a cross-sectional method of 73 nurses as respondents who were taken by simple random sampling. The study found a negative relationship between knowledge of K3 and occupational accidents of nurses in risk units. That is, the better the knowledge of nurses, the lower the incidence of work accidents. This is indicated by the results of the regression analysis in the form of a regression coefficient of -0.403 and a p-value of 0.000.

Furthermore, in the same year, a similar study was conducted in the form of a cross-sectional analytical survey with the title *"The Relationship Between Knowledge and Attitudes About K3 and Occupational Accidents in Fishermen Groups in Belang Village, Belang District, Southeast Minahasa Regency"* conducted by Kalalo et al. al., (2016) of 50 fishermen as respondents who were taken by total sampling with the fisher's exact test results. It was obtained a p-value of 0.000 and a POR value (95% CI) of 1.700, which means that respondents with a low level of OHS knowledge, will be more at risk of experiencing work accidents compared to respondents who have a good OHS knowledge level. Statistically, it can be stated that there is a relationship between knowledge about K3 and the incidence of work accidents.

Rudyarti (2017) also conducted a cross-sectional descriptive-analytical study entitled *"The Relationship of Occupational Safety and Health Knowledge and Attitudes to Use of Personal Protective Equipment with Occupational Accidents at Batik Knife Craftsmen at PT.X"* on 31 respondents in the production section where samples were taken randomly through total sampling method. From this study, the results of bivariate analysis RX1 -0.400 and p-value 0.026, which indicated a significant relationship between K3 knowledge and the

incidence of work accidents. In other words, a decrease in K3 knowledge will significantly increase the incidence of work accidents. The magnitude of the relationship between the two is shown by the results of multivariate analysis using a regression test with a regression coefficient of -0.412.

Another cross-sectional quantitative study was conducted by Syaputra (2017), namely *"The Relationship of K3 Knowledge and Motivation with Work Accidents for Production Employees of PT. Borneo Melintang Buana Exports"* to 67 respondents from the production department which was taken by purposive sample. This company is a company engaged in trading services and manufacturing furniture and accessories. The results of the chi-square test show that there is a significant relationship between knowledge and the incidence of work accidents, which is indicated by a p-value of 0.000 and an RP of 2.75, and a CI value of 1.54-4.90. The RP value of 2.75 indicates that workers who have good knowledge have a 2.75 times chance of not experiencing work accidents compared to workers who have less knowledge. Meanwhile, the results of the univariate analysis in this study found that 38 respondents (56.72%) had good knowledge and 36 respondents (53.73%) had low work accidents.

Referring to the information that has been collected and described above, it can be seen that K3 is one of the important efforts as a form of preventing work accidents and occupational diseases. If K3 is managed properly, adequately, and guaranteed for all workers, then a high work commitment can be formed. Workers with high work commitment will have increased work productivity, followed by effective and efficient work processes. To implement good OSH, it is necessary to increase workers' OHS knowledge through safety talk, OSH education, and OSH training. This effort is important to implement because high knowledge of OHS in workers will result in positive attitude changes in job security. This positive attitude can be maintained through regulation, which covers the production process, work environment, and workers.

In addition to increasing knowledge of K3 among workers, the implementation of K3 also requires support from supervisors or company management who are consistent in carrying out risk management, can solve problems related to K3 comprehensively, and collaborate with other parties to improve the quality of K3 in the workplace. Several studies related to the title of this paper have similar results, namely, the level of knowledge of workers related to K3 has been proven to affect the incidence of work accidents in the health, fisheries, industry, and mining sectors. However, the information obtained is still limited to these sectors so that further research is needed in other sectors, such as agriculture, tourism, oil, transportation, and other sectors.

## 4. Conclusion

Efforts to increase knowledge of occupational safety and health (K3) of workers such as risk management through identification, assessment, and control as well as applying risk mapping are forms of preventing work accidents in the workplace environment. In addition, it is necessary to increase workers' knowledge of occupational safety and health (K3) in the form of safety talk, K3 education, and regular OSH training, accompanied by the preparation of regulations to support the implementation of K3.

This level of K3 knowledge needs to be instilled in workers because based on the findings of several studies, it has been proven that it affects the incidence of work accidents, including the health, fishery, industrial, and mining sectors. In other words, it can be said that the higher the level of knowledge of K3 among workers in a workplace, the incidence of work accidents also tends to be lower.

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