

Conference Paper

The Correlation Between Knowledge About Occupational Accidents and Safe Work Behaviors Among Employees at the Production Division of PT X Indonesia

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Abstract

Knowledge about work accidents can minimize unsafe actions so it can create safe work behaviors in employees. The purpose of this study was to understand the relationship between employees' knowledge about occupational accidents and safe work behaviors among employees in the production division of PT X, Indonesia. We used an observational, analytical method with a cross-sectional approach involving 46 respondents. Data were collected during field observation and the questionnaires about knowledge on occupational accidents as well as safe work behaviors. Data were analyzed using the Spearman test. We found a correlation between knowledge about occupational accidents with safe work behaviors. Furthermore, we also found a relationship between safe work behaviors and other confounding variables. It can be concluded that there is a relationship between the knowledge about occupational accidents and safe work behaviors of the employees at the production division. It is expected that the company improves the safety and health aspects of its workers.

Keywords: occupational accidents, work safe behaviors

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1. Introduction

The development of industrialization is currently increasing rapidly. Developments in various industrial sectors lead to a growing number of workers and a higher risk of workplace accidents. Work accidents are not desirable, unpredictable, and cause harm to both property and people [3]. Work accidents are caused by unsafe behaviors and working conditions as well as human-related factors such as a lack of knowledge and

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skills [4]. Behaviors can rely on attitudes, knowledge, workplaces, perceptions, age, the duration of working, level of education, training, company rules, safety promotion, supervision, personal protective equipment, motivation, and work colleagues [5]. A previous researcher reported that there is a relationship between knowledge and unsafe actions [6]. Another researcher found that there is an influence of the knowledge about occupational accidents and the perception of control to the risk of workplace accidents [1]. Human behaviors hold essential roles in occupational accidents.

PT X is one large-scale company that has different work units. Production division is one work unit that has a high level of workload involving various types of work and employs many labors from various backgrounds. Therefore, understanding the knowledge about work accidents will minimize the occurrence of unsafe actions thus can create safe work behaviors among employees. The purpose of this research was to find out the relationship between the knowledge about occupational accidents and safe work behaviors among employees in the production division of PT X, Indonesia.

2. Methods

This research used an observational, analytical method with a cross-sectional approach. This research was conducted at the production section of PT X with a population of 83 employees who were all males. We selected 46 respondents by using a random sampling technique. Data were collected by field observations and by using 2 types of questionnaire. Before filling out the questionnaire, the respondents signed informed consent. The Spearman test was performed to analyze the data by using the SPSS v.23 software.

The first questionnaire examined respondents' knowledge about occupational accidents. We used the questionnaire compiled by Doloksaribu [1] which has been modified according to the theory of workplace accidents. The questionnaire consisted of 10 negative questions and 10 positive questions that had undergone a validity test and a reliability test. We also modified the questionnaire according to the Guttman scale; that is, if the respondent answered correctly, we gave the score value of 1 and if the respondent's answer is wrong, then we gave the score value of 0 [7]. The maximum value in the questions about knowledge on workplace accidents was 20 and the minimum value was 0. After this, we categorized the employees' knowledge based on the following classification [8]:

1. Good knowledge; if the respondent answered correctly in >75% of questions or had a total score value of >15

2. Medium knowledge; if the respondent answered correctly in 40-75% of questions or had a total score value of 8-15
3. Lousy knowledge; if the respondent answers were correct in <40% of questions or had a total score value of < 8

For evaluating safe work behaviors, we used the questionnaire compiled by Fitrie [2] that has been modified in accordance with the theory of safe behaviors. The questionnaire consisted of 30 questions (20 were favorable questions and 10 were unfavorable questions) that had undergone a validity test and reliability test with 4 categories of answer choices; i.e. very often, often, sometimes, and never. The scoring was done by using Likert scale in which “very often” was given the score value of 4, “often” was given the score value of 3, “sometimes” was given the score value of 2, and “never” was given the score value of 1 [7]. The higher the score value indicates the higher degree of safe behaviors performed by an employee, whereas the lower the score value shows the more unsafe behaviors. The maximum value on the questionnaire about safe work behaviors was 120 and the minimum value was 30. Following this, we categorized safe work behaviors according to the classification below [8]:

1. Safe work behaviors were high if the respondent answers correctly in >75% of questions or had a value of > 90
2. Medium safe work behavior, if the respondent's answer is right in 40-75% of questions or had a value of 48-90
3. Bad work behavior, if the respondent's answer is correct in < 40% of questions or had a value of < 48.

3. Results

Table 1 shows that all of the respondents were adults, have worked in the production section for a long time, had a moderate level of education. More than half of the respondents have attended training and most of them had a good knowledge about occupational accidents already practiced highly safe working behaviors.

Table 2 shows that the correlation value (r_s) between knowledge about occupational accidents and safe work behaviors is 0.824 ($p < 0.001$). This value indicates a solid relationship between knowledge about occupational accidents and safe work behaviors of employees in production division at PT X. Further evaluation of the relationship between

TABLE 1: Characteristics, Knowledge on Occupational Accidents, and Safe Work Behaviors of 46 Employees from Production Division at PT X, Indonesia, 2018.

Category	Frequency	n(%)
Age (years old)^a		
Final Teenager (17 – 25)	9	19.6
Early Adult (26 – 35)	13	28.3
Final Adult (36 – 45)	16	34.8
Early Elderly (46 – 55)	8	17.4
The Duration of Working (years)^b		
New (≤ 3)	11	23.9
Old (> 3)	35	76.1
Level of Education^c		
Low	0	0
Medium	38	82.6
High	8	17.4
Training		
Ever	28	60.9
Never	18	39.1
Knowledge about Occupational Accidents		
Bad	0	0
Medium	7	15.2
Good	39	84.8
Safe Work Behaviors		
Low	0	0
Medium	5	10.9
High	41	89.1

^aCategorized by Indonesian Health Ministry (2009); ^bCategorized by Hani Handoko (2010); ^cCategorized by Indonesian Law Number 20, Year 2003

TABLE 2: The Correlation between Knowledge about Occupational Accidents with Safe Work Behaviors of 46 Employees from Production Division at PT X, Indonesia, 2018.

	Safe Work Behavior			Total	r _s ^a	p value
	Low	Medium	High			
Knowledge about Occupational Accidents					0.824	< 0.001
Bad	0	0	0	0		
Medium	0	5	2	7		
Good	0	0	39	39		
Total	0	5	41	46		

^aSpearman test

the factors that might influence the dependent variable, we found a relationship between training and safe work behaviors (Table 3).

TABLE 3: Other Factors that May Influence Work Safe Behaviors.

	Safe Work Behavior	
	r_s	p value
Age	-0.380 ^a	0.800
Duration of Working	-0.380 ^a	0.833
Level of Education	0.160 ^a	0.287
Traning	0.966 ^b	0.006

^aSpearman test; ^bContingency Coefficient test

4. Discussion

Respondents of this study were dominated by employees of 36-45 years old which consisted of 16 people (34.8% of total respondents). This is in accordance with the conditions in the company that the workers in the production section were old workers who have worked long enough in this company. Most employees were in the category of early elderly and were rotated to the work unit where the workload is lighter because they will reach the pre-retirement period; for example, working in the office.

There were 35 employees (76.1% of respondents) who have worked for more than three years. It shows that the majority of the respondents studied were permanent employees and have worked for a long time in this company. The levels of education of the respondents were mostly in the medium category: not graduating from high school/equivalent to graduating from high school/equivalent which represents 38 people (82.6% of respondents). In recent years, this company accepts workers with a minimum education of high school graduates. As for workers who have worked for decades, the majority of them were elementary and junior high school graduates.

There were 60.9% of respondents who have attended training on occupational accidents or prevention of work accident or similar training. It means that most of the respondents have awareness and knowledge regarding occupational accidents or accident prevention and the like. Every workforce, especially in the production department, is required to attend work-related training such as training related to workplace accidents. Workers in the production section who have never participated in similar training were those who were recently rotated to the production department.

This study involved 46 respondents which represented more than 50% of the total employees at the production division of PT X. We found that 39 employees (84.8% of respondents) have good knowledge on occupational accidents. Different background and different experience of the respondents contribute to the different knowledge about workplace accidents. Doloksaribu [1] stated that the dissemination of knowledge about

occupational accidents is an effort to increase knowledge, perceptions and risk control for workplace accidents that can affect laborers' behaviors.

Most respondents in our study demonstrated highly safe work behaviors (n=41, 89.1%). This may be due to the sequence of the questionnaires given to the respondents. The first questionnaire given was about the knowledge on occupational accidents; therefore, after filling out the questionnaire, the knowledge of the respondents would have been increased as they had received knowledge about occupational accidents that affected their safe work behaviors. If someone had obtained knowledge about occupational accidents, it will influence his/her safe work behaviors so that he/she can minimize work accidents or incidents. Patel [9] found that awareness of any unsafe work behavior reduced the likelihood of work-related accidents.

The present study found a very strong relationship between knowledge about occupational accidents with safe work behaviors with ($r_s = 0.824$, $p = 0.000$). This finding is similar to the research conducted by Sholihin et al [10]. Doloksaribu [1] found that knowledge about accidents in the workplace influenced the perception of controlling the risks of workplace accidents. Yoga [11] also found a similar result to our study and Budiono [12] stated that human behavior is a factor that plays an essential role in an accident; thus, an effective way to prevent work accidents is to avoid unsafe behavior. Griffin [13] stated that knowledge plays a vital role in influencing the perception of one's safe work behavior.

With regards to other factors influencing safe work behaviors, we found a relationship between safe work behaviors and training but not with age, the duration of work, and level of education. Pratiwi [14] found that there was no relationship between age and unsafe actions. Another research also found that there was no relationship between age and safe behaviors [15]. It seems that age does not affect a person's safe behaviors which means that the older a person is, his/her work behaviors may not be safer. However, Notoatmojo [16] found that with increasing age, it increases the level of a person's maturity in thinking and receiving information which can affect his/her behavior. According to Budiman [17], the older a person is, the experience will be increased and the experience of vigilance against workplace accidents which in this case means safe working behaviors will improve as the age is increasing [18].

Our study is similar to previous research that found no relationship between the duration of working and safe work behaviors [15]. Respondents who have worked for a long time experienced work rotation so that the experience of working in different parts of production can be the cause of the absence of a relationship between the two. However, a previous study [18] found that the longer a person's duration of working, the more

he/she will gain experience which contributes to safer work behaviors. This is due to an increase in the attitude and morale of the workforce which will have a positive impact on the work [19].

With regards to the level of education, research conducted by Pratama [20] found that there is a weak relationship between education and unsafe action. This is because the research involved respondents whose highest level of education was in the category of being or not graduating from high school. Only a few respondents have a high level of education; i.e, in the tertiary level, which can be the cause of the lack of relationship between the level of education and safe work behaviors.

This study found a relationship between training and safe work behaviors which is similar to a previous study [21]. According to Giller [22], safe work behaviors are not only formed by the knowledge of accidents. Other factors may influence such behaviors. Our present study provides an overview of other factors that may have influenced safe work behaviors. In this study, we could not control the attitudes and perceptions of the employees. According to Peterson [21], attitudes and perceptions are related to someone's views, interpretations, and behaviors toward the existing hazards and risks. These factors are difficult to control.

We overlooked other factors such as co-workers and motivation. A previous study [13] conducted in-depth interviews to learn about the influence of co-workers and motivation on safe work behaviors. The study found that employees who behaved safely were more influential to motivate their colleagues to behave safely as well.

5. Conclusions

There is a relationship between knowledge about occupational accidents and safe work behaviors among employees at production division of PT X, Indonesia. Further research on the relationship between safe work behaviors and other factors is warranted.

References

- [1] Doloksaribu J A 2015 *The relationship of knowledge about workplace accidents with the perception of controlling the risk of work accidents on employees in the Gajah Baru Premier Oil Indonesia platform* Jakarta: EsaUnggul University p 3-20
- [2] Fitrie S 2011 *Differences in Safety Behavior between Workers Who Have Occupational Accidents and No Occupational Accidents at PT. Lanjarjaya Mitra Abadi (Case Study of Production Section Employees at PT. Lanjarjaya Mitra Abadi)*. (Jakarta: Esa

- Unggul University) p 15-40
- [3] Suma'mur 2009 *Corporate Hygiene and Occupational Health* Jakarta: CV Sagung Seto **19** 453-61
- [4] Tarwaka 2014 *Occupational Safety and Health Management and OSH Implementation in the Workplace* Surakarta: Harapan Press **1** 13-30
- [5] Agiviana A P 2015 *Analysis of the Influence of Perception, Attitude, Knowledge and Workplace on Employee Safety Behavior (Study on PT Muliaglass Container Division Company)* Semarang: Diponegoro University 15-29
- [6] Hapsari Y D 2013 *Relationship Between Predisposing, Enabling, and Reinforcing Factors with Unsafe Action* Surabaya: Airlangga University 7-35
- [7] Riduwan and Akdon 2015 *Formulas and Data in Statistical Analysis* Bandung: Alfabeta 16-18
- [8] Pratomo H 1986 *Operational Definition of Variable* Jakarta: Ministry of Education and Culture 20-31
- [9] Patel D A and Jha K N 2016 *Safety Sciences* **89 (1)** 240-48
- [10] Sholihin S, Wahyu A, Muis M 2013 *Relationship between OHS Perception of Employees and Unsafe Behavior in Unit IV Production Division of PT Semen Tonasa in 2013*. Makassar: OHS Section Faculty of Public Health Hassanudin University 3-10
- [11] Yoga N C 2005 *Relationship between Knowledge, Attitude, and Employee Behavior concerning Occupational Safety and Health with Work Accidents at the West Sumatra Provincial Laboratory* Yogyakarta: Gadjah Mada University 7-35
- [12] Budiono S, Jusuf, Pusparini A 2003 *Anthology Of Corporate Hygiene, Occupational Health And Occupational Safety* Second Edition Semarang: Badan Penerbit Diponegoro University. 16-40
- [13] Griffin M A and Andrew N 2000 *J. Occup. Health. Psychol.* **5 3** 347-58
- [14] Pratiwi O R and Hidayat Sho'im 2014 *The Indonesian Journal of Occupational Safety and Health* **3(2)** 182-91
- [15] Halimah S 2010 *Factors Influencing Safe Work Behavior of PT SIM Plant Tambun II Jakarta: Islamic State University of the Syarif Hidayatullah* 215-47
- [16] Notoatmojo, Soekidjo 2012 *Health Promotion and Health Behavior* Jakarta: PT. RinekaCipta 2-37
- [17] Budiman and Riyanto A 2013 *Anthology of Selected Topics Knowledge and Attitudes Questionnaire in Health Research* Jakarta: Salemba Medika 66-9
- [18] Simbolon N H 2017 *Factors Associated with Unsafe Behavior in Oil Palm Harvesting Workers PTPN IV Kebun Bah Jambi in 2017* Medan: Sumatera Utara University 1-29

-
- [19] Sukoco B M 2007 *Modern Office Administration Management* Surabaya: Erlangga 30-50
- [20] Pratama A K 2015 *The Indonesian Journal of Occupational Safety and Health* **4(1)** 64-73
- [21] Minanti S T 2015 *Description of Factors of Unsafe Behavior in PT Krakatau Engineering Workers Cook Over Plant (COP) Area PT Blast Furnace Project PT Krakatau Steel (Persero), Tbk* Jakarta: Islamic State University of the Syarif Hidayatullah 2-38
- [22] Sugiyono 2015 *Qualitative Quantitative Research Methods R & B* Bandung: Alfabeta 12-72