Analysis Of Individual Factors With Unsafe Action Toward The Production Workers Of A Chemical Industry In Gresik Indonesia

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Abstract: The main factors cause work accidents are unsafe condition and unsafe action. The majority of work accidents of 85% are caused by human factors with unsafe action. This study aims to analyze the relationship of individual factors with unsafe action toward chemical production workers in Gresik, East Java. This study is observational with cross sectional design. The population is production workers with 69 people, sampling technique using simple random sampling, with 59 people as a sample. The data collected using an interview through out questionnaire, observation using checklist unsafe action observation and documentations. The data analyzed descriptively and inferential analysis using logistic regression. The results of study show that respondent with 24-31 years old and 32-39 years old did unsafe action low category compared with age respondent of ≥ 40 years old. Respondents who have a work period <5 years did unsafe action low category compared with respondents who have work period >10 years. There is a relationship of age and work period with unsafe action, based on the coefficient score B, variable of work period is the most influential independent variable toward dependent variable.

Keywords : individual factor, unsafe action, work accident, chemical industry, production worker.

1 INTRODUCTION

Industrial accident is an accident occurs in the workplace especially in the industry environment. According to International Labour Organization (ILO) every year there are 270 million workers experience an accident caused by working, 160 million workers get illness caused by working and 1.1 million accident caused by illness or accident caused by working relationship. ILO estimates that loss experienced as an accident effect and illness as a result of working every year more than US$ 1.25 billion (Markkanen, 2004). The theory of work accident namely domino theory by Heinrich in 1930 accomplished by Frank E. Bird in 1985 stated that the main factor causes work accident namely unsafe condition and unsafe action. The majority of work accident, 85% caused by human factors with unsafe act. The work accident factor must be controlled in order not to cause work accident (Ramli, 2010). Pheasant (1991) stated that human error is the main contributor for accidents. Pheasant details that the human error contributed to the accident in the following areas: the accident that occurred at the nuclear power contribution exceeds 45%, on an airplane crash exceeds 65%, the accidents that occur in the oceans exceed 85%, the contribution to traffic accidents by 90% and its contribution to the work accident that occurred in the industrial organization is to exceed the number. Chemical industry in Gresik consists of 3 units of supporting factory that Production Department I, the Department of Production II and Production Department III. The Company has had a risk management to each production department. The results of risk management known potential hazards of each work area, as well as the risk category of risk control planning. Risk management company done, indicates that the company has made efforts and implementation of the occupational health and safety program to protect workers from the risk of accidents and occupational diseases. In fact, although the company has done the risk management, workplace accidents still happen. The results of a preliminary study of the data obtained from 2012 to July 2014 occurred 34 work accidents in the company. There are 2 cases of work accident occurred in 2012, 12 cases in 2013 and 20 cases from January 2014 to July 2014. From January 2014 to July 2014 there is an accident resulted the loss of working days. The principle of accident prevention is so simple namely by eliminating the causes of the accident called unsafe condition and unsafe action. The practice is not as easy as one might imagine because it involves a variety of interrelated elements ranging from direct cause, the cause of the basis and background (Ramli, 2010). Therefore, this study aims to analyze the relationship between individual factors with unsafe action toward chemical industry production workers in Gresik, Indonesia.

2 MATTER AND METHOD

This study is quantitative with observational and cross-sectional study design. This study was held in one of the Chemical Industries in Gresik, East Java. The study was held from September 2014 to February 2015. Data collection was conducted in December 2014. The populations of this study are production workers, amounting to 69 people. Based on the calculations using formulas Lemeshow, sample number was 59 people. The sampling technique used a random sampling method (simple random sampling). The independent variable in this study is the individual factors that include ages, work period, level of education, knowledge of workers to unsafe action and workers' attitudes to unsafe action. The technique of data collection used an interview technique through out questionnaires, observations with the help of observation checklist unsafe action and documentations. The data in this study were analyzed descriptively and inferential Logistic Regression.

3 RESULT

Based on Table 1.1 it can be seen that 59 workers as respondents, obtained result of Frequency distribution of the study distribution follows:

Table 1.1 *The Frequency Distribution of Variables*

Variables	Category	Total	Percentage (%)
Age	24-31 years old	11	18,6
	32-39 years old	15	25,4
	≥ 40 years old	33	55,9
Work Period	< 5 years	6	10,2
	5-10 years	11	18,6
	>10 years	42	71,2
Level of education	Senior High School	46	78,0
	University	13	22,0
Knowledge of Workers to Unsafe Action	Enough	20	33,9
	good	39	66,1
Workers Attitudes to Unsafe Action	Enough	27	45,8
	good	32	54,2
Total		**59**	**100**

Table 1.2 *The Crosstabs of Independent Variables against Dependent Variables*

Crosstabs analysis was conducted to determine the distribution of the independent variable on the dependent variable. The results of the crosstabs can be seen in the following Table 1.2:

No.	Independent Variable	Category	*Unsafe Action*				Total	
			low		medium			
			n	%	n	%	N	%
1.	Age	24-31 years old	5	45,0	6	55,0	11	100
		32-39 years old	9	60,0	6	40,0	15	100
		≥ 40 years old	9	27,3	24	72,7	33	100
2.	Work Period	< 5 years	1	16,7	5	83,3	6	100
		5-10 years	6	55,0	5	45,0	11	100
		>10 years	16	38,0	26	62,0	42	100
3.	Level of education	Senior High School	17	36,9	29	63,1	46	100
		University	6	46,2	7	53,8	13	100
4.	Knowledge of Workers to Unsafe Action	enough	7	35,0	13	65,0	20	100
		good	16	41,0	23	59,0	39	100
5.	Workers Attitudes to Unsafe Action	enough	9	33,0	18	67,0	27	100
		good	14	43,8	18	56,2	32	100

The Research of Inferential Analysis Variables

Inferential analysis was conducted to determine the relationship between independent variables and dependent variable using logistic regression test. The following table 1.3 are the results of logistic regression analysis of the relationship of individual factors to unsafe action

Table 1.3 *The Results of Logistic Regression Analysis*

Independent Variable	B	Sig.	information
Age			
24-31 Years old	-4,070	0,050	Significant
32-39 Years old	-3,051	0,011	Significant
≥ 40 Years old	reference	-	-
Work Period			
< 5 Years	5,058	0,044	Significant
5-10 Years	0,103	0,947	Not Significant
>10 Years	reference	-	-
Level of education			
Senior High School	-1,019	0,341	Not Significant
University	reference	-	-
Knowledge of Workers to Unsafe Action			
Enough	0,845	0,256	Not Significant
Good	reference	-	-
Workers Attitudes to Unsafe Action			
Enough	0,356	0,689	Not Significant
Good	reference	-	-

Dependent Variable: *Unsafe action* (Medium)
Reference : Low
Based on Table 1.2 it is known that:

1. Respondents from 24 to 31 years old and from 32 to 39 years old did unsafe action low category compared with those ≥ 40 years old.
2. Respondents who have a work period < 5 years did unsafe action low category compared with those who have a work period of >10 years.

4 DISCUSSION

a. Age

It is said that the performance and worker productivity declines because of the growing age. It is often assumed that the skills of an individual, especially the speed, agility, strength and coordination decreases because of the growing age, prolonged saturation as well as the lack of intellectual stimulation towards the work, contributes to a decrease in productivity. This can lead to the appearance of faults in the work that can cause work accidents. The results show that there is a relationship between age and unsafe action. Respondents who are ≥ 40 years old tend to perform unsafe actions with medium category (72.7%). The results are in accordance with the research conducted by Siddiq et.al (2013) which states that there is a relationship between age and unsafe behavior on the production workers in Tonasa Cement company. In this study, respondents from 24 to 31 years old mostly perform unsafe action medium category because they have a short work period <5 years. Those who have worked less than 5 years don't understand the conditions of the working environment and occupational health and safety regulations so that they tend to perform unsafe actions when working.

b. Work Period

The period of one's work is associated with work experience can affect work accidents, especially experience in using a variety of work tools. The longer the work period of a person is the more experience they will get and allow the workers to work more safely (Dirgagunarsa, 1992). The results of this study demonstrated that there is a relationship between work

period and unsafe action. In this study, the 6 of the respondents who have a work period <5 years did unsafe action with medium category (83.3%). This study is in accordance with the research conducted by Siddiq et.al (2013) which states that there is a relationship between work period and unsafe behavior in the production worker of Tonasa Cement company. According to Cooper (2001) that people often behave unsafely because they have never been injured when carrying out their work unsafely. Something they do not realize that the impact of unsafe action are not all felt at that moment. But there is an impact felt in the future when the unsafe action continuously performed. One of them is a decrease in auditory function for indiscipline using ear protective equipment when working in noisy areas. Some workers over 40 years old who become a respondent of the study, mostly have problems with sense of hearing function. It is proved that at the time of speaking, the respondents always asked the researcher to ask and speak louder.

c. Level of Education

The level of education relates to a person's intelligence. There is a growing assumption that intelligence is negatively correlated with the accident. A person with low intelligence is assumed to have an accident more often than those of high intelligence. But this assumption is not all true because some studies have found that the level of intelligence will be correlated with occupational accidents in certain types of work (Winarsusnu, 2008). In this study, the level of education is not related to unsafe action as based on the analysis of data both of senior high school-educated respondents (63.1%) and higher education (53.8%) mostly did unsafe action medium category. It can be seen that the education level of respondents did not distinguish the behavior when working because there is no difference in the type of work performed by the educational level. So, the potential dangers and risks of exposure received by the respondents either those who have high school diplomas or college graduates are alike.

d. Knowledge

Knowledge is the result of known and this happens after people perform a sense perception of a particular object. It occurs through out human senses, namely: the sense of sight, hearing, smell, taste and touch. Most of human knowledge gained through out the eyes and ears. The knowledge or cognitive domain is very important for the formation of one's actions (overt behavior). In fact the experience and the study, the behavior based on knowledge will be more imperishable than one that is not based on knowledge (Notoatmodjo, 2007). The result of this study showed that there is not a correlation between knowledge of respondents and unsafe action. Both respondents who have a good knowledge (59%) and respondents who have enough knowledge (65%) mostly did unsafe action medium category. Green (1980) stated that the increase of knowledge does not always lead to the changes in behavior, but the knowledge is very important given before an individual performs an action. The action will be in accordance with the knowledge if the individual receives a strong signal enough to motivate him/her to act in accordance with his/her knowledge. Someone who has a good knowledge towards an object is expected to have a good action. In this study, the majority of respondents who have a good knowledge of the unsafe action actually did unsafe action medium category. This happens because it was based on an observations of researchers, the respondents have already known that a job they did was not safe but they still did it because they have been used to doing unsafely job and when they work unsafely, they can survive.

e. Attitude

Attitude is someone's reaction or response who is still covered to a stimulus or an object. The manifestations of this attitude cannot be directly seen, but they can only be interpreted first of a covered behavior. The attitude clearly shows that the connotation of correspondence reaction to a certain stimulus. It is not an action or activity, but it constitutes an action or behavior predisposition. The attitude is still a covered reaction but not an open reaction with behavior open. In details it can be explained again that an attitude is a reaction to certain objects in the environment as an appreciation of the object (Notoatmodjo, 2007). This study analyzed the relationship between attitudes and unsafe action. The result of the data analysis states that there is not a relationship between the attitudes of respondents and unsafe action. There is no relationship between attitude and unsafe action is because of both respondents who had a good attitude (56.2%) and respondents who had enough attitude (67%) of the unsafe action mostly did unsafe action medium category. According Notoatmodjo (2007) one can act or have a new action without knowing first the meaning of the stimulus received. In other words, one's actions must not be realized by the knowledge or attitudes.

CONCLUSIONS

Based on the results of research and discussion above, it can be summarized as follows:

1. There is a relationship between age and work period and unsafe action.
2. Based on the value of the coefficient B, work period variable is the most influential independent variable to the dependent variable.
3. Unsafe action controlling in the chemical industry needs to focus on the workers' age and work period because both variables are variables related to unsafe action.

SUGGESTION

The suggestions can be given to the respondents and company are as follows:

1. Insert the incident report of unsafe action in the company's internal internet system so that all of the employees can know the violation done by their colleagues. It also aims to make a feeling of embarrassment to individuals if they do not abide to the company regulations.
2. Implement training programs periodically to update workers's knowledge and understanding of the latest issues of occupational health and safety being experienced by the company. The implementation of periodic training also aims to refresh information for the workers themselves.

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