The Relationship between Work Safety Knowledge and Work Safety Behavior of Manufacturing Workers in Rubber Wood Industry

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Abstract
The study of work safety knowledge and work safety behavior of manufacturing workers in Rubber Wood Industry was the survey research. The objectives of this research were to study work safety knowledge and work safety behavior of manufacturing workers in Rubber Wood Industry and to study the relationship of work safety knowledge and work safety behavior of manufacturing workers in Rubber Wood Industry. The samples group of this research were 440 manufacturing workers from 89 Rubber Wood factories. The data were collected by the questionnaires and the researchers analyzed the statistic by using descriptive statistic which included frequency, percentage, mean and Pearson's Product Moment Correlation Coefficient. The study found that most of the respondents were males with Diploma degree or higher, married and live together with less than 5 years work experience. Most of them work as manufacturing workers in Rubber Wood drying factories located in Trang province. The result showed that work safety knowledge is related to work safety behavior at .05 level of significance. Therefore, the appropriate safety knowledge should be promote among workers as well as work safety training and continuous evaluation to change their behavior towards work safety in Rubber Wood industry and to reduce accidental and future loss.
Keywords: Safety Knowledge, Safety Behavior, Rubber Wood Industry

Introduction
In agricultural statistic of 2013 showed that Southern Andaman Coast has the potential to produce rubber close to the national average. Because Southern Andaman Coast hold agricultural area of 4 million rai of 21 percentage. There are 89 processing factories in Southern Andaman Coast within 5 provinces include Ranong province, Phangnga province, Phuket province, Krabi province and Trang province which allowed to operate in 2014. However, the provinces in Southern Andaman Coast still have sufficient potential to develop the processing industry in order to add value to existing crops in the area. (Office of the National Economic and Social Development Council, 2011)
The Rubber Wood Processing Industry is the manufacturing process from rubber wood with the multi-step process. It's start from cut down rubber trees from rubber plantations truncation to the log then loaded to the factory, sawed, wood impregnation, wood drying and wood shaved. Most of the rubber wood factory employees spend their time not less than 1 in 3 or 8 hours a day for the daily work. (Tadkatuk, 2013) During this time, the staff may be exposed to inappropriate working

environment which they may exposure to chemicals in various forms (Sukdee, 2010; Wichitnan, 2008) such as wood dust, borax and the other hazards that may conceal in the manufacturing process which include noises from working machine and etc. (Wichitnan, 2008) In addition, employees may get accidents from work due to unsafe working behavior. (Chochanak, 2005; Sukdee, 2010) It's include working incorrect posture, same posture for a long time, did not wear protective equipment properly and work in unsafe working conditions. These health problems may effect employee's quality of life who work in Rubber Wood Processing Industry for 6 areas which are (The Human Capacity Building Institute, The Federation of Thai Industries, 2009) body, mind, spirit, social relationship, environment and stability in life.

The rubber wood processing industry uses large tools and machinery which may result in safety working in the factory. Because the use of tools and machinery require knowledge and expertise in using otherwise the accidents may occurs during the work. The risk of working in rubber wood processing factories can occur at all production processes from cutting down rubber trees from rubber plantations truncation to the log until the wood has been processed. Mostly risk are the danger from the wood fall over, The wood pierced in hands, arms, legs or feet. Also the pain of the arm muscles from the sawing the wood for a long time, get an accident from the saw blade, irritation in respiratory system, exposure to chemicals and the accident from the car, etc. (Khongsattayakoun, 2003; Chochanak, 2005) In addition, the dust and the chemical that the employee have to receive at all time of their work if this is not taken in consideration it can effect the physical health and intelligence of employees (Thailand Industrial Standards Institute, 2002). Fritz and Sonnentag (2009) metioned that in taking initiative safety proactively will increase organization effectiveness.

Therefore, the safety management in working in Rubber Wood Processing Industry is important in minimize the danger from the accident and occupational disease which start from educate them about work safety. The knowledge in work safety should be known by all employees to prevent the accident from work. All the employee must have knowledge, skills and understanding the steps in working which may help the employee in aware and avoid the danger that may happen during the work. From Yule et al. (2007) found that safety knowledge has the direct and indirect influence on safety behavior and employees may lack of the confidence to demonstrate safety behaviors without adequate safety knowledge. The research of Burke & Signal (2010) mentioned that safety awareness focuses on the knowledge gained from actual events, safety practice to reduce risk, exchange of health and safety information, exercise rights and responsibility of employee and learning about safety may result in a change of attitude.

As a result, the researchers are interested to study knowledge and safety behavior of Rubber Wood Processing Industry. The results of the study will be beneficial for development and improvement of safety management to reduce risk and workplace accidents.

Research Objectives

To study safety knowledge and safety behavior of manufacturing workers in rubber wood industry. To study the relationship between safety knowledge at work with safety behavior in work of manufacturing workers in rubber wood industry.

Research Methodology

There are the scope of the research on safety knowledge and safety behaviors of manufacturing workers in the rubber wood industry are as follows:

Population and Samples: The population used in this study were manufacturing workers in Rubber Wood Industry in Southern Andaman Coast 1,105 workers from 5 provinces include Ranong province, Phangnga province, Phuket province, Krabi rovince and Trang province which

allowed to operate in 2014. The researchers calculated the sample size by using Proportional Stratified Random Sampling at 95% confidence level and the size of error (e) equal to 0.05 with Multi-Stage Sampling and received 440 samples.

Research Instrument: The instrument use to collect data was the questionnaire developed by the researcher from concepts and related theories which consists of 3 parts. First, checklist for personal information which include gender, age, highest education level, marital status, time spent in this factory, industrial and provincial groups. The second part was the questionnaire on safety knowledge factors with 4 variables on knowledge of the operational tools, knowledge of working environment, knowledge of the workplace and knowledge of how to work safely. Third part was the safety behavior questionnaire with 2 variables on the compliance with safety guidelines and the participation in safety work.

The assessment of research instrument, the researchers conducted a content validity analysis with 5 experts to examine the conformity of the questionnaire on both language and contents which consider questions and research objectives. The results from the Index of Item-Objective Congruence analysis are between 0.60-1.00. Then, try out the revised questionnaire from the advice of the expert with 30 non-sample manufacturing workers to analyze reliability of the instruments by Internal Consistency using Cronbach's alpha coefficient.

Collection of Data: The data collected for this research, the researchers coordinating with human resources office to collect the data from 440 manufacturing workers from 89 factories in 8 weeks. The questionnaires were completed in time of 100 percent responds. The data were then analyzed for statistical analysis.

Data Analysis: Statistics used by the researchers in data analysis for this research were Descriptive statistics which included percentage, frequency, mean and calculated Pearson's Correlation Coefficient (α - Coefficient) 0.844.

Research Results

The samples were 288 males equal to 65.0 percent, 64.0 percent of the respondents were the age between 30 - 39 years old which were 281 samples. There were 167 samples hold Diploma degree equal to 38.0 percent, 279 samples were married and lived together as of 63.5 percent. The samples of 241 had experience in work under 5 years equal to 54.7 percent. There were 219 manufacturing workers which are 49.8 percent, 311 workers were from wood drying factory equal to 70.7 percent. The 184 workers lived in Trang province as of 41.7 percent.

The overall average level of opinion toward work safety knowledge were in the highest level ($\overline{X}$ = 4.28, S.D. = 0.535). In considering of each item found that the highest average level was the knowledge of the workplace ($\overline{X}$ = 4.42, S.D. = 0.618) followed by knowledge of the working environment ($\overline{X}$ = 4.41, S.D. = 0.648), knowledge of how to work safely ($\overline{X}$ = 4.30, S.D. = 0.606) and knowledge of the operational tools ($\overline{X}$ = 4.00, S.D. = 0.695) accordingly as shown in table 1**.**

Table 1 The average level of opinion toward work safety knowledge

Work safety knowledge	**Mean**	**S.D.**	**Level**
knowledge of the operational tools	4.00	0.695	High
knowledge of the working environment	4.41	0.648	Very High
knowledge of the workplace	4.42	0.618	Very High
knowledge of how to work safely	4.30	0.606	Very High
Total	**4.28**	**0.535**	**Very High**

The average level of opinion toward work safety behavior were ranked in high level ($\overline{X}$ = 3.97, S.D. = 0.574) when considering in each area found that the area with the highest average level was the compliance with safety guidelines ($\overline{X}$ = 3.99, S.D. = 0.616) followed by the coordination in safety work ($\overline{X}$ = 3.95, S.D. = 0.795) accordingly as shown in table 2.

Table 2 The average level of opinion toward work safety behavior

Work safety behavior	**Mean**	**S.D.**	**Level**
Compliance with safety guidelines	3.99	0.616	High
Coordination in safety work	3.95	0.795	High
Total	**3.97**	**0.663**	**High**

The analytical result between the relationship of work safety knowledge and work safety behavior found that the work safety knowledge is related to work safety behavior at statistical significance of .05 as shown in table 3.

Table 3 The relationship between work safety knowledge and work safety behavior

Correlation	**Work safety behavior**	
	Pearson Correlation	**P-value**
Work safety knowledge	.424	.000

Discussion and Conclusion

From the study found that work safety knowledge is related to work safety behaviors at the significance level of .05 which consistent with the research of Kamolphut Poongernkam (2007) study on the strategies for developing safety behaviors of manufacturing workers: Case study of Quality Cartons Co., LTD. Samut Prakarn province found that work safety knowledge have an influence on work safety behavior which the work safety education were given to all workers through different media channels. The results of the analysis found that work safety knowledge has a positive impact on work safety behavior at the significance level of .05 which consistent with the study of Sapsatree Santaweesuk (2007: 78); Piyanan Sawadsaringkarn (2012: 266); Neal, Griffin and Hart (2000: 106) and Griffin and Neal (2000: 355) found that work safety knowledge has a positive influence.

Work safety knowledge is an issue that the management level should focus on and promote among the manufacturing worker seriously in order to help employees assess the potential risks that may happen which consistent with the safety model of Firenze (Firenze System Model, 1978) stated that the workers need to decide which to pursue in order to get the job done. But each decision in achieving the goal is always a risk. Therefore, the workers should have enough information to make the right decision. If there is a wrong decision or a high risk, it may result in the work failure and work accident. It is also consistent with the study of Carleton (2010) on the Motivating Employees for Safe Work Behavior stated that the encouragement of the organization to be a safe workplace is that the organization need to promotes and supports information, resource and work safety training for the employees to enhance work safety performance. Smith-Crowe, Burke, & Landis (2003) indicated that work safety knowledge means the information related to safety which will enhance the workers to aware of various danger and assess the risk related to work which is also consistent with the study of Withit Kamonrat (2009) on the work safety behavior of manufacturing workers in Aditya Birla Chemicals (Thailand) Ltd. found that the guidelines for reducing accident from work caused by unsafe working behavior of the workers was to educate them about work safety knowledge which as Thammarak Srimarut (2012) stated in the work safety behavior of

manufacturing workers that there was the suggestion for work safety training and create work safety consciousness among manufacturing workers. However, The training on work safety should include all aspects according to Canadian Centre for Occupational Health and Safety (Canadian Centre for Occupational Health & Safety, 2007) which is the Canadian tripartite non-profit organization for safety and occupational health mentioned that work safety knowledge were include knowledge of specific tools needed in the job, policies and procedures for safety work and work structure. Weerapong Chaleumjirarat & Witoon Simachokdee (2005) indicated that employees must learn and be trained which covered 4 areas 1) Operational tools is the difference component merge together and energize power for their movement. The danger that may happen from the operational tools such as the pulling of cloth, cut finger or hands, dust in the eyes, machine fall over and electric shock, etc. 2) Work environment is the important factor surrounded the workers which may include machine, operational tools, breathing air, light, vibration, infrared, cold, gas, dust, chemicals and animals as well as the recurring work conditions, hastily working, job rotation continuously, relationship between colleagues, compensation and working hours, etc. Inadequate working environment is a factor that is involved in the cause of occupational hazards. 3) Workplace include unsafe work area such as untidy material placement, rugged factory floor with swamp and oil spilled, zoning workspace, prepare driveway for forklift, pulley lift, etc. Most of the accidents occurring in the workplace were related to slipping and fall, sprained from excessive force, crush with objects or with workers, clamped between the solid and 4) How to work safely were include work safety procedures which considering the seating position or work stand, body movement, the using of tools correctly, appropriate selection of protective equipment with also the performance in controlling the machine with their ability as well as work safety awareness. Burke & Signal (2010) suggested that safety awareness focuses on the knowledge gained from actual events, work safety practice to reduce risk, health and safety information exchange, exercise rights and responsibility of the workers on work safety. Therefore, the workers will perceive, understand and readjust the attitude toward work safety which will increase their precautionary protection of both themselves and others.

Recommendation

Recommendation for the use of research results

(1) The government should prepare the training plan to educate, advice and follow up the results of factory work safety to promote policy behavior.

(2) The organization should define the policy and set safety objectives, assign responsible person for work safety to manage the system and plan security work and follow up the result continuously which will help to reduce work accidental rate.

Recommendation for the future research

(1) There should be the study of different variables such as the area in upper south provinces of Thailand which may result in work safety behavior.

(2) The study of future research may include other research tools such as in-depth interview to gain deeper information therefore the research will be more complete.

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