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Research Article

The Influence of Fire Safety Training towards Workers' Attitude at PT. Maruki International Indonesia Makassar in 2019

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Abstract: Fire is an oxidation reaction from the meeting of fuel, oxygen and heat that causes losses, damage to equipment, death and disruption to business. The wood processing industry has a high fire risk due to the use of various kinds of machinery and raw materials. One effort to prevent and overcome fires is to conduct fire management training for all employees. This study aims to determine the differences in knowledge, attitudes and preparedness for fire prevention and control of workers before and after intervention is given. This research was conducted at PT. Maruki International Indonesia. The method of this research is quasi experiment with sampling using proportionate stratified random sampling technique. The research sample of 43 workers. Data were analyzed by paired sample T-Test with a significance level of 0.05 and the Generalized Linear Model (GLM) Repeated Measures. The results of the statistical analysis of the T-test from the measurement of workers' attitudes at the pre-test up to the 4th post-test showed no significant difference ($p > 0.05$). The results of the GLM Repeated measures statistical analysis indicate an increase in the attitude scores of workers (pretest-posttest) with the Greenhouse-geiser score $F = 2.975$, $p < 0.05$. There is a significant influence of fire safety training on attitudes towards the workers of the production department of PT. Maruki International Indonesia. It is expected that the company will complete the fire protection system, conduct safety patrol and carry out regular fire safety training for workers.

Keywords: Fire Safety Training, Knowledge, Attitude.

INTRODUCTION

In the industrial sector experienced very rapid development but in the process of development industrial activities in the production process are accompanied by factors that contain the risk of accidents due to work or illnesses due to work (Suardi, 2007). Therefore, policies on occupational safety and health are regulated in Law No. 1 of 1970 concerning work safety whose scope is related to machinery, workplace foundation, work environment, how to prevent accidents and occupational diseases, paying attention to sources of production so as to increase efficiency and productivity (Abidin *et al.*, 2008). One potential work accident that often occurs is a fire. Potential work accidents that often occur are fires. The risk of fire is a risk that must be considered in production activities because it can cause many casualties, damage and losses to the industry (Renni *et al.*, 2010).

Data from the ILO. (2018) in the Fire Risk Management module recorded several fire disasters that occurred in various parts of the world including in 1991 in New York City, a fire occurred in a garment factory and resulted in 146 workers killed, in 1988 in Piper Alpha North Sea, England had a fire on an oil rig and 167 workers were killed, in 1993 in Nakhon Pathom, Thailand there was a fire in a toy factory and 188 were killed, and in 2012 in Karachi Pakistan a fire broke out at a garment factory and resulted in 289 workers killed in the event of the fire.

Fire data compiled by the National Disaster Management Agency within the last 5 years, namely in 2011 to 2015 were 979 fire incidents and 31 of them

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were fires that occurred in factory buildings, offices, school buildings and hotels (Mubarok *et al.*, 2018). Work safety requirements relating to fire prevention and control are clearly outlined in Law No. 1 of 1970 include: (1) Preventing, reducing and extinguishing fires. (2) Provision of road facilities for the process of saving themselves, controlling smoke, heat and gas. (3) conduct fire management training for all employees. Based on the Decree of the Minister of Manpower of the Republic of Indonesia KEP.186 / MEN / 1999 concerning Fire Fighting Units in the Workplace in Chapter I Article 2 Paragraph 1 namely management or employers are obliged to prevent, reduce and extinguish fires as well as fire prevention training in the workplace. In paragraph 2 it states the obligation to prevent, reduce, extinguish fires in the workplace, one of which covers the implementation of periodic fire exercises and rehearsals and the establishment of a fire prevention unit.

Based on previous studies conducted, this industry uses flammable liquid chemicals in the wood painting process such as acetone and thiner as well as various machines that have the potential to cause fire. An interview with the head of HRD (Human Resource Development) answered that there had been fires in the last few years due to electrical short-circuit disruptions and friction of wood dust on the machine. In 2018 there was a fire at factory 4 due to an electrical short circuit. This incident caused financial losses and disrupted the continuation of operational activities for one day. Besides that, in the past three years, there had never been any training or simulation of fire management in the company.

METHODOLOGY

Research Design

This type of research is quantitative with a quasi-experimental research design with a modified of time series design. This study analyzes the effect of fire safety training on workers' knowledge, attitudes and readiness before and after periodic interventions for one month. This research was conducted at PT. Maruki Internasional Indonesia Makassar.

Population and Sample

The population in this study was all production workers of PT. Maruki Internasional Indonesia as many as 203 workers and sampling in this study using proportionate stratified random sampling. The number of samples were 43 workers.

Data Collection

Data obtained from the distribution of questionnaires about the attitude of fire prevention and control. The questionnaire was given once before the intervention (pre-test) and was given four times after the intervention (post-test).

Data Analysis

Statistical data analysis using paired sample T-tests and GLM Repeated Measures using SPSS 16 software.

RESULTS

Univariate Analysis

Table 1. Characteristics of workers at PT. Maruki International Indonesia

Characteristics	Frequency	
	N	%
Age		
25-29 years	4	9.3
30-34 years	8	18.6
35-39 years	7	16.3
40-44 years	14	32.6
45-50 years	8	18,6
>50 years	2	4.7
Total	43	100
Education		
Junior high school	4	9.3
High school	37	86.0
Bachelor	2	4,7
Total	43	100
Duration of Work		
6-10 years	6	14.0
7-11 years	9	20.9
12-16 years	3	7.0
17-22 years	24	55.8
>22 years	1	2.3
Total	43	100
K3 training		
Ever	9	20.9
Never	34	79.1
Total	43	100
Fire Fighting Training		
Ever	8	18.6
Never	35	81.4
Total	43	100

Table 1 illustrates that the distribution of respondents by age is more in the 40-44 years age group of 14 people (32.6%) and the least age group> 50 years is 2 people (4.7%). For education, most respondents with the most recent high school education / equivalent are 37 people (86.0%), junior high school / equivalent ie 4 people (9.3%) and the last educationBachelor, namely 2 people (4.7%). Most of the respondents' work tenure is dominated by 17-22 years of work group namely 24 people (55.8%) and the least number of respondents with>22 years of work namely 1 person (2.3%). For the category of respondents who had attended occupational Safety and Health (K3) training / education namely 9 people (20.9%) and those who had never attended K3 training / education were 34 people (79.1%). And respondents who said they had participated in firefighting training were 8 people (18.6%) and those who said they had never participated in firefighting training were 35 people (81.4%).

Bivariate Analysis

Table 2. Differences in Fire Prevention and Control Attitudes Before and After Intervention

Variable	Paired Samples Statistics		Paired Samples Correlation	Paired Samples Test			
	Mean	SD	Correlation	Df	T	Mean	P *Value*
Attitude							
Pre-test	75.74	5.265	0.363	42	0.581	0.535	0.564
Post-test 1	75.21	5.247					
Pre-test	75.74	5.265	0.967	42	0.551	0.116	0.585
Post-test 2	75.63	5.456					
Pre-test	75.74	5.265	0.560	42	-1.971	-1.535	0.055
Post-test 3	77.28	5.603					
Pre-test	75.74	5.265	0.420	42	-1.713	-1.651	0.094
Post-test 4	77.40	6.351					

Table 2 attitude variable show that there is no significant difference in the attitude of fire prevention and control before and after intervention in workers in time series (p value> 0.05).

Multivariate Analysis

Table 3. Effects of Fire Safety Training on Worker's Attitudes Before and After Time Series Interventions

Variable	Descriptive		Mauchyl's test of Sphericity		Test of Within Subjects Effect		Multivariat Test
	Mean	SD	Mauchy's W	P Value	Greenhouse Geisser (F)	P Value	Wilks Lambda (Partial Eta Square)
Attitude							
O_1	75.74	5.265					
O_2	75.21	5.427					
O_3	75.63	5.456					
O_4	77.28	5.603	0.094	0.000	2.975	0.041	0.178
O_5	77.40	6.351					

Table 3 shows that there is a significant effect of fire safety training on the attitude of fire prevention and control of workers in time series (pretest-posttest) seen in the value of Greenhouse-geiser (F) <0.05.

DISCUSSION

Based on the results of statistical analysis using paired sample T-test showed that there were no differences in the attitudes of respondents before and after the intervention this was marked by p value> 0.05 in the pre-test and post-test. Regarding these results it is said that workers' attitudes are not the same between initial measurements and subsequent measurements.

This also happened in a time series study conducted by (Purwanto *et al.*, 2015) that the initial, second and third measurements differed so that the initial conditions before the intervention were in unstable or inconsistent conditions. In addition, the research (Suryanto, 2015) shows that there is an increase in the attitudes of respondents regarding OSH before training and after training. However, based on statistical test results obtained p value> 0.50 means that there were no significant differences in the attitude of respondents towards K3 before and after training. In the theory put forward by (Purwanto, 1998) about behavior in the form of attitude said that attitudes can change because of that attitudes can be learned and therefore also attitudes can change in people if there are certain conditions and conditions that facilitate attitudes to that person. Azwar (2010), argues that knowledge has an important role in shaping the attitudes and behavior of someone who determines the quality of society. The formation of attitudes to someone as a basis for carrying out a behavior or life activity that is not only influenced by knowledge and experience alone, there are other factors that can determine the formation of attitudes, among others, culture such as habits, traditions and support systems of the family and the environment (Suryanto, 2015).

The results of statistical analysis with GLM repeated measures in a time series resondent attitude have a Greenhouse-geiser (F) value = 2975, p value 0.041 <0.05. This shows that there is an interaction between time series (pretest-posttest). Interaction shows there is a change in pre-test score towards post-test. It can be concluded that there is a significant effect of fire safety training on workers' knowledge and attitudes towards fire prevention and management before and after intervention.

Teach in Moratis *et al.*, (2006) states that simulations can improve the competencies needed for someone to make systematic decisions, make predictions in an uncertain environment and measurement goals. Simulation techniques can be used to improve the technical competencies needed to support work. Zoloxochitl and Berges (2005), explained that the simulation model can improve the knowledge and skills needed by the organization, so that the model developed is a suitable method for increasing competence in a fast and efficient way. Swaak and De Jone (2001) suggest that simulation-based training has a positive impact not only on knowledge about fire

prevention and prevention but is able to improve decision-making ability in the event of a fire in the workplace. Besides this simulation-based training enlivens the atmosphere of learning when the simulation is practiced successfully.

To find out the effectiveness of the simulation-based training that is carried out involves 3 aspects, namely: cognitive relating to the knowledge of workers about the process of fire, the occurrence of fires, the concept of fire suppression and how to prevent and control fires, affective aspects regarding the attitudes of workers in the prevention and prevention of fires, then psychomotor aspects regarding the ability of workers to apply their knowledge in this case it can also be said that this psychomotor aspect is the readiness of workers because it involves the knowledge, experience, skills and motivation of workers in preventing and overcoming fires.

CONCLUSION

There are significant differences in the knowledge of workers' fire prevention and control. There is no significant difference in the attitude of fire prevention and control of workers in the pre-test and post-test. There is a significant influence of fire safety training on the knowledge and attitudes of workers' in a time series (pretest-post-test). suggestions for the company are expected to carry out training / education on fire prevention and prevention to workers on a regular basis and consistently, create a safety patrol schedule so that they can control every workplace situation and the attitude of workers at work every day. suggestions for workers are expected to pay attention to their work area after doing work, use work equipment safely to avoid the risk of fire, report to the officer if they find a potential risk of fire.

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