Safety Training, Company Policy and Communication for Effective Accident Management

Haslinda, A.
Faculty of Defence Studies and Management, National Defense University Malaysia
Email: drhaslinda@gmail.com

Shaharulliza Saharudin
Center for Graduate Studies, Open University Malaysia
Email: rishahanna@gmail.com

Nur Hidayah Roslan
Faculty of Defence Studies and Management, National Defense University Malaysia
Email: hidayah_sun@yahoo.com

Rosmah Mohamed
College of Business Administration, Prince Sultan University, Riyadh
Email: drrosmah70@gmail.com

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ABSTRACT
The construction industry in Malaysia is currently characterised by an accident-prone culture on construction sites. There have been several fatal incidents, incidents causing physical disability and near-miss incidents. With effective accident management, it is expected that accidents could be reduced and existing knowledge and awareness of safety and health could be improved. The objective of this study is to determine the relationship between safety training, company policy and communication in the context of effective accident management. The research design of this study is descriptive and cross-sectional. Quantitative research method using questionnaire survey is utilised to collect data at a selected Mass Rapid Transit project in the Klang Valley. The respondents consists of the main contractor, client and consultants employee. A total of 150 questionnaires were distributed to the respondents in which simple random sampling was performed in selecting the respondents for this study. Out of the total questionnaires distributed, only 136 (90.6%) valid and usable questionnaires were returned. Descriptive and Pearson Correlation analyses were used to analyse the data collected from respondents. The results revealed a significant strong positive relationship between safety

training, company policy, communication with effective accident management. These findings indicate that effective accident management is not likely to succeed without full commitment from both employees and their organization.

Keywords: Safety training, company policy, communication, accident management, construction site, Malaysia

INTRODUCTION

The construction industry has certainly played an important role in the national development process, contributing to employment and economic growth. However, according to Carter and Smith (2001), the construction industry has been recognized as one of the most dangerous industries. Throughout the world, the construction industry is disproportionately more dangerous when compared to other industries with a poor safety record (Rosenfeld et al., 2006). Thus, safety at the work site is an important aspect with respect to overall construction safety. Even though there have been improvements in safety performance and an increase in safety awareness in this industry, the injury rate is still one of the highest across all sectors. As well as causing human tragedy and economic losses, construction accidents also affect the productivity and reputation of the construction industry (Huang and Hinze, 2006).

Globally, the International Labour Organization (ILO) reports the deaths of nearly two million workers each year due to accidents and illness at workplace. In 2000, the ILO reported more than 5,000 deaths each day due to accidents, as well as 500 to 2,000 reported cases of injury depending on the type of job (Takala, 2002). The ILO is confident that the results of accidents and occupational health problems are largely preventable. However, worldwide statistics have shown a rising trend in the case of accidents and health at work from year to year. Protection of workers against injury and illness in the workplace has become a major issue for the ILO since its inception in 1919 (Takala, 2005).

Over the past few decades, Malaysia has achieved significant improvements in the standards of Occupational Safety and Health (OSH). The rate of occurrence of work-related accidents has dropped from 11.0 for every 1,000 workers in 2000 to 6.1 per 1,000 workers in 2007. However, during the same period, the rate of fatalities has remained static, at around 12.8 for every 100,000 workers. The country has to pay out compensation for work-related injuries, disease and fatalities covering both the employment injury insurance scheme and the invalidity pension scheme. There is clearly an urgent need for all parties to do more to enhance OSH standards in the country (Occupational Safety and Health Master Plan for Malaysia, 2015). National Institute for Occupational Safety and Health (NIOSH) Chairman Tan Sri Lee Lam Thye has stated that the number of industrial accident cases in Malaysia is still at a high level, although it has dropped in recent years. SOCSO's statistics reveal a drop in such cases from 63,423 in 2002 to 38,657 in 2007. In addition, according to the Department of Occupational Safety and Health (DOSH), statistics showed that there were 1,775 accidents in the manufacturing sector in 2008. This dipped to 1,318 cases in 2009 before climbing to 1,714 cases in 2010 and falling dramatically to 913 in 2011. The manufacturing sector was able to reduce

the number of workplace-related accidents, especially in factories by multinationals, as they were able to invest in machinery with advanced safety features (Cox & Cheyne, 2000)

Several studies have been conducted to examine the relationship between safety management practices and safety performance. These studies all used multi-dimensional measurement instruments of safety management practices and safety performance in hospitals (Nor Azimah et al., 2009), in universities (Wu, Chen and Li, 2008) and in the oil and gas industry (Khdair, Faridahwati and Subramaniam, 2011). In addition, it was argued that researches and business strategists who study organizational culture and safety phenomena also believe that a strong safety culture in large measure initiatives drives safety performance. Hence, organizations can help to improve their employees' understanding and perception to keep improving safety in the organization (Andi, 2008). Although the linkage between the management role and the actual state of safety has been studied extensively, there has been a lack of effort to investigate safety management practices in the construction industry in Malaysia. This industry is currently characterised by an accident-prone culture on construction sites. This is due to the attitude of contractors who do not cooperate in ensuring the safety and health of workers at work and do not comply with the rules and procedures of safety and health. They are too focused on profit and completion dates, forcing employees to work beyond their ability and thus causing a lot of accidents. There have been several fatal incidents, incidents causing physical disability and near-miss incidents. With effective accident management, it is expected that accidents could be reduced and existing knowledge and awareness of safety and health could be improved. Therefore, the objective of this study is to examine the extent and relationships of safety training, policy and communication with effective accident management in the selected construction industry. In addition, through reviews of the literature, the following hypotheses have been developed to deduce the relationships between safety training, company policy and communication with effective accident management.

There is a significant positive relationship between safety training and effective accident management H_1

There is a significant positive relationship between safety policy and effective accident management H_2

There is a significant positive relationship between communication and effective accident management H_3

LITERATURE REVIEW

Theory of Accidents/Incidents – Accident Causation

The Accident/Incident Model developed by Petersen in 1971 has a totally different concept from the domino theory, which suggests that there are many contributing factors, causes, and sub-causes of the main impact in an accident scenario. This theory is used to identify the root causes of the accident and does not focus only on the injured person, but also on the management, supervisors, and other persons or departments that are involved in the accident. The management also has a major responsibility towards employees at work and it must keep

safety as the top priority (Sariwati, 2005 and Seyyed Shahab Hosseinian & Zahra Jabbarani Torghabeh, 2012).

Training

Training is an important part of building the capacity of those involved in managing accident (Siriwardena et al., 2013). Due to the multidisciplinary nature of accident management, formal means of education are usually ineffective and lifelong learning is seen as a better way to address this issue (Siriwardena, et al., 2013). It is clear that the need to create a workplace safety climate demands management support (Coyle, Sleeman and Adams, 1995); De dobbeleer and Beland, 1991), particularly in addressing the importance of training. There is evidence to indicate that many workplace accidents are associated with poor training. This is because sub-contractors do not look seriously at safety perceptions for staff safety on the job. The role of training is vital in overcoming deficiencies in plant layout (Booth, 1979). The importance afforded to training and improving competence has led them to be recognised as the main areas for preventing accidents in workplace. The area of education, skill development and selection of competent operatives have also been argued as critical aspects towards effective accident management (Male, 2003). It was also argued that with longer periods of safety training conducted on a regular basis, the consistent result of works safety can be upheld (Shannon, Mayr and Haines, 1997).

The importance of safety training to improve the safety performance in the construction industry has been addressed by many researchers (Huang and Hinze, 2003; Aksorn and Hadikusumo, 2008). Effective training of construction workers can be one of the best ways in which to improve site safety performance (Hislop, 1991; Tam et al., 2004). Zeng et al. (2008) pointed out that some accidents, such as falling from height and being hit by falling materials in construction, could easily be prevented by implementing training programs for employees. Erickson (1997) argued that safety training should be an on-going process and initial safety orientation could not result in better safety performance. In addition, it was stated that firms that encourage employees to attend seminars, conferences and continuing education courses have better safety performance. This view was supported by Barling et al. (2003), who also noted that training allows employees to acquire greater competencies to control their work, leading them to perform their jobs safely.

If a training program is proven to be effective, it will definitely yield positive results, perhaps more than what is desired by the company. Nevertheless, measuring the effectiveness of training is one of the biggest challenges for firms today. Training will involve higher costs and adding more components to it may not be a good idea in terms of financial capacity. In order to reduce the cost of training, companies can employ several tools which may be classified under business intelligence. These tools will help the company to evaluate the training and reliably improve its methodologies. This is critical, since business needs change in response to the environment and the types of people in the company also change (Baldwin and Ford, 1988).

Policies and Procedure

Safety policy and procedure is an illustration of the organisation's expression in prioritizing safety in the workplace (Torner and Pousette, 2009). As depicted in the Malaysian OSHA (1994) act, it is the duty of the employer to formulate safety policies to his employees in the workplace. Notably, having high standard policies will harness positive management attitudes, formal conditions, collective values and individual attitudes that will foster better safety performance (Torner and Pousette, 2009). It has been demonstrated that companies with OHSAS 18001 certification perform better in terms of safety than those who do not (Vinodkumar and Bhasi, 2010). Well-documented safety rules and procedures and their enforcement by supervisors and managers can improve the safety behaviour of workers (Glendon and Litherland, 2001). The presence of safety rules and procedures may minimize accidents caused by unsafe conditions because they give a clear picture of safety program implementation in construction projects. The problem is often found that the rules and procedures are difficult to understand and implement, inappropriate for the current conditions, and over-specified (Andi, 2008).

Safety rules and procedures have also been included as a factor in offshore safety studies and showed to have a significant correlation with accident rates (Cox & Cheyne, 2000; Mearns, Whitaker & Flin, 2003). In addition, Andi (2008) states that information on issues such as unsafe conditions and new rules and procedures is very important to support the safety programme. Deming (1986) has pointed out in his study that whatever operation system or work procedures or safety rules of work are introduced by the top management in the workplace, the workers will tend to become reactive and sensitive to it. Nevertheless, Andi (2008), in his study on Indonesian construction workers' perceptions toward safety, found that workers easily understood and became aware of the applicable rules and procedures through posters and signboards.

Safety Communication

Communication is the most important factor in delivering messages. Various types of communication are used to increase the general effectiveness of any effort to motivate employees. Two-way communication can lead to a change in behaviour. Communication equipment related to safety issues between management, supervisors and workers is an effective management practice to improve safety in the workplace. Poor safety communication in an organization will not help the organization to improve safety in the workplace (Vinodkumar & Bhasi, 2010). Nor Azimah et al. (2009) describe safety communications as an openness in communication. Safety communication is also included as one of the important factors in a number of questionnaire surveys among various categories of workers, which show that safety performance is influenced by the level of communication within an organization (Cohen, 1977; Vredenburgh, 2002; Cox & Cheyne, 2000; Mearns, Whitaker & Flin, 2003). Similarly, Erikson (1997) noted that open communication was among the elements that are most predictive of high safety performance. Therefore, in order to support site safety programs and to make available appropriate information lines from management to workers and vice versa, effective communication essential. By conducting safety promotion and events,

information on issues such as unsafe conditions and new rules and procedures is very important to support the safety program (Andi, 2008).

METHODS

Quantitative research is a deductive theory-based research process that focuses primarily on testing theories and specific research hypotheses. It can be considered as finding differences and relationships using numeric data and statistical methods to reach specific conclusions about the phenomena (Kalaian, 2008). A survey in general is a study with certain limits, which means that the data obtained are samples from a population, which represent the overall population. Therefore, the deductive approach and descriptive methods using a questionnaire have been chosen for this research.

For the purpose of this study, a descriptive and correlational design will be applied, because it is undertaken to ascertain and describe the characteristics of the variables of interest in a given situation (Sekaran, 2000). Descriptive design has been defined as a design that is typically structured with a clearly stated hypothesis or one that investigates specific questions (Cooper and Schindler, 2008). Correlation design allows the researcher to integrate research literature, the pilot study and the actual study as a main procedure to gather data. This study applies a descriptive and correlational design because it aims to analyse relationships between variables.

This research is a quantitative study using a correlational design to look at the relationship between safety and health, training, policy, communication and accident management. Correlational designs have no control groups and there is no randomization (Creswell, 2008). A quantitative research method has been chosen in this study because it gathers data using a structured questionnaire. By using this method, the researcher will be able to test relationships between all the variables. It will be conducted by distributing the questionnaire to all staff in a given construction project, i.e. the Main Client, the Main Consultant and the Main Contractor. Quantitative data refers to numerical data that could be quantified to answer the research question. It can range from simple counts such as frequency of occurrences to more complex data (Sekaran, 2000).

A questionnaire is used because it is an effective and efficient data collection mechanism that enables the researcher to assess the requirement and measurement of the variables. Furthermore, self-administered questionnaires were most appropriate for this study since time and cost were important considerations, especially given that the study needed to be completed within a specific period of time. An established questionnaire is a means by which participants express their feedback regarding the topic of interest – in this case, accident management. A questionnaire was used to conduct this survey because it is an effective and efficient data collection mechanism. In order to focus on accident management, a structured questionnaire was developed based on the Likert Scale method. A Likert scale is a numeric scale to measure the respondent's attitude towards a given statement on a range from positive to negative. According to Cooper and Schindler (2008) and Zikmund, Babin, Carr, & Griffin, (2013) previous researchers have also applied this scales in their studies.

The target population of this study are employees on construction sites, ranging from general workers to the managerial level. The respondents were selected using convenience sampling in order to get a large number of completed questionnaires quickly, conveniently and economically. Thus, a total of 150 sets of questionnaires were distributed randomly to the respondents over a period of three weeks. According to Krejcie and Morgan (1970), using G Power Analysis, and Sekaran (2003), using Manual Calculation and Roscoe's Rule of Thumb, the minimum sample size is 30. In this research, the sample size of 150 construction industry employees exceeded this minimum number. According to Krejcie (1970), of 150 questionnaires, it is reasonable to expect 20% spoilt questionnaires arising from non-response and spoilt answers, which in this case is about 30 questionnaires. The survey was carried out in several ways. The process started with the development of questionnaires, identifying locations for circulating questions, distribution of the survey to the respondents and finally the gathering of the completed questionnaires to start analysing the data. The questionnaire was distributed by hand to the respective respondents once the researcher had received a letter of consent from the Health and Safety Manager in the selected construction firm. This approach was used to provide a comfortable and effective means of conducting the survey. A cover letter was attached to each survey form so that the participants could understand the main purpose of this study. The researcher also gave respondents a simple briefing before the survey was started in order to provide them with a better understanding of the questions.

The questionnaires were prepared in English. It was assumed that respondents understood English and that if there were foreign workers, the leader would translate the form into their language. It was hoped that this would minimize translation errors while respondents were answering the questions. Out of 150 questionnaires that were sent out, only 136 usable questionnaires were returned, representing a 93.3 percent response rate.

In conducting this research, a letter of authorization was obtained from the relevant authorities to conduct surveys and distribute survey forms. The authorities and the respondents were clearly informed of the objectives of this study and principles of research ethics were maintained throughout the research. Respondents from the construction site were required to provide all necessary responses for the purpose of this study.

For the purpose of this study, descriptive analysis was used to present the information that would help the researcher to describe responses for each question in the questionnaire. This analysis was used to describe the degree to which respondents agree to items in safety training, company policy, communication and effective accident management. Pearson Correlation analysis was used to determine the relationship between safety training, company policy, communication and effective accident management. The use of Pearson's correlation method is considered suitable to show the relationship between variables because it can assess the magnitude or strength of such relationships and it is also able to determine whether the relationship is positive or negative. Regression analysis, another statistical tool for the investigation of relationships between variables (Alan, 1993), was also used. This was to identify which of the independent variables is the most significant, using multiple linear regression analysis to identify the most significant factors and relationships.

FINDINGS AND DISCUSSION

Level of Respondents' Satisfaction on Training

Table 1 presents the descriptive statistics on safety training. The findings of this study suggest that respondents agreed that all workers in the company receive specific training in procedures to identify and report safety concerns, adverse events, near misses and errors (mean 4.15). Safety issues are given high priority in training programmes (mean 4.48) and that safety components are included in the orientation or induction program for all new workers (mean 4.46). In addition, respondents reported that they had received safety awareness training before being assigned to work (mean 4.43). Respondents indicated that health and safety risks associated with their job responsibilities had been covered in the training they attended (mean 4.24) and they had also received training on emergency procedures (mean 4.27) as well as had been briefed to identify safety hazards in workplace (mean 4.40). Generally, respondents agreed that the safety training given to them was adequate to enable them to assess hazards in the workplace (mean 4.32).

Table 1: Descriptive analysis for safety training

No.	Question	Mean	SD
1.	The training I attended covered all the safety and health risks associated with the work for which I am responsible.	4.24	0.772
2.	I have received training on emergency procedures in the workplace.	4.27	0.821
3.	I have been briefed to identify safety hazards in the workplace.	4.40	0.682
4.	Safety training on components is included in all new employee orientation programs (induction).	4.46	0.78
5.	All workers receive specific training in procedures to identify and report safety concerns, adverse events, near misses and errors.	4.15	0.973
6.	I received safety awareness training before been assigned to work on site.	4.43	0.685
7.	Safety issues are given high priority in training programmes.	4.48	0.608
8.	Safety training given to me is adequate to enable me to assess hazards in the workplace.	4.32	0.769

Level of Safety Rules and Procedures

The findings suggest that there are safety and health rule or procedures in their workplace (mean 4.46) and that these rules are practical to use (mean 4.17). The safety rules and procedures followed in the company were sufficient to prevent accidents from occurring (mean 4.15). The company provides a checklist to ensure that safety procedures are followed before starting a job (mean 4.07). They also agreed that the safety policy has been reviewed and updated (mean 4.30), and was implemented effectively (mean 4.16). Indeed, it was agreed that the safety policy met the legal requirements (mean 4.43) and safety inspections were carried out regularly (mean 4.26). They also indicated that a system for reporting workers' accidents

exists in the organization and that those who did not follow the stated procedures to do work should be punished (mean 4.28).

Table 2: Descriptive statistics for safety rules and procedures

No.	Question	Mean	SD
1.	This company has safety & health rules and procedures.	4.46	0.619
2.	Safety policy meets the legal requirements and best practices of safety & health.	4.43	0.640
3.	The company safety policy has been reviewed and updated regularly.	4.30	0.828
4.	The company safety policy is implemented effectively	4.16	0.827
5.	The safety rules and procedures in this company are sufficient to prevent accidents occurring.	4.15	0.882
6.	This company has a system for employees to report accidents.	4.28	0.747
7.	The safety and health procedures/rules are very practical.	4.17	0.726
8.	Adhering to safety procedures is enforced.	4.28	0.737
9.	Safety inspections are carried out regularly	4.26	0.722
10.	I have a checklist to ensure safety procedures are followed before I start a job.	4.07	0.836

Level of Safety Communication

It was agreed that there is open communication about safety issues in the workplace (mean 3.77) and that accidents were always reported (mean 4.21). Respondents felt that they could report accidents and near misses without fear of blame or retribution (mean 4.06). In addition, the respondents agreed that there was good feedback from the management on reported safety issues (mean 4.10), and the company always encourages suggestion on safety and health improvement (mean 4.08). The respondents agreed that they had been given sufficient information on management decisions regarding safety matters (mean 4.07), and that they had received useful and accurate safety information (mean 4.08) regularly as the management has communicated a clear vision and objectives on safety with them (mean 4.46).

Table 3: Descriptive statistics for safety communication

No.	Question	Mean	SD
1.	I received useful and accurate safety information.	4.37	0.718
2	The company encourages suggestions on safety and health improvement.	4.23	0.740
3.	There is good feedback from management on reported safety issues.	4.29	0.808
4.	I can report an accident or near miss without fear of blame or retribution.	4.14	0.944
5.	Accidents which happen are always reported.	4.34	0.809
6.	I am given sufficient information on management's decisions regarding safety matters.	4.29	0.742
7.	Sharing information related to each other is important	4.54	0.677
8.	I believe that management has communicated a clear objective regarding safety.	4.46	0.687
9.	Accident cases are posted on a bulletin board for others to know and be aware	4.38	8.34

Accident Management

This study found that respondents agreed that management emphasized and placed high priority on workers' safety and that safety issues are always at the forefront in any decision-making process. The management knows exactly what to do when there is an accident (mean 4.32) as there is a policy on accident management in place in the organisation (mean 4.23). In addition, the organisation has all the necessary resources to handle any accidents (mean 4.13). In addition, the management considers safety to be of equal importance to the production of the organization and that management place high priority on safety training (mean 4.02) and workers are provided with suitable personal protective clothing and equipment for their jobs (mean 4.06). However, there is an argument that management are proactive and quick in solving problems related to safety and accidents (mean 3.01) and that managers' show interest in workers' safety (mean 3.06).

Communication during accidents was reported good (mean 4.02) and the management handles media efficiently (mean 4.01). The employees were well informed on what to do during an accident and when near-miss accidents are reported, the management acts quickly to resolve these problems (mean 4.14). Being a construction site the management is always prepared for any accidents (mean 4.20).

Table 4: Descriptive Statistics for Accident Management

No.	Question	Mean	SD
1.	When there is an accident in my workplace, the management knows exactly what to do.	4.32	0.696
2	We are given sufficient training on handling accidents at work.	4.02	0.865
3.	There is a policy in management accident in my organisation.	4.23	0.779
4.	Management place high priority on safety training to reduce accidents	4.02	0.551
5.	Workers are provided with suitable personal protective clothing and equipment for their jobs.	4.06	0.556
6.	Management are proactive and quick in solving problems related to safety and accidents	3.01	0.781
7.	Managers show keen interest in workers safety	3.06	0.751
8.	The communication during accidents is good.	4.02	0.865
9.	When an accident occurs, the management handles the media efficiently.	4.01	0.852
10.	My organisation has all the resources to handle accidents.	4.13	0.748
11.	We are well informed on what to do during an accident.	4.14	0.781
12.	Management has way to reduce the occurrence of accidents.	4.20	0.815

The Relationship between Safety Training, Policy and Communication in Accident Management

In order to understand the significant relationship between all the variables in this study, an inferential analysis was conducted using Pearson's correlation to measure the relationship between variables. This analysis was conducted to determine the relationship between training, policy and communication with effective accident management. The level of relationships between variables is guided by Evan (1996) indication of correlation strength, i.e. very weak = 0.00-0.19; Weak=0.20-0.39; Moderate=0.40-0.59; Strong=0.60-079; Very Strong=0.80-1.00.

Relationship between Safety Training and Accident Management

It is found that there is a significant positive linear relationship between safety training and accident management. The Pearson coefficient between these variables is strong and high where r = 0.680 and p = 0.000. There is also a significant positive relationship between safety training and accident management indicated by the p = < 0.01which is less than 0.01 set up alpha value. This is consistent with hypothesis H_{a1}.

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Table 5: Pearson's Correlation (*r*) between training and accident management

		Accident Management
Training	Pearson Correlation	0.680**
	Sig. (2-tailed)	0.000
	N	136

** Correlation is significant at the 0.01 level (2-tailed).

Relationship between Safety Policy and Accident Management

There is a significant positive relationship between safety policy and accident management. This is indicated by the Pearson coefficient r = 0.772 and p = 0.000. The Pearson coefficient r = 0.772 indicated that the relationship between safety training and accident management is high and strong and the relationship is significant as indicated by the p = less than 0.01 alpha value that has been set up. Safety policy and accident management has a significant positive linear relationship, hence, this correlates with hypothesis H_{a2}.

Table 6: Pearson's Correlation (r) between policy and accident management

		Accident Management
Policy	Pearson Correlation	0.772**
	Sig. (2-tailed)	0.000
	N	136

** Correlation is significant at the 0.01 level (2-tailed).

Relationship between Communication and Accident Management

There is a significant positive relationship between communication and accident management. This is indicated by the Pearson coefficient r = 0.764 and p = 0.000. The Pearson coefficient r = 0.764 indicated that the relationship between safety training and accident management is high and strong and the relationship is significant as indicated by the p = less than 0.01 alpha value that has been set up. It is found that there is a significant positive linear relationship between communication and accident management. This is consistent with hypothesis H_{a3}.

Table 7: Pearson's Correlation (*r*) of the relationship between communication and accident management

		Accident Management
Communication	Pearson Correlation	0.764**
	Sig. (2-tailed)	0.000
	N	136

** Correlation is significant at the 0.01 level (2-tailed).

Influence of Training, Policy and Communication on Accident Management

A regression analysis was conducted and the analysis produced a significant outcome with an F value of 69.800 and p value of 0.000. This confirms that there is a linear relationship between the predictor variable of safety training, policy and communication to effective accident management.

It is found that communication makes the largest contribution in explaining effective accident management with its Beta coefficient value of 0.433 and p value less than 0.005, whilst company safety policy has the least contribution with a Beta coefficient value of 0.251 and p value less than 0.05. Safety training has no contribution towards effective accident management as indicated by the Beta coefficient value of 0.093 and p value of more than 0.05. The model summary indicated that the derived R square value is 0.613. This imply that the predictor variables explain about 61.3% of the variation in effective accident management.

CONCLUSION

Due to the importance of accident management in the success of any organization, it is important to identify factors that contribute positively to this objective. This study has focused on accident management in the construction industry, which is vital in order to prevent and reduce the occurrence of sudden accidents. The framework for this study postulated that the three aforementioned independent variables were critical components of effective accident management. The results have led to conclusions and recommendations to improve accident management in the construction industry. This study was conducted with the aim of establishing the level of knowledge in accident management among construction employees on a selected Mass Rapid Transit project in the Klang Valley. Training is the most important element: staff are provided with the specific training and procedures to identify safety weaknesses, adverse events, near misses and errors in the workplace. The findings revealed that there is a system in place, which is reviewed regularly, the policy is implemented effectively and adherence to safety procedures is enforced. Communication is an important tool in the delivery of safety objectives and information and also encourages suggestions on safety and health improvement. Management knows what to do when accidents do occur due to sufficient training, good communication and sufficient resources to handle such situations.

This study has specifically contributed to three different aspects. First of all, this study adds to the existing literature, policy and practice of strategically managing training, policy and communication towards the attainment of effective accident management by exhibiting a model of statistically significant relationships between safety training, company safety policy and communication variables. As such, the overall contribution of this research to the literature is that it further extends and strengthens the theoretical discourse on accident management. In other words, this study shows the essence and strength of the relationship between training, policy, communication and effective accident management. In term of the firm's policy, the findings from this study could help policy makers in making decisions concerning the firm's internal safety attributes that should be given more attention or priority relative to others. For example, the firm needs to enhance its safe work systems and safety

management policy relative to its organizational safety policy in order to improve its overall organizational safety performance. In addition, firms also need to strengthen their research and development policy, training and exercise to attain better safety knowledge and safety performance amongst workers. Changes to the policy can be made with reference to the results of this study as guidelines. Before the study, the project staff might not have been clearly aware of problems and issues related to the safety and health of their employees and ways to improve safety performance while conducting their tasks. Therefore, this research can improve their principles of action. Reference can be made to OSHA 1994, which has been widely used, in order to create or revise work rules, procedures and policies. From the practical aspect, the findings from the research have contributed to the management of the organization in terms of providing valuable input and awareness on the factors or variables to consider as far as attaining safety knowledge and improving the firm's safety performance are concerned. The research illustrates, with empirical evidence, that it is vital for organizations to have good safe work systems to organize both internal capabilities and resources towards achieving safety knowledge and enhancing the firm's safety performance. In other words, firms need to improve their research and development and promotion capabilities in terms of safety, and also enhance their safe work systems in terms of standard operating procedures (SOP) to attain safety knowledge. On the other hand, to improve their safety performance, organizations need to further enhance their aggregate resources, especially human resources, as well as to encourage and promote their employees to participate in safety activities, work in a safe manner and strengthen their networking or interactions among employees on safety issues. The result of this study also emphasise the importance of conducting safety management practices in the workplace efficiently and transparently. If any shortcoming is identified, the same mistake should not be repeated again. This can contribute to the good image of the company and encourage more employees in the organization to join the safety community and work safely.

The findings of his study have several implications for the concern of effective accident management in the construction industry. When the management and staff have knowledge about the problems and level of effective accident management, they will develop more positive attitudes and implement the knowledge and skills acquired in the event of an accident, and will be more able to handle difficult and emergency situations. Besides, the safety team and staff will also review and consider the factors that can influence the relationship between training, policy and communication in effective accident management. As a result, the company and staff will gain a better understanding of the issue in order to achieve successful accident management. Thus, the company and safety team can minimize the time and cost required for accident management.

Limitations and Recommendations for Further Research

This study has several limitations. Based on these limitations, recommendations as to the probable course of actions and avenues to be considered for future study are proposed. The measures of the safety management practices may represent a weakness. Due to the lack of

existing measures, some new items were developed for this study. The dependent variable measures were also a limitation. Effective accident management was set as the measure of the safety practice in this study, as in some past studies, whereas traditionally, accidents or injury rates have been used to measure safety performance. Therefore, for future research, a combination of these safety elements is needed to establish the importance of measuring effective accident management in an organization.

This study used only a quantitative approach. Future studies could use either qualitative research methods or mixed methods, so that the researchers know the results and also the reasons behind the responses. Both research approaches collect data, but the qualitative approach relies on general interviews and or observation and it does not restrict the views of participant respondents (Creswell, 2008). In addition, this study was only conducted with workers in a selected Mass Rapid Transit project site. For future research, a wider range of respondents should be considered to provide meaningful perspectives from all players in the construction industry. Future researchers are recommended to widen the research to other construction companies or other organizations. The time frame of the research should also be expanded to obtain more accurate and reliable data.

REFERENCES

Aksorn. T., and Hadikusumo, B. H. W. (2008). Critical Success Factors Influencing Safety Program Performance in Thai Construction Projects, *Safety Science,* Vol 46, pp 709-727

Alan O. S. (1993). An Introduction to Regression Analysis (Coase-Sandor Institute for Law & Economics Working Paper No. 20), pp 1-34.

Andi. A. (2008) Construction Workers Perceptions toward Safety Culture. *Civil Engineering Dimension*. Vol 10 (1), pp 1-6.

Baldwin, T. T. and Ford, J. K. (1988). Transfer of Training: A Review and Directions for Future Research. *Personnel Psychology*, Vol 41 (1): pp 63-105

Barling, J., Kelloway, E. K. and Iverson, R. D. (2003). High-Quality Work, Job Satisfaction, and Occupational Injuries. *Journal of Applied Psychology*, Vol 88 (2): pp 276-283

Booth, R.T. (1979). Making Factories Safe for Fork Lift Truck Drivers. Occupational Health, pp 193 - 197

Carter, G., and Smith, S. (2001). IT Tool for Construction Site Safety Management, CIB W78 Conference, Mpulunga, South Africa.

Cohen, A. (1977). Factors in Successful Occupational Safety Programs. *Journal of Safety Research*, Vol 9, pp 168 – 178.

Cooper, C. R. & Schindler, P. S. (2008). *Business Research Methods (10 Ed.).* Boston: McGraw-Hill.

Cox, S. J. and Cheyne, A. J. T. (2000). Assessing Safety Culture in Offshore Environments. *Safety Science.* 34, pp 111-129.

Coyle, I. R., Sleeman, S.D., and Adams, N. (1995). Safety Climate, Journal of safety Research, Vol. 26, pp 247 – 254.

Creswell, J. (2008). Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research. New Jersey: Pearson: Merrill Prentice Hall.

De dobbeleer, N., and Beland, F. (1991). A safety climate measure for construction sites, Journal of Safety Research, Vol. 22, pp 97 – 103.

Deming, W. E. (1986). Out of the Crisis, Cambridge University Press, pp 1-507.

Erickson, J.A. (1997). The Relationship between Corporate Culture and Safety Performance. Professional Safety, 42 (5), 29-33.

Glendon, A.I., Litherland, D.K., 2001. Safety Climate Factors, Group Differences and Safety Behavior in Road Construction. *Safety Science*, 39, 157–188.

Hislop, R.D. (1991). A Construction Safety Program. *Professional Safety*, Vol 36(9): pp 14–20.

Huang, X., and Hinze, J. (2003), 'Analysis of construction worker fall accidents', *Journal of Construction Engineering and Management*, Vol 129(3), pp 262- 271

Huang, X., and Hinze, J. (2006), Owner's role in construction safety. *Journal of Construction Engineering and Management*, Vol 132(2), pp 164-173.

Kalaian, S. A. (2008). Research Design. In Paul J. Lavarkas (Ed.), Encyclopedia of Survey Research Methods. Thousand Oaks, CA: Sage Publications.

Khdair, W.A., Faridahwati, M. S. and Subramaniam, C. (2011) A Proposed Relationship between Management Practices and Safety Performance in the Oil and Gas Industry in Iraq. *World review of Business Research*, Vol 1(3): pp. 27-45

Krejcie, R., and Morgan, D. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement,* Vol 30, pp 607-610.

Department of Occupational Safety and Health (2006). Guidelines on Occupational Safety and Health Act 1994 (Act 514), Percetakan Nasional Malaysia Berhad, Kuala Lumpur, pp 1-81.

Male, G.E. (2003). Safety of Industrial Lift Trucks: A Survey of Investigated Accidents and Incidents (April 1997 – March 2001). Health and Safety Executive, Special Inspector Reports 60.

Mearns, K., Whitaker, S. M., Flin, R. 2003. Safety Climate, Safety Management Practice and Safety Performance in Offshore Environments, *Safety Science*, Vol. 41(8), pp. 641 – 680.

Nor Azimah C.A., Spickett, J.T., Rumchev, K.B, and Dhaliwal, S.S. (2009) Assessing Employees perception on Health and Safety Management in Public Hospitals. *International Review of Business Research Papers*, Vol. 5(4): pp.54-72

Rosenfeld, Y., Rozenfeld, O., Sacks, R. and Baum, H., (2006) Efficient and Timely use of safety Resources in Construction. *Proceedings of the CIB W99 2006 International Conference on Global Unity for Safety and Health in Construction*, 28-30 June, Beijing, China, 290-297

Sariwati, M.S. (2005) *Occupational Safety and Health Management*. Kuala Lumpur: UPENA

Sekaran, U. (2003), *Research Methods for Business: A Skill-building Approach (4th Ed).* New York: John Wiley.

Sekaran, U (2000), Research method for business: A skill building approach, John Wiley and Sons, Inc.

Seyyed Shahab Hosseinian & Zahra Jabbarani Torghabeh (2012) Major Theories of Construction Accident Causation Models: A Literature Review. *International Journal of Advances in Engineering and Technology*, Vol 4(2) : pp. 53-66

Shannon, H., Mayr, J., Haines, T., (1997). Overview of the Relationship between Organizational and Workplace Factors and Injury Rates. *Safety Science*, Vol 26, 201–217.

Siriwardena, M., Malalgoda, C., Thayaparan, M., Amaratunga, D. & Keraminiyage, K. (2013). Disaster resilient built environment: role of lifelong learning and the implications for higher education. *International Journal of Strategic Property Management*, Vol. 17: pp. 174-187.

Takala, J. (2002) Life and Health are fundamental rights for workers. *Labour Education*. No 126.

Takala, J. (2005) *Introductory Report: decent Work – Safe Work. XVIIth World Congress on Safety and Health and Work.* Geneva: International Labor Organization.

Tam, C.M., Zeng, S.X., and Deng, Z.M., (2004), 'Identifying Elements of Poor Construction Safety Management in China, *Safety Science*, Vol 42, pp 569–586.

Torner, M. and Pousette, A. (2009) Safety in Construction – A Comprehensive Description of the Characteristics of High Safety Standards in Construction Work, from the Combined perspective of Supervisors and Experienced Workers. *Journal of Safety Research*, Vol. 40(6) : pp. 399-409

Vinodkumar, M. N. and M. Bhasi, M. (2010). Safety Management Practices and Safety Behaviour: Assessing the Mediating Role of Safety Knowledge and Motivation. *Accident Analysis & Prevention,* Vol 42 (6), pp 2082–2093

Vredenburgh, A. G. (2002). Organizational Safety: Which Management Practices are Most Effective in Reducing Employee Injury Rates?. *Journal of Safety Research*, 33, pp 259–276

Wu, T. C., Chen, C. H., & Li, C. C. (2008). A Correlation among Safety Leadership, Safety Climate and Safety Performance. *Journal of Loss Prevention in the Process Industries*, Vol 21(3), 307-318.

Zeng, S.X., Tam, V.W.Y., and Tam, C.M. (2008) Towards Occupational Health and Safety Systems in the Construction Industry of China. *Safety Science*, Vol 46: pp, 1155−1168.

Zikmund, G. Babin, B.J., Carr, J.C. & Griffin, M. (2013) *Business Research Methods*, (9th Ed) Mason, Ohio: South-Western Cengage Learning