# SAFETY MANAGEMENT PRACTICES TOWARDS SAFETY BEHAVIOURS IN CONSTRUCTION COMPANY

**NORHAZLENDA BINTI MOHD NOR**



**Thesis Submitted to**
**School of Business Management,**
**Universiti Utara Malaysia,**
**in Fulfilment of the Requirement for the**
**Master of Occupational Safety and Health Management**

**Pusat Pengajian Pengurusan Perniagaan**
SCHOOL OF BUSINESS MANAGEMENT
**Universiti Utara Malaysia**

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**ABSTRACT**

Limited studies have been carries out involving safety management practices and safety behaviour. Safety training and awareness programmes have been aggressively put into action to encourage employees' involvement and commitment towards safety related matters however, there are still many incidents and accidents in the construction industry. This study measured employees perceptions in six safety management practices (management commitment, safety training, workers involvement in safety, communication and feedback, rules and procedures and safety policies) and its influences towards safety behaviour, safety compliances and safety participation as using information from 130 workers in the construction industry in Klang Valley. The analysis used SPSS Version 23 software indicating that some of the safety management practices have a strong relationship with safety behaviour. The result of this study provided valuable guidance for researchers and practitioners in identifying the mechanisms by which they can improve safety in the workplace.

Keywords: Management Commitment, Safety Training, Workers' involvement, Safety communication and Feedback, Safety Rules and Procedures, Safety Promotion Policies, Safety Behaviour, Safety Compliance and Safety Participation.

## ABSTRAK

Kajian terhad telah dijalankan melibatkan amalan pengurusan keselamatan dan tingkah laku keselamatan. Program latihan dan kesedaran keselamatan telah dilakukan secara agresif untuk menggalakkan penglibatan dan komitmen pekerja terhadap hal berkaitan keselamatan tetapi masih terdapat banyak insiden dan kemalangan dalam industri pembinaan. Kajian ini mengukur persepsi pekerja dalam enam amalan pengurusan keselamatan (komitmen pengurusan, latihan keselamatan, penglibatan pekerja dalam keselamatan, komunikasi dan maklum balas, peraturan dan prosedur dan dasar keselamatan) dan pengaruhnya terhadap tingkah laku keselamatan, pematuhan keselamatan dan penyertaan keselamatan menggunakan maklumat daripada 130 pekerja dalam industri pembinaan di Lembah Klang. Analisis menggunakan perisian SPSS Versi 23 menunjukkan bahawa beberapa amalan pengurusan keselamatan mempunyai hubungan yang kuat dengan tingkah laku keselamatan. Hasil kajian ini memberikan bimbingan berharga bagi para penyelidik dan pengamal dalam mengenal pasti mekanisme yang dapat meningkatkan keselamatan di tempat kerja.



Kata kunci: Komitmen Pengurusan, Latihan Keselamatan, Penglibatan Pekerja, Komunikasi Keselamatan dan Maklum Balas, Peraturan Keselamatan dan Prosedur, Dasar Promosi Keselamatan, Tingkah Laku Keselamatan, Pematuhan Keselamatan dan Penyertaan Keselamatan.

## ACKNOWLEDGEMENT

This research is dedicated to my parents who encouraged me to further my studies to graduate level. I also thank my family and friends for sacrificing time and encouraging me to overcome all obstacles in completing my Master's Project Paper in good manner.

I would like to take this great opportunity to express my sincere gratitude to my project paper supervisor Dr. Zuraida Hassan for her help and guidance throughout completing this assignment and all lecturers of Universiti Utara Malaysia (UUM) who have taught me in my graduate studies. All the knowledge and information gained will guide me throughout my life. I also give my sincere thanks to my work colleagues, friends and course mates for all the support and help in completing this project paper.



Finally, I would like to thank the management of construction companies and respondents for providing high cooperation and support in completing this project paper. Once again I take this great opportunity to thank all persons who had supported, guided, and help all the way through in completing this project paper.

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# CHAPTER 1

# INTRODUCTION

In this chapter I will discuss the background of the study, problem statement, research questions, research objectives, significance of the study, scope and limitations of the study. The organisation of this research paper will be discussed at the last part in this chapter.

## 1.1 Background of Study

The construction industry in Malaysia contributes to the nations economic wealth with progressive and profitable growth. This industry provides employment opportunities and enhances economic development. However, the construction industry has been identified as high risk and more hazardous compared to other industries which I will explain in my thesis. The high number of accidents and injuries occurring in the construction industry affects the nations economic growth. The impact of such accidents are significant in all aspects from human capital, economic losses and productivity. Accidents are unforeseen events and unwanted events which cause damage, injuries, fatalities, unintentionally and unexpectedly that can result in the loss of production or damage to property and assets. The common occupational risk that might occur in the construction industry such as a fall from height, accidents from misconduct in plant and machinery, electric shocks, excessive noise.

According to the current report from the Department of Safety and Health (DOSH) (Table 1) construction sites have the highest fatality rate among all the industries (DOSH, 2018). Due to the fatality rates the construction industry became the most crucial industry in the need of effective safety measures and a safety management systems to achieve better safety performance (DOSH, 2018). From the Table 1.1 the total number of occupational accidents reported to Social Security Organisation (SOCSO) for 2018 is 2660 cases. From all the industries, the manufacturing sector shows the highest accident number with 1303 cases. However the construction sector shows the highest number of death, 46.8 % compared to the manufacturing sector 14.4%

Table 1.1 *Occupational Accidents Statistics by Sector Until October 2018 (Investigated)*

| Sector | NPD | PD | Death | Total |
|---|---|---|---|---|
| **Manufacturing** | 1188 | 90 | 25 | 1303 |
| **Mining and Quarrying** | 18 | 2 | 2 | 22 |
| **Construction** | 61 | 6 | 81 | 148 |
| **Agriculture, Forestry and Fishery** | 264 | 7 | 18 | 289 |
| **Utilities (Electricity, Gas, Water and Sanitary Services)** | 47 | 0 | 1 | 48 |
| **Transport, Storage and Communication** | 54 | 2 | 9 | 65 |
| **Wholesale and Retail Trades** | 49 | 2 | 1 | 52 |
| **Hotels and Restaurants** | 59 | 2 | 1 | 62 |
| **Finance, Insurance, Real Estate and Business Services** | 102 | 5 | 13 | 120 |
| **Public Services and Statutory Authorities** | 21 | 0 | 3 | 24 |
| **No Information** | 497 | 11 | 19 | 527 |
| **Total** | **236** | **127** | **173** | **2660** |

Legend:-

NP - Non Permanent Disability PD - Permanent Disability

The objective of this study is to comprehend the factors that influence safety behaviour on construction sites to help the organisation learn more about how employee and management interaction can reduce accidents at the workplace. The management can manage safety at construction sites proactively and effectively among their employees. Improving safety behaviour is an important way to achieve organisations safety goals. The aim of this study is to investigate the safety management practices and the influence on safety behaviour in the construction industry.

## 1.2 Problem Statement

In past few years the studies indicate that the construction sector has an increasing rate of accident-related causality. The workers in the construction industry face a greater risk of fatality compared to workers in other industries. According to Leung et al. (2016) construction workers are groups of skilled and unskilled workers employed for the operation of construction projects by the company on a contract basis. The construction workers performance are crucial to the quality, duration, cost and safety of the construction project. However their working environment is usually very poor and highly exposed to hazards. Past studies in this industry explain the mechanism through which accidents happen, including the domino theory (Heinrich 1931), human error theory (Choudhry and Fang 2008), epidemiological theory (Goetsch 2009), system theory (Gatti et al. 2013), etc. Previous studies by Gibb et al. (2014) also found that accident models can be classified in three different sequential groups, accident models, human information processing models and systematic acci-

dent models. Sequential models are described as an accident in a specific order such as the 'domino model' however later updated to include a lack of management role. While human information processing models explain as accidents in terms of human behaviour and actions. However, systemic accident models include organisational and management factors and describe the performance of the whole system. However, previous studies by Shin et al. (2014) concluded construction safety management concentrated on two aspect that can prevent construction accidents which is the removal of unsafe conditions such as environment-based Safety Management and the elimination of workers' unsafe acts.

While the study by Zhang et al. (2016) found that unsafe behaviour is the major factor of accidents and by focusing on safety behaviour on construction sites will help reducing accidents and improving safety performance. Understanding safety behaviour helps the construction company to strategically allocate resources and focus their effort to improve safety performance. According to Leung et al. (2016) safety behaviour is defined as an individuals behaviour towards safety and health on oneself and at the workplace. Beuset et al. (2016) concludes that safety compliance and safety participation is crucial in safety behaviour. Safety compliance involves carrying safety activities including following safety procedures and performing work in a safe manner ie: wearing protective equipment. While safety participation consists of behaviour that improves the development of the workplace safety, such as assisting coworkers, promoting the safety program within the workplace, demonstrating initiative, and putting effort into improving safety in the workplace. (Neal & Griffin, 2000)

A study by Wachter & Yorio (2014) found the system of safety management practices and worker engagement reduces and prevents accidents. According to the study by Gao et al. (2019) safety management practices are policies, strategies, procedures and activities that are implemented for the safety of employees in the organisation. They are the basic elements of an organisational safety management system (Vinodkumar and Bhasi, 2010). Safety management systems and practices are considered antecedents of safety culture and play vital roles in both improving workplace safety performance and forming the safety culture in an organisation especially in the early stages. They also ensure that employees are able to acquire, understand and be involved in safety and health programmes based on the strategy, policy and commitment of managers. Another study by Wu et al. (2019) found the factors influencing construction safety performance have been widely analysed, including work conditions, worker behaviours and safety management systems. Safety programs that include safety commitments and responsibilities, safety supervisions, employee involvement, and safety evaluations are recognised as some of the most effective approaches for preventing construction work-related accidents.

The underpinning theory of this study was behavioural based safety. The relationship of safety management practices and safety behaviour can be explained with the theory of Behaviour Based Safety (BBS). BBS is an effective method for accident prevention which has been widely applied in Europe and North America since the 1980s. There is a significant amount of literature on this approach. BBS is an integrated management process that focuses on people and emphasises observing human behaviour without presuming knowledge of the thought processes and usually in-

volves four well-defined steps. This theory focuses on baseline observations of human behaviour, safety training, follow-up observation and feedback, and reinforcement. The purpose of this study is to investigate how safety management practices impact safety management of employees. Previous studies conducted on safety management practices have found positive effects on safety behaviours.

## 1.3 Research Objective

This study is to examine whether all the six independent variables of safety management practices can affect the participation and compliance among workers in construction company.

This study's objectives were formulated:

1.3.1 To determine the relationship between safety management practices (management commitment, safety training, workers involvement in safety, safety communication and safety feedback, safety rules and procedures and safety policies) and safety compliance among construction workers.

1.3.2 To examine the relationship between safety management practices (management commitment, safety training, workers involvement in safety, safety communication and safety feedback, safety rules and procedures and safety policies) and safety participation among construction workers .

## 1.4 Research Questions

The following research questions will ensure all the six independent variables and the determination of safety participation and safety compliance can be measured to gain the appropriate findings and conclusion. The list of questions are:

1.4.1 How safety management practices (management commitment, safety training, workers involvement, safety communication and feedback, safety rules and procedures and safety promotion policies) influences safety compliance among construction workers?

1.4.2 How safety management practices (management commitment, safety training, workers involvement, safety communication and feedback, safety rules and procedures and safety promotion policies) influences safety participation among construction workers



## 1.5 Significance of Study

The significance of this research is to view aspects of theory and practices. The previous studies that related to BBS focused on the construction industry. However, limited studies are direct on the behavioural aspect of employees in construction industries in Malaysia. The findings of this study will be useful for industrial practitioners to understand all influencing factors towards safety behaviour which is safety compliance and safety participation, especially among construction workers.

The findings of the six safety management practices will help the organisation better understand employees perception of management commitment, safety training,

worker involvement, safety communication and feedback, safety rules and procedures and safety promotion policy practices. The findings of this study will assist the management to reduce the accident rate, the personal injuries and material damage, and simultaneously improve working conditions. Furthermore, Occupational Safety and Health teams in the construction industry can use the result of this study as a source of guidance to improve current safety management practices and enhance better safety performances in the future. Also, this information can be used as a source to encouragement to obtain management's positive responses towards safety related activities and plan safety measures. The results and findings in this research will contribute important information related to safety management practices and safety behaviour and can be used as a reference and guideline for safety programme expansion and enhancement which will minimise accidents in the workplace and reduce medical expenses. In addition, findings from the study provides essential references and evidence for future researchers on safety management practices and safety behaviour.



### 1.6 Scope of Study

This study was conducted in a construction company. The aim of this study was to determine the relationship between safety management practices and safety behaviours among construction workers. The questionnaire was designed for this study to achieve the objectives. The respondents were constructions workers who were ask to fill in the questionnaires. Details about population and samples involved, pilot studies and finally the method used to analyse all the data that will be collected in future research. The next chapter is set to explain the data analysis during this study.

## 1.7 Definition of keys terms

### 1.7.1 Safety behaviour

Safety behaviour is defined as actions and/or reactions of persons or things in response to external or internal stimuli which is determined by behavioural intention in the workforce.

### 1.7.2 Management Commitment

Management commitment can be defined as management action, behaviour, communication and attitude to workplace safety.

### 1.7.3 Safety Training

Safety training describes as a goals or activities is helping workers establish the power to reduce and eliminate hazards which will prevent injuries and diseases in the workplace. Safety education and training are the most effective methods for promoting construction safety in the long run and can improve the awareness and competence of employees working safely.

### 1.7.4 Workers Involvement

Worker Involvement can be define as employee influence over safety management system practices, programs and safe work procedures works by actively facilitating safe attitudes and behaviours.

### 1.7.5 Safety communication and safety feedback.

Safety communication and feedback is tied to the frequency and methods (distinct from safety training) of emphasising knowledge and the importance of safe work.

### 1.7.6 Safety rules and safety procedures

Safety rules and safety procedures can be defined as detection and monitoring works to reinforce other safety management system practices used by an organisation. Organisations can create and utilise checklists used by supervisors and other employees to detect situations and behaviours that may not be in line with the safety rules and requirements in place.

### 1.7.7 Safety promotion policies

Safety policy is defined as a published statement reflecting the organisation's vision and mission in relation to the management of health and safety matters.

## 1.8 Organisation of the thesis

This study consists of five chapters. The first chapter in this study presents an introduction and covers the background of the study, problem statement, research questions, research objectives, significance of study, and definition of key terms. The second chapter covers the literature review and describes the overview of the safety management practices and safety behaviour among workers in the construction industry. The third chapter discusses the research framework, hypothesis or propositions development, research design, and operational definitions. Continued with measurements of variables, data collection, sampling, data collection procedures and techniques of data analysis. Chapter four relates to the findings and chapter five represents the discussion and recommendations.



## 1.9 Summary.

This chapter covers the background of the study, background of the problem, problem statement, research questions, research objectives and significance of the study.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 Introduction

In this chapter will explain the literature review about safety behaviour and safety management practices, which is management commitment, safety training, workers involvement, safety communication and feedback, safety rules and procedures and safety promotion policies.

## 2.2 Safety behaviour

A Shin et al. (2014) study found that accidents occur due to unsafe behaviour and unsafe conditions. Such accidents reduce when the unsafe behaviour and unsafe conditions are also reduced. While Choudry (2014) said Safety behaviour is also defined as actions and/or reactions of persons or things in response to external or internal stimuli which is determined by behavioural intention in the workforce.

Furthermore, Zerguine et al. (2017) found that in previous studies that safety behaviour can refer to how workers respond to specific circumstance or situation in the workplace and unsafe behaviour can be related to human error or a decision that can cause accidents, injuries, and deterioration of the project schedule. While Seo et al. (2015) describes safety behaviour as personal action taken for self protection such as following safety regulations to prevent danger to self or others, and wearing protective clothing. A study by Liu et al. (2015) found that safety behaviour is divided into two types, safety compliance and safety participation. Safety compliance is described as complying with safety procedures and carrying out work duties in a safe manner.

Safety participation is defined as ‘‘safety-oriented behaviour that involves the individual providing safety suggestions within the organisation, promoting the safety program within the workplace, demonstrating initiative, and putting effort into improving safety in the workplace’’. (Griffin and Neal, 2000).

## 2.3 Factor Influence Safety Behaviours

This chapter will explain the factors that influence safety behaviour, which is management commitment, safety training, workers’ involvement, safety communication and feedback, safety rules and procedures and safety promotion policies.

### 2.3.1 Management Commitment

According to a Skeepers & Mbohwa (2015) study it was found that employees believe that management is more committed to production than to safety. However, when management communicate their dedication to safety to the employees there is a direct correlation between that communication and improved safety performance. A McGonagle et al. (2016) study found that when managers demonstrated the value and commitment of the company to workplace safety the employees also indicated that level of commitment to safety. This perception by employees of the management commitment to safety is the most important dimension of a safety climate in the workplace. The study also found that management commitment to safety can predict employee safety behaviour in relation to incidents/injuries. A Pinion et al. (2017 ) study concluded that management commitment is defined as management action, behaviour, communication and attitude to workplace safety. Positive management

commitment has an impact on employees safety performance, lowers injury rates and engage in working safely.

### 2.3.2 Safety Training

Mahan et al. (2013) found the important key of safety training goals is helping workers establish the power to reduce and eliminate hazards which will prevent injuries and diseases in the workplace. In previous studies Li et al. (2015) found that safety education and training are the most effective methods for promoting construction safety in the long run and can improve the awareness and competence of employees working safely. A Namian et al. (2016) study found that most organisations invest millions of dollars to train their workforce on safety issues including hazard recognition, hazard management, and safe work practices with safety training being the most widely adopted interventions to improve workplace safety. Additional training is also provided to promote the proper use of personal protective equipment (PPE) and to encourage the implementation of effective injury prevention strategies.

### 2.2.3 Workers Involvement

A study by Wachter & Yorio (2014) concluded that employee influence over safety management system practices, programs and safe work procedures works by actively facilitating safe attitudes and behaviours. As employee influence over safety practices increases they are more likely to defend their existence and adopt the value of working safely and encouraging others to do so. Employee influence and involvement over safety practices can have a strong impact on safety culture and climate as the collective workforce has a stake in the safety program's success. Also employee

engagement has been directly correlated to the amount of involvement that employees have in their work processes. Employee influence and/or participation in developing and implementing safety management system practices, processes, programs and procedures, functions by actively facilitating employee engagement. A Fang et al. (2015) study found that workers involvement is also an important component of an excellent safety climate. Although management participation and involvement in safety activities is important. The inclusion of employees in the safety activities should be encouraged to better identify any issues. A Srinivasan et al. (2016) study found that employee involvement is an integral part of the safety climate as this gives the employees a better perception of targeting any safety issues and rectifying those issues which would otherwise not be identified. The study concluded that if employees are not involved in the safety identification process there is a higher risk of injury from workplace hazard.



### 2.3.4 Safety communication and safety feedback.

Wachter & Yorio (2014) found that communication is tied to the frequency and methods (distinct from safety training) of emphasising knowledge and the importance of safe work. Companies might use print media (e.g., posters and payroll stuffers) to increase cognitive awareness of safe work and emphasise its importance. Companies can also share information concerning near misses and incidents experienced within and outside the immediate establishment. A study by Zaira & Hadikusumo (2017) found that feedback is required in safety management at the workplace, and they have a positive impact on safety performance. According to Li et al. (2015) a communication safety net can be established and maintained to help

create a positive on-site safety climate There are two types of safety training in this context. One addresses an audience of supervisors and foremen who are instructed by safety officers. This training focuses on how to communicate with workers to instil enhanced safety attitudes and how to instruct workers on construction site safety. A previous study by Wu et al. (2018) found that effective communication between workers and managers significantly reduces the number of work-related accidents, and management conferences are reported to be the best way to communicate safety objectives.

### 2.3.5 Safety rules and safety procedures

Wachter & Yorio (2014) found that detection and monitoring works to reinforce other safety management system practices used by an organisation. Organisations can create and utilise checklists used by supervisors and other employees to detect situations and behaviour that may not be in line with the safety rules and requirements in place. When a violation is observed organisations can handle it in different ways. For example, negative sanctions can be divvied out to an employee for a deviation from a safe work rule or procedure while other organisations may use a constructive problem solving approach. Nordlof et al. (2015) found that safety rules and regulations at the workplace are formalised norms, and officially expressed. The compliance with the rules is part of communication. Safety culture enhanced when workers compliant with safety rules. Safety rules not only focuses with written, official expressed, informal content but also included with values and norms on socially influence of safety action and behaviour. Safety rules need to be communicated and shared regardless on formal or informal method of the rules.

### 2.3.6 Safety promotion policies

A study by Tan & Abdul Razak (2014) found that safety policy is defined as a published statement reflecting the organisation's vision and mission in relation to the management of health and safety matters. The safety policy must define the organisation's corporate philosophy towards health and safety matters, in the context of its business activities. This must be clearly presented in the form of a policy statement and originating from the organisation's board of executive management. Haslinda et al. (2016) study found safety policy and procedure is an illustration of the organisation's expression in prioritising safety in the workplace and it is the duty of the employer to formulate safety policies to his employees in the workplace. High standard policies will harness positive management attitudes, formal conditions, collective values and individual attitudes that will foster better safety performance. Zaira & Hadikusumo (2017). Safety policy development demonstrates an organisation's commitment to safety with a clear sense of responsibility to encourage workers improvement in safety behaviour. Safety policy is a clear mission and goals must be set by the organisation which the safety objectives must be determined.

## 2.4 Empirical studies of Safety management practices and safety behaviour.

A study has been done by Guo et al. (2016) to examine, develop, and test an integrative model of construction workers safety behaviour with an attempt to better understand the mechanisms by which key safety climate aspect such as management safety commitment, social support, and production pressure and individual aspect such as safety knowledge and safety motivation on affecting workers safety behaviour. The

data was collected from 215 construction workers in New Zealand using a questionnaire. The findings shows that management safety commitment was significantly related to social support and production pressure. This aspects that have been identified have direct and significant effects on safety motivation, safety knowledge, safety participation and safety compliance.

A study was conducted by Mohammadfam et al. (2016) at several power plant construction projects in Iran. The data was gather using a questionnaire with nine factors, including management commitment, supporting environment, safety management system, employees' participation, safety knowledge, safety attitude, motivation, resource allocation, and work pressure. In order to measure the score each factor was assigned to a responder, a measurement model was constructed for each of them. The findings of the study shows that the most of employees do not favour on consider safety rules, regulation, procedures and norms in their behaviour at the workplace.



### 2.5. Underpinning theory.

The underpinning theory of this study was behavioural based safety. The relationship of safety management practices and safety behaviour can be explain with theory of Behaviour Based Safety (BBS). BBS is an effective method for accident prevention that has been widely applied in Europe and North America since the 1980s. There is a significant amount of literature on this approach. BBS as an integrated management process that focuses on people. BBS theory emphasises observing human behaviour without presuming knowledge of the thought processes of human beings and usually involves four well-defined steps. This theory are focuses on baseline obser-

vation human behaviour, safety training, follow-up observation and feedback and reinforcement. The purpose of this study is to investigate how safety management practices bring in the impact on the safety management practices of employees. Previous studies conducted on safety management practices have found positive effects on safety behaviours.

## 2.6 Conclusion

The literature review focuses on safety management practices, safety performance and empirical studies that related to safety management practices towards safety behaviour. This research examines the employees perception on safety management practices and its influences towards safety behaviour in the construction industry.

# CHAPTER 3

# METHODOLOGY

## 3.1 Introduction

This chapter is to explain the methodology of collecting empirical evidence, procedures and information needed to achieve the objective of the study. The independent variables are demonstrated conceptually and operationally. This study considered reliable methods of measuring the contributing measurements of safety management practices on safety behaviour, namely safety participation and safety compliance by providing an explanation on theoretical framework, data collection, research instruments, population, sample and data analysis method.



## 3.2 Research Framework

The research framework of this study is as in 3.1 below

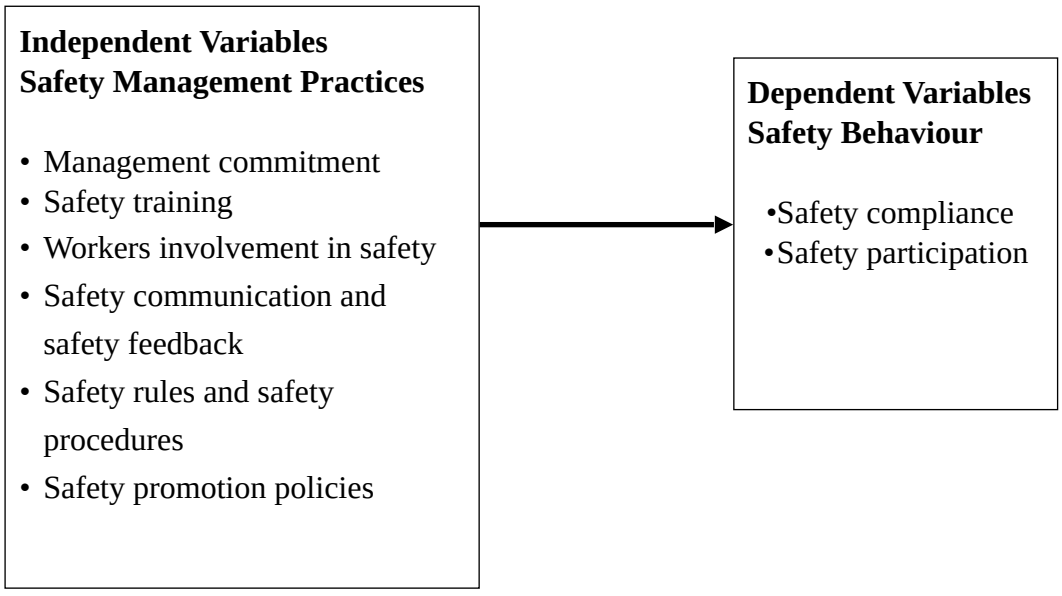


Figure 3.1 *Research framework*

### 3.3 Hypotheses Development

Based on the previous literature, the hypotheses of the study could be developed and enable the process of relationship testing. Hypotheses have been developed in the study to express the relationship between safety management practices consisting of management commitment, safety training, workers' involvement in safety, safety communication and feedback, safety rules and procedures and safety promotion policies with safety compliance and safety participation among workers in the construction industry.

Hypothesis 1a :

Management commitment have significant positive relationship with safety compliance among workers in construction company.



Hypothesis 1b :

Management commitment have significant positive relationship with safety participation among workers in construction company

Hypothesis 2a :

Safety training have significant positive relationship with safety compliance among workers in construction company

Hypothesis 2b :

Safety training have significant positive relationship with safety participation among workers in construction company.

Hypothesis 3a :

Workers' involvement have significant positive relationship with safety compliance among workers in construction company

Hypothesis 3b :

Workers' involvement have significant positive relationship with safety participation among workers in construction company

Hypothesis 4a :

Safety communication and feedback have significant relationship with safety compliance among workers in construction company



Hypothesis 4b :

Safety communication and feedback have significant positive relationship with safety participation among workers in construction company

Hypothesis 5a :

Safety rules and procedures have significant positive relationship with safety compliance among workers in construction company

Hypothesis 5b :

Safety rules and procedures have significant positive relationship with safety participation among workers in construction company

Hypothesis 6a :

Safety promotion policies have significant positive relationship with safety compliance among workers in construction company

Hypothesis 6b :

Safety promotion policies have significant positive relationship with safety participation among workers in construction company

### 3.4 Research Approach and Design

The purpose of this study was to determine whether safety management practice can influence safety behaviour among construction workers. The safety management practices, as independent variables, was used to measure the degree of influence towards safety behaviour as dependent variables. To examine the relationship between these variables, a quantitative method is used to gather the data. The quantitative data is most often collected in the form of a questionnaire or survey. Quantitative methods emphasise objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computational techniques. Quantitative research focuses on gathering numerical data and generalising it across groups of people or to explain a particular phenomenon. A questionnaire is a research instrument consisting of a series of questions for the purpose of gathering information from respondents. A questionnaire methods are quick and efficient way of obtaining large amounts of information from a large sample of people. The primary data for this re-

search was obtained through quantitative research surveys using self-administered questionnaires derived from a few notable research instruments.

The questionnaires contain three parts. The first part is made up of a cover letter, explanation of study's title, the aim of the questionnaire and a statement to declare respondent's confidentiality. The second part consisted of four questions on the respondents' demographic profiles. These questions were about information of age, nationality, trade and duration in construction. The third part consisted of fourth questions that were related to the dependent variable and the independent variables. These questions were related to management commitment, safety training, safety communication and feedback, employees' involvement, safety rules and procedures, safety promotion policies, safety compliance, and safety participation.



### 3.5 Sampling and Sampling Procedure

Sampling is the process of selecting a sufficient number of elements from the population. The purpose of sampling is to determine population's characteristics based on the sample drawn from the population. In this study probability sampling method specifically simple random sampling method was used to select the sample from population. The selected subjects were representative of the samples. The sample or respondents in this study are workers of construction company which limited only on the labour workers

In this study, the sample size was identified by using Krejcie and Morgan's (1970) table. The suggested sample size for given population of 190 is approximately 127 respondents. However for this study total of 130 a total of questionnaires were distributed among employees by providing them an adequate time to complete. The completed questionnaires were collected immediately. The survey can take a number of weeks to complete.

Table 3.1 *Table for Determining Sample Size of a Known Population*

*Table for Determining Sample Size of a Known Population*

| N | S | N | S | N | S | N | S | N | S |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 10 | 100 | 80 | 280 | 162 | 800 | 260 | 2800 | 338 |
| 15 | 14 | 110 | 86 | 290 | 165 | 850 | 265 | 3000 | 341 |
| 20 | 19 | 120 | 92 | 300 | 169 | 900 | 269 | 3500 | 346 |
| 25 | 24 | 130 | 97 | 320 | 175 | 950 | 274 | 4000 | 351 |
| 30 | 28 | 140 | 103 | 340 | 181 | 1000 | 278 | 4500 | 354 |
| 35 | 32 | 150 | 108 | 360 | 186 | 1100 | 285 | 5000 | 357 |
| 40 | 36 | 160 | 113 | 380 | 191 | 1200 | 291 | 6000 | 361 |
| 45 | 40 | 170 | 118 | 400 | 196 | 1300 | 297 | 7000 | 364 |
| 50 | 44 | 180 | 123 | 420 | 201 | 1400 | 302 | 8000 | 367 |
| 55 | 48 | 190 | 127 | 440 | 205 | 1500 | 306 | 9000 | 368 |
| 60 | 52 | 200 | 132 | 460 | 210 | 1600 | 310 | 10000 | 370 |
| 65 | 56 | 210 | 136 | 480 | 214 | 1700 | 313 | 15000 | 375 |
| 70 | 59 | 220 | 140 | 500 | 217 | 1800 | 317 | 20000 | 377 |
| 75 | 63 | 230 | 144 | 550 | 226 | 1900 | 320 | 30000 | 379 |
| 80 | 66 | 240 | 148 | 600 | 234 | 2000 | 322 | 40000 | 380 |
| 85 | 70 | 250 | 152 | 650 | 242 | 2200 | 327 | 50000 | 381 |
| 90 | 73 | 260 | 155 | 700 | 248 | 2400 | 331 | 75000 | 382 |
| 95 | 76 | 270 | 159 | 750 | 254 | 2600 | 335 | 1000000 | 384 |

*Note: N is Population Size; S is Sample Size* *Source: Krejcie & Morgan, 1970*

### 3.6 Measures

This research use questionnaire to collect data. The participants for this study need 5 to 10 minutes to complete answering the questionnaire. The questionnaire is categorised into three sections: (A) Background Information (B) Safety Management Practices and (C) Safety Behaviour.

Section A was set to gather the employees' demographic and work-related particulars. This consists of age, nationality, trade and duration of working experience in the construction industry.

Section B, Safety management practices contain measurement adopted from Vindokumar and Bhasi (2010). Six dimensions of safety management practices are management commitment, safety training, safety communication and feedback, employees' involvement, safety rules and procedures and safety promotion policies. Each dimension has its own items and the items are measured on 5 point Likert scale (1 = strong disagree; 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree).

The first dimension is Management Commitment. It consists of five (5) items which are related to the dependent variable (Vindokumar & Bhasi, 2010). Some examples of items in the questionnaire include "Safety is given high priority by the management."; "Management considers safety to be equally important as production." and "Management provides sufficient personal protective equipments for workers". The instrument has a reliability coefficient alpha of 0.878.

The second dimension is safety training which consists of five (5) items adopted from Vindokumar and Bhasi, (2010). Some examples of items in the questionnaire include “Management given enough training to the employees in workplace health and safety issues”; “and “Safety issues are given high priority in training programs.” The instrument has a reliability coefficient alpha of 0.875.

The third dimension is workers’ involvement which consists of five (5) items adopted from Vindokumar and Bhasi, (2010). Some examples of items in the questionnaire include “Management always welcomes opinion from the workers before making final decisions on safety related matters.”; and “Management promotes workers involvement in safety related matters.” The instrument has a reliability coefficient alpha of 0.867.

The fourth dimension is safety communication and feedback which consists of five (5) items adopted from Vindokumar and Bhasi, (2010). Some examples of items in the questionnaire include “Management operates an open door policy on safety issues.” and “There is sufficient opportunity to discuss and deal with safety issues in meetings.” The instrument has a reliability coefficient alpha of 0.864

The fifth dimension is safety rules and procedures which consist of five (5) items adopted from Vindokumar and Bhasi, (2010). Some examples of items in the questionnaire include “The safety rules and procedures followed in my company are sufficient to prevent incidents occurring.”, and “The facilities in the safety department are not adequate to meet the needs of my organisation.” and “Safety inspections are carried out regularly.” The instrument has a reliability coefficient alpha of 0.864.

The sixth dimension is safety promotion policies which consist of five (5) items adopted from Vindokumar and Bhasi, (2010). Some examples of items in the questionnaire include “Safety conduct is considered as a positive factor for job promotions.”, and “Employees are rewarded for reporting hazards (thanked, cash or other rewards, recognition in newsletter, etc.)” and “Safety week celebration and other safety promotional activities arranged by the management are very effective in creating safety awareness among the workers.” The instrument has a reliability coefficient alpha of 0.885

Section C on employees safety behaviour which is safety participation and safety compliance that is measured. Five (5) items adopted from Vinodkumar & Bhasi (2010) were used to measure the safety compliance towards safety performance. Some examples of items in the questionnaire include “I use all necessary safety equipment to do my job”; “I carry out my work in a safe manner”; and “I follow correct safety rules and procedure while carrying out my job”. The instrument has a reliability coefficient alpha of 0.861



Five (5) items adopted from Vinodkumar & Bhasi (2010) were used to measure the safety participation towards safety performance. Some examples of items in the questionnaire include “ I help my co-workers when they are working under risky or hazardous conditions”; “I always point out to the management if any safety related matters are noticed in my company”; and “I put extra effort to improve the safety of the workplace”. The instrument has a reliability coefficient alpha of 0.866.

### 3.7 Data Collection Procedure

A self-administered questionnaire which was considered as a suitable quantitative method to collect the data for this study. According to Sekaran and Bougie (2013), the questionnaire is one of the most common quantitative methods in a survey method to collect data. After the questionnaire had undergone a validation procedure through, data collection was started. The questionnaires were prepared with Malay and English version to give flexibility for the respondents to respond in either medium they were comfortable with. Prior to distributing the surveys, the selected safety committee's and safety personnel explained the details of the survey questions to the workers. The questionnaires were administered on the premises on Monday morning during the tool box meeting. The questionnaires distributed by the safety officer to construction workers to complete. This questionnaire assured the workers responses would be anonymous and confidential, and the respondents completed the questionnaires within 10 minutes. The process was continued until completion of 130 samples.

### 3.8 Data Analysis Procedure

The data collected was analysed used SPSS programme. This study will use Statistical Package for the Social Sciences (SPSS) computer program 23.0 version utilised to perform and carryout the statistical analysis. This SPSS program helps to generate analysis from the data collected. The types of analysis that will be implemented are reliability analysis, descriptive analysis, correlation analysis and multiple regression analysis.

Reliability analysis is important to check the dependability of the data. The reliability analysis will be used when there are multiple questions in questionnaires. According to Sekaran (2005) all data entries have to be checked to ensure that subsequent analysis and findings were credible to establish the reliability of data. Cronbach's alpha is used in measurement of internal consistency ("reliability"). Cronbach's alpha coefficient used to measure the core reliability. In reliability analysis the figure will be measured using Cronbach's Alpha. This determine how well the measured variables are positively related to one another. The alpha values for all measured variables are in an acceptable range which is more than 0.7 (DeVellis 2003; Nunnally, 1978). Alpha values above 0.7 are viewed as up to standard. However, alpha values 0.8 are desirable (Pallant, J., 2007).

The descriptive analysis for this study will be adopt to define the aspects of the sample including the demographic sample. In this research, working experience and age are continuous variables, the mean, standard deviation of the maximum and minimum values will be used to describe this particular demographic sample.

The Pearson's correlation is adopt in this study to measure a correlation relationship between two variables. Pearson correlation two tail statistical analyses will identify the correlation significant between all independent variables and the dependent variables. Here strength among the variables can be computed and investigated.

### 3.9 Pilot Study

A pilot test was conducted on the data collected to determine the reliability of this study. Pilot study is a small scale version on analyse data collection and functioning as guidelines before final data collection analyse conducted. Cronbach's alpha for pilot study was used on a sample size of 30 workers to measure the core reliability analysis of this study.

In Table 3.2, the tested Cronbach Alphas values of the reliability are listed according by the variables group. All independent variable and dependent variables found to be reliable as the results indicated all variables were above 0.8.

The alpha values for all measured variables are in desirable range which is more than 0.8. The alpha values 0.8 are desirable (Pallant, J., 2007). In this study, the alpha values for all variables are in range of 0.864 to 0.878. Thus, the scale in this study has very good internal consistency reliability.

Table 3.2 *Tested Alphas of Variables - Pilot Study*

| Variables | Types of Variables | Cronbach-Alpha |
|---|---|---|
| **Management commitment** | Independent Variable | 0.878 |
| **Safety training** | Independent Variable | 0.875 |
| **Workers involvement in safety** | Independent Variable | 0.867 |
| **Safety communication and safety feed-back** | Independent Variable | 0.864 |
| **Safety rules and safety procedures** | Independent Variable | 0.864 |
| **Safety promotion policies** | Independent Variable | 0.885 |
| **Safety compliance** | Dependent Variable | 0.861 |
| **Safety participation** | Dependent Variable | 0.866 |



### 3.10 Summary

This chapter will explain all the methodological factors involved when carrying out the study. This chapter will explain the research frame work, conceptual and operational definition of framework, the instruments used, details about population and samples involved, pilot study and finally the method used to analyse all the data that will be collected in future research. The next chapter is set to explain the data analysis during this study.

# CHAPTER 4

# RESULTS AND DISCUSSION

## 4.1 Introduction

This chapter provides the results from research conducted in the questionnaire which was distributed and collected from construction company workers. All data was analysed using Statistical Package for Social Science (SPSS) version 23.0 to perform the statistical analysis. The data collected was examined with descriptive frequency analysis for demographic details of respondents. The analysis proceeded with reliability analysis, descriptive statistic of variables, correlation analysis, regression, and coefficient.



## 4.2 Response Rate

A total of 130 questionnaires were distributed to the respondents working at construction company based in Kuala Lumpur. The respondents were given a sufficient time period to complete the questionnaires within 10 minutes and were collected immediately once completed. The total response rate for this research was 100%. Table 4.1 summarised the response rate of the survey

Table 4.1 *Response Rate*

| Item | Total | Percentage (%) |
|---|---|---|
| Distributed Questionnaires | 130 | 100 |
| Collected Questionnaires | 130 | 100 |
| Unreturned Questionnaires | 0 | 0 |
| Completed Questionnaires | 130 | 100 |

## 4.3 Respondents Demographic Background

Respondents' demographic profile are described in Table 4.2 below.

Table 4.2 *Demographic Characteristic of the Respondents*

| Demographics | Frequency | Percentage (%) |
|---|---|---|
| ***Age*** | | |
| **18 - 25 years old** | 23 | 17.7 |
| **26 - 35 years old** | 58 | 44.6 |
| **36 - 45 years old** | 34 | 26.2 |
| **46 - 55 years old** | 13 | 10.0 |
| **More than 55** | 2 | 1.5 |
| ***Nationality*** | | |
| **Malaysia** | 31 | 23.8 |
| **Indonesia** | 40 | 30.8 |
| **Bangladesh** | 40 | 30.8 |
| **Myammar** | 16 | 12.3 |
| **Others** | 3 | 2.3 |
| ***Trade*** | | |
| **Carpenter** | 26 | 20.0 |
| **Machinery & Equip-ment** | 17 | 13.1 |
| **Barbender** | 31 | 23.8 |
| **Mason** | 44 | 33.8 |
| **Others** | 12 | 9.2 |
| ***Duration on Construction*** | | |
| **1 - 5 years** | 50 | 38.5 |
| **6 - 10 years** | 55 | 42.3 |
| **11 - 15 years** | 20 | 15.4 |
| **16 - 20 years** | 4 | 3.1 |
| **More than 20 years** | 1 | 0.8 |

Table 4.2 shows the largest group of respondents aged between 26 to 35 years old with 58 respondents, equal to 44.6% of the total respondents. The lowest number of respondents was 55 years old and over, with 2 respondents, equal to 1.5% of the total. Employees aged above 55 years are those whose services are extended after their retirement age of 60 on a contract basis due to their skills in certain work area.

There are a total of 5 nationalities in this study, the highest group of respondents shared by Indonesia and Bangladesh with 40 respondents equal to 30.8% each. The lowest score for nationality is 3 respondents (2.3%) others nationalities in this research consist of mixed nationalities from Nepal and Pakistan.

The total respondents were from different trades, carpenter, machinery and equipment, barbender, mason and others trades. From the table the highest respondents are masons with 44, equal to 33.8% General workers, cleaners and helpers where the lowest respondents with 12, equal to 9.2%.

The largest group of respondents for duration was construction, from 6 to 10 years which consisted of 55 respondents or 42.3%. This followed by those who work for 1 to 5 years, 50 respondents or 38.5%. The longer duration on construction, more than 20 years, was only 1 respondent, or 0.8% which is a respondent with specific skills.

## 4.4 Reliability Analysis

Table 4. 3 *Reliability Analysis Before and After Items Deleted*

| Item | No.of Initial Items | Cronbach-Alpha | No. Of Final Items | Cronbach-Alpha |
|---|---|---|---|---|
| **Management commitment** | 5 | 0.878 | 5 | 0.869 |
| **Safety training** | 5 | 0.875 | 5 | 0.863 |
| **Workers involvement in safety** | 5 | 0.867 | 5 | 0.866 |
| **Safety communication and safety feedback** | 5 | 0.864 | 4 | 0.864 |
| **Safety rules and safety procedures** | 5 | 0.864 | 4 | 0.865 |
| **Safety promotion policies** | 5 | 0.885 | 4 | 0.878 |
| **Safety compliance** | 5 | 0.861 | 4 | 0.883 |
| **Safety participation** | 5 | 0.866 | 5 | 0.884 |
| **Total** | **40** | | **36** | |



As presented in table 4.3, the Cronbach's Alpha coefficient for management commitment (0.900) is better closer to gets to 1.0.

While safety training, worker involvement in safety, safety communication and feedback, safety rules and safety procedures, safety promotion policies, safety compliance and safety participation is above 0.80 is consider good.

The Cronbach Alpha values in this study acceptable as it shows good internal consistency reliability for scale with the Cronbach alpha value greater than 0.60.

## 4.5 Descriptive Analysis

Table 4.4 *Frequencies of variables*

| *Variables* | *Mean* | *Std. Deviation* | *N* |
|---|---|---|---|
| **Management Commitment** | 4.254 | 0.589 | 130 |
| **Safety Training** | 4.220 | 0.564 | 130 |
| **Worker's Involvement** | 3.906 | 0.584 | 130 |
| **Safety Communication and Feedback** | 3.842 | 0.572 | 130 |
| **Safety rules and Procedure** | 3.845 | 0.520 | 130 |
| **Safety Promotion Policies** | 3.466 | 0.599 | 130 |
| **Safety Compliance** | 4.051 | 0.544 | 130 |
| **Safety Participation** | 3.881 | 0.591 | 130 |



The descriptive frequencies of all variables in this study were shown in Table 4.4 frequencies of variables. The results of analysis which includes the mean and standard deviation values for the independent and dependent variables. The result shows Management commitment variables have the highest mean at 4.254 compare to the lowest mean at 3.842 Safety communication and safety feedback . The highest standard deviation value at 0.591 for safety participation and lowest at 0.520 for safety rules and procedures.

## 4.6 Pearson Correlation Analysis

Table 4.5 *Pearson Correlation Analysis Result*

| | **Safety Behaviours** | **Safety Management Practices** |
|---|---|---|
| **Safety Behaviours** | 1 | 0.600** |
| **Safety Management Practices** | 0.600** | 1 |
| **N** | 130 | 130 |

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

As suggested by Pallant (2007), the strength of statistical significance determined as: r=0.10 to 0.29 (weak), r=0.30 to 0.49 (moderate) and r= 0.50 to 1.0 strong.

The Pearson Correlation results as shown in Table 4.5 Pearson correlation analysis result, the correlation among safety management practices (management commitment, safety training, worker's involvement, safety communication and feedback, safety rules and procedures, safety promotion policies), and safety behaviour (safety compliance and safety participation) showed strong correlation at r = 0.600

Table: 4.6: *Detailed Pearson Correlation Analysis Result*

| | MC | ST | WI | SCF | SRP | SPP | SC | SP |
|---|---|---|---|---|---|---|---|---|
| **Management Commitment (MC)** | 1 | | | | | | | |
| **Safety Training (ST)** | 0.737** | 1 | | | | | | |
| **Workers Involvement (WI)** | 0.562** | 0.643** | 1 | | | | | |
| **Safety Communication & Feedback (SCF)** | 0.548** | 0.644** | 0.581** | 1 | | | | |
| **Safety Rules & Procedures (SRP)** | 0.520** | 0.545** | 0.562** | 0.694** | 1 | | | |
| **Safety Promotion Policies (SPP)** | 0.418** | 0.424** | 0.537** | 0.519** | 0.617** | 1 | | |
| **Safety Compliance (SC)** | 0.440** | 0.478** | 0.327** | 0.431** | 0.454** | 0.306** | 1 | |
| **Safety Participation (SP)** | 0.344** | 0.400** | 0.489** | 0.417** | 0.429** | 0.366** | 0.428** | 1 |

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

The detailed Pearson correlation result as mentioned in Table 4.6 showed that the management commitment, safety training and workers involvement, safety communication and feedback, safety rules and procedures and safety promotion policies was moderately correlated with safety compliances and safety participation with correlation result were ranged 0.306 to 0.489

## 4.7 Multiple Regression

### 4.7.1 The relationship between Safety Compliance and Safety Management Practices

Table 4.7 *Model Summary Multiple Regression Results on Safety Compliance.*

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.543 | 0.295 | 0.260 | 0.468 |

Table 4.8 ANOVA *Multiple Regression Results on Safety Compliance.*

| Model | | Sum of Squares | *df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 11.252 | 6 | 1.875 | 8.564 | 0.000 |
| | Residual | 26.933 | 123 | 0.219 | | |
| | Total | 38.185 | 129 | | | |



Table 4.9 C*oefficients Multiple Regression Results on Safety Compliance.*

| **Model** | **Unstandardised Coefficients** | | **Standardized Coefficients** | | |
|---|---|---|---|---|---|
| | **B** | **Std. Error** | **Beta** | **t** | **Sig.** |
| **(Constant)** | 1.558 | 0.362 | | 4.303 | 0.000 |
| **Management Commitment** | 0.124 | 0.107 | 0.134 | 1.162 | 0.248 |
| **Safety Training** | 0.248 | 0.125 | 0.257 | 1.985 | 0.049 |
| **Workers' Involvement** | -0.090 | 0.102 | -0.096 | -0.880 | 0.381 |
| **Safety Communication & Feedback** | 0.075 | 0.113 | 0.078 | 0.661 | 0.510 |
| **Safety Rules & Procedures** | 0.253 | 0.124 | 0.241 | 2.040 | 0.043 |
| **Safety Promotion Policies** | 0.003 | 0.092 | 0.004 | 0.035 | 0.972 |

### 4.7.2 The relationship between Safety Participation and Safety Management Practices

Table 4.10 *Model Summary Multiple Regression Results on Safety Participation*

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.531 | 0.282 | 0.247 | 0.514 |

Table 4.11 *ANOVA Multiple Regression Results on Safety Participation.*

| Model | | Sum of Squares | *df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 12.745 | 6 | 2.124 | 8.056 | 0.000 |
| | Residual | 32.431 | 123 | 0.264 | | |
| | Total | 45.176 | 129 | | | |



Table 4.12 Coefficients *Multiple Regression Results on Safety Participation.*

| **Model** | **Unstandardized Coefficients** | | **Standardized Coefficients** | | |
|---|---|---|---|---|---|
| | **B** | **Std. Error** | **Beta** | **t** | **Sig.** |
| **(Constant)** | 1.336 | 0.397 | | 3.362 | 0.001 |
| **Management Commitment** | -0.012 | 0.117 | -0.012 | -0.106 | 0.916 |
| **Safety Training** | 0.067 | 0.137 | 0.064 | 0.491 | 0.624 |
| **Workers' Involvement** | 0.301 | 0.112 | 0.298 | 2.689 | 0.008 |
| **Safety Communication & Feedback** | 0.086 | 0.124 | 0.083 | 0.693 | 0.490 |
| **Safety Rules & Procedures** | 0.163 | 0.136 | 0.143 | 1.198 | 0.233 |
| **Safety Promotion Policies** | 0.052 | 0.101 | 0.053 | 0.519 | 0.605 |

Hypotheses Testing for Safety compliance and Safety Participation describes the relationship between the six management practices variables with safety compliance and safety participation. The relationship between management commitment and safety compliance was not significant ( beta = 0.134 at $p > 0.05$). Hypotheses 1a there is a significant positive relationships between management commitment with safety compliance, was not supported. The results shows relationship between management commitment with safety participation was not significant ( beta = -0.012 at $p > 0.05$). Hypotheses 1b which stated there is a significant positive relationship between management commitment with safety participation, not supported.

The relationship form safety training with safety compliance ( beta = 0.257 at $p < 0.05$) was significant. Hence, hypotheses 2a (there is a significant positive relationship between safety training and safety compliance) was supported. Hypotheses 2b that there is a significant relationship between safety training and safety participation. The results show that the relationship between safety training and safety participation was statistically not significant with beta = 0.604 at $p > 0.05$ not supported.

The relationship from workers involvement to safety compliance was not significant with coefficient of beta = -0.096 at $p > 0.05$. Hypotheses 3a is a significant relationship between workers involvement and safety compliance was not supported. Hypotheses 3b that there is a significants relationship between workers involvement and safety participation. The results show that the relationship between workers involvement and safety participation was significant with beta = 0.298 at $p < 0.05$ was supported.

The hypotheses 4a suggested that there is a significant relationship between safety communication and feedback with safety compliance and 4b there is a significant relationship between safety communication and feedback with safety participation. The results showed that the relationship from safety communication and feedback to safety compliance and safety participation were not significantly related with coefficient of 0.078 at $p > 0.05$ and 0.083 at $p > 0.05$. Thus, hypotheses 4a and 4b were not supported.

The hypotheses 5a suggested there is a significant relationship between safety rules and procedures with safety compliance and 5b there is a significant relationship between safety rules and procedures with safety participation. The results showed that the relationship from safety rules and procedures to safety compliance was significantly related with coefficient of 0.241 at $p < 0.05$ and the relationship from safety rules and procedures to safety participation was not significantly 0.143 at $p > 0.05$. Thus, hypotheses 5a was supported and 5b were not supported.

Finally, the relationship between safety promotion policies to safety compliance and safety participation were not significant with coefficient of 0.004 and 0.053 at $p > 0.05$. These indicated that the safety promotion policies were not significantly related with safety compliance and safety participation. Thus, hypotheses 6a (there is a significant relationship between safety promotion policies and safety compliance) and 6b (there is a significant relationship between safety promotion policies and safety participation) were not supported.

## 4.8 Summary of Hypothesis

Table 4.13 *Hypotheses Results*

| Hypotheses | | Result |
|---|---|---|
| **1a** | There is a significant positive relationships between management commitment with safety compliance | Not Supported |
| **1b** | There is a significant positive relationships between management commitment with safety participation | Not Supported |
| **2a** | There is a significant positive relationships between safety training with safety compliance | Supported |
| **2b** | There is a significant positive relationships between safety training with safety participation | Not Supported |
| **3a** | There is a significant positive relationships between workers' involvement in safety with safety compliance | Not Supported |
| **3b** | There is a significant positive relationships between workers' involvement in safety with safety participation | Supported |
| **4a** | There is a significant positive relationships between safety communication and feedback with safety compliance | Not Supported |
| **4b** | There is a significant positive relationships between safety communication and feedback with safety participation | Not Supported |
| **5a** | There is a significant positive relationships between safety rules and procedures with safety compliance | Supported |
| **5b** | There is a significant positive relationships between safety rules and procedures with safety participation | Not Supported |
| **6a** | There is a significant positive relationships between safety promotion policies with safety compliance | Not Supported |
| **6b** | There is a significant positive relationships between safety promotion policies with safety participation | Not Supported |

# CHAPTER 5

# DISCUSSION AND RECOMMENDATION

## 5.1 Introduction

This chapter discusses the results of this research and examines the relationship between six independent variables of safety management practices consisting of management commitment, safety training, workers involvement in safety, safety communication and safety feedback, safety rules and procedures and safety policies with safety compliance and participation among worker in construction company by understanding the relationship, it may provide tools and insight for organisation and academics to continue improving safety management practices and safety behaviour. The next part discusses the theoretical implication, practical implication, limitation and opportunity for future studies in completing this research.

## 5.2 Discussion Of Research Questions

This study mainly focuses on examining the effect of safety management practices on workers safety behaviour. Also safety compliance and safety participation among employees in the construction industry. I will discuss the result of the hypotheses of this study based on theories and previous empirical evidence.

### 5.2.1 Management Commitment with Safety Compliance and Safety Participation.

The research hypotheses indicate the relationship between management commitment and safety behaviour which is safety compliance and safety participation are not significant. In this study management should increase their commitment with strong teamwork on safety and encourage positive teamwork among the workers. Positive management commitment has an impact on employees safety performance, lowers injury rates and engage in working safely.



### 5.2.2 Safety Training with Safety Compliance and Safety Participation

This research hypotheses predicted a significant relationship between safety training with safety compliance and safety participation. The results from the analysis indicates there is a significant positive relationship between safety training and safety compliance but not significant with safety participation among workers in the construction industry. The significant relationship between safety training with safety compliance occurs when management gives the highest priority level to safety training for employees towards safety compliance.

### 5.2.3 Workers' Involvement with Safety Compliance and Safety Participation

This research hypothesised that there will be a significant relationship between workers involvement with safety compliance and safety participation. In this study workers involvement is not significantly related with safety compliance but shows significantly with safety participation. In this study workers involvement is not significantly related with safety compliance probably due to the main decision on formulation of safety policies, rules and procedures are decided by the top management without any involvement of workers. However, in this study workers involvement shows significantly with safety participation probably due to employee feels obligated to participate with the safety rules and procedures at workplace as there is supervision and monitoring by the site supervisor. As mention in study by Wachter & Yorio (2014) employee influence over safety management system practices, programs and safe work procedures works by actively facilitating safe attitudes and behaviours. As employee influence over safety practices increases they are more likely to defend their existence and adopt the value of working safely and encouraging others to do so. Also employee engagement has been directly correlated to the amount of involvement that employees have in their work processes.

### 5.2.4 Safety Communication and Feedback with Safety Compliance and Safety Participation.

This study revealed the result that hypothesised relationship between safety communication and feedback was not significant with safety compliance and safety participation. The management need take this into consideration when communicating on the safety and health information to foreign worker. As mentioned by Wachter & Yorio (2014) communication is tied to the frequency and methods (distinct from safety training) of emphasising knowledge and the importance of safe work. Companies might use printed methods to raise subconscious awareness of safe work and increase the cruciality. With sharing information about nearly misses and incident occurs in the workplace will helps increase safety awareness among workers.



### 5.2.5 Safety Rules and Procedures with Safety Compliance and Safety Participation

The study showed hypotheses relationship between safety rules and procedures and safety behaviour which is safety compliance are significant. However, the relationship between safety rules and procedures with safety participation are not significant. This is probably because the workers feel there are adequate safety rules and procedures in their workplace but the safety rules and procedures are hard to follow due to complicated safety procedure. The management should try to simplify safety rules and procedures for better understanding and easy to be carried out by the workers.

### 5.2.6 Safety Promotion Policies with Safety Compliance and Safety Participation

In this study the hypotheses shows that relationship between safety promotion policies and safety behaviour which is safety compliance and safety participation are both not significant. The results occur because in this organisation there are no rewards or recognition by the management towards the safety practices by workers and this will discourage the worker on safety. The management should be proactive on promoting safety behaviour such as providing rewards and recognition applying safety practices at workplace. This will make workers feel appreciated by the company and helps increase safety behaviour. Besides that supervisors play important roles on promoting safety by showing a good safety example and appreciate the workers when they take part in safety by reporting unsafe conditions at the workplace instead of being unhappy and angry.



## 5.3 Implication

### 5.3.1 Theoretical Implication

The research was conducted to examine influence of safety management practices towards safety behaviour among workers in the construction company. There are similar studies conducted in construction companies, thus this provides results for this research. This study would contribute values to the academic research because not many studies have been conducted in construction industries in Malaysia. This research also benefits to the researcher to understand about the safety management that influence the safety behaviour ( Safety compliance and safety participation )

among workers in the construction company. This finding could be used for further improvement on safety and health management among workers.

### 5.3.2 Practical Implication

The management need to continuously encourage safety compliance and safety participation among workers. Safety communication and feedback among workers are importances for management for providing safety workplace.Management need to improve communication between worker especially foreign workers.The management should take action by creating, evaluating and improving the safety training and safety rules and procedures. Management need to take immediate action to respond to all reports of unsafe, unhealthy condition at workplace.

## 5.4 Limitation and Suggestion for Future Research

The study was conducted among employees on one construction company. First, feedbacks given by the participants are unpredictable. Some of the respondents may answer the question given just for the satisfaction of the researcher and some respondents take longer to answer questionnaires. The second limitation is the language barrier. Even though the questionnaires are prepared in dual language (Malay and English) some respondents were unable to read and understand the questionnaire. For this study the researcher needed to explain the questionnaire in detail to the workers until the foreign workers understood and were able to answer. Therefore, in future research, the researcher should consider adding others languages to the questionnaires based on the respondents origin, this will help for data collection time.

## 5.5 Conclusion

The result of this study determine the validity and reliabilities of six facets of safety management practices on safety compliance and safety participation among workers in construction industries. The relationship of safety management practices component and safety behaviour were also be identified. The result of this study highlighted the management commitment, safety training, safety commitment, safety rules and procedures and safety promotion policies were important factor to minimise the accident rate in the industry. This research would be beneficial to all relevant parties involved in the education sectors, academic research, student, companies and various practitioners in safety behaviour management identifying the best practices for improvement of safety at workplace.

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Kajian Kepatuhan Perilaku Keselamatan

Saya ingin mendapatkan kerjasama tuan/puan untuk mengisi borang soal selidik yang dikepilkan. Soal selidik ini hanya akan mengambil masa lebih kurang 5 minit untuk diisi. Walaupun kerjasama dan penglibatan tuan/puan amat bermakna buat penyelidikan ini, namun penglibatan tuan/puan dalam kajian ini adalah suka rela. Tuan/puan boleh menarik diri daripada kajian ini pada bila-bila masa.

Saya juga memberi jaminan bahawa identiti dan jawapan yang tuan/puan beri akan dirahsiakan. Semua jawapan yang di kutip akan di jumlahkan. Dengan itu, tuan/puan tidak perlu berasa gusar bahawa jawapan dan identiti tuan/puan akan terdedah. Sekiranya tuan/puan sanggup untuk melibatkan diri secara suka rela dengan kajian ini, saya memohon kerjasama tuan/puan untuk mengisi borang persetujuan penglibatan di bawah ini.

Saya mengucapkan berbanyak-banyak terima kasih atas kerjasama dan kesudian tuan/puan melibatkan diri dengan kajian ini. Sekian, terima kasih.
Yang benar

_____

Norhazlenda Binti Mohd Nor
Nombor Matriks Pelajar: 819259

Borang Kajiselidik

Kaji Selidik ini adalah untuk pengukuran dan persepsi pekerja di tapak bina berhubung amalan Keselamatan dan Kesihatan Pekerjaan. Maklumat yang anda berikan adalah sulit dan hanya digunakan untuk tujuan kajian ini sahaja.

1. Sila tandakan [ √ ] pada petak yang sesuai atau mengisi ruang yang di Please tick (√) in the appropriate box or fill the space provided

A. Maklumat Latarbelakang/Back ground

1. Umur/Age

☐ 18-25

☐ 26-35

☐ 36-45

☐ 46-55

☐ Lebih 55/more than 55

2. Warganegara/Nationality

☐ Malaysia

☐ Indonesia

☐ Bangladesh

☐ Myanmar

☐ Lain-lain / Others

3. Bidang Pekerjaan/ Trade

☐ Kayu/ Carpenter

☐ M&E

☐ Besi/Barbender

☐ Simen/mason

☐ Lain-lain/others.....

4. Tempoh masa di sektor Pembinaan/Duration in construction

☐ 1hingga 5 tahun/1 to 5 year

☐ 6 hingga 10 tahun/6 to 10 year

☐ 11 hingga 15 tahun/11 to 15 year

☐ 16 hingga 20 tahun/16 to 20 year

☐ Lebih dari 20 tahun/ More than 20 year

Bahagian B: Keselamatan Kerja

Section B: Job Safety

Fikirkan tentang pekerjaan anda. Sejauh mana anda bersetuju atau tidak bersetuju sama ada setiap kenyataan di bawah menggambarkan kerja yang anda lakukan sekarang? Bulatkan jawapan anda berpandukan skala di atas.

(Think about your job. To what extent you agree or disagree whether each statement below describes your job? Circle your answer using the scale below).

| Sangat tidak setuju (Strongly disagree) | Tidak setuju (Not agree) | Berkecuali (neither agree nor disagree) | Setuju (Agree) | Sangat setuju (Strongly agree) |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **B.** | Management commitment | 1 | 2 | 3 | 4 | 5 |
| **1** | Isu keselamatan diberi keutamaan oleh pihak pengurusan /<br>Safety is given high priority by the management | 1 | 2 | 3 | 4 | 5 |
| **2** | Pihak pengurusan menganggap keselamatan menjadi sama penting dengan pengeluaran. /<br>Management considers safety to be equally important as production. | 1 | 2 | 3 | 4 | 5 |
| **3** | Ahli Jawatankuasa keselamatan selalu memberi nasihat berkaitan dengan keselamatan di tempat kerja. /<br>Safety Committee members used to advise workers pertaining safety. | 1 | 2 | 3 | 4 | 5 |
| **4** | Pihak Pengurusan memberi penekanan yang kuat terhadap keselamatan dan kesihatan di tempat kerja. /<br>Management places a strong emphasis on work Place safety and health. | 1 | 2 | 3 | 4 | 5 |
| **5** | Pihak pengurusan menyediakan peralatan perlindungan peribadi yang mencukupi untuk pekerja. /<br>Management provides sufficient personal protective equipments for the workers. | 1 | 2 | 3 | 4 | 5 |

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|---|---|---|---|---|---|---|
| **C** | Safety training | 1 | 2 | 3 | 4 | 5 |
| **1** | Pihak pengurusan memberikan latihan yang mencukupi kepada pekerja di tempat kerja dan isu-isu keselamatan. / Management given enough training to the employees in workplace health and safety issues. | 1 | 2 | 3 | 4 | 5 |
| **2** | Latihan Keselamatan memberikan saya pemahaman yang jelas tentang aspek kritikal pekerjaan saya yang melibatkan bahaya. / Training give me clear understanding on the critical aspect regarding safety at site. | 1 | 2 | 3 | 4 | 5 |
| **3** | Isu keselamatan diberi keutamaan dalam program latihan. /Safety issues are given high priority in training programmes. | 1 | 2 | 3 | 4 | 5 |
| **4** | Pihak pengurusan menggalakkan para pekerja menghadiri program latihan keselamatan. / Management encourages the workers to attend safety training programmes. | 1 | 2 | 3 | 4 | 5 |
| **5** | Latihan keselamatan memberikan saya keyakinan untuk melakukan pekerjaan saya. / Training give me more confidence in executing my work. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **D** | Workers' involvement | 1 | 2 | 3 | 4 | 5 |
| **1** | Pihak pengurusan sentiasa mengalu-alukan pendapat daripada pekerja sebelum membuat keputusan akhir mengenai hal berkaitan keselamatan./ Management always welcomes opinion from employees before making final decisions on safety related matters. | 1 | 2 | 3 | 4 | 5 |
| **2** | Perkerja mengambil bahagian melaporkan kemalangan, insiden, dan situasi yang berpotensi berbahaya di tempat kerja./ Employees are participate reports accidents, incidents, and potentially hazardous situations in workplace. | 1 | 2 | 3 | 4 | 5 |
| **3** | Pekerja memainkan peranan aktif dalam mengenal pasti lokasi bahaya. / Employees plays an active role in identifying of safety performance. | 1 | 2 | 3 | 4 | 5 |
| **4** | Ahli jawatankuasa keselamatan yang terdiri daripada wakil pengurusan dan pekerja. / Safety committees consisting of representatives of management and employees. | 1 | 2 | 3 | 4 | 5 |
| **5** | Pengurusan menggalakkan penglibatan pekerja dalam hal berkaitan keselamatan. / Management promotes employees involvement in safety related matters. | 1 | 2 | 3 | 4 | 5 |

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| **E** | Safety communication and feedback | 1 | 2 | 3 | 4 | 5 |
| **1** | Pihak pengurusan jelas menyampaikan isu keselamatan kepada semua peringkat dalam organisasi. /<br>Management are clearly communicates safety issues to all levels within the organisation. | 1 | 2 | 3 | 4 | 5 |
| **2** | Pengurusan mengendalikan dasar pintu terbuka mengenai isu keselamatan./<br>Management operates an open door policy on safety issues. | 1 | 2 | 3 | 4 | 5 |
| **3** | Terdapat peluang yang mencukupi untuk membincangkan dan menangani isu keselamatan dalam mesyuarat./<br>There is sufficient opportunity to discuss and deal with safety issues in meetings. | 1 | 2 | 3 | 4 | 5 |
| **4** | Sasaran dan matlamat untuk prestasi keselamatan dalam pengurusan tidak jelas kepada pekerja. /<br>The target and goals for safety performance in management are not clear to the workers | 1 | 2 | 3 | 4 | 5 |
| **5** | Terdapat komunikasi terbuka mengenai isu keselamatan di tempat kerja. /<br>There is open communications about safety issues in this workplace. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **F** | Safety rules and procedures | 1 | 2 | 3 | 4 | 5 |
| **1** | Peraturan keselamatan dan prosedur yang diikuti di syarikat saya adalah mencukupi untuk mencegah insiden yang berlaku. / The safety rules and procedures followed in my company are sufficient to prevent incidents occurring. | 1 | 2 | 3 | 4 | 5 |
| **2** | Kemudahan di jabatan keselamatan tidak mencukupi untuk memenuhi keperluan organisasi saya. / The facilities in the safety department are not adequate to meet the needs of my organization. | 1 | 2 | 3 | 4 | 5 |
| **3** | Penyelia dan pengurus saya sentiasa berusaha untuk menguatkuasakan prosedur kerja yang selamat. / My supervisors and managers always try to enforce safe working procedures. | 1 | 2 | 3 | 4 | 5 |
| **4** | Pemeriksaan keselamatan dijalankan dengan kerap. / Safety inspections are carried out regularly. | 1 | 2 | 3 | 4 | 5 |
| **5** | Prosedur dan amalan keselamatan dalam organisasi ini berguna dan berkesan. / The safety procedures and practices in this organization are useful and effective. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **G** | Safety promotion policies | 1 | 2 | 3 | 4 | 5 |
| **1** | Tingkah laku selamat dianggap sebagai faktor positif untuk kenaikan pangkat pekerjaan. /<br>Safe conduct is considered as a positive factor for job promotions. | 1 | 2 | 3 | 4 | 5 |
| **2** | Pekerja diberi ganjaran untuk melaporkan bahaya keselamatan (terima kasih, wang tunai atau ganjaran lain, pengiktirafan dalam surat berita, dll.)<br>Employees are rewarded for reporting safety hazards (thanked, cash or other rewards, recognition in news letter, etc.) | 1 | 2 | 3 | 4 | 5 |
| **3** | Minggu keselamatan dan aktiviti promosi keselamatan lain yang diatur oleh pihak pengurusan sangat berkesan dalam mewujudkan kesedaran keselamatan di kalangan pekerja. /<br>Safety week celebration and other safety promotional activities arranged by the management are very effective in creating safety awareness among the workers. | 1 | 2 | 3 | 4 | 5 |
| **4** | Terdapat persaingan sihat di kalangan pekerja untuk mengetahui dan melaporkan keadaan dan perbuatan yang tidak selamat. /<br>There exists very healthy competition among the employees to find out and report unsafe condition and acts. | 1 | 2 | 3 | 4 | 5 |
| **5** | Penyelia menjadi sangat tidak senang dan marah apabila pekerja mengetahui dan melaporkan keadaan yang tidak selamat dan bertindak di bahagian kami. /<br>Supervisor becomes very unhappy and angry when employees find out and report unsafe conditions and acts in our section. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **H** | Safety compliance | 1 | 2 | 3 | 4 | 5 |
| **1** | Saya menggunakan semua peralatan keselamatan yang diperlukan untuk melakukan kerja saya. /<br>I use all necessary safety equipments to do my job. | 1 | 2 | 3 | 4 | 5 |
| **2** | Saya menjalankan kerja saya secara selamat. /<br>I carry out my work in a safe manner. | 1 | 2 | 3 | 4 | 5 |
| **3** | Saya mengikuti peraturan dan prosedur keselamatan yang betul semasa menjalankan tugas saya. /<br>I follow correct safety rules and procedures while carrying out my job. | 1 | 2 | 3 | 4 | 5 |
| **4** | Saya memastikan tahap keselamatan tertinggi apabila saya menjalankan tugas saya. /<br>I ensure the highest levels of safety when I carry out my job. | 1 | 2 | 3 | 4 | 5 |
| **5** | Kadangkala kerana kekurangan masa, saya menyimpang borang prosedur kerja yang betul dan selamat. /<br>Occasionally due to lack of time, I deviate form correct and safe work procedures. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **I** | Safety participation | 1 | 2 | 3 | 4 | 5 |
| **1** | Saya membantu rakan sekerja saya apabila mereka bekerja di bawah keadaan berisiko atau berbahaya. /<br>I help my co-workers when they are working under risky or hazardous conditions. | 1 | 2 | 3 | 4 | 5 |
| **2** | Saya selalu menunjukkan kepada pihak pengurusan sekiranya ada perkara berkaitan keselamatan yang dapat dilihat di syarikat saya. /<br>I always point out to the management if any safety related matters are noticed in my company. | 1 | 2 | 3 | 4 | 5 |
| **3** | Saya berusaha keras untuk meningkatkan keselamatan tempat kerja. /<br>I put extra effort to improve the safety of the workplace. | 1 | 2 | 3 | 4 | 5 |
| **4** | Saya secara sukarela menjalankan tugas atau aktiviti yang membantu meningkatkan keselamatan di tempat kerja. /<br>I voluntarily carryout tasks or activities that help to improve workplace safety. | 1 | 2 | 3 | 4 | 5 |
| **5** | Saya menggalakkan rakan sekerja saya bekerja dengan selamat. /<br>I encourage my co-workers to work safely. | 1 | 2 | 3 | 4 | 5 |