

THE CORRELATION BETWEEN PREDISPOSING FACTORS AND THE FIRE EMERGENCY PRACTICES AMONG GAS STATION WORKERS

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Abstract

Gas Station (SPBU) is a place with a major level of fire risk. The accident in SPBU will cause huge losses, both the loss of human lives and material losses. One of the accident occurred lately was the fire incident in the gas station in Blora. The aim of this research was to determine the predisposing factors that mostly influence on the fire emergency practices of the workers at the gas station in Blora. The research used the analytic observational designs with cross sectional approach. The sample of this research was the total population of gas stations' operator in Blora, of 73 respondents. The data were analyzed by using chi square and multivariate logistic regression. All of the respondents have a good percentage in categories of knowledge on fire emergency (60.3%), attitude of fire emergency (79,5%), fire emergency practices (63%). The attitude of fire emergency was the most dominant factor affecting the fire emergency practice in gas stations in Blora. To improve the management of gas stations, the development on the routine programs i.e. socializing, counseling, training and simulations, is required.

Keywords: Predisposing Factors, Emergency Response, Fire Safety, Gas Stations Workers

***Presenting Author's biography**



Haris Setyawan, SKM., M.Kes was graduated from occupational health and safety department of Public Health Faculty in Diponegoro University (2008), and has Mastered in Health Promotion Program especially in Health and Safety at Diponegoro University (2011). He started Working in the Coal mining at Borneo Island as a Health and Safety Officer (2011-2012), in 2012, he was moved to Semarang as a lecturer at the Academy of Pharmacy Nusaputera, and in 2014 worked as a lecturer at the Health and Safety Program at Sebelas Maret University. He is a members of a research group in Health and Safety, he also has many research experiences. He published some papers in the international proceedings and national journals.

INTRODUCTION

Fire is a rapid oxidation process, which is a chemical reaction resulting in the evolution of light and heat in varying intensities [1]. Fire may cause of losses, both direct and indirect losses. Fires often lead to unwanted consequences on material activities, cessation of business activities, environmental damage or pose a threat to the safety of human lives. Fire disaster which is far-reaching dangers including social and economic life of the people. Hence the arrival of catastrophic fires is not common and not a danger that routinely occurs will further increase the losses. Cooper research showed that 80% - 95% of all workplace accidents that occurred were caused by unsafe behavior [2]. To reduce unsafe behavior, the supervisors should give attention to the safety act of employees, regular inspection in the area of the workplace, keeping good communication about safety. In addition to reduce unsafe acts, it can be done through the selection and placement, training, motivation with the placement of posters, safety awards, positive reinforcement, behavior-based safety training and safety inspections [3]. Notoadmotjo stated that behavior is caused by three main factors predisposing, enabling and reinforcing factors. Predisposing factors consist of knowledge, attitudes, traditions, beliefs, values, educational level, and socioeconomic level. Enabling factors include the availability of facilities and infrastructure. Reinforcing factors comprise community leaders, religious leaders, officials, and regulations [4].

Gas station is an area with high risk of fire with very adverse consequences, both human lives and material damages. In the creation of the pump, Pertamina provides the requirements and standards of safety procedures of fighting fires, environmental protection, security systems, lighting systems, equipment and completeness of filling fuel, duiker, fire sensors, generators, electrical installations, safety signs standard pump. The spacing between the trigger of the potential hazards and the risk of fire is very important to prevent the occurrence of fire emergency in the workplace that can be caused by unsafe action [6]. Practicing fire safety is very important in preventing fires that could reduce or even increase the chance occurrence or accident risk of fire cases. Fire safety behavior is also influenced by the standardization of the management to support the role of safety in the workplace [7]. Practice is the ability to demonstrate/perform a particular action based on the acquired knowledge, because knowledge will cause a response in the form of attitudes towards the unknown object, which in turn will cause a response in the form of action on the stimulus or a particular object. Knowledge and attitudes related to each other in the formation of the ability to perform a particular practice. The changes will affect the attitude of knowledge and ability in carrying out the practice, so unwittingly with changing one component can then also change a person's ability to carry out specific practices. To improve fire safety in the workplace, roles and responsibilities of personnel is important in the process of firefighting and rescuing victims [8]. Prevention practice of fires will not only protect the property of the company but also protect the human beings involved in it workplace [9]. To obtain the best results of fire safety at the gas station, the capacity to implement the action/safety practices appropriate standard operating procedure, practice fire safety can be obtained from training conducted by gas station management.

METHODS

The research used the analytic observational designs with cross sectional study. The samples of this research were the total population of gas station workers in Blora of 73 people. Chi square test and multivariate logistic regression were used to analyze the data. The independent variables in this study were age, gender, level of education, work periods, marital

status, knowledge and practices, while the dependent variable was the fire safety practice. All variables were measured by using a questionnaire whose validity and reliability had been tested previously. Prior to data collection, the researcher described the purpose of the study in addition to the information related to data retrieval before the respondents filled for in the informed consent.

RESULTS

This research was conducted at five gas stations in Blora. The respondents in this research were the operators who were responsible to operate the gas stations pump.

Table 1. The number of gas stations operators in Blora

No	SPBU name	The number of gas station operators	The number of gas station supervisors
1	Randublatung Gas Station	13	2
2	Kedutungtuban Gas Station	14	2
3	Blora Gas Station	17	2
4	Cepu Gas Station	18	2
5	Sambong Gas Station	14	2
	Total	73	10

Predisposing factors in this research were age, sex, level of education, working period, marital status, knowledge on fire emergency, attitude about fire emergency, all of variables related to fire emergency practices. Subsequently, the data was analyzed by using Chi Square and Logistic Regression Statistic Test.

Table 2. Univariate Analysis with Crosstab Test

No	The factor	Category	Percentage
1	Fire emergency practice	good	63 %
2	Knowledge in fire emergency	good	60.3%
3	Attitude about fire emergency	good	79.5 %

Table 3. Bivariate Analysis using Chi Square Statistic Test

No	Factors	Sig. Value	Type of Sig.
1	Age	0.042	Significant
2	Sex	0.026	Significant
3	Level of Education	0.016	Significant
4	Work Period	0.060	Insignificant
5	Marital Status	0.034	Significant
6	Knowledge In Fire emergency	0.019	Significant
7	Attitude About Fire emergency	0.038	Significant

Table 4. Multivariate Analysis using Logistic Regression Statistic Test

No	Variable	P Value	Exp. B	CI 95%
1	Age	0,585	2,622	0,075 – 81,619
2	Sex	0.086	11,623	0,710 – 190,535
3	Level of Education	0.983	0,963	0,034 – 27.115
4	Marital Status	0,068	10,255	0.925 – 113,696
5	Knowledge In Fire Emergency	0,048	0,132	0,020 – 0,895
6	Attitude About Fire Emergency	0,044	5,011	1,088 – 34,888

The Table 4 shows that knowledge in fire emergency and attitude about fire emergency are the most dominant factor from all of them with significant value 0.048 and 0.044.

DISCUSSION

Age

Age is one factor that affects the perception of a person's demographics [10]. The study showed that most of the respondents aged 31-56 years old (58.9%), and the remaining (41.1%) aged 18-30 years old. There is a correlation between age and fire safety practices ($p=0.042$), which is different with previous research. Risyanto stated that age had no correlation with the practice of fire safety because age is only a process of physical growth of a person who is not absolutely affect with the level of understanding and treatment of a person on the desirability of an object [11]. On the contrary, Rahmi explained that the age of the operator of gas stations related to the incidence of fires since the respondents in that study showed younger operators were more likely to do unsafe fire related practices in the workplace, and age was one of the demographic factors that was not directly related to the possibility of a person to act in particular fire precautions [13]. In this current study, gas station operator with the category of age between 18-30 years old is the best in the category of respondents with fire emergency practices with a percentage of 74.4%, this data showed that the longer a person works as a operator gas station has the work experience and better fire safety practices as describe with the ILO Book 5th Edition that better experience in the workplace can prevent the worker from the accident [12]. Based on the results of the multivariate analysis showed that the respondent's age is not a dominant variable (Exp. B value 2.622, $p=0.585$), which means that the age of the respondents did not showed the effect on fire safety practices.

Sex

This study showed there was correlation between sex and fire safety practices ($p=0.026$). It shows that the fire safety practice varied between sex differences. There was 84.2% female operator who practiced good fire safety, while there were only 55.6% male who practiced good fire safety. The gender affects people's perceptions and behavior. It is a form of stimulus to external stimuli, though the shape of the stimulus is the same but the shape of the response will be different for each person, and one of the differentiating factors are sex [4]. Female gas station operators have a better perception of the safety practices than the man operators, it is evidenced by the majority of female respondents admonish fellow employees or consumers who are found smoking in area gas stations. Based on ICPC 8th Annual Colloquium and Crime Prevention, the female always want to be always safe in any place in

the world, it stimulate her basic concern to always keep health and safety [5]. Based on the results of the multivariate analysis, sex is not a dominant factor (Exp. B value 11.623, $p=0.086$) which means gender of respondents did not affect fire safety practices.

Level of education

The level of education is the last formal education level of the gas station operators. The result of bivariate analysis showed that the level of education and fire safety practice has a significance correlation ($p=0.016$). This showed that the person's level of education has a major effect on good fire safety practices with a percentage of 74.4%. The level of education is one of the predisposing factors that related to person behavior besides knowledge and attitudes which are in agreement with previous research [14]. The research of Ferri Mollana showed that the level of education influenced the incidence of fire practices because education level is a standard for a person to more easily provide the perceptions and responses [14]. Besides behavior, other factors that supported fire safety preparedness are the availability of fire tools, panels and fire safety point for emergency response and preparedness responses [15]. The gas stations operators with high school education background had a perception of fire safety better than other operator with different educational background , it can be seen from most respondents (74,4%) warned to turn off the engine when filling fuel processes. Based on the results of multivariate analysis showed that the level education of gas station operators was not a dominant factor (Exp. B value 0.963, $p =0,983$), which means the level of education of respondents did not show the effect on fire safety practices

Working Period

Work period is the time of work for the operator at the gas station from the first sign until the researched begin. The result of bivariate analysis showed that work period with fire safety practices had no significance correlation ($p=0.060$). This research showed that the work period of operators did not affect the good fire safety practices. The working period is one predisposing factor that can make the behavior of worker better as mentioned in the theory of the behavior by Lawrence Green [11], but the working period without any procedures and emergency response training will not gain optimal results in improvement to prevent the incident at the workplace [11]. Based on the results of multivariate analysis showed that the working period of gas station operators was not a dominant factor ($p =0,060$), which means the level of education of respondents did not show the effect on fire safety practices

Marital status

The result of multivariate analysis showed that marital status with fire safety practices had a significance correlation ($p=0.034$). The research of Aditya Rahmi (2009) showed that marital status of operators influenced in the fires safety practice and the operators who had married have better performances in safety practices than the responses of operators who are not married [13]. A person's marital status can take effects the increase of individual responsibilities towards his work responses [4]. Based on the results of multivariate analysis showed that the marital status of gas station operators was not a dominant factor (Exp. B value 10.255, $p =0,068$), which means the marital status of respondents did not show the effect on fire safety practices.

Knowledge of Fire Emergency

The result of multivariate analysis showed that Knowledge of Fire Emergency with fire safety practices had a significance correlation ($p=0.017$). The domain knowledge is very

important for the based person behavior, because of behavior based on knowledge will be more lasting than the behavior that is not based knowledge responses [4]. The research of Risyanto showed that knowledge is one of the factors which form the basis for any action or implementation of fire prevention efforts. Knowledge is a factor that becomes the basis or motivation to take action for a healthy life [11]. A good knowledge of fire evacuation and safety devices play an important role in the evacuation efforts fires and emergencies in the workplace. Knowledge of fire safety can be obtained through training and simulation of disasters in the workplace, that can be scheduled periodically [11]. Based on the results of multivariate analysis showed that the knowledge about fire emergency of gas station operators was not a dominant factor (Exp. B value 0.132, $p=0,048$), but the knowledge about fire emergency of respondents show the effect on fire safety practices

Attitudes about Fire Emergency

The result of multivariate analysis showed that attitudes about fire emergency with fire safety practices had a significance correlation ($p=0.017$). The research of Risyanto showed that practice fire safety is not affected by the attitude [11]. Notoadmojo (2003) stated that the attitude is the reaction that form of evaluation or feelings and support on human behavior [4]. Attitude is very important in a safety management system especially in the field of fire prevention in both the prevention and alleviation of cooperation during a fire. Based on the results of the multivariate analysis showed that of the attitudes about fire emergency is a dominant factors among the other risk factors (i.e. age, sex, level of education, work period, marital status), it can be seen from the value Exp. B 5.011 with the smallest p value 0.044 which means that if the attitude of the respondent about fire emergency practices in gas station operators have the opportunity to practice 5 times with good fire emergency.

CONCLUSION

All of the respondents have a good percentage in categories of knowledge on fire emergency (60.3%), attitude of fire emergency (79,5%), fire emergency practices (63%). The attitude of fire emergency was the most dominant factor affecting the fire emergency practice in gas stations in Blora. To improve the management of gas stations, the development on the routine programs i.e. socializing, counseling, training and simulations, is required.

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