



Faculty of Cognitive Sciences and Human Development

**The Relationship Between Work Safety Scale (WSS) with Safety
Performance and Safety Behavior as Mediator: A Study at Sarawak's
Plantation Industry**

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The Relationship Between Work Safety Scale (WSS) with Safety
Performance and Safety Behavior as Mediator: A Study at Sarawak's
Plantation Industry

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A thesis submitted

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.



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ABSTRACT

While numerous variables contribute to workplace accidents, safety behaviours have received little attention in occupational safety research, despite the fact that unsafe behaviours were attributed for almost all reported accident occurrences in the industries. This is likely due to the difficulty of comprehending the diversity and dynamic nature of human behaviour, and with so many different personality traits, determining which personality trait influences safety behaviour has been a difficult challenge. This study is to identifying the Relationship Between Work Safety Scale (WSS) with Safety Performance and Safety Behavior as Mediator: A Study at Sarawak's Plantation Industry. A total of 260 set questionnaires were provided to the study's sample, which included five independent Work Safety Scale variables: (a) job safety, (b) co-worker safety, (c) supervisor safety, (d) management safety and (e) satisfaction of safety programme and safety performance as the dependent variables. The conceptual framework was built based on the related literature review done (empirically and theoretically). Employees in the Sarawak' plantations industry were the target respondents, and a quantitative method based on availability sampling was used. This study used simple random sampling methods to collect data from oil palm plantations in Sarawak. For descriptive and inferential statistics analysis, the survey data was analysed using Statistical Package for Social Science (SPSS) version 23. The survey results were graded on a Likert scale, with "1" indicating strongly disagree and "5" indicating strongly agree. Factor analysis, correlation analysis, and multiple regression analysis were used to analyse the data using Partial Least Square (PLS) software. Finding from the study revealed that three components WSS were found to be positively related to safety behaviour; Job safety, management safety, and satisfaction of safety programme.

Furthermore, co-worker safety, supervisor safety, and satisfaction of safety programme were positively related to safety performance. However, job safety and management safety having a positive impact on safety performance in the present of the safety behaviour as a mediator's influence. Among all of the five facets, management safety contributes the most on safety behavior whereas co-worker safety contributes the most on safety performance.

Keywords: Job safety, co-worker safety, supervisor safety, management safety, satisfaction of safety programme.

Hubungan antara Skala Keselamatan Kerja (SKK) dengan Prestasi Keselamatan dan Tingkah Laku Keselamatan Sebagai Pengantara: Satu Kajian di Industri Perladangan Sarawak

ABSTRAK

Walaupun banyak pembolehubah menyumbang kepada kemalangan di tempat kerja, tingkah laku keselamatan kurang mendapat perhatian dalam penyelidikan keselamatan pekerjaan, walaupun pada hakikatnya tingkah laku tidak selamat dikaitkan dengan hampir semua kejadian kemalangan yang dilaporkan dalam industri. Ini berkemungkinan disebabkan oleh kesukaran untuk memahami kepelbagaian dan sifat dinamik tingkah laku manusia, dan dengan begitu banyak ciri personaliti yang berbeza, menentukan ciri personaliti yang mempengaruhi tingkah laku keselamatan telah menjadi satu cabaran yang sukar. Kajian ini adalah untuk mengenal pasti hubungan antara Skala Keselamatan Kerja (WSS) dengan prestasi keselamatan dan tingkah laku keselamatan sebagai pengantara: Kajian di industri perladangan Sarawak. Sebanyak 260 set soal selidik telah diberikan kepada sampel kajian, yang merangkumi lima pembolehubah Skala Keselamatan Kerja bebas: (a) keselamatan kerja, (b) keselamatan rakan sekerja, (c) keselamatan penyelia, (d) amalan keselamatan pengurusan dan (e) kepuasan program keselamatan dan prestasi keselamatan sebagai pembolehubah bersandar. Kerangka konsep dibina berdasarkan kajian literatur berkaitan yang dilakukan (secara empirikal dan teori). Pekerja dalam industri perladangan Sarawak adalah responden sasaran, dan kaedah kuantitatif berdasarkan persampelan ketersediaan telah digunakan. Kajian ini menggunakan kaedah persampelan rawak mudah untuk mengumpul data dari ladang kelapa sawit di Sarawak. Untuk analisis statistik deskriptif dan inferensi, data tinjauan dianalisis menggunakan Pakej Statistik untuk Sains Sosial (SPSS) versi 23. Keputusan

tinjauan telah digredkan pada skala Likert, dengan "1" menunjukkan sangat tidak setuju dan "5" menunjukkan sangat setuju. Analisis faktor, analisis korelasi, dan analisis regresi berganda digunakan untuk menganalisis data menggunakan perisian Partial Least Square (PLS). Hasil kajian menunjukkan bahawa tiga komponen WSS didapati mempunyai kaitan positif dengan tingkah laku keselamatan; Keselamatan kerja, keselamatan pengurusan, dan kepuasan program keselamatan. Tambahan pula, keselamatan rakan sekerja, keselamatan penyelia, dan kepuasan program keselamatan berkait positif dengan prestasi keselamatan. Walau bagaimanapun, keselamatan kerja dan keselamatan pengurusan mempunyai kesan positif terhadap prestasi keselamatan sekiranya terdapat tingkah laku keselamatan sebagai pengaruh pengantara. Di antara semua lima komponen, keselamatan pengurusan menyumbang paling banyak pada tingkah laku keselamatan manakala keselamatan rakan sekerja menyumbang paling banyak pada prestasi keselamatan.

Kata kunci: *Keselamatan kerja, keselamatan rakan sekerja, keselamatan penyelia, keselamatan pengurusan, kepuasan program keselamatan.*

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LIST OF ABBREVIATIONS

BBS	Behavior-Based Safety
CI	Continuous Improvement
CSB	Compliance Safety Behavior
CWXs	Co-Worker Exchanges
DOSH	Department of Occupational Safety and Health
ER	Emergency Room
GDP	Gross Domestic Products
HCWs	Health Care Workers
ICU	Intensive Care Unit
IM	Internal Medicine
LMXs	leadership-Member Exchanges
NISP	Nigeria Institute of Safety Professionals
NSC	National Safety Council
OSHMS	Occupational Safety and Health Management System
PA	Preventive Actions
POS	Perceived Organisational Support
PPE	Personal Protective Equipment
PSM	Process Safety Management

RSU	Respiratory Services Unit
SDQ	Safety Diagnosis Questionnaire
SMS	Safety Management System
SOCSSO	Social Security Organization
WSS	Work Safety Scale

CHAPTER 1

INTRODUCTION

1.1 Introduction

This study examines the Relationship Between Work Safety Scale (WSS) with Safety Performance and Safety Behavior as Mediator: A Study at Sarawak's Plantation Industry. The conducted research went into great detail about some key aspects of improving safety performance in the plantation industry, such as the background of the study regarding the safety behavior and performance, problem statements, research objectives, research hypotheses, conceptual framework, significance of study, definition of terms, and chapter summary. This chapter is significant because it will explain all of the major aspects of the study in detail.

1.2 Background of Study

Agriculture is a prominent industry in Malaysia. Agriculture has long been the economic backbone of Malaysia, producing agricultural products for domestic use while also earning foreign currency. Agriculture contributes to the country's gross domestic product (GDP). Individuals, particularly in rural locations, have numerous employment opportunities. In 2021, Malaysia's economy has gained the momentum by recording RM1,386.7 billion Gross Domestic Product (GDP), increased 3.1 per cent as compared to RM1,345.1 billion in 2020. Growth in agriculture sector decreased by 0.2 per cent in 2021 as compared to negative 2.4 per cent in the previous year. The decrease was caused by the commodity sub-sector especially oil palm which recorded a growth of negative 5.6 per cent

(2020: -3.6%). Even though the growth rate of oil palm showed a decline, it was the main contributor to the value added of agriculture sector with RM34.8 billion or 35.2 per cent (Ministry of Economy, Department of Statistic Malaysia, 2023).

Agriculture is vital to Malaysia's economy, and it will continue to create significant profits and positive foreign exchange for many years to come. Plantation workers are without a doubt the most vital assets to the company in order to keep it running. They can only contribute effectively to their employment if their company meets their physical and psychological needs (Rozhan, 2015). Several studies have examined the effectiveness of injury and illness prevention programmes in schools and workplaces (e.g., Alsop & LeCouteur, 1999; Bunn et al., 2001; Conference Board, 2003; Huang et al., 2009; Lewchuk et al., 1996; Smitha et al., 2001; Torp et al., 2000; Yassi, 1998). Such programmes are beneficial in altering workplace culture, reducing workers' compensation and other costs, improving morale and communication, enhancing image and reputation, and improving processes, commodities, and services, according to this study. Management commitment and leadership, effective employee participation, integration of health and safety into corporate strategy, and continuous programme review are all important aspects of strong programmes, according to the studies. They argue that programmes that lack these characteristics are useless (Shannon et al., 1996, 1997; Gallagher, 2001; Gallagher et al., 2003; Liu et al., 2008).

Agriculture, on the other hand, accounts for nearly a quarter of all occupational accidents. This worrying trend jeopardizes our rapidly growing economy and the government's efforts to make agriculture more dynamic and competitive. A plantation's

concession area often encompasses a large area of land and is located in a distant region. On the other hand, regularly shifting and dispersed work sites make supervision and control challenging, requiring workers and field supervisors to be self-sufficient (Rozhan, 2015).

Because the plantation sector has never been subjected to any regulatory regulations, there are still no safety and health promotion initiatives in place, resulting in a lack of safety knowledge among all the employees. The success of an occupational safety and health programme in a plantation depends on the plantation's management team taking the lead throughout the process. Many successful Malaysian businesses have demonstrated that strong safety management leads to higher plantation output (Abang Abdullah et al., 2005).

Accidents, with a few exceptions, do not occur at certain times or locations, but rather in widely dispersed locales and during all hours of the day and night. Only a few of these instances can be linked to specific logistical aspects or equipment failures. The failure of the "human element" of the person or persons involved, or literally "loss of control", accounts for the bulk of accident causes. There had been an alarming rise in the number and frequency of work-related fatal accidents, work-related injuries, and permanent impairments in the country over the years, inflicting tremendous agony and suffering not only to the victims and their families, but also to the bottom line of the company business (Fahlbruch, 2010).

The true number of work-related illnesses, deaths, and injuries, according to estimates from the Social Security Organization (SOCSO) and Workman Compensation, is more than three times the amount recorded. They had gambled with risk many times in their company's activities, and some had resulted in injuries and property damages, while others had resulted in near misses that, upon examination, could easily have ended in fatalities or catastrophic catastrophes. In the majority of these incidents, only the on-site supervisors were able to halt the series of events before it reached its conclusion. Safety measures, on the other hand, are most effective when those in control, such as plantation managers, are able to manage and lead the occupational safety and health in their plantations (Abang Abdullah et al., 2005).

The principal activity on a plantation is the cultivation of one of two types of crops. This includes planting, crop treatment, harvesting, soil preparation, cultivation, manuring, pruning, weeding, crop transportation to the mill, and produce storage. In these operations, a variety of instruments, machines, and agricultural chemicals are used. Where virgin ground is to be cultivated, clearing forest land by cutting trees, burning out undergrowth, and uprooting stumps, followed by ditch and irrigation channel digging, may be necessary. In addition to basic agricultural operations, other activities on a plantation may include rearing animals, processing crops, and maintaining and repairing buildings, plants, machinery, implements, roads, and tracks. Energy, drilling wells, maintaining irrigation ditches, running engineering or woodworking facilities, and transporting items to palm oil mills for processing may all be necessary. Because of the working environment, tools and equipment used, and the nature of the task, plantation work carries a number of risks (Hong, 2017).

Table 1.1: Occupational accident statistics by sector January to November 2022 (Reported to DOSH only)

SECTOR	NON PERMANENT DISABILITY	PERMANENT DISABILITY	DEATH	TOTAL
Hotel and Restaurant	118	1	0	119
Utilities (Electricity, Gas, Water and Sanitary Service)	178	2	9	189
Finance, Insurance, Real Estate and Business Services	345	4	24	373
Construction	87	2	59	148
Transport, Storage and Communication	234	4	10	248
Manufacturing	4273	183	58	4514
Wholesale and Retail Trade	114	3	2	119
Public Services and Statutory Authorities	74	3	0	77
Mining and Quarrying	27	2	8	37
Agriculture, Forestry and Fishery	856	23	16	895
TOTAL	6306	227	186	6719

Source: International Policy and Research Development Division

Inadequate use of sufficient PPE is to blame for many of the plantation accidents and illnesses. Many labourers, for example, may cut their feet or hands on palm fronds or spread manure without wearing gloves or shoes. PPE is usually available, and the organisation places a premium on enforcing its use. Despite the fact that most plantation companies have hired a full-time Health and Safety officer who is in charge of monitoring and auditing practises throughout the estates, developing training programmes for all employees, and developing action plans for continuous improvement, accidents can still occur. Every estate is required by the government to conduct internal safety audits on a regular basis in partnership with the Department of Occupational Safety and Health

(DOSH), in accordance with the current legislation. The plantations' safety goal is to continue minimising accidents and lost workdays while also ensuring that no further fatalities occur (Rozhan, 2015). According to the Department of Occupational Safety and Health (DOSH) Occupational Accident Statistics, Sarawak has the third percentage of mortality accidents among the states, accounting for 20 occurrences in 2022. Agriculture, forestry, logging, and fishing are the second-largest contributors to occupational accidents in Malaysia as shown in Table 1.1.

1.3 Problem Statements

In order to understand the current situation of occupational hazards in formulating new policies, control measurement, and welfare improvement, a number of studies have been conducted to identify occupational hazards in the palm oil industries (Shamsul, Manohar, Karmegam, Baba, Azmin & Shahrman, 2016). Nawi et al. (2016) reported that their research showed that oil palm plantation employees are exposed to the daily dangerous job duties, emphasising the ergonomic issues and risk of daily accidents. Employers, plantation workers, and society as a whole are the key groups impacted by occupational accidents. Although there are laws and guidelines that provide protection for reliability, safety and health such as OSHA 1994, OHSaS 18001 and MS 1772 (Hong, 2013), palm oil industry is relatively lacking behind in process safety as several catastrophic accidents occurred were believed caused by process failures (DOSH, 2017). Therefore, Process Safety Management in palm oil industry must be enhanced to a higher-level standard to minimize the risk of process related incident in the industry.

Many studies have shown that the incidents of work-related accidents are caused by non-compliance with workplace safety rules; this could be a compelling argument to maintain workplace safety compliance. Many companies had made it clear that they wanted to reduce workplace accidents and evaluate the effectiveness of such initiatives (McDonald & Hrymak, 2009). Despite the fact that their study focused on the construction industry's safety behaviours, the central factors in predicting organisational safety performance and individual safety behaviour are those related to procedure compliance, organisational climates and cultures, management system effectiveness, and risks facing attempts. Rather than the accidents, the choice of compliance was highlighted as a dependent variable. Individual, site, and external site elements were considered as factors that influence on-site safety behaviour and compliance, which are the true causes of accidents. Non-confirmation of procedures, according to McDonald et al. (2009), is a contributing factor in safety-related incidents and accidents in a variety of industries, despite the fact that procedures defining key rules and regulations are developed to ensure work is done both efficiently and safely. From a safety standpoint, they discovered that not all safety infractions are significant, and that rules violations can sometimes be efficient ways of functioning, as staff understand.

Evidently, between 5% and 15% of accidents are caused by intrinsic occupational dangers, with the remaining 85 percent to 95 percent being caused by what employers do or do not do (Enckhardt, 1998). It's also been stated that there's a strong link between safety and production, as well as cost and suffering (Williams, 2000).

According to previous study, three key elements can cause accidents, injuries, and fatalities: technology, systems, and human error (Vinodkumar & Bhasi, 2010). The technological perspective refers to onsite accidents that occur as a result of technology faults, such as mechanical defects, complex systems, design flaws, and a skill-to-technical understanding imbalance (Reiman & Rollenhagen, 2014). Due to insufficient safety measures, a lack of employee accountability, ineffective inspection and rectification, and limited requirements addressing the avoidance of fatalities, accidents, and injuries, system mistakes occur (Bellamy, 2010; Chen & Chen, 2014; Cooper & Phillips, 2004; Stricoff, 2000). Human mistake, according to the third viewpoint, is to blame for workplace accidents (e.g. Bottani, Monica, & Vignali, 2009; Cigularov et al., 2010; Enshassi et al., 2008; Fahlbruch, 2010; Gordon et al., 2005; Jiang et al., 2010; Mearns & Yule, 2009; Ryerson & Whitlock, 2005). Human error is frequently the result of time constraint, mental pressure, interruption, and overconfidence, according to a prior study by Yorio and Wachter (2014). Mishandling, insufficient communication, a lack of skills, and insufficient supervision are all examples of human error. It follows that if construction workers are supplied with adequate safety policies, rules, and procedures, as well as information about safety, human negligence and errors on construction sites can be reduced, and the number of accidents and fatalities can be reduced (Atkinson, 1999; Dong et al., 2012; Garrett & Teizer, 2009).

According to Wameedh, Faridahwati, and Chandrakantan (2011), safety performance is a very sensitive and difficult issue for the organisation to handle since it affects the lives of those participating in the project's success as well as the resources and people they use. The lack of focus on safety performance, safety procedure, and

advancements in accident and injury prevention techniques, however, is the reason why occupational accidents are on the rise. On the other side, occupational accidents are either brought on by a lack of knowledge, training, supervision, or the application of rules. A human error also results in negligence, worker carelessness, worker recklessness, and a lack of monitoring and managing. All of these elements either have an impact on safety performance or cause it to deteriorate, resulting in a high rate of accidents (Wameedh et al., 2011)

Human error, clearly, plays a substantial role in all near-accidents. For example, according to Fleming and Lardner (2002), "human behaviour is a contributory element in nearly 80% of accidents." According to Goetsch (2002), human factors are responsible for 88 percent of industrial accidents. Furthermore, Kumar, Gupta, Agarwal, and Singh (2016) claimed that human error plays a significant part in accidents and should be effectively addressed through risk and safety management.

Based on the foregoing debate, very little theoretical development and research has been done explicitly studying occupational safety and health in the plantation industry, which is growing increasingly relevant in comparison to other industries. Plantation safety is linked to activities such as pesticide management, contractor management, line site management, transportation safety, harvesting safety, and ergonomics in estate operations. However, major effects of safety infractions must be addressed by management in order to improve overall safety performance. As a result, the research will look into the impact of the five elements of Work Safety Scale (WSS): job safety, coworker safety, supervisor safety, management safety, and satisfaction of safety programmes towards the safety

performance and mediate by safety behavior. There have been several studies on safety compliance in the past, however this study will focus on the Sarawak plantation industry. The study will investigate the relationship of the five elements towards the safety behavior and performance. It will then provide management with a greater understanding of employee safety behaviour and performance, as well as to reduce the accident happen and improve the organization's safety performance.

1.4 Research Objectives

The objectives in this study were separated into two categories: general objectives and specific objectives, with descriptions of each following:

1.4.1 General Objective

The purpose of this study is to identify whether there is any relationship on WSS and the mediating effect of safety behaviour towards safety performance.

1.4.2 Specific Objectives

The specific objectives of the study aims to determine the relationship between five facets of Work Safety Scale (WSS) towards safety performance and safety behaviour. This study also to identify the mediating effect of safety behavior towards safety performance. The study also aims to examine the Safety behavior mediates five facets of WSS towards safety performance. The specific objectives of the study are as follows:-

- (i) To determine the relationship of Job safety towards safety performance.
- (ii) To determine the relationship of Co-worker safety towards safety performance.

- (iii) To determine the relationship of Supervisor safety towards safety performance.
- (iv) To determine the relationship of Management safety towards safety performance.
- (v) To determine the relationship of Satisfaction of safety programme towards safety performance.
- (vi) To determine the relationship of Job safety towards safety behavior.
- (vii) To determine the relationship of Co-worker safety towards safety behavior.
- (viii) To determine the relationship of Supervisor safety towards safety behavior.
- (ix) To determine the relationship of Management safety towards safety behavior.
- (x) To determine the relationship of Satisfaction of safety programme towards safety behavior.
- (xi) To determine the relationship of Safety behavior towards compliance with safety work.
- (xii) To determine the relationship of Safety behavior towards using PPE as prescribed
- (xiii) To determine the relationship of Safety behavior towards increased awareness of hazards
- (xiv) To determine the relationship of Safety behavior towards executing emergency procedures
- (xv) To determine the relationship of Safety behavior mediates the relationship between job safety and safety performance

- (xvi) To determine the relationship of Safety behavior mediates the relationship between co-worker safety and safety performance
- (xvii) To determine the relationship of Safety behavior mediates the relationship between supervisor safety and safety performance
- (xviii) To determine the relationship of Safety behavior mediates the relationship between management safety and safety performance
- (xix) To determine the relationship of Safety behavior mediates the relationship between satisfaction of safety programmes and safety performance
- (xx) To determine which of the five safety facets that contributes the most on safety behavior
- (xxi) To determine which of the five safety facets that contributes the most on safety performance

1.5 Research Hypothesis

Discussion on how all related research hypotheses derived for this study will be discussed at Chapter 2; Literature Review. In this section, the researcher hypothesizes that the formulated hypotheses have a direct relationship between independent variables and dependent variables as highlighted in the proposed theoretical framework (Figure 1.1). Moreover, the researcher also predicts that safety behaviour has positive impact on safety performance, and mediates the relationship between job safety, co-worker safety, supervisor safety, management safety, and satisfaction of safety programme and safety performance. This study intends to examine the relationship between:-

Ha1: Job safety is positively related to safety performance.

Ha2: Co-worker safety is positively related to safety performance.

Ha3: Supervisor safety is positively related to safety performance.

- Ha4: Management safety is positively related to safety performance.
- Ha5: Satisfaction of safety programme is positively related to safety performance.
- Ha6: Job safety is positively related to safety behavior.
- Ha7: Co-worker safety is positively related to safety behavior.
- Ha8: Supervisor safety is positively related to safety behavior.
- Ha9: Management safety is positively related to safety behavior.
- Ha10: Satisfaction of safety programme is positively related to safety behavior.
- Ha11: Safety behavior is positively related to compliance with safety work.
- Ha12: Safety behavior is positively related to using PPE as prescribed
- Ha13: Safety behavior is positively related to increased awareness of hazards
- Ha14: Safety behavior is positively related to executing emergency procedures
- Ha15: Safety behavior mediates the relationship between job safety and safety performance
- Ha16: Safety behavior mediates the relationship between co-worker safety and safety performance
- Ha17: Safety behavior mediates the relationship between supervisor safety and safety performance
- Ha18: Safety behavior mediates the relationship between management safety and safety performance
- Ha19: Safety behavior mediates the relationship between satisfaction of safety programmes and safety performance

This study also intends to address the following research questions:

- 1) Which of the five safety facets that contributes the most on safety behavior?
- 2) Which of the five safety facets that contributes the most on safety performance?

1.6 Conceptual Framework

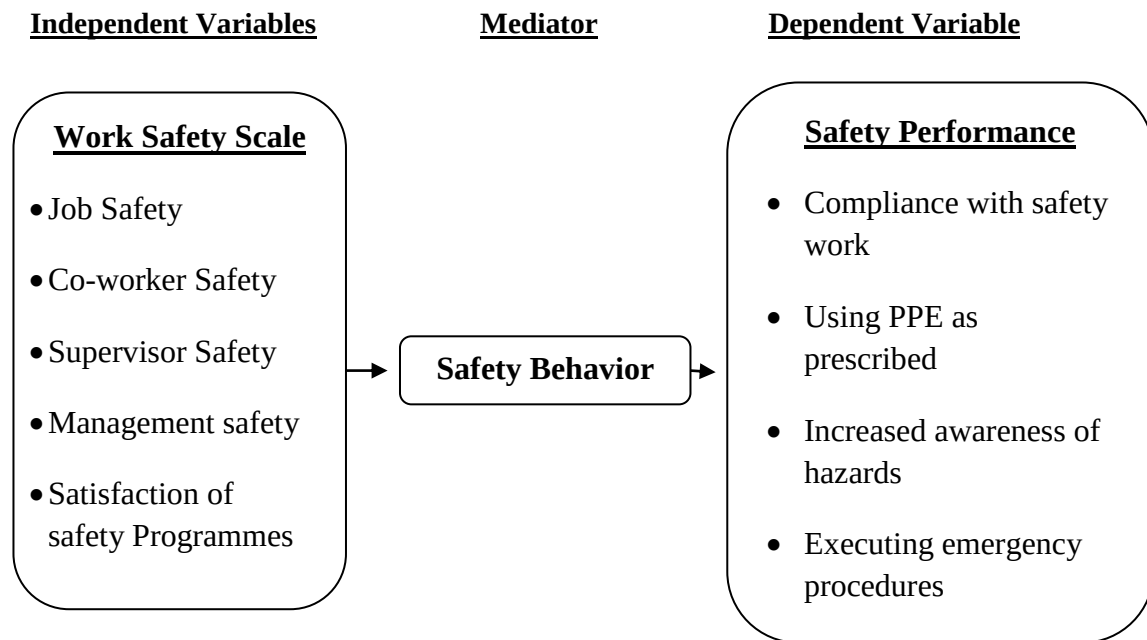


Figure 1.1: Detailed Elements of Theoretical Framework

The theoretical framework is the foundation on which the entire research project is based. It is based on the related literature review done (empirically and theoretically). This study was conducted to investigate the influence of WSS towards the safety performance and safety behaviour as a mediating variable. It identifies relationship among the components of the WSS to improve the safety behaviour and performance. The framework of this study consists of five independent variables of WSS which are job safety, co-worker safety, supervisory safety, management safety, and satisfaction of safety programmes. All those independent variables will be examined towards the safety performance being the determinants (dependant variable) and influence by safety behaviour (i.e. employees engagement, management behaviour, safety behaviour modification, punishment, disciplinary actions, sympathy, disregards & etc) as a mediating variable.

1.7 Significance of the Study

1.7.1 Body of knowledge

According to research on work safety measures and perceptions of work safety (Guastello & Guastello, 1988; Sandman, 1992; Smith et al., 1992; Smith et al., 1987; Zohar, 1980) and research on several areas of workplace safety, such as the effectiveness of safety programmes, indicators of safety compliance behaviours, and safety management; (Brauer, 1990; Cleveland, Cohen, Smith, & Cohen, 1979; Dedobbeleer & German, 1987; Murphy et al., 1993; National Safety Council [NSC], 1967; Niskanen, 1994; Petersen, 1975, 1978). For this study, a five-facetted measure of workplace safety was suggested. Job safety, coworker safety, supervisor safety, management safety, and satisfaction with the safety programme were the five subject domains that the WSS evaluated. The study adopted a five-facet approach to safety evaluation since there is evidence that the work safety rubric encompasses a variety of distinct criteria (Cleveland et al., 1979), a few examples are the management's dedication to safety, the calibre of the training provided, and the conduct of both employees with regards to safety (Guastello, 1992) and supervisors.

The findings of this study will aid in identifying the five factors that could lead to an accident, injury, or death at plantation site which mediating by safety behavior among people in the plantation industry. Furthermore, the findings of this study provide proactive information about worker safety issues in the plantation industry before they become events that need to be investigated by management for the establishment of safety programmes such as training, awareness workshops, and so on. The findings and conclusions of this study will provide valuable information about safety behaviour and performance in this industry and will serve as a reference and benchmark for future safety

programme development and improvement in order to become more efficient by reducing unwanted incident, accident, and fatality. The study's findings provide important references and data for future scholars looking into safety behaviour and performance. In reality, comparable research might be undertaken in numerous industries to improve the study's stability and reliability.

1.7.2 Policy Development

Furthermore, the findings of this study may help our government persuade workers to stay in the plantation industry by identifying the safety issue among plantation workers and developing a solution or prevention method for all of the influencing factors that could lead to an accident, injuries, or death. This is to ensure the safety, health, and welfare of plantation employees. Plantation sectors will continue to advance as a result, and Malaysia's economy will expand indirectly as a result.

The study's major goal is to identify the factors that are linked to accidents caused by poor safety practises in the plantation industry. The findings may aid the industry in reducing workplace accidents so that employees may perform better, minimise absenteeism, and improve employee health. Besides, the study's findings will add to the existing literature on safety behaviour concerns and put it as safety and health policies.

Organizational occupational safety has evolved over time, resulting in regulations, standards, and codes of practise that govern procedures, machinery, processes, and even physical handling techniques. Even the safest workplace with the most up-to-date safety rules will have safety accidents if people's behaviours and behaviour are inappropriate (i.e.

be they reckless, awkward, ignorant or simply untrained about what is expected of them). A large number of accidents can be traced back to dangerous behaviour that occurred just before the event.

The assumption that people's behaviour at work can be altered to embrace safer behaviour has dominated approaches to workplace safety since the 1970s, and with good reason. It's tempting to think of the approach as the norm now that it's so widespread and popular, but it's a relatively new one that's based on more than just common sense. Typical behavioural safety systems programmes include:

- i. trained observers identifying behaviours that may or may not have contributed to accidents, which are then agreed upon by management and staff.
- ii. A continuous observation and data gathering system that enables peer-to-peer interventions to improve detected behaviours and identify corrective actions.
- iii. Reinforcement of such behaviours based on constructive feedback based on observations of behaviours by trained observers.

1.7.3 Practitioners

The standard strategy currently is to encourage individuals to behave properly through frequent training and feedback, which, when done effectively, may make a significant contribution to workplace safety. Success in creating such desired behaviours, like with other organisational projects, has been proven to be dependent on genuine commitment from the top, with organisations that demonstrated a serious commitment from leadership faring well. The behavioural method is based on three principles:

- i. That people's actions can be tracked.

- ii. That they are a function of their outcomes, and that behaviours are reinforced by the outcomes they produce (i.e. take a habitual short cut in the procedure).
- iii. Re-enforcement and feedback can be used to change behaviour.

In practise, this involves preventing risk-taking behaviour by cultivating a culture of safety by publicly acknowledging desired behaviour and remarking on risk-taking behaviour whenever it occurs. There is still a distinction between getting people to acknowledge or agree on the importance of workplace safety and getting them to act and behave consistently in that regard. The linkages between attitudes, behaviours, and consequences are at the heart of Behavioural Based Safety Programs. Consider the idea that what people think has an effect on what they do and how they act. While a link between attitudes and behaviours may appear to be totally natural, the far stronger link is, maybe shockingly, the other way around. Attitude is significantly more likely to be determined by and reinforced by behaviour than the other way around. As a result, if people intentionally change their behaviours, their attitudes are likely to change as well, which will have a longer-term impact on their future behaviour. Changing people's attitudes via changing their behaviours, according to this strategy, is more likely to result in changes in how they behave than changing their attitudes alone, which is likely to result in fewer workplace mishaps.

In other words, the organization's setting or culture will have a significant impact on its safety record by reinforcing safety-conscious behaviours. A lower total incidence rate will not be achieved by focusing on machinery or constantly re-designing processes. Placing a guard on a piece of machinery, for example, will not ensure its safe operation

unless the operator has a thorough understanding of the machine's purpose, how it operates, how the machine guard works, and how accidents could occur if the machine guard is missing. Finally, awareness is achieved by training, site leadership's unwavering commitment, and ongoing behaviour monitoring "What gets measured gets managed," as the saying goes, will ensure that safety results continue to improve.

Due to the prevalence of the behavioural approach and its tendency to focus unduly on human error and, as a result, disregard defects in process design, more recent thinking and literature in the domain of organisational safety has cautioned of a potential scapegoating of frontline personnel. Trevor Kletz in *Learning from Accidents* (2001) writes that "Managers and designers, it seems, are either not human or do not make errors". The investigating managers typically want to know the name of the individual (the usual suspect) whom 'they are not accusing,' as is common in a so-called 'no-blame' safety culture.

Inadequately conceived engineering processes or safety systems will not be compensated by improved behaviour. Both approaches are complementary in that they combine engineering and human behaviour to create a safer work environment. As with so many management difficulties, all elements must be considered, and safety protocols will not be sufficient to ensure safe outcomes. Employees' hearts and minds must also be 'engaged' to ensure that safe behaviours result in safe processes that prevent both minor and major workplace disasters.

For both economic and human reasons, businesses are scrambling to develop ways to decrease workplace accidents. Some of them may have put in place effective safety procedures but failed to reduce accidents, while others may have put in place successful safety programmes but want to improve even more. This research will assist organisations in learning more about safety behaviour and performance, as well as how it might help to prevent workplace mishaps. This is critical since the only way to achieve the organization's safety goals is to improve safety behaviour and performance.

Given the importance of workplace safety, this research was carried out to determine the determinants of dominating elements and suggestions for the five facets of the WSS and safety performance. This allows employers to gain a better knowledge of the importance of safety performance as well as employee attitudes toward workplace safety standards. As a result, employers will be able to develop solutions that may be used to prevent future accidents.

1.8 Definition of Terms

Definitions that describe concepts by using other concepts are conceptual definitions. Conceptual definitions of research may come from various source of literature review whether from the text book, journals article, authentic document, and various modes of academic presentation. This definition represents the theoretical understanding of that specific term or key word. On the other hand, operational definition is a set of procedures that describe the activities to be performed to establish empirically the existence or degree of existence of what is described by a concept. Operational definition refers to the specific definition used by the researcher in their research. It may come from

any specific literature review or from combinations of all the resources. It is also possible, if the operational definitions come from the researcher's understanding or point of view.

1.8.1 Work Safety Scale

The conceptual definition

Work safety Scale (WSS) measures five factorially distinct constructs which are job safety, coworker safety, supervisor safety, management safety, and satisfaction of safety program (Hayes, Perander, Smecko & Trask, 1998).

The operational definition

In this study, 5 facets of Work Safety Scale which are the major factors to measure the safety performance.

1.8.2 Job Safety

The conceptual definition

Job safety refers to the nature of the job or the environment in which employees are protected against unwelcome incidents or accidents while on the job (Hayes et al., 1998).

Job safety refers to the type of work or working conditions that prevent employees from becoming injured or catching diseases while on the job (Vance, 2006). Job safety refers to the nature of a job's safety that protects workers from events or accidents while performing their duties (Vinodkumar et al., 2010).

The operational definition

Job safety in this study relates to the state of one's workplace environment, such as whether it is dangerous, hazardous, risky, safe or unsafe, or healthy.

1.8.3 Co-worker Safety

The conceptual definition

Co-worker safety refers to workers' care for one another's safety while on the job (Hayes et al., 1998). Coworker safety refers to how coworkers perceive each other's safety behaviour as well as the level of concern they show for each other's safety while on the job (Vance, 2006). When executing a task, workers were concerned about their coworkers' safety. The greatest description for supervisor safety is a well-monitored safety through supervision (Vinodkumar et al., 2010).

The operational definition

In this study, coworker safety refers to an employee's impression of their coworkers' or peers' safety habits on the job.

1.8.4 Supervisor Safety

The conceptual definition

Having a proper and well-monitored system at work can explain supervisor safety (Hayes et al., 1998). Supervisory safety refers to a supervisor's responsibility to ensure that their subordinates are sufficiently safeguarded against occupational dangers (Vance, 2006). Subordinates' perceptions of their supervisor's or immediate leader's or manager's safety behaviours are based on the fact that he or she generally gives them commands and has direct influence over their daily tasks (Vinodkumar et al., 2010).

The operational definition

Supervisor safety is defined in this study as subordinates' perceptions of their supervisor's or immediate manager's safety practises when he or she gives them orders and has direct influence over their daily operations.

1.8.5 Management Safety

The conceptual definition

Management safety is a concept that encompasses all of management's efforts and actions to ensure that safety measures are prioritised at work (Hayes et al., 1998). Management safety is defined as the process of developing a safety programme, policies, plans, and procedures via effective management (Vance, 2006). The application of an organization's management policies, plans, processes, and activities is known as management safety (Vinodkumar et al., 2010).

The operational definition

Management safety practises are defined in this study as any management's safety concern, awareness of safety, safety inspection/provision of safety requirements, and the manner in which management promotes safety.

1.8.6 Satisfaction of Safety Programmes

The conceptual definition

Workers' opinions on the safety programmes or policies implemented by management in a company are referred to as satisfaction with safety programmes (Hayes et al., 1998). When commencing on risk prevention, the level of satisfaction with the use of tools to increase

worker skill and attitude (Robson et al., 2012). Every effective accident prevention and safety health programme relies on participant satisfaction with safety programmes (Vinodkumar & et al., 2010)

The operational definition

The satisfaction with safety programmes is defined in this study as the workers' satisfaction with the safety programmes or safety training provided to them throughout their occupation.

1.8.7 Safety Behavior

The conceptual definition

The terms "safety compliance" and "safety participation" are used to describe how people behave when it comes to safety behaviour. Safety compliance refers to the basic tasks that employees must perform in order to keep the workplace safe, whereas safety participation refers to actions that do not directly contribute to an employee's personal safety but do help to create a safe atmosphere (Neal & Griffin, 2006). Safety compliance explains the core activities that must be carried out by employees in accordance with occupational, safety, and health requirements to prevent workplace accidents. Safety behaviour describes the behaviour that supports safety practises and activities such as providing safety training (Mahmood, 2010). The terms "safety compliance" and "safety participation" are used to describe how people behave when it comes to safety. Safety compliance is a state of adhering to an organization's rules and regulations, which must be followed by personnel to ensure workplace safety. Safety participation may aid in the support of environmental safety programmes, but it does not always contribute directly to personal safety (Neal et al., 2006). Safety behaviour as a technique of determining the attitude and perception toward

health and safety issues through measuring (Oyle, 1996). Individual perceptions of the values of safety in the workplace are described by safety behaviour as a mediating variable between organisational climate and safety performance (Flin et al., 2000). Safety behaviour describes an employee's safety attitudes and perceptions at a certain point in time in order to discover system flaws and chances for improvement (Findley et al., 2007).

The operational definition

Employees' behavior towards organisation safety rules and regulations, as well as voluntary engagement in safety practices and activities are measured in this study.

1.8.8 Safety Performance

The conceptual definition

Complying with safety work practises, wearing protective equipment as directed, displaying heightened awareness of dangers by reporting dangerous circumstances to encourage corrective action, and executing emergency procedures if such events occur are all examples of safety performance (Cohen & Colligan, 1998). A self-reported rate of accident and occupational injuries can be used to describe safety performance (Siu et al, 2004). Employee safety control and self-reported occupational injury are used to define safety performance (Huang et al., 2006). A company's safety performance is described as an effort made with the ultimate goal of reducing workplace accidents and injuries in order to save money. It refers to how an organisation makes the best use of its limited resources in order to achieve the company's safety objectives (He et al., 2012).

The operational definition

In this study, safety performance is related to safety outcomes and the achievement level of the organization safety objectives.

1.9 Scope of the Study

This study is to expound on the Relationship Between Work Safety Scale (WSS) with Safety Performance and Safety Behavior as Mediator: A Study at Sarawak's Plantation Industry. The five Work Safety Scale (WSS) of this study are job safety, co-worker safety, supervisory safety, management safety, and satisfaction of safety programmes. All these Work Safety Scale will be examined towards the safety performance being the determinants (dependant variable) and influence by safety behaviour as a mediating variable. The quantitative methodology is regard as the main research methodology by using questionnaire survey, while the two open ended questions act as supplement methodology to support the quantitative results.

The population of this research was all the plantations in the state of Sarawak. The sample target of this research was the local non-executive local workers from 30 plantations which more than three thousand hectares out of 365 oil palm plantations in Sarawak. The executive local workers and foreign workers are excluded from this study. The executive local employees normally not direct deal with workplace safety issues and they involved more on supervision and management of workplace. The foreign workers are excluded from this study because they are low educated level and they normally don't know how to read and write. Besides, the researcher only selected those service more than

one year to participate in this study because they are more knowledgeable about the company culture.

1.10 Chapter Summary

In conclusion, this chapter might be considered the research's central beginning point. The background to the topic of safety behaviour and performance was discussed at the beginning of the chapter. The study's background was based on many findings and studies. Then came the problem statement, which was similar to the situation that had occurred in the Sarawak plantation industry. The research objectives, as well as the general and specific objectives, are included in the research process. This chapter also contains the study's hypothesis and significance level. Finally, all significant factors will be summarised in the theoretical framework, which will also include all important term definitions.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

A literature review is a step-by-step process that involves finding published and unpublished work on the topic of interest from secondary data sources, evaluating it in relevance to the problem, and documenting it (Sekaran & Bougie, 2010). A literature review identifies and highlights essential variables, as well as documents major findings from previous research, which will serve as the foundation for the current study's theoretical framework (Sekaran & Bougie, 2010). This literature review looked at the five aspects of WSS that have an impact on enhancing safety behaviour and performance, as well as a few more empirical researches relevant to the topic. It gives readers a general idea of the relationship between job safety, coworker safety, supervisor safety, management safety, and satisfaction of safety programmes, as well as the mediating effect of safety behaviour on safety performance. Each component of the work safety scale is interconnected and can influence employee safety behaviour and performance.

2.2 Work Safety Scale

The WSS, a workplace safety tool, was developed and validated through a number of planned research. Based on studies and reviews on various aspects of work safety (including quality of safety programmes, predictors of safety compliance behaviours, and safety management; Brauer, 1990; Cleveland et al., 1979; Dedobbeleer & German, 1987; Murphy et al., 1993; National Safety Council, 1993; National Safety Council, 1993;

validated the WSS, a 50-item measure that assesses employees' perceptions of workplace safety, using three independent samples (1998). This WSS assesses five distinct factual constructs: job safety, coworker safety, supervisor safety, management safety, and satisfaction of safety programme.

Across the three samples, each of these scales displays a high level of internal consistency. The best predictors of job satisfaction were supervisory and managerial safety procedures. Furthermore, supervisory and managerial safety measures were shown to be highly linked with reported accident rates, corroborating earlier studies. Employee compliance with safety behaviours was substantially associated to coworker and supervisor safety. Each predictor of WSS on safety performance will be briefly examined in the following review.

2.2.1 Job Safety

Individual achievement in developing a safety culture is impossible (Langford et al., 2000). In order to prevent accidents, management should be held accountable for promoting a safety culture and creating an environment where employees can understand and accept norms and roles. As a result, top management must delegate safety responsibilities to lower levels of the business (Aksorn & Hadikusumo, 2008). Cooperation between workers and the safety system coordination process is essential for creating a safer work environment (Langford et al., 2000). Construction sites where workers actively engage with one another and regularly offer suggestions to one another report fewer accidents and less worker dissatisfaction (Olcott, 1997; Siu et al., 2004).

It is vital for businesses to learn from workplace health and safety issues. Such occurrences garner a lot of attention in the media and are harmful to both people and the organisations in which they work. By looking back at what happened and identifying lessons gained, as well as projecting likely future issues, learning from incidents can help avert future safety crises (Bond, 2002). Rather than a single event, incidents are frequently the outcome of a series of failures (Sepeda, 2006). They are usually preceded by precursors like near misses and minor events. Large incidents frequently occur as a result of failure to detect and learn from these early indications (Heinrich, 1959). Surprisingly, as people become more aware of safety issues and take steps to improve their safety, there are fewer opportunities for direct experience learning within enterprises (Rose, 2004; Kolb, 1984). In addition, learning from incidents should entail planning for different and unforeseen incidents. As a result, there is a pressing need to implement broader learning methodologies that ensure relevant knowledge is shared across businesses and industries (Rose, 2004; Kolb, 1984).

A study was conducted in 1980 to characterise a specific sort of organisational climate and to investigate the effects (Zohar, 1980). This study consists of a series of questionnaires based on the following dimensions: (a) perceived management's attitude toward safety, (b) perceived effects of safe conduct on promotion, (c) perceived effects of safe conduct on social status, (d) perceived organisational status of safety officer, (e) perceived importance and effectiveness of safety training, (f) perceived risk level at work, and (g) perceived effectiveness of enforcement versus guidance in promoting safety. A 40-item questionnaire was created utilising a five-likert scale based on the dimensions. The scale ranges from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was

subsequently given to workers from four different production categories who were chosen at random from five different factories. Metal fabrication, food processing, chemical industry, and textile industry were the four categories. From the literature on organisational climate and safety procedures, two hypotheses were developed. The results that supported the first hypothesis showed that chemical facilities have the safest climate scores, followed by metal processing, textile industries, and food processing plants. The most influential component in influencing safety climate levels was perceived relevance of safety to occupational behaviour. The perceived management attitude toward safety was the second most influential factor. The second hypothesis can be supported by these two extremely influential dimensions. Workers have their own opinions about the safety aspects of their workplace, as a conclusion to fit in this subtopic of job safety.

A study on cause attribution of Ghanaian industrial workers for accident occurrences was undertaken on 320 respondents (Gyekye & Salminen, 2004) with the cooperation of their supervisors a few years after the establishment of WSS. The study used two methodologies: an interview and a questionnaire distribution. To protect respondents' privacy, each interview was performed individually and lasted 15 to 20 minutes, depending on the environment and educational background of the respondents. The questionnaire consisted of 30-items on respondents' attributions for accident cause by dispositional features of accident victims (internal factors) or situational and environmental circumstances on a 5-point likert scale ranging from 1 (very little) to 5 (very much). External factors yielded an alpha of 0.89, whereas internal factors yielded an alpha of 0.79. ANOVA, t-test value, and item-by-item comparison were the three types of statistical analyses used. To confirm differences in statistical significance on the external and internal

variables scale, a one-way ANOVA was utilised. On the internal and external causal factors scale, the T-test value was used to see if there were any statistically significant differences between the victims' and Supervisors' causation attributions. On the external and internal causal scales, the final component of the measures involved item-by-item comparisons between victims' and supervisors' cause attributions. According to the ANOVA results, common workers attributed accident aetiology to external sources more than to internal factors. In the comparison analysis, it was observed that worker and supervisor attributions appeared to be in the middle. Furthermore, compared to their supervisors, the victim's (worker) responsibilities for accident occurrences were lower. The item-by-item comparison resulted in a two-factor causal scale. According to the findings of the study, workplace accidents are caused by human error and environmental variables, with human factors serving as the primary antecedent to the accident process.

In the next study, the content and qualities of a work, as well as occupational safety, were compared at various levels of automation (Mattila & Kivinitty, 1993). The research was carried out in two machine shops. The first company, A, makes process automation equipment, whereas the second, B, makes crushing machines. The Safety Diagnosis Questionnaire (SDQ) is a tool for describing demands for safety behaviour in a systematic and exact manner. It has 256 questions divided into seven sections: organisation, work environment, dangers and exposures, information processing, executing work tasks, cooperation and communication, and working in dangerous situations. The rating item was created using a five-point likert scale and observations. Other information on the safety implications of various vocations was gleaned from occupational safety analysis. This knowledge is essential in identifying any job-related hazards in various work

circumstances. The findings revealed that safety equipment were the most essential safety elements, with work environment features coming in second. Presentation of information, informing, communication, cooperation, conflicts, and disturbances were the other essential safety characteristics listed. Other findings revealed that better working conditions boost the ability to compete for highly trained young professionals with other industries. Accidents investigated in this study demonstrated the proof difficulty that the operator was unable to forecast the machine's current state. The most important finding of this study is that using a modern oriented machine rather than manually driven machinery improved job safety. Another significant finding of this study was that safety engineering knowledge, as well as proper handling of the safety system, becomes increasingly vital.

A local study on Occupational Safety and Health Management System (OSHMS) guideline compliance across medical laboratories in the Klang Valley was undertaken in terms of job technical components (Anuar et al., 2008). The goal of this study was to determine how well medical laboratories in Malaysia followed national occupational safety and health management system requirements. What's remarkable about this study is that it includes an in-depth assessment of occupational safety and health metrics in work management elements like policy, organising, planning, and implementation, as well as evaluation and improvement action. It was conducted on 17 governmental medical laboratories and 17 commercial medical laboratories in the Klang Valley, with seven executives, 52 managers, and 53 supervisors chosen as samples. According to OSHMS-ILO 2001, each sample was given a self-administered OSHMS checklist based on MS 1722:2003. This survey has five sections, 16 measurements, and 225 indicators to assess the level of compliance in medical laboratories with national OSHMS recommendations.

Items were categorised with "compliance" and "non-compliance" for each element in the OSHMS checklist. Respondents were asked to answer open-ended questions about laboratory staff compliance with each factor. The internal reliability of OSHMS compliance received a score of 0.9943. The significant value mean score of commercial and public medical laboratories was found to be 0.05. The significant difference score was 0.01 when comparing medical laboratories that were accredited and non-certified with MS ISO 15189. As a result, there was no discernible difference between laboratories that were ISO 9000 certified and those that were not. In comparison to non-accredited medical laboratories, the five OSHMS elements of policy, organising, planning, and implementation, evaluation, and action for improvement received good marks. According to the findings, becoming recognised or qualified under either of the ISO programmes may have an impact on laboratory personnel' personal awareness.

2.2.2 Co-worker Safety

The ability to be both sensitive and responsive to change has become crucial in the unstable circumstances that today's enterprises are confronting. The work context in which change behaviour occurs is one aspect that can help an organization's capacity for change (Broadbent, 2004). Employee activities, including change-related behaviour, are shaped by organisational climate (Litwin, Stringer, 1968). Employee climate perceptions, or psychological climate (James & Jones, 1974), should play an important part in the change process, according to a conceptual change process framework (Porrás & Robertson, 1992), which states that employee cognitions mediate in work setting elements and change behaviour. As a result, how employees' perceptions of organisational change atmosphere are shaped is a critical problem. For the formation and comprehension of safety culture, it

is necessary to have knowledge of workers' risk perceptions and attitudes toward safety (Williams et al., 2000). The safety culture, on the other hand, appears to have a major impact on risk behaviour (Rundmo et al., 1997). In this regard, Vries et al. (2000) discovered that workers with more obvious risk behaviour have a lower benefit perception, less social support, and, most importantly, higher barriers to compliance behaviours in a study conducted in occupational settings. These impediments are often related to how businesses approach and deal with workplace safety, or, in other words, their safety culture.

Socialization is one component that may play a role in shaping individual safety behaviour at work. This component was investigated in a study to see what factors influence individual safety behaviour at work (Mullen, 2004). Organizational factors, performance over safety, socialisation influences, safety attitudes, perceived hazards, and image saving were the independent variables sorted. Individual work safety behaviour, on the other hand, is the dependent variable. Silverman (2001) used a purposive sampling strategy to pick all seven respondents in this study so that they would give good responses during the interview sessions. The interview questions were created with the goal of establishing a complete framework for comprehending organisational elements that influence individual workplace safety behaviour. The interview conduct guidelines were adapted from McCracken's (1988) by allowing respondents to tell their own narrative in their own words, in an unobtrusive and non-directive manner. The questions were presented in a semi-structured fashion, with each session lasting around an hour. The interview instructions were created for three main reasons: (1) to guarantee that all questions are asked; (2) to ensure that the scope and direction of the study are consistent with the study's goal; and (3) to provide probes for more information. According to Glaser

and Strauss (1967), the results of the interviews were based on a grounded theory approach. In an orderly and methodical approach, the theory aids in classifying the data and identifying events that occurred throughout the interview to a specific common theme. Later, using Corbin and Strauss (1990) current grounded theory methodologies, all of the similar aspects were organised into separate themes. The findings demonstrated that a number of organisational and societal factors contributed to people engaging in risky work behaviours. For organisational factors, all of these aspects were grouped into common themes such as role over, performance over safety, socialisation influences, safety attitudes, and perceived risks. In terms of social factors classification, this component consists of image preservation and avoiding undesirable repercussions such as coworker mocking and the fear of losing a good job. Both aspects were generated by workers' socializations with their closest acquaintances for peers and coworkers, which then influenced their workplace safety behaviour.

A study of the links between leadership-member exchanges (LMXs) and coworker exchanges (CWXs) was done in 2002 (Sherony & Green, 2002). Initially, 110 people were chosen as respondents for this study, however the researchers were only able to collect 67 useable surveys back. The survey's five components make up the measures. According to Graen and Uhl-Bien (1995), leadership-member exchanges (LMXs) were determined using a seven-item likert scale on trust, respect, and obligation. This part also includes a question about a worker's "working relationship" with their boss, which ranges from 1 (worst) to 5 (best) (One of the best). This variable yielded a high level of internal consistency: $\alpha=0.93$. The alpha score for coworker exchanges was 0.92, based on the respondent's estimate of his or her relationship with a coworker. Kunin (1955) used a one-item Faces Scale with an

alpha score of 0.90 to measure job happiness. Concerning organisational commitment, three questions were adapted from Mowday, Steers, and Poners (1979) and related to willingness to extend effort for organisational success, personal and organisational values similarity, and concern about the organization's fate. The score for dependability was 0.82. To test hypotheses regarding firm tenure and employee reposed to his/her boss, control variables were also included. The study's first conclusion was that different forms of exchanges existed, such as leadership-member interactions and coworker exchanges, but that these may impact one other. To be more explicit, when both had high-quality LMK relationships with their supervisor or vice versa, they had a high-quality CWX relationship with each other. It indicates that leaders must try to improve positive coworker relationships because they can effect organisational commitment as well as team development, group functioning, and cohesiveness. If he fails, he will create subgroup polarisation, which will make it difficult to manage friction among coworkers and undermine organisational commitment. Another research suggests that coworker interactions have an impact on work attitudes. Higher variety in coworker exchange connections was found to have a detrimental impact on organisational commitment. Job satisfaction, on the other hand, was unrelated to relationship quality variety.

In 2008, the 'Guru' of this topic conducted an advance study on safety climate antecedents in relation to transformational leadership and group networking interaction analysis (Zohar, 2008). The study's main goal was to investigate the long-assumed impacts of leadership and group interaction on climate strength. For this study, 1,328 army soldiers were hired as responders. The research team distributed questionnaires during on-site group meetings, with the topics of interest being safety climate, transformational

leadership, and social network. The communications and friendship networks were measured in the social network area. Friendship network respondents were asked to mark the appropriate names in the table below questions with an X, while communications network respondents were requested to use a five-point likert scale ranging from 1 (very little) to 5 (a great deal). Wasserman and Faust (1994) were the authors of this approach. Because military tasks necessitated cooperation, social network density was assessed using a dichotomization approach. The density coefficient was then recalculated using Ucinet software for Windows, as recommended by Borgatti, Everett, and Freeman (2002), and the parameter result was computed. The data was processed using Freeman's (1979) degree-based centralization index for social network centralization. According to Zohar and Luna (2004), the safety climate was assessed using a six-item scale that was linked to a wider questionnaire for troops for procedural safety application across scenarios. This section also includes a five-point likert scale to assess the time-consuming nature of social networks between safety climate and leadership, with a scale ranging from 1 (completely agree) to 5 (completely disagree) (Completely Disagree). For this variable, the Cronbach's alpha is 0.73. The last dimension, transformational leadership, was assessed using a ten-point scale adapted from Bass and Avolio's (1997) Multifactor Leadership Questionnaire (MLQ). This variable had a several subscales with a five-point rating scale ranging from 5 (Completely Agree) to 1 (Strongly Disagree) (Completely disagree). The main findings of this study were that the density of the communication network arbitrates the effect of transformational leadership on safety-climate strength. Other minor findings worth mentioning here are that leaders must be aware of everyday instrumental links, symbolic interactions, and friendship relationships among unit members, as these predict shared

group cognitions. Apart from their impact on the group's social needs, activities that build social ties and friendships should be carefully targeted.

According to Geller (2001), our behaviours have a greater impact on others than we think. Children learn by watching us at home, and our coworkers are influenced by our work practises, even if we aren't conscious of it. Not only does the frequency of safe acts inspire spectators to repeat the behaviour, but verbal behaviour can also have an impact. Observers may improve their execution of similar safety behaviours (through vicarious reinforcement) or decrease the frequency of similar at-risk activity if a supervisor commends a worker for her safe behaviour or reprimands an employee for an at-risk practise (through vicarious punishment). Indeed, we must always set an example, both in our own work practises and in the verbal penalties we offer coworkers following their safe and at-risk activities, if we are to make safe behaviour the norm rather than the exception.

If certain employees are unsure of how to do a task safely, behavioural guidance is required. It's not enough to have a global "percent safe score." Behavioral direction is given when the CBC is evaluated in a one-on-one coaching session. The worker determines whether vital behaviours are "safe" and "at-risk." A positive chat with the coach provides encouragement for safe behaviour and corrective criticism for potentially risky behaviour. This frequently includes advice on how to make the safe behaviour more practical, comfortable, and easy to remember. It could also entail the removal of physical and social barriers to safe behaviour. If a "percent safe score" is calculated for each conduct, groups can receive help and direction. Calculate separate percentages for each behaviour rather than aggregating safe and at-risk checks across behaviours. The group

may then determine which important habits are risk-free and which need to be improved. The outcomes could be displayed in a conspicuous location (Geller, 2001).

According to Geller (2001), human performance issues should be viewed as a discrepancy rather than a defect (Mager & Pipe, 1997). This focuses on the behaviour rather than the person. In other words, there is a distinction between the behaviour that has been displayed and the conduct that is intended. When it comes to considering safety issues, there is a distinction between risky and safe behaviour. A "sin of omission" or a "sin of substitution" could be the cause of the behavioural inconsistency. Because he took a shortcut, the worker may have failed to perform a certain safe action, or the employee may have engaged in behaviour that puts others at danger of damage. After determining what is safe and what is dangerous for a certain person and work scenario, an action plan can be created to close the gap between what is and what should be. When another, less expensive, and more successful strategy is required, "retraining" or "discipline" (meaning punishment) is frequently chosen impulsively as a remedial measure for behaviour modification. A thorough behavioural safety analysis allows for the most cost-effective solution to be chosen.

Mager et al. (1997) argue that many disparities between real and ideal behaviour can be resolved with relatively little effort based on their combined experience of more than 60 years analysing and fixing human performance problems. More specifically, because expectations are unclear, resources are insufficient, or feedback is unavailable, behaviour may be more at risk than planned. Solutions to eliminating a behavioural difference are obvious and generally affordable in many situations. Invisible expectations

can be overcome by behavior-based education or example, and behavior-based feedback can lead to continual development. A work group could also determine what resources are required to make safe behaviour more convenient, comfortable, or efficient.

A major premise of applied behaviour analysis is the conduct motivated by its consequences (Geller, 2001). In other words, our actions have positive or negative repercussions, and these consequences influence our future conduct. Natural consequences can sometimes work against us. This is especially true in the case of safety, because safe behaviour is typically less comfortable, easy, or efficient than the at-risk option. Those who are investigating an occurrence should try to perceive the scenario from the performer's eyes (Geller, 2000). This is referred to as empathy. Some outcomes may appear positive to an observer but are perceived as undesirable by the performer. For example, a safety manager may view an individual's public safety award as a positive result, but it may be a negative consequence for the individual due to anticipated harassment from coworkers. In some workplace cultures, reporting an environmental hazard or near-miss has more negative than positive interpersonal effects. After all, these circumstances imply that someone was reckless or irresponsible. It is not uncommon for people to be mocked if they wear protective equipment or use an equipment guard. Working unprotected and taking unsafe shortcuts could even be deemed "cool" or "macho." "Only a 'chicken' would wear that fall protection," the hidden motive would say. These scenarios are referred to as "upside-down consequences" by Mager et al. (1997), who argue that whenever there is a behavioural mismatch, part of the problem is due to the desired action being penalised. It is not uncommon for top performers to be "rewarded" with additional labour. Giving extra work for exceptional performance may appear to be a

wise management move in the short term, but the long-term consequences of this "upside-down consequence" could be bad, as it can lead to avoidance behaviour. To put it another way, a behavioural inconsistency may arise in order to avoid excessive work responsibilities.

2.2.3 Supervisor Safety

According to Kunreuther, McNulty, and Kang (2002), a Safety Management System must include effective safety monitoring, inspection, and audits (SMS). Employers must provide active and sufficient supervision to protect employees from potential hazards and risks on the jobsite in order to create a successful safety culture (Thanet et al., 2008). A effective supervisor should be able to match work to workers' abilities and recognise workers when jobs are completed safely. This necessitates a competent character that effectively communicates by speaking and listening, as well as setting a good example by adhering to safety standards and resolving any issues that arise (Fang et al., 2004).

Leadership is an important part of an organization's safety and health system (Lingard et al., 2006) and an important part of the safety culture (Misnan et al., 2008). Leadership is a crucial enabler in building an effective safety culture in the construction sector, according to numerous studies (Health and Safety Executive (HSE), 2003; Lingard et al., 2006; Molenaar et al., 2002; Teo et al., 2005). Leaders must deliver values and apply them through appropriate behaviour in order to develop and fulfil the organization's mission and vision of safety and health (Misnan et al., 2008; Mohamed & Chinda, 2011). In order to strengthen safety culture, a great leader must also be able to deal with people and influence their activities (Misnan et al., 2008).

Reason (1998) discovered that managerial practises and employee climate perceptions are inextricably linked. Leaders tend to be able to influence organisational transformation by cultivating relationships with employees (Weisberg & Bowen, 1977) and engaging in climate-controlling behaviours. As a result, the study's primary focus is on the supervisor-employee connection and how the nature of the relationship, as well as supervisor climate views, influence employee climate perceptions. Employee change climate impressions are influenced by the quality of supervisor-employee relationships. The Leader-Member Exchange (LMX) method provides a potentially effective framework for this line inquiry since it focuses primarily on the quality of the supervisor-employee dyadic relationship and represents a transformative type of leadership (Gyeke, 2006). According to the LMX hypothesis, managers engage in differentiated relationships with their employees that develop through time and through behavioural exchanges (Gyeke, 2006). As a result, supervisors build dyadic relationships of different quality, ranging from highly interactive, interpersonally supportive connections (known as a high LMX dyad) to less interaction, very formal ties (known as a low LMX dyad). The description of a change-conducive climate, based on the five change conditions discussed earlier, supports a link between LMX and employee experiences of a change climate.

A study was conducted at the end of the twentieth century on the roles of perceived organisational support (POS) and leader-member exchange (LMX) as antecedents of safety-related behaviour (Hofmann & Morgeson, 1999). The goal of this study was to see if there was a link between POS and LMX and safety communication, commitment, and accidents. A total of 49 manufacturing plant group leaders were polled. Perceived organisational support was assessed using a five-point likert scale of nine questions

developed by Eisenberger et al. (1986), ranging from 1 (not at all) to 5 (very) with an internal consistency of 0.96. The internal consistency of 0.87 was used to measure the LMX using seven items provided by Graen and Uhl-Bien (1995) on a five-point likert scale ranging from 1 (not at all) to 5 (to a very considerable extent). Gibb (1961) and Hofmann and Stetzer (1998) used five-point likert scales with seven items to assess safety communication. 0.85 was the internal consistency. After that, three items on a five-point likert scale were used to assess safety commitment: responsibility for safety records, work group safety performance, and initiative to meet or exceed safety standards. This variable has a reliability of 0.89. Accident rates were taken from the organization's record archive as the dependent variable. Demographics analysis, intercorrelations matrix, and regression analysis were also used in the data analysis. The data revealed that point-of-sale (POS) was strongly linked to safety communication. LMX was also associated to safety communication, attention to safety, and accidents. The findings showed that safety communication and safety commitment acted as mediators between LMX and POS in determining accident rates.

A study on the effects of leadership characteristics, safety climate, and assigned priorities on minor injuries in work groups was undertaken in 2002 by a researcher (Zohar, 2002). The goal of this study was to learn more about the connections between safety climate and leadership, as well as the outcomes of supervisory practises as a source of safety climate and safety priority by higher superiors, all of which influence supervisory safety practise in the free leadership style. A total of 411 production workers from a metal processing factory took part in this investigation. During work hours, each of them was given a series of safety-climate and leadership questionnaires. The five elements of the

questionnaire were group-level safety climate, leadership, assigned safety priority, risk level, and statement of experienced injuries. According to Zohar (2000), the group-level safety atmosphere consists of ten items rated on a five-point scale ranging from "completely agree" to "completely disagree". The Multifactor Leadership Questionnaire, developed by Bass and Avolio (1997), was used to investigate the leadership element. This section used a five-point rating scale with a single subscale of Transformational Leadership (TL, $\alpha = 0.88$) and four subscales of Management by Exception/Passive (MEP, $\alpha = 0.72$), Management by Exception/Active (MEA, $\alpha = 0.75$), and Laissez-Faire (LF, $\alpha = 0.70$). The assigned safety priority was assessed on a five-point scale ranging from "not at all" to "to a great extent." The level of risk was assessed using ten-point scales and two criteria: (1) chance of injury while performing this type of employment over a year, (2) relative level of danger in this subunit. The statement of injuries is made up of instances that were recorded during a six-month period and then separated by group size. The findings demonstrated that injury rate in organisational subunits is predicted by transformational and constructive (contingent-reward) leadership, which mediates the impacts of the climate preventative actions (PA) subscale. The leadership-climate link is tempered by higher superiors' safety priorities, which vary depending on leadership dimension.

Later research proposed that the employee's visibility to the supervisor be determined in order to assess safety-related interactions and employee behaviour (Luna et al., 2008). Employee visibility and supervisory interactions can be studied from a variety of perspectives and in a controlled environment, such as a laboratory or in the field. The major goal of this research was to see how visibility affected supervisory actions. In Eve

plants, 955 line workers and 57 managers participated in this survey. The study's first tool was a one-page questionnaire about work activities and supervisory interchange that was adapted from Zohar and Luna (2003) to assess safety-related supervisory interactions. This questionnaire includes a description of work-related activities over the last two hours, an open-ended question about verbal/nonverbal interactions with the supervisor over that time, a checklist of subject exchanges, and a single-sentence quotation for verbal encounters. The poll also contained a measure of worker safety behaviour, which was monitored by trained observers on a random basis. Workers' dangerous behaviour was the dependent variable, whereas supervisory rate of safety interactions was the independent variable. The survey findings identified an important moderator of supervisory safety interventions, recommending that ongoing dialogues between leaders and members have a substantial impact on leadership as a factor in improving safety. The impact of leaders' interactions on subordinates' safety atmosphere and behaviour is similar to the impact of their safety orientation.

A study by Luria, Zohar, and Ereve (2008) looked into the impact of workers' visibility on the success of intervention programmes. In five plants, the sample includes 955 line workers and 57 shop floor supervisors. The study concluded that employee visibility to the supervisor is important in determining safety-related interactions and employee behaviour. Employee visibility and supervisory interactions can be studied from a variety of perspectives and in a controlled environment, such as in the construction sector. The major goal of this research was to see how visibility affected supervisory actions. The survey findings identified an important moderator of supervisory safety interventions, recommending that ongoing dialogues between leaders and members have a substantial

impact on leadership as a factor in improving safety. The impact of leaders' interactions on subordinates' safety atmosphere and behaviour is similar to the impact of their safety orientation.

Caravello (2011) has conducted another study to investigate the function of leadership in influencing a persistent trend in the energy business associated to a higher injury rate. A total of 27 people were questioned using a self-developed questionnaire, including 12 supervisors and 15 employees from an oil field service company's land-based operations in the United States. Data was gathered from two sources: (a) employees having at least 8 months of tenure in US land operations, and (b) supervisors with at least 8 months of tenure in US land operations. Leadership was determined to be the driving force behind safety motivation and, as a result, a positive outcome.

2.2.4 Management Safety

Management has a track record of improving safety culture (Abudayyeh et al., 2006). Management must take a number of steps to foster safety culture, including developing a written safety policy, responding to safety input and suggestions, providing appropriate resources, and visiting the worksite on a frequent basis, among other things (Abudayyeh et al., 2006). Furthermore, when making decisions, management should prioritise safety over productivity and revenue.

In the construction sector, effective organisational safety culture is heavily reliant on management's dedication (Teo et al., 2005). According to the literature, management commitment is a critical component in affecting employees' safety behaviour and attitudes

(Zohar, 1980). The degree to which top-level management recognises safety as a guiding concept in the organisation is referred to as management commitment (Misnan et al., 2008). Safety culture, according to Hinze and Raboud (1988), starts with top-level management and spreads to all levels of the business if it succeeds. Several previous research have found that companies with top-level management that prioritises safety commitment have a superior safety culture (Hinze & Raboud, 1988; Lingard et al., 2006).

The importance of successful safety management is put on managing the relationship between the system and the people. Human factors cause 88 percent of industrial accidents, according to Herbert W. Heinrich, an early pioneer in accident prevention and industrial safety (Goetsch, 2008). Because human factors play such a large influence in safety performance (Donald, 1996), more emphasis is being paid to the behavioural causes of technical failures, which is now commonly referred to as "human error." Many researchers now recognise the value of a strong safety culture in ensuring that both the business and the employees maintain a high level of workplace safety. Performance in any management function, however, is dependent not just on management policies and procedures, but also on the development of effective operational practises that are both appropriate for the working environment and considered to be appropriate by the workforce that implements them. Employers must audit and assess their management systems and operational procedures to identify existing strengths and shortcomings in order to maintain high performance. Only then can actions to address sources of significant residual risk in the workplace be implemented.

DeJoy, Gershon, and Schaffer evaluated management and organisational factors on safety in 2004 (DeJoy et al., 2004). Two studies on the safety climate were done in two separate fields. The first study looked at how well healthcare personnel followed universal precautions (UP) (HCWs). UP are the suggested work practises for HWCs who are exposed to bloodborne pathogens in this region. The purpose of this research was to find out how environmental and contextual factors affect compliance. There were 1,716 HCWs that took part in this study, with nurses being the largest occupational group. They were given a questionnaire with a 4-point and 5-point Likert scale rating system, ranging from "strong agree" to "strongly disagree," and the results showed good internal consistency in terms of dependability. Predisposing factors, enabling factors, and reinforcing factors were chosen as independent variables to be tested against UP compliance in healthcare as the dependent variable. To evaluate the diagnostic factors on compliance, all of the factors were a combination of explanatory and confirmatory approaches. DeJoy et al. (1994) cited the PRECEDE Model developed by Green and Kreuter (1991), which was used to measure person, job/task, and environmental/organizational aspects in conjunction with UP compliance. The study found that health care workers (HCWs) with more positive views toward HIV patients had greater general compliance because they had reduced risk-taking tendencies and were well-informed about HIV transmission mechanisms in healthcare. Apart from that, two enabling characteristics, namely, convenient availability of personal protective equipment (PPE) and having fewer job hindrances, were found to be strongly connected to PPE compliance. In addition, three reinforcing elements were projected to increase compliance with PPE usage: safety priority, official feedback, and informal feedback. To simulate the effects of the safety climate on compliance, a number of nested models were used. As a result, it was discovered that a positive or supportive safety

climate includes components that allow workers to adhere to safe work practises. The PRECEDE Model was shown to be beneficial in measuring overall compliance rather than compliance with personal protective equipment in the initial study (PPE). The provision of personal protective equipment (PPE) resulted in better compliance with the PPE in regression coefficient tests. It indicates that if safety gear is made available by the employer, HCWs will be willing to use it. To summarise the findings of this study, the PRECEDE Model provides a valuable framework or instrument for assessing the human, environmental, and organisational factors that influence UP compliance among health care employees (HCWs). The second study was conducted in the retail industry with the goal of determining the components of safety climate and determining the extent to which safety climate acts as a mediator between various work scenario elements and safety-related outcomes. A total of 2,208 employees from 21 retail outlets of a prominent retailer in the southeastern United States completed a questionnaire for this study. To conceive an organization's atmosphere of safety, five multi-item scales have been included: organisational support, coworker support, communication, involvement with supervisor, and participation with coworkers. The tests looked at general worker perceptions in the workplace, but not explicitly on workplace safety. Environmental conditions were assessed by a "walkthrough" of the store and exposure to hazards such as extreme heat, noise, and poor lighting. Safety policies and programmes are evaluated in terms of things like safety training, danger communication, and personal protective equipment. To research safety climate, a seven-item version of the NIOSH Safety Climate Scale was used, which was a combination of De Joy et al. (1995). The scale can be used to assess employee views of management's safety assistance in the context of the company's safety challenges. Age, gender, job tenure, and weekly working hours were treated as control variables using

hierarchical, multiple regression approaches. Another method is to use hierarchical regression studies to see if the introduction of safety climate after other control and independent variables would result in mediation. As a result, working conditions, safety rules and programmes, organisational support, and the safety atmosphere all play a role in how safe people feel at work. The integration of other standard programming such as environmental control and safety policies and programmes was found to be important in terms of safety related results. Both studies imply that organisational and management elements play a key role in achieving effective safety performance in practise. If the compliance to use the PPE is required, it must be provided available.

In 2006, a study looked into employees' perceptions of workplace safety in the African working environment (Gyekye, 2006). This study was created to look at accident predictors found in a safety climate analysis. The element of management values and management practises, which is related to the micro title above the paragraph, was included as part of the perspectives. The Hayes et al. (1998) 50-item Work Safety Scale (WSS) was developed to measure views of safety climate, while Porter and Lawler's (1968) one-item global scale was used to quantify job safety satisfaction. The five-point job satisfaction rating ranged from 1 (very dissatisfied) to 5 (highly satisfied) (extremely satisfied). The current study enlisted the participation of 320 Ghanaian industrial workers, and data was gathered using questionnaire interviews tailored to the participants' educational backgrounds. T-test analysis is part of data analysis. The coefficient alphas were 0.91 for job safety, 0.91 for coworker safety, 0.95 for supervisor safety, 0.95 for management safety, and 0.93 for overall safety (satisfaction of safety programme). The survey found that the workers' safety welfare was severely lacking in all areas. They were

not acknowledged or praised, and safety issues were not thoroughly probed. Poor safety management was found to be one of the leading causes of accidents in this study. Management's lack of concern for worker safety will erode job satisfaction, resulting in a higher rate of industrial accidents.

The 50-item Work Safety Scale (WSS) is then used to assess employees' perceptions of work safety as part of a larger study of Perceived Organizational Support (POS), which was also measured for the first time with Eisen, Fasolo, and LaMastro's (1990) survey, and job satisfaction was measured with Porter and Lawler's one-item global measure (Gyekye & Salminen, 2007a). The goal of this extensive study was to assess the relationship between job satisfaction, worker compliance with safety management regulations, and the incidence of accidents. Workplace safety, coworker safety, supervisor safety, management safety practises, and safety programmes were all included as independent variables. Job satisfaction and adherence to safe work standards, on the other hand, were dependent factors. Regression and T-test analyses were used to examine the data. Employees with high opinions of perceived organisational support (POS) were also enthusiastic about the safety climate, according to the findings. Workers will believe that the company values their safety, which will influence their adherence to safety procedures.

A study was conducted to see what level of management practises in safety culture are effective in minimising workplace injuries (Ali et al., 2009). In this study, 12 physicians were asked to rate injuries on a scale of 1 (not severe) to 24 (very severe) (extremely severe). Days off from work, permanent or long-term inability to execute job duties, medical expenses, and the injury's life-threatening state were all variables to be

considered in the ranking instructions. McIver and Carmines (1981) used Thurstone's Discriminate Model to rank injury severity data, which was then translated into an interval scale. Following that, these rating scales were utilised to weight overall injury data provided by study participants. Through a questionnaire, those companies were asked to provide injury data for the previous three years as well as specifics on six management practises. The management procedures were assessed using 18 items from a comparable survey conducted in hospitals in the United States of America by Vrendenburgh (2002). This diagnostic instrument used a five-point scale ranging from 1 (no extent) to 5 (very severe) (A great extent). There are three subscales in each of the management practises. Cronbach alpha's reliability had an internal consistency of 0.74. The execution of recruiting practises (mean=2.53, standard deviation=0.66) was the weakest practise, while management commitment (mean=3.57, standard deviation=0.68) was the best practise among the Malaysian organisations who participated. A multiple regression analysis was used to determine the relationship between management practises and injury rates, and the results revealed that only communication and feedback ($t=2.98$, $p=0.004$) and employee participation ($t=2.001$, $p=0.04$) significantly contributed to injury rates. Bruises are the most common injury, with 196 occurrences documented in the industrial industry. The findings corroborated the regression results, indicating that regular safety input can reduce injury rates.

2.2.5 Satisfaction of Safety Programmes

All staff should be offered periodic educational sessions and training programmes to strengthen the safety culture (Tam et al., 2004; Cooper, 2000; Fang et al., 2004). This fosters a culture of safety and ensures that individuals carry out tasks efficiently, safely,

and to a high standard (Tam et al., 2004; Teo et al., 2005). Organizations with a strong safety culture make sure that their employees are well-trained and aware of the dangers of risky activity (Lardner et al., 2000). Worker safety training programmes contribute to improving the psychological and mental aspects of safety culture (safety knowledge, perception). As a result, the number of injuries and accidents in the workplace is reduced (Christian et al., 2009).

Nielsen, Carstensen, and Rasmussen (2006) conducted a study on the potential impacts of continuous improvement (CI), a Lean concept, on safety outcomes, and presented the findings of an empirical analysis based on an industry-wide survey of industrialised homebuilders on safety outcomes and CI programmes. The research looked at 67 of 141 replies from builders in the United States who gave information on how they used CI programmes. CI programmes are used by nearly half of the survey respondents (62 homebuilders). When compared to builders without a CI programme, the presence of a CI programme is associated with significantly reduced injury incidence rates. However, there were no significant differences in total OSHA recordable instances, cases with restricted or transferred personnel, total days lost, or days with restriction or transfer when CI programmes were present or absent. The findings of this study will help to improve our understanding of Lean's applicability and possible benefits in the housing industry in terms of employee safety. Specific Lean techniques (CI programmes) tend to have some favourable benefits on OSHA incidence rates, suggesting that Lean may be advantageous not just for process optimization and waste reduction in the construction sector, but also for increasing safety.

The effectiveness of a training programme may result in a shift in all workers' safety attitudes and culture (Harvey et al., 2000). The study began with the goal of determining the effectiveness of training in changing safety culture and attitudes in a highly regulated setting. The goal of this study was to look into how safety culture changed after a post-training intervention for all personnel in a highly regulated environment. The study's dependent variables were workers' shifting attitudes and cultures. The surveys were given twice, 16 months apart on each occasion. In order, the survey was separated into two phases for two categorizations: T1 for identification of roles, such as shop floor or supervisors/management/professional (managers), and T2 for age, sex, and duration of service. The first survey received 417 replies, while the second survey received 480. The attitudes scale ranges from 1 (strongly agree) to 6 (strongly disagree) (Strongly disagree). This assessment was provided at the start of training to provide a "first impression" of attitudes and views inside the department, as well as a tool to track these throughout time (The measure were custom-made by referring to the relevancy of the industry). The Cronbach's-alpha reliability tests were used to assess the internal consistency of the elements involved. The variables were perceived management style and communications ($\alpha=0.882$), organisational engagement and accountability ($\alpha=0.605$), self-risk-taking and responses to self- and others' risk-taking ($\alpha=0.704$), work satisfaction ($\alpha=0.742$), complacency ($\alpha=0.654$), and risk awareness ($\alpha=0.621$). The two-way ANOVA was used as a metric for determining the significance of variables. For the five factors examined, the manager group received higher scores (perceived management style, responsibility, complacency, job satisfaction and risk awareness). The mean score for the shop floor group showed a high level of job satisfaction. At both phases of measurement, significant variations in perceived management style, responsibility, and job satisfaction were found.

There were no significant differences in risk taking and risk reactions at both times of measurement, as well as no grade disparities.

There was also another study that supported the idea that adequate training could reduce workplace injury rates (Sinclair et al., 2003). The goal of this study was to see how training relates to knowledge levels and how both training and knowledge are linked to injury claims in three different food service establishments. The respondents included 137 employees for the nominal research and 159 managers from three organisations for the knowledge analysis. Descriptive statistics were created to measure demographic variables on both individuals and work units within a firm. Injury experience was used as the dependent variable in this study, which was quantified using workers' compensation claim data. The poll for managers used a five-point likert scale with items ranging from 1 (very frequently) to 5 (extremely infrequently) to gauge managers' opinions of organisational support for putting what they learnt in training into practise. The regular staff was also assessed using the same tool, which was distributed at the start of the training session. Supervisor support factor ($\alpha=0.89$), peer support factor ($\alpha=0.79$), and subordinate support factor ($\alpha=0.63$) were the three interpretable factors used in the study. Other measurements included a regression model that showed that the new curriculum group had a higher mean significance of knowledge test score than the traditional-training group. The justifications for new training materials, management training sessions, and staff training sessions all backed this. A powerful behaviour model based on hands-on activities was added to the new curriculum group. Using a two-tailed statistical test to examine the effect of training on injury experience, the findings imply that safety training may be linked to lower injury rates.

Safety programmes were not simply confined to workplace safety training and development. Personal protective equipment provided by the business to safeguard workers from danger and hazards is also included in the safety programme. In this scenario, a survey of user preferences for facial protection equipment will be examined to discover if there is a link between satisfaction with the safety programme and workplace safety performance (Bryce et al. 2007). The study's major goal was to find out how health care workers (HCW) felt about their understanding of facial protection equipment, their preferences for using it, and their compliance with it. The study included 137 health care personnel from the intensive care unit (ICU), emergency room (ER), respiratory services unit (RS), and internal medicine (IM) service who were frequent users of N95 respirators. Respondents were asked to share their knowledge of facial protection, favourite type of N95 face mask, history of fit testing, and length of time spent wearing respirators in this study. The participants were also asked about the frequency and maximum time each shift that they used respirator and eye protection gear, as well as their self-reported compliance and comfortability. The level of training and comfortability were assessed using a four-point likert scale in this content. A six-point likert scale was used to compare the respirators to surgical masks in this area. The next section consisted of five questions about N95 respirator compliance, which were also graded on a six-point likert scale.

The study discovered that prolonged usage of N95 respirators was caused by instrument comfort and tolerance. When this equipment was used instead of a surgical mask, most health care workers (HCWs) felt safer. When developing standards for selecting facial protection, health care employees' views of workplace safety should be taken into account, especially during outbreaks of airborne pathogens such as H1N1 or

avian flu. Other findings suggest that there is no link between comfort and the number of years spent using respirators or protective eyewear.

Burke et al. (2006) did another study to see how effective different types of worker safety and health training are at improving safety knowledge and performance and reducing accidents, illnesses, and injuries. Other kinds of safety and health training are often less effective than training that includes behavioural modelling, a significant amount of practise, and discourse. The effectiveness of training, according to the study, enhances knowledge while considerably reducing unfavourable effects.

2.3 Safety Behavior

Even though they have different concepts and techniques, the terms safety behaviour and behavior-based safety (BBS) are occasionally used interchangeably to refer to the behavioural approach to improving workplace safety performance. The goal of BBS is to apply behaviour change science to real-world problems by focusing on what people do, analysing why they do it, and then implementing a research-based intervention method to improve what they do. This is a short-term solution that merely addresses the employees' observable behaviour (Goetsch 2008). The missing component of the BBS strategy is to go deeper into the individual's inner core and gain a better understanding of their personality traits, competency level, and what motivates them to behave safely. Safety behaviour recognises this gap, and its goal is to improve conduct by enhancing an individual's inner-self. It's a long-term process that requires both businesses and employees to put forth significant effort and commitment.

After accident records revealed that as many as 95 percent of workplace mishaps were caused by employees' risky activities, the evolution of workplace safety behaviour was first created in the early 1930s (Geller, 2001; Wikipedia, 2008; Cooper, 2009). Cooper (2009) explained that people behave in dangerous ways because they have never been wounded when doing their work in dangerous ways. The absence of any injuries among those who have been continuously undertaking risky acts will encourage the unsafe behaviours over time. They may eventually be involved in serious accidents as a result of their actions. According to Cooper (2009), a risky behaviour is a reinforcer, and its effects are stronger because the result is immediate, certain, and positive. Smokers, for example, find it difficult to quit smoking (i.e., risky behaviour) because the positive consequences of smoking are immediate (immediate), certain (every time), and positive (nicotine top up), whereas the negative consequences (e.g., lung cancer) are delayed (some years later) and uncertain because not every smoker dies from lung cancer.

Similarly, some personnel take shortcuts and struggle to follow safety standards and procedures since their actions are continuously (certainly) rewarded by immediate (short) time savings that result in increased production (positive). Line supervisors who turn a blind eye to unsafe process workflow and thereby implicitly encourage employees to take shortcuts for the sake of productivity may promote this unsafe conduct. It has become one of the key determinants of occupational accidents (Sadullah & Kantan, 2009), with enormous economic implications for businesses and enormous pain, suffering, and responsibilities on families (Cooper, 1999).

Employees' compliance with the organization's safety laws and regulations, as well as voluntary engagement in safety programmes and initiatives, are measured in this study (Neal & Griffin, 2002). Personal safety is directly influenced by safety compliance, and it reflects the basic tasks that must be carried out to keep the workplace safe. The usage of personal protection equipment is a basic compliance requirement that is enforced by many companies and regulated by the authority under the Occupational Safety and Health Act of 1994. Similarly, safety involvement refers to acts that do not directly contribute to employees' personal safety but do contribute to the creation of a safe workplace environment. Attending a safety meeting to address safety issues is an example of safety involvement. Attendance is not required, but employees are urged to participate and provide ideas to promote a safe working environment. The task performance and contextual performance reported by Borman and Motowidlo (1993) are similar to the safety compliance and voluntary involvement behaviour. Task performance is represented by compliance behaviour, while contextual performance is represented by involvement in safety initiatives.

According to Campbell et al. (1996), there are variances in safety behaviour performance across employees, and these disparities are mostly determined by the knowledge, competence, and motivation of the employees. As a result, individual safety behaviour is affected by a lack of information about workplace safety and a lack of skill to perform the job safely. Individual differences in safety motivation will also have an impact on individual safety performance. Self-motivated employees are more likely to have strong safety standards.

Reason et al. (1998) recommend ten rule-related behaviours when discussing the necessity of leading employees down a route that assures workplace safety compliance. These regulations are divided into four categories: psychologically rewarding and unrewarding conduct, violations and conforming behaviour, accurate and erroneous behaviours, and excellent and bad rules, according to the authors. As a result, the authors claim that a behaviour is psychologically rewarding when it meets personal safety goals and drives personnel to follow safety regulations and procedures. They must appropriately assess the hazards at work, take the necessary precautions to protect themselves from harm, and work in accordance with all applicable safety regulations. Reason et al. (1998) proposed ten types of rule-related behaviours, which are detailed below:

- i. Correct compliance: A psychologically rewarding behaviour that occurs after a thorough risk assessment has been completed at work.
- ii. Correct violation: A psychologically gratifying activity that involves consciously breaking rules that are deemed unsuitable for the task.
- iii. Correct improvisation: In the absence of appropriate operational norms, this is a psychologically gratifying behaviour that involves improving the work procedure.
- iv. Misconduct: Behaviour that deviates from acceptable operational procedures.
- v. Miscompliance: An erroneous compliance behaviour based on erroneous operating standards.
- vi. Error: A mistake is a behaviour that occurs as a result of an improper plan of action in the lack of appropriate operational standards.
- vii. Violation of suitable rules that is not just incorrect but also psychologically pleasant. Individuals that engage in this type of activity achieve their safety objectives despite failing to analyse safety dangers and breaking operational regulations.

- viii. Appropriate rule compliance that is correct yet psychologically unsatisfying. This type of behaviour indicates that the safety concerns have been correctly assessed, but the actions taken do not meet the individual goals.
- ix. Appropriate rule infringement that is psychologically unsatisfying. This form of behaviour acknowledges that the rules are ineffective and chooses to break them, yet the individual is uncomfortable doing so.
- x. Wrong yet psychologically pleasant adherence to unsuitable norms. This form of behaviour chooses to follow safety regulations despite the fact that they are ineffective for the task.

Organizational safety climate and culture (Hoffman & Stetzer, 1996; Neal & Griffin, 2000; Cooper & Phillip, 2004; Probst, 2004; Clark, 2006, O'Toole 2002, Perez-Floriano & Gonzalez, 2007), safety culture (Cooper, 2000; Harvey et al., 2001), organisational safety commitment (Komaki et al., 1980; Morgeson, 1999; WyId, 2002; (Wallace & Vodanovich, 2003; Wallace, 2004: Hinsz et al., 2007). The following paragraphs explain how each aspect affects safety behaviour, with a summary at the end of each chapter.

Employee perceptions of corporate commitment to workplace safety are influenced by the safety atmosphere (Neal et al., 2000; Lu & Shang, 2005). This encompasses management's attitudes toward safety, safety communications, safety training, and the safety system (Probst Brubaker, and Barsotti 2008). Safety atmosphere, according to Neal et al. (2002), reflects employees' impressions of organisational safety policies, processes, and practises, but more significantly, how these practises were valued in the organisations

influenced employee safety behaviour. Employees' positive perceptions of the organisational safety climate were based on active participation in safety activities and adherence to organisational safety regulations and procedures. Employees' positive perceptions of company safety commitment aid to impact their safety behaviours as long as it is adequately developed and managed across organisations.

According to Harvey, Bolam, Gregory, and Erdos (2001), creating the perceptions was timely, and major behavioural changes could only be achieved if the organisation prioritised safety. Fuller and Vassie (2001) found that a positive safety climate brought harmony to their working relationship and, as a result, minimised unsafe behaviour across organisations and industries that practise partnership agreements where people from different groups work closely, such as in offshore platforms. Using archival survey data and presented questionnaires to employees working in manufacturing and mining businesses, Neal et al. (2000) conducted two studies to investigate the association between safety climate and safety practises. They discovered a link between the safety climate and employee safety compliance and participation. It can be inferred that employees value and appreciate safety if prior corporate commitment is built through a favourable safety climate. Higher safety cultures established by increased care for employees' health and safety emerging from deeper individualised relationships promotes safe behaviours among the employees, according to a study by Zohar (2002), who collected data from 411 production workers in a metal processing factory.

Safety atmosphere was investigated as a moderator in a relationship between leader-member interchange and safety citizenship behaviour by Hofmann and Morgeson

(2003). Employees were urged to reciprocate implicit leader-member exchange duties by behaving in ways that were compatible with contextual behavioural expectations. The information was gathered from 127 US army personnel who were assigned to the transport unit and were in charge of moving heavy equipment during the military deployment procedure. The team leaders were asked to score each team member's performance on 27 different safety citizenship behaviours. The authors discovered that when there was a favourable safety atmosphere, high-quality leader-member exchange interactions resulted in increased safety citizenship behaviour, but no such expansion happened when there was a less positive safety climate.

To investigate the mediating effect of group level safety climate in the cross-level relationship between organisational safety climate and employee safety behaviour, Zohar (2005) collected data from 3,952 production employees in 401 work groups nested in 36 small to medium size plants in the metal, food, plastics, and chemical industries. The findings indicate that group level safety climate mediated employee safety behaviour. When the organisational level safety environment is linked with the group level safety climate, it will be effective in influencing safety behaviour. Supervisors, for example, play an important role in influencing group members' safety behaviour by enforcing and educating them on organisational safety policies, rules, and procedures.

Glendon and Litherland (2001) used a safety climate questionnaire and a safety behavioural observation checklist to assess employees' safety performance in road construction companies. They presented results that contradicted those of Neal et al. (2000) and Zohar (2002), who found no link between safety climate and safety behaviour

measures. Cooper and Phillips (2004) employed a safety behavioural observation checklist to analyse safety behaviour among 540 employees in a packaging manufacturing plant, concluding that changes in safety climate perceptions did not always mirror changes in behavioural safety performance levels. Similarly, shifts in safety behaviour may not always correspond to shifts in safety climate perceptions. Furthermore, the authors strongly argue that the favourable association between safety climate and safety behaviour is not as straightforward as previously thought. The only variation that might explain these contradicting results was the measurement method utilised in these two studies to assess safety behaviours. Because the safety climate questionnaire is a subjective self-report measure and behaviour observation is a more objective method, the questionnaire offered different information than the objective behavioural observation measure.

Probst et al. (2008) employed a safety climate measure to forecast the level of underreporting of organisational injury rates in construction firms. The safety climate was analysed using data collected from 1,390 employees of 38 companies hired to work on a large construction site, and the injury rate was calculated using the companies' own injury logs. The authors discovered that firms with a positive safety climate had fewer workplace injuries and that underreporting of injury rates was around 50% lower than underreporting of injury rates in organisations with a negative safety climate. Using data from 2,208 employees in 21 retailers, DeJoy, Shatter, Wilson, Vanderberg, and Butts (2004) investigated the relationship between safety climate and perceived workplace safety. The respondents were given a range of options to rank their personal exposure to workplace safety and health concerns, ranging from very safe to very hazardous. The authors discovered that the influence of safety atmosphere on perceived workplace safety was a

direct relationship rather than a mediated relationship. It can be assumed that fewer workplace injuries and a better sense of workplace safety were due to employees' positive perceptions of the organisational safety climate, which prompted them to display safe workplace behaviour.

At a study of production workers in a metal processing facility, Hofmann et al. (1996) discovered that the organisational safety climate has a substantial negative link with dangerous behaviour and accidents. Neal et al. (2000) revealed that organisational safety atmosphere has a substantial positive association with safety engagement and compliance behaviour, based on data obtained from manufacturing and mining workers in Australia. In a meta-analysis study, Clark (2006) found 35 studies that linked organisational safety climate to occupational accidents, injuries, safety compliance, and safety participation. Almost half of the research found (N=15) used data from the manufacturing sector, with the construction, mining, offshore oil and gas, and other industries accounting for the remainder. The findings revealed a favourable link between safety climate and safety compliance and participation, with the latter showing a stronger link. Probst (2004) studied the effects of job insecurity on self-reported safety outcomes such as safety knowledge, safety compliance, accidents, and injuries using data from 136 manufacturing employees. The findings revealed that a positive organisational safety climate would reduce the negative effects of job insecurity on those variables, hence reducing the impact of probable safety noncompliance, injuries, and accidents.

Mark et al. (2007) investigated the moderating effect of safety climate on the connection between staffing adequacy and work conditions on nursing injuries in a

longitudinal research. Over the course of six months, 3 distinct sets of questionnaires were delivered to 281 medical-surgical units in 143 general acute care hospitals. Work engagement and working circumstances were found to be positively associated to the safety climate, according to the authors. Furthermore, the influence of work conditions and job engagement on nursing injuries was found to be moderated by the safety climate. Following that, the authors proposed that positive job engagement and work conditions improve the safety climate and affect nurse safety behaviour, potentially reducing nurse injuries.

Another major indicator of safety behaviour that is linked to safety climate is safety culture. It outlines how common values and ideas interact with organisational structures and the correct system to establish behavioural norms in the context of long-term safety and health performance (Cooper, 2000). According to O'Toole (2002), numerous metrics of organisational safety culture, such as management safety commitment, have a significant impact on the reduction in workplace injuries. Positive safety culture ideas were projected to impact safe behaviours, resulting in fewer workplace accidents. Safety cultural values differ across geographical regions, according to Perez-Floriano and Gonzalez (2007), but they influence how people think and behave when faced with safety-related issues.

In conclusion, all of the research found that an organization's safety environment and culture support personal safety ownership, which leads to employees developing stronger safety norms and engaging in less risky activities. Furthermore, organisations that succeeded in improving their safety climate would see real results in terms of fewer

workplace accidents and injuries (Clark, 2006). Without active, real, and consistent management support, Philson (1998) stated that the presence of safety and health professionals in firms did not ensure high safety performance. The notion that employee safety is a high priority and that corporate commitment can make a difference in improving safety behaviours must be the foundation of the support. Broadbent (2004) addressed the complex relationship between managerial commitment to safety and safety outcomes. According to the author, all managers, particularly supervisors, line managers, and senior managers, should demonstrate their dedication to safety because this will affect employee safety practises. Due to their direct control over team members' performance, supervisors have the biggest influence on their team members' safety behaviour (Heinrich, 1959). The care and concern for their team members' safety and well-being sent a strong message that management is devoted to employee safety. Employees' safety initiative was related to their feeling of identification with the organisations, and compliance behaviour was predicted by their perception of supervisor commitment to safety, transformational leadership, and workgroup cohesion, according to O'Dea (2001), who collected data from 231 workers operating six North Sea oil and gas installations.

Using an intervention design before and after the adoption of a safety reporting scheme, Nielsen et al. (2006) investigated the association between incident rates, safety climate, willingness to report occurrences, and perceived management commitment to safety. According to the data, senior management commitment to safety was the most important element in influencing the deployment of an event reporting plan to reduce injuries. According to Zohar (2002), enhanced safety-related communication between

supervisors and subordinates resulted in a considerable reduction in micro-accidents and an increase in safety compliance behaviour (e.g., using personal protective equipment).

Komaki, Heinzmann, and Lawson (1980) studied the influence of safety training and feedback on maintenance personnel' safety behavioural performance over 45 weeks by conducting 165 safety observations. Safety training alone, without supervisory support to provide feedback on employees' behavioural safety performance, was not enough, according to the findings.

Hofmann et al. (1999) examined the impact of perceived organisational support and the leader-member exchange relationship on safety-related behaviour using data from 49 supervisor-group-leader dyads in a manufacturing facility. The findings revealed that the support businesses provide to their employees, as well as the quality of their exchange connections with their respective supervisors, are linked to safety-related communication and dedication, which will ultimately improve their workplace safety behaviour. Furthermore, according to Miozza and WyJd (2002), the success of safety programmes such as behavior-based safety, a proven technique for reducing injuries and preventing accidents, is contingent on top management support, which includes personal involvement, leading by example, and allocating adequate organisational resources to promote workplace safety.

In a study of manufacturing employees who produce commercial heating and air conditioning systems, Hofmann et al. (1999) discovered that organisation support for employee safety and the quality of the exchange relationship between supervisors and

subordinates improved safety behaviour and reduced accidents. In a study of blue collar employees in wood product manufacturing facilities, Michael, Guo, Wiedenbeck, and Ray (2006) discovered that having a favourable leader-member exchange relationship increased the employees' safety behaviours. As a result, only strong management support and commitment to safety will motivate employees to reciprocate by displaying safe behaviours at work. However, strong management support and commitment alone will not guarantee employee safety behaviour unless there is a strong commitment from the employees to drive safety to higher levels of safety.

A range of person-based elements, such as cognitions, perceptions, and attributions, might contribute to injuries (Geller, 2001). The first dimension to be considered was behaviour, and it is involved in all of the others, either directly or indirectly. Behavior affects attitudes, sensations, imagery, and cognitions—the thinking person side of the Safety Triad (Geller et al., 1989). That is what the phrase "acting people into changing their minds" refers to. Certain person variables change when we change our behaviour, such as adopting a new strategy or paradigm. It's also true in the other direction. Behaviors can be influenced by changes in attitudes, sensations, imagery, and cognitions. However, much study has demonstrated that "acting people into altering their thinking" is easier and more cost efficient than the reverse, particularly in corporations and community contexts (Glenwick & Jason, 1980, 1993; Goldstein & Krasner, 1987; Greene et al., 1987).

Heinrich's famous Law of Safety blames at-risk conduct for the majority of near-misses and injuries (Heinrich et al., 1980). Various behavior-based research studies have confirmed this element of Heinrich's Law over the last 20 years by systematically

examining the impact of treatments meant to reduce at-risk behaviours among employees. Behavioral observation feedback, whether communicated verbally, graphically through tables and charts, or by remedial action, was a consistent feature in most successful intervention methods. Individual study pieces by Chhokar and Wallin (1984), Geller et al. (1980), Komaki et al. (1980), and Sulzer-Azaroff and De Santamaria (1980), for example, or the comprehensive review by Petersen (1989). Figure 2.1 depicts a behavior-based approach to injury prevention. At-risk behaviours are thought to be a contributing factor in a sequence of increasingly serious occurrences, ranging from a near-miss to a fatality. Heinrich's Law states that for every near hit, there are several risky activities, and there are far more near hits than lost-time injuries. This is good news, but keep in mind that the only difference between a near miss and a major injury is generally timing or luck. Behavioral change approaches are typically applied to specific objectives. Participants must, of course, understand why certain behaviours are undesirable and have the physical ability to prevent them. To satisfy the physical and knowledge components in Figure 2.1, education and engineering interventions are sometimes required. The execution elements are the most important since they represent the motivational side of the problem. In other words, most people are aware of at-risk behaviours and are capable of avoiding them, but their motivation may be insufficient or misplaced. Individual and group motivation are aligned with the avoidance of unwanted at-risk behaviour via behaviour change strategies. The pyramid in Figure 2.1 is built on the foundation of values and attitudes. These obviously important human variables must contribute to the safety procedure. Risk compensation and Wilde's caution that lowering risk tolerance is more essential than increasing adherence to specific safety rules (Wilde, 1994). This occurs when people believe in the safety procedure and assist in its implementation. Behavior contributes to the success of the

process, and if participation is voluntary and adequately rewarded, it will result in supporting attitudes and values that will help the process continue.

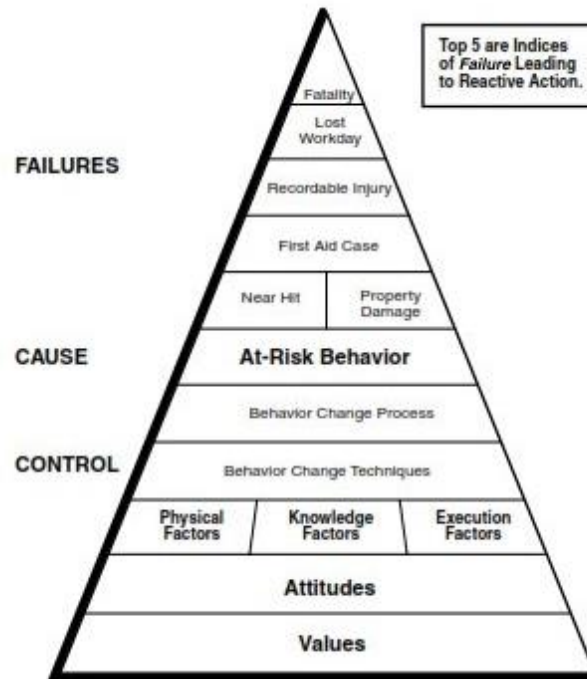


Figure 2.1: Behavior-based safety can decrease at-risk behavior in order to avoid failure

2.4 Safety Performance

Companies' profitability have been observed to suffer as a result of poor safety performance. A high level of workplace safety minimises the number of accidents, and hence the number of personal injuries and property damage, while also improving working conditions, which increases employee enthusiasm and reduces absenteeism (Fernandez-Muniz et al., 2009). As a result, all types of firms that are responsible for protecting and optimising the functionality of their human resources consider workplace safety to be one of their top priorities. The importance of worker safety perceptions in comprehending the industrial accident process has been investigated by researchers. It demonstrates that employee compliance with safety behaviour is linked to variables such as accident rate, anxiety, and employee perceptions of workplace safety.

According to Neal et al. (2000), the factors directly responsible for individual differences in compliance and involvement are the determinants of safety performance. According to Campbell et al. (1993), there are just three factors that influence individual differences in performance. These are the skills, knowledge, and drive. Individual disparities in performance might occasionally be caused by situational circumstances, according to Hesketh and Neal (1999). Evidence suggests, however, that knowledge, skill, and motivation are major predictors of individual differences in performance in a variety of situations. As a result, knowledge, competence, and desire should all play a role in safety behaviour.

The effects of knowledge, skill, and motivation on different aspects of performance should be distinct. Safety knowledge and expertise should be associated with compliance rather than participation, and safety motivation should be associated with participation rather than compliance.

To conduct job safely, one must have the knowledge and skill to follow safety procedures. Knowledge and skill, on the other hand, are likely to be less significant for safety engagement. Because participatory activities are frequently based on one's willingness, motivation is likely to be more crucial for participation than conformity.

Individual safety knowledge was shown to mediate at least some of the linkages between safety climate and safety performance, according to Neal et al. (1997), who examined the model of safety performance and discovered that compliance and participation are different components.

Neal, Griffin, and Hart (2000) did research to look at the influence of general organisational climate on safety climate, as well as the impact of safety climate on individual knowledge, motivation, and performance. A total of 525 employees from 32 work groups in a large Australian hospital were included in the study. The 35 items from Hart et al. (1996)'s Organizational Climate Scale were used to gauge employee perceptions. The study discovered that organisational climate influences safety climate perceptions, and that safety climate perceptions influence safety performance through their effects on knowledge and motivation.

Individuals must carry out essential safety actions such as wearing personal protective equipment to preserve workplace safety, which is defined as safety compliance. Safety involvement was defined as activities that, while not directly contributing to workplace safety, do contribute to the development of a safe atmosphere (e.g. attending voluntary safety meetings and training). It has been proposed that safety compliance relates to mandatory actions, whereas safety participation refers to voluntary behaviours (Neal et al., 2000).

The Work Safety Scale (WSS) was a 50-item instrument that looked at employees' work safety perceptions by looking at five content domains: (a) job safety worker, (b) coworker safety, (c) supervisor safety, (d) management safety practises, and (e) satisfaction with the safety programme, as well as an 11-item compliance of safety behaviour tool (Hayes et al., 1998). The major goal of this study was to create a useful instrument with three functions: (a) suitable psychometric integrity-reliability and validity; (b) detailed assessment of significant characteristics of workplace safety perception; and (c) ease of use.

The researcher conducted three trials with distinct operations in order to validate the use of WSS. To test the tools on job satisfaction, reported accidents, and compliance with safety behaviour, three distinct samples were considered. The first study was conducted on treated patients at a medical consulting firm who were seeking compensation for industrial accidents by attaching a Work Safety Scale questionnaire to their medical examination. The responses, however, remained anonymous. Respondent preferences for WSS items were described using a five-point rating scale (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree). Correlations, reliability, and stepwise regression analysis were used as metrics. "Internal consistency was 0.91 (job safety), 0.91 (so-worker safety), 0.95 (supervisor safety), 0.95 (management safety procedures), and 0.93 (management safety practises)" (satisfaction with the safety programme). WSS subscale correlations range from 0.33 to 0.82. The best predictors of accidents, according to the stepwise regression analysis, were so-worker safety, management safety, contentment with the safety programme, and job safety. The purpose of the second study was to cross-validate the results of the first. The psychometric quality of the WSS was tested again on 879 patients in order to see if other characteristics of employees' perceptions of work safety were connected to their compliance with prescribed safe work practises. The WSS was then rationally connected with job-related attitudes as well as health-related factors in this study, which included measures of job satisfaction, job stress, and psychological, physical, and sleep complaints. Despite the fact that the methodology used in this second investigation was the same as in the previous one, the 11-items of compliance safety behaviour were revealed for the present study. Each of the items in this test is rated on a scale of 1 (never) to 5 (always) for reflecting behaviour on the respondent's current employment (Always). Internal consistency reliability was 0.92 (job

safety), 0.89 (so-worker safety), 0.96 (supervisor safety), 0.95 (management safety), and 0.92 (internal consistency reliability) (satisfaction of safety programme). When examining the association between WSS subscales and health-related measures such as general health complaints, physical complaints, and sleep complaints, it was discovered that they are linked. The best predictors of accidents were management safety and job safety, while the best predictors of compliance safety behaviour were supervisor safety and so-worker safety, according to stepwise regression analyses. The third study used a sample of 181 telephone line workers from a prominent telecommunications business to provide additional proofs of the WSS's internal consistency and validity utilising a more traditional way of data collecting. The WSS was given to the respondents together with additional materials such as questions about their work, self-reported accidents, and self-reported near-accidents.

In addition, respondents were asked to rate how often they receive formal safety awareness training on a scale of 1 (never) to 5 (more than once a month), as well as if they had a safety orientation programme when they started their present position. The 11-item compliance safety behaviour (CSB) measures were used in this study once again. According to the study's reliability alphas, all of the WSS subscales scored over 0.87. In terms of intercorrelations, the scaling range was 0.33 to 0.76. According to other studies, all of the WSS scales were adversely related to the near-accident variable. This could be related to the fact that 89 percent of employees did not record any incidents in the previous year. Management safety was found to be the best predictor of near accidents in hierarchical regression analysis, whereas management safety and so-worker safety were the top predictors of compliance safety behaviour. Finally, management safety procedures

and supervisor safety subscale were among the best predictors of accidents, job satisfaction, and compliance with safety behaviour in all studies on this WSS subscale.

However, various empirical ways to examine multiple attitudes within a specific restricted domain on safety performance can be supported by this five facets and compliancy description on workplace safety perceptions. All of the research can be compared to find a unique approach to determining workplace safety performance.

Dov Zohar, a well-known safety researcher, published a study in 2002 titled "The Effects of Leadership Dimensions, Safety Climate, and Assigned Priorities on Minor Injuries in Work Groups" (Dov Zohar, 2002). The study's goal was to look at the links between safety climate and leadership, two dimensions that are related to leader conduct but have different views. This research builds on two prior studies that looked at leadership and atmosphere as variables in workplace safety (Zohar, 2000; Hoffman et al., 1999). Respondents for the safety-climate and leadership questionnaires were selected from a group of 411 production workers in a company's metal processing plant during work hours. Group-level safety climate, leadership, and assigned priorities were the three categories of independent factors. The number of injuries reported by the company's medical staff is the dependent variable. A 10-item questionnaire on a 5-point rating scale ranging from "totally agree" to "absolutely disagree" was used to assess the group's safety climate. Component analysis is based on three factors: preventive action (PA), reactive action (RA), and a five-item prioritisation system (P). P has an Alpha reliability score of 0.78, PA has an Alpha reliability score of 0.80, and RA has an Alpha reliability score of 0.78. The leadership element was assessed using the Multifactor Leadership Questionnaire, which included a 5-

point rating scale that corresponded to the safety climate survey. Transformational Leadership (TL) = 0.88, Contingent Reward (CR) = 0.69, Management-by-Exception/Active (MEA) = 0.75, Management-by-Exception/Passive (MEP) = 0.70, and Laissez-Faire (LF) = 0.70 are the outcomes of the alphas. The final independent variable, safety priority, was determined using a 5-point rating scale ranging from 1 (not at all) to 5 (very) (to a very large extent). The results showed that a leadership dimension that involves group members' welfare from stronger relationships, as well as the promotion of supervisory safety procedures, has resulted in higher safety climates and safer conduct.

Clarke (2006) investigated the impact of the workplace environment, job communication, and safety attitudes on accidents and dangerous conduct in a car manufacturing plant. The goal of this study, which began in 2006, was to look into the attitudes of workers, supervisors, and managers in a UK-based automobile manufacturing factory toward risky behaviour and accidents. Due to its previous successful use and wide range of measures, a set of questionnaires originally designed for the offshore oil industry (OSQ) by Flin et al. (1996) was used among the 185 respondents with some changes to accommodate the study. The questionnaire contained certain additions, such as demographic information and subsections. The work environment was divided into subsections. Job communication, safety evaluation, safety climate, safety behaviour, and, of course, previous accident history are all important considerations. The study's independent factors included the work environment, workplace communications, and safety attitudes. The number of accidents and dangerous behaviours, on the other hand, were chosen as independent variables and examined using hierarchical multiple regression analysis. Job communication ($\alpha=0.78$), appraisal of safety > 0.70 , and dependent variable

of safety behaviour ($\alpha=0.86$) received the highest scores on alpha reliability tests. The 5-point work environment scale included two subscales from Moos and Insel's (1974) work environment scale, which measured work pressure (6 items) and work clarity (6 items) (4 item). Rundmo (1990) developed a job communication scale with seven items that rate the participant's willingness to communicate in their job. For 11 safety measures, respondents were asked to rate their satisfaction on a 5-point scale (from "extremely unhappy" to "very satisfied"). The OSQ's 20 safety and prevention components were incorporated into the safety climate. The safety behaviour scale was validated by Mearns et al. and incorporates items from Rundmo (1994) and the Health and Safety Executive (1995). (2001). The final section of the questionnaire asked respondents to state whether they had ever been in an accident at the current plant. The data show that factors such as safety climate have little bearing on plant accidents. Nonetheless, it was revealed that having an uncertain perspective of the workplace was associated with a higher risk of being involved in an accident. The data therefore revealed that workers' attitudes toward safety are linked to their perceptions of work pressure and job clarity, but not to their attitudes toward safety.

A pair of studies in 2007 looked at the empirical findings of an examination of ethical contexts and workplace safety behaviours (Parboteeah & Kapp, 2007). This research was conducted on 137 employees from five manufacturing plants in the Midwest of the United States of America. "The study's goal was to see how different local ethical climates are associated to injury rates with two forms of safety-enhancing behaviours: safety compliance and safety engagement." Egoist-local, benevolent-local, and principled-local ethical climates were used as independent variables. Safety compliance and safety involvement were the dependent variables. Except for three shifts across two sites, all

employees from various shifts received questionnaires at their mid-shift break time. The Ethical Climate Questionnaire (ECQ), created by Victor and Cullen, was used in this study (1987; 1988).

Respondents were asked to rate how well each of the items characterised their ethical work atmosphere on a five-point likert scale, which described how accurately each item described the organisational expectations on the climate ratings. Respondents were asked how many injuries they had in the previous six months when analysing the incidence of injuries, and then it was measured on safety-enhancing behaviours using Neal et al. (2000). The results were then categorised into two categories: safe work practises (safety compliance) and safety support behaviours (safety participation). Four items would be used to assess individual performance of safety procedures and practises in order to assess safety compliance. Four elements related to supporting safety improvement behaviours in the company were also imposed as a result of safety involvement. The measurement's reliability test resulted in a score of 0.79. Four questions were used to assess motivation to execute safety-related tasks, with a reliability test score of 0.91. Six items with a reliability measure of 0.84 were used to investigate motivation to participate supportively in all levels of safety in the business. Correlations, descriptive statistics, and multiple regressions were also used to investigate the relationship between factors and demographics. The first finding was that none of the egoist-local climatic variables were connected to safety motivation or injury rates. The second finding demonstrated that there were no links between benevolent-local climate and motivation to participate in or comply with safety-related activities. Positive connections between principled-local climate and safety-

enhancing behaviours were found, but they were mediated by individual incentive to behave safely.

Individual differences are another aspect that may have an impact on safety performance. A study was conducted to uncover this issue in order to learn more about it (Henning et al., 2009). The study's major goal was to look at the links between safety attitudes and a number of individual variables that represent risk and control preferences and tendencies. One hundred and ninety engineering and occupational safety students from two universities were chosen as the sample. This study looked at five different categories of individual differences. According to John et al., the authors termed it The Big Five personality, which was assessed using the 44-items of The Big Inventory (1991). Risk propensity was assessed using Goldberg's (1999) nine-item scale from The International item Pool, sensation-seeking was assessed using Zuckerman's (1979) 10-item thrill and adventure seeking subscale, both promotion and prevention regulatory focus were assessed using Wallace and Chen's (2006) six-items, fatalism in relation to accident prevention was assessed using Rundmo and Hale's (2003) seven-items, and (1987). Individual differences variables are significant in each of the attitudes, according to the findings of this study, particularly overall safety attitudes and attitudes toward management's obligations, worker's responsibilities, and discipline. Individual differences such as agreeableness, preventative emphasis, and fatalism appear to play the most important role in predicting safety attitudes and may be effective in job selection in the future to avoid workplace accidents. Furthermore, having employees who are prone to safety attitudes would result in a more favourable safety culture in the workplace (Schneider, 1987).

The evolved Minnesota Safety Perception Survey, which includes: (a) management's demonstration of commitment to safety, (b) workforce education and knowledge, (c) supervisory process effectiveness, and (d) employee involvement and commitment, is another measurement that can be included in survey perceptions on safety performance (Carder & Ragan, 2003). This tool was created to help people perform better in terms of safety. The survey comprised 5,400 respondents from over 50 plants to ensure the instrument's reliability and validity. This survey's instrument contained 41 questions from Bailey's (1989; 1997) original Minnesota Safety Perception Survey and 55 questions produced by the present study team. The study focused on six elements, which were as follows:

- i. Management's demonstration of commitment to safety.
- ii. Workforce education and knowledge.
- iii. The supervisory procedure' effectiveness.
- iv. Employee participation and commitment.
- v. Alcohol and drugs (fitness for duty)
- vi. Off-the-job security.

The survey instrument's dependability was determined using two ways. The first method was applied to a person's replies to one and a half of the survey's items (randomly chosen), while the other half of their responses were associated in the opposite direction. The reliability of this procedure resulted in a higher degree range of 0.90. The second method involves using Pearson correlation and chi-square statistics to examine all previously administered surveys conducted over a period of years. There are also two more

data sources to ensure that this effective diagnostic tool is used in the development of actions to improve safety performance. Increases in recognition and management commitment were statistically significant, but improvements in education, knowledge, and off-the-job were not. As a consequence, the survey's use was validated, and it could be used as a diagnostic tool for safety improvement efforts on performance.

It was discovered that perceptions of safety climate may be distinguished from perceptions of knowledge and motivation, as well as self-reported safety compliance with participation, by performing two distinct investigations (Neal et al., 2002). This study was a follow-up to the prior one, which focused on the same root cause in terms of safety climate. It proposes a research programme aimed at determining the causes and implications of safety climate and behaviour. Individuals' work behaviours were used to represent the job performance components. Factors that influence behaviour through their impact on knowledge, skill, and motivation were used to represent the antecedents of performance. One of several potential antecedents of safety behaviour has been proposed: the safety atmosphere. Leadership and conscientiousness are two examples of sub-dimensions. The antecedents of safety climate sub-dimensions can be split into two situations: internally and outside, to make this framework understandable. The framework offered in this study also clarified two key concepts in the components of safety performance: safety compliance and safety involvement. These research, on the other hand, indicated that knowledge and motivation influence the link between the two components. It indicates that a resourceful safety programme will have a significant impact on workers' safety climate by increasing their knowledge, skill, and motivation, resulting in desired safety behaviour.

2.5 Theories of Accident Causation

There are various prominent hypotheses about what causes accidents, each with some explanatory and predictive merit.

2.5.1 The Domino Theory

Herbert William Heinrich coined the term "Domino Theory" in 1929. Several times over the course of several years, the hypothesis has been expanded. Heinrich's idea uses the analogy of dominoes falling over one another and causing a chain of events to explain accidents. Despite the fact that it is not the most advanced or complex theory, it is notable for being one of the earliest scientific ideas to explain accidents. Even now, seven decades later, it is frequently cited. When one domino falls over, the next one falls over, and so on until all of the connected dominoes have fallen. The entire process comes to a halt if just one domino is removed. In the same way, Heinrich discusses the cause of an accident. As depicted in Figure 2.2, Heinrich identified five stages of accident causation. The steps of accident causation are shown below, labelled on five metaphorical dominoes in the sequences:

The first stage, social environment and ancestry, covers everything that can lead to people developing undesirable characteristics. Heinrich's use of genetics and ancestry reflects the time era in which it was written. A modernised version of this idea would most likely utilise the term hereditary behaviour, similar to how alcoholism and temperaments can be inherited. This level of accident causation is quite similar to social learning theories.

The second stage, a person's defects, is concerned with human characteristics that cause mistakes. For example, having a bad temper might lead to unexpected outbursts and a disregard for safety. Similarly, general irresponsibility could be a symptom of poor character. This stage also includes ignorance, such as a lack of familiarity with safety regulations or standard operating procedures.

A harmful behaviour or situation, the third stage, is typically the recognisable start of a certain occurrence. Unlike the previous two phases, which have an impact on the chance of an accident occurring, this stage is closer to the occurrence in time. This can include doing something dangerous, such as starting a machine without warning, or not taking the appropriate precautions, such as using guardrails or other safety measures. In essence, this category includes behaviours (or failures to act) that infrequently result in accidents.

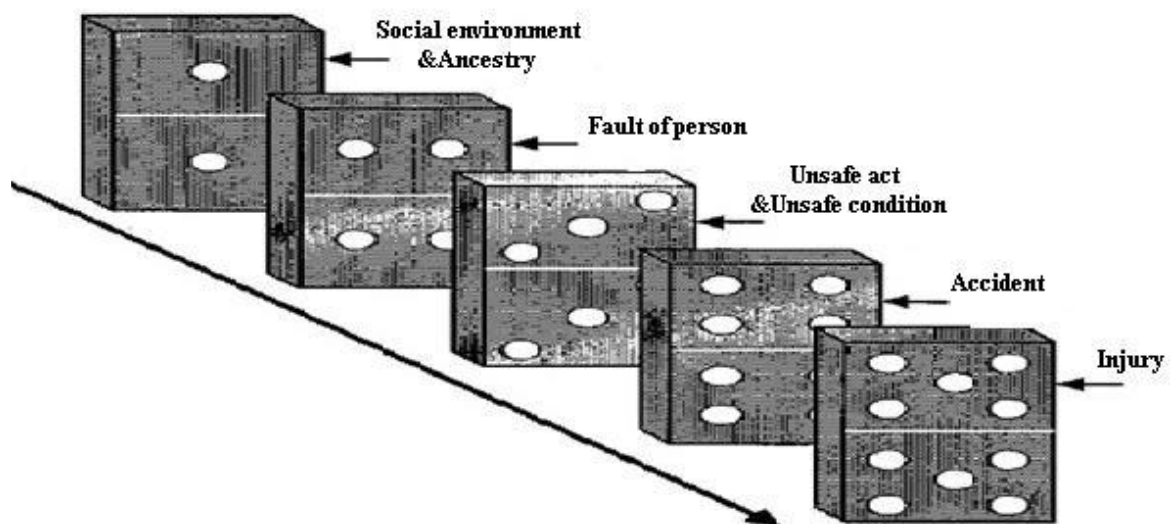


Figure 2.2: Heinrich's Domino's sequences of accident causation theory

The accident itself is the next logical step. This requires minimal explanation in and of itself. It's simply when anything happens that is unintended and unwanted.

Injury is the terrible result of a series of errors towards the end. Whether or whether an injury occurs during an accident is largely a question of luck, and this is not always the case. This relationship emphasises the correlation (or links - relationship is repeated in sentence) between phases in terms of causality. The occurrence of an accident is a required, but not sufficient, cause of harm. Similarly, the negative characteristics of the second stage do not always occur in adverse conditions, but they would not exist otherwise.

Given this required causation, the most significant policy implication is to eliminate at least one of the dominoes, which can then lead to a healthy subculture via positive accident prevention training and seminars. Although a company may not be able to exclude all persons with undesirable characteristics, it may establish a method for dealing with incidents in order to reduce injury and loss.

Heinrich's Domino theory was one of the most understandable and unambiguous ideas characterising accident processes, but it had some flaws that made it difficult to apply. Because of the flaws, the theory was amended to account for the overemphasis on individual blame, the failure to address management and organisational error, and the belief in a single cause when there may be several.

Bird and Loftus' "Domino hypothesis" was published in 1974, and the role of management was included in Heinrich's sequence of accident causes (See Figure 2.3). As a result, the following new sequences were created:

1. Inadequate management/control
2. The origins/causes of the problem (basic causes: 1-personnel factors, 2-job factors)
3. Symptoms/causes that are occurring right now (unsafe act and condition)
4. An occurrence (the events which could cause harm to either people or properties)
5. Suffering (properties, people, processes).

The process of incidents begins with management's lack of control, according to a revised model of Domino theory that denotes the function of management. Management's planning, controlling, coordinating, and leading are all characteristics that can help avert incidents. Vincoly divided the fundamental reasons into two categories:

- i. Personal difficulties (non-work-related), mental disorders, disease, a negative attitude, and a lack of knowledge or aptitude are all examples of personnel factors.
- ii. Job considerations: insufficient work, normal or excessive wear and tear, low-quality equipment, and poor design or maintenance are examples of these issues.

Vincoly argues that the management system permits the factors to remain unchecked and uncontrolled, resulting in an incident, while the new model characterises unsafe acts and conditions as symptoms of root causes that arose from domino 1 and 2 (shown in Figure 2.3).

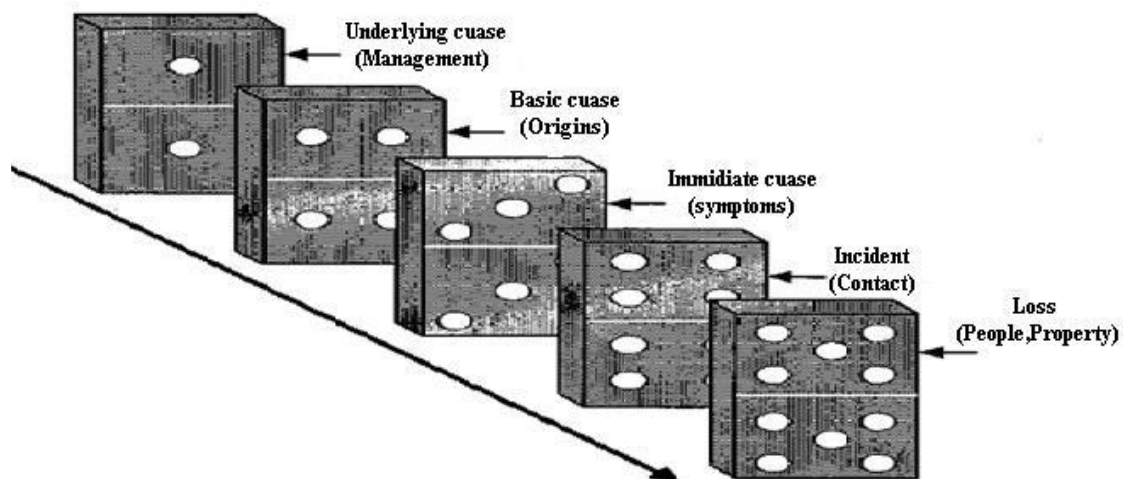


Figure 2.3: Updated Domino sequence of accident causation theory (Bird 1974)

In terms of intelligibility, Heinrich's Domino theory varies from previous accident theories in that it is applicable and employable at all levels of employment, from employees to experts and managers. The theory has the following defining properties that make it unique in its application:

Simplicity

The theory illustrates the phases of causation in simple terms. As a result, it's easy to utilise, and an investigator doesn't have to look for a lot of different answers. It's also understandable for non-experts in the realm of security.

Easy fix being

Almost everyone who works in a business has been exposed to Domino theory's processes. It signifies that anyone can readily establish and conduct the line of the theory.

Blame placing

The person who does harm to others can be easily identified using the theory's sequencing. As a result, the proper responsibility can be assigned to the relevant individual in order to pay for the loss or injury suffered. As a result, the theory is appealing to those who have lost their rights.

The way to be looked good and professional

An investigator's capacity to solve an occurrence would undoubtedly be reflected. According to the investigation, the one's professionalism is represented, and the one knows how to prevent the issue from happening again:

There is always a relationship between behaviours and their outcomes, according to James Reason. Organizations must provide enough protection against the risks that may arise as a result of risky behaviour or its implications in terms of people's well-being. The degree of protection must be determined logically such that it does not cost more than is required and does not, on the other hand, cost less than the associated potential threats. The main goals of an organisation are to maintain revenues, expand opportunities, and eliminate unneeded and unpleasant expenses. As a result, detrimental behaviour and hazardous conditions may jeopardise such objectives. Risky actions and unsafe conditions are the most common immediate causes of losses. To invalidate the theory, simply remove the first domino from the chain. Some of the unsafe activities and situations include insufficient lighting, the absence of rail guards, an unsecured point of operation, the removal of safeguards and mechanical or physical dangers, horseplay, starting machinery without notice, and standing under suspended load.

Construction accident theories and models are established based on descriptions of how construction accidents occur. The theories clarify the direct and contributing causes of accidents. Although various other accident theories accurately capture accident causation, Domino theory presents a straightforward model based on a single idea of risk.

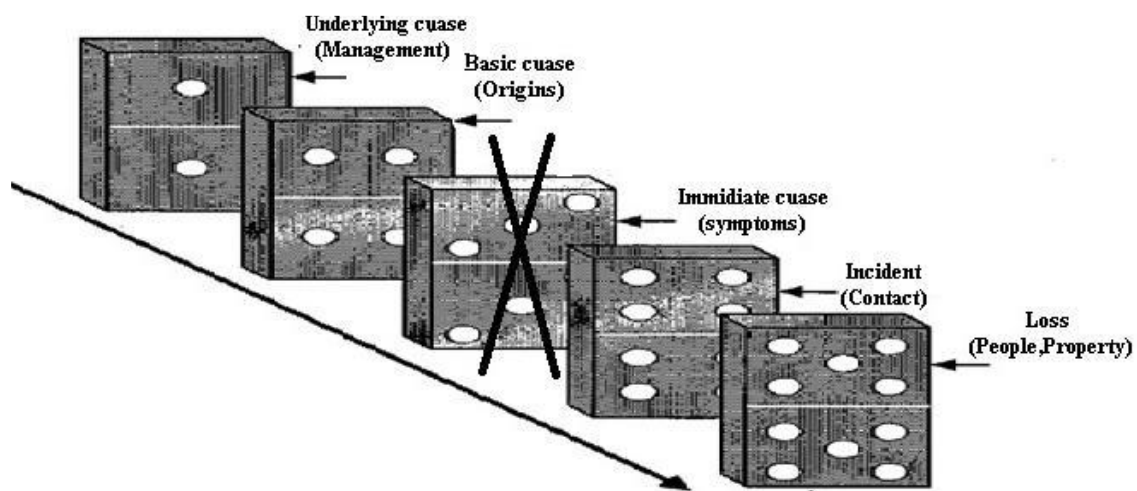


Figure 2.4: Remedy model of Domino theory

As previously stated, unsafe activities and conditions are classified as immediate causes, which include safety management failures and employee physical and mental problems. At Domino theory, the role of humans in causing accidents is stressed. Ferrel (1977), Peterson (1982), and Mc Clay (1989) expanded on the human error concept of accident causation by emphasising the involvement of human elements in their accident theories. The interactions between the work environment, the workers, the equipment, the tools, and the others participating in the activities that generate the sequences of events that lead to accidents always have the potential for negative consequences. The safety measures can be developed greatly based on the simplicity of domino theory to make it

understandable for all levels of construction people. Following the improvement of safety performance, a project's safe working environment pushes it toward rapid productivity.

The most recent issues that a construction site faces are accidents and incidents. They result in unnecessary costs and downtime, as well as non-productivity or entrapments. Accidents occur when employees act in an unsafe manner or provide unsafe acts, and management ignores the presence of hazardous conditions. As a result, the immediate (direct) causes of accidents, such as risky conduct and unsafe conditions, are the most important variables in causing an accident. Other physical and mental conditions of an employee, as well as environmental influences and a lack of oversight on safety performance, all contribute to risky acts and unsafe settings that result in accidents. Following such issues on construction sites, researchers devised a number of hypotheses to explain how accidents or incidents occur, as well as methods to reduce the causes of losses or injuries. Heinrich devised the Domino theory in 1929 as the most understandable and simple model. Bird and Loftus refined it in 1976, and Vincoli revised it in 1994. The updated model's structure consists of five metaphorical dominoes identified with accident and incident causes listed in sequences displayed in Figure 2.2 and Figure 2.3. The underlying causes are tied to job and human factors, whereas the basic causes are related to management. Lifting up the domino 3 (unsafe acts/unsafe situations) is the focus of the remedial model (Figure 2.4). In other words, the greatest and simplest solution to take within the steps of accident causation is to eliminate risky acts and conditions.

2.5.2 Ferrell's Human Factor Model

Unlike Heinrich, who explained accidents in general terms as a single-chain reaction, Ferrell's model includes several causes and is quite explicit about them. Ferrell also defines accidents as the outcome of an individual's error. As a result, he described his hypothesis by assuming that one person is responsible for all incidents. Overload, incompatibility, and incorrect activity are three common causes of accidents, according to Ferrell. These are broad categories that encompass a number of different reasons. Improper action is the most straightforward of the principles, as it incorporates two simple causes of accidents. To begin with, it's possible that the individual in charge just did not know any better. Alternatively, he or she may have been aware that an activity could result in an accident but opted to take the risk nevertheless. The cause of incompatibility is a little more complicated than poor behaviour. It includes both an individual's inappropriate response to a circumstance and minor environmental features, such as an awkwardly shaped workstation.

The final cause, overload, is the most difficult of Ferrell's causes. It can also be broken down into three sections. To begin with, part of an overload is caused by the individual's emotional state. These feelings include being unmotivated and annoyed. Second, capability refers to an individual's physical and educational background. Physical fitness, training, and even inheritance all influence this. Drug and pollutant exposure, as well as job-related stressors and pressures, all have an affect on one's capacity. Finally, the individual's burden may increase an overload. This includes the task's difficulty, the task's level of hazard, and the environment's negative or positive effects (noise, distractions, etc.).

Overburden, incompatibility, and inappropriate activity can all result in human error, which can lead to an accident.

2.5.3 Petersen's Accident/ Incident Model

Ferrell's Human Factor Approach is extensively expanded upon by Petersen's model. Ferrell's work is extremely similar to the concept of an overload created by capacity, status, or load. There are, however, a few tweaks and improvements. The environmental aspect of incompatibility (workstation design and displays/controls) was first envisaged by Petersen as a separate section of the paradigm, which he dubbed ergonomic traps. Petersen also distinguished between a decision to err and the overload reason. Petersen went on to say that there are different reasons to choose to err. A reasonable judgement based on the scenario (mainly for financial cost and time constraints), an unconscious desire to err (psychological failings), and a low probability of an accident are among these explanations. The sense of low accident probability, on the other hand, can contain both genuine examples of an accident being exceedingly improbable and a human's inherent predisposition to neglect his or her own mortality. Because it makes the same assumptions about human rationality and hedonistic calculus as criminology's rational choice perspective, this aspect of Petersen's model is similar to criminology's rational choice perspective.

Petersen's realisation that human mistake is merely one component of a bigger paradigm is also notable. As a possible mediator between errors and accidents, a system failure of the organization's inability to fix errors was added. These failures can occur in a variety of ways. System failures include management's failure to notice faults and a lack of

training, to name a few. Even bad policy can cause a system failure, which doesn't prevent an accident from happening due to a human error.

2.5.4 Epidemiological Theory

Gordon is credited as being the first to suggest an epidemiological hypothesis of accidents. Gordon (1949) believed accident to be an environmental issue. According to this study, the causative variables in accidents are found in agents, the host, and the environment, as shown in Figure 2.5. The process through which the three components interact to produce a result, the accident, is referred to as the mechanism of accident production. As a result, if the problem is the cause of the accident, it is reasonable to attack the problem in the same manner and with the same tactics as other mass sickness concerns. Haddon introduced a 2D dimensional matrix for injury management in 1968, which was primarily designed for automotive accidents. This matrix aids in the identification of the host, agent, and environmental factors in chronological order (pre-event, during the event, and after the event) as well as the identification of preventive measures. Later in 1970, Haddon presented 10 ideas for decreasing losses based on the energy transfer principle. The basis for this energy transfer idea is that the transfer of energy is a major class of ecological phenomena.

Reason proposed in 1990 that there are hidden human flaws that result in accidents with no obvious reason. The following three concepts were presented in the proposal: (i) a latent failure, (ii) a local triggering event, and (iii) system defences. The study looked at the differences between active and latent human failure, as well as a framework for accident causation dynamics. The Swiss cheese model and the organisational accident model were

later improved and proposed by Reason (1997). (shown in Figure 2.3). Organizational accidents are common in today's complex technology cultures, and can have a variety of reasons. Many people from various levels of their respective companies are involved in the accidents. Losses are caused by hazards, and barriers are in place to prevent them. The barriers have holes in them, just like Swiss cheese. Hazards pass through and cause losses when all of the holes align. Each barrier provides a different level of loss protection for the organisation.

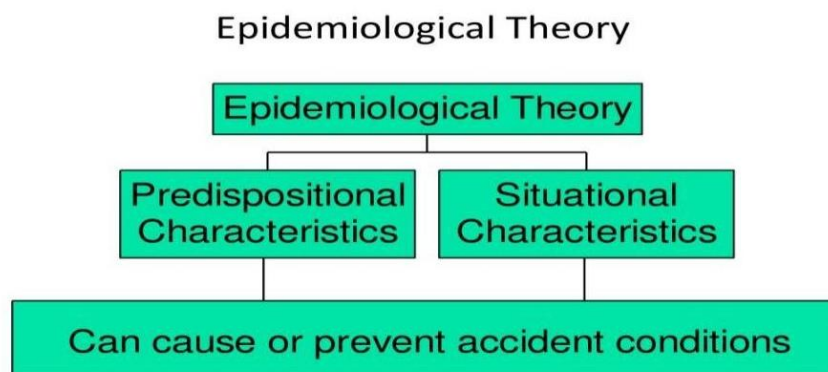


Figure 2.5: Epidemiological Theory

2.5.5 Systems Theory

The majority of the hypotheses discussed thus far have been on human flaws and environmental issues. A systems model theory approaches the relationship between people and their surroundings in a unique way. Instead of the environment being full of hazards and a person being prone to errors, a system model view sees a harmony between man, machine, and environment. Under normal circumstances, accidents are quite unlikely. If someone or something throws this balance off, whether by changing one component or the interaction between the three, the chances of an accident skyrocket.

The concept of risk-taking is another component of the systems model. When someone decides to do something, there is always a risk. Smaller chores and risks are usually calculated on an unconscious level. When someone decides to drive to work every day, they assess the risks (a minuscule probability of being in a car accident) against the benefits (the ability to earn a living) and conclude that the benefits outweigh the risks. This hedonistic calculus, like Petersen's model, is quite similar to the rational choice approach. Managers, safety experts, and supervisors analyse the risks of injury or financial loss in the same way that potential thieves do.

Firenzie's Systems Theory

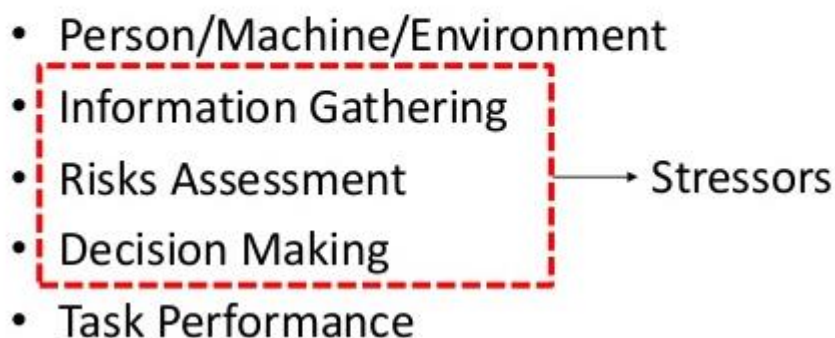


Figure 2.6: Firenzie's System Theory

The decision to proceed with the assignment is taken only when it is judged that the possible benefits outweigh the potential losses. Ford was once accused of calculating that the benefits of avoiding having to pay to correct all the defective automobiles on the manufacturing line outweighed the dangers of releasing a defective vehicle (causing several fatalities and wrongful deaths). While subsequent reports have proved that this claim is mostly incorrect, this case has been used as an example of risk-taking and financial calculations. There are five evaluated risks and rewards to consider, according to Firenze:

- i. Job specifications
- ii. The worker's strengths and limitations in connection to his or her job
- iii. The profit that could be made if you succeed
- iv. The possible ramifications of failure
- v. The cost of failing to attempt the assignment

After an initial try, feedback provides more information regarding these five factors. To put it another way, a previously completed activity has well-known dangers and advantages, whereas a new task frequently has more unknown aspects.

2.5.6 Behavior Theory

The behavior-based approach to applied psychology is based on Skinner's notion and research in behavioural science (1938, 1974). Skinner dismissed unobservable elements like self-esteem, goals, and attitudes for scientific investigation in his experimental examination of behaviour. Only observable behaviour and its social, environmental, and physiological factors were studied by him. The behavior-based method begins by identifying the observable behaviours that need to be changed, as well as the environmental factors or contingencies that may be changed to impact the target behavior(s) in desirable directions. (Contingencies are the connections between specified target behaviours and their accompanying outcomes.)

The core premise is that by detecting and modifying the environmental variables (or stimuli) that immediately precede and follow a target behaviour, behaviour can be objectively investigated and changed. The antecedent conditions (which he refers to as "activators") indicate when behaviour can lead to a pleasant result (a reward) or avoid a

negative result (a penalty), as shown in Figure 2.7. As a result, activators control behaviour, whereas repercussions decide whether or not the conduct will be repeated. People are driven by the consequences they expect to obtain, escape, or avoid as a result of engaging in a specific behaviour.

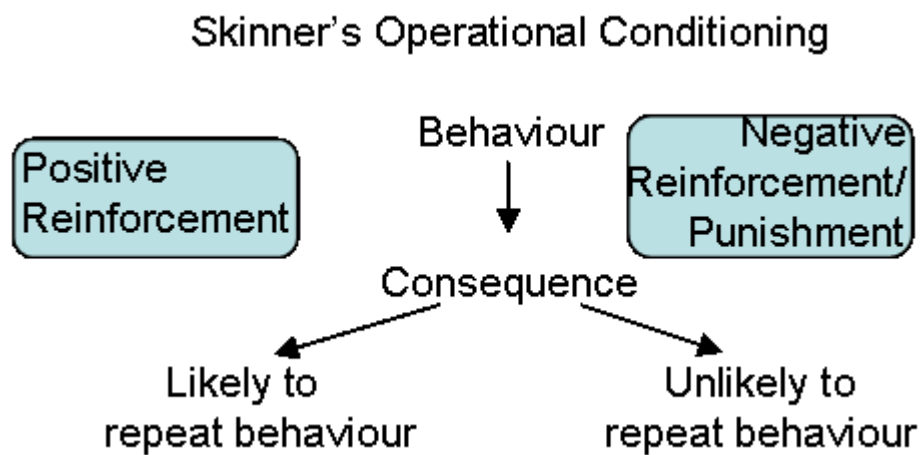


Figure 2.7: Skinner's Operational Condition

When people change their attitudes, values, or thinking strategies, certain behaviours change as a result (Festinger, 1957); when people change their attitudes, values, or thinking strategies, certain behaviours change as a result (Festinger, 1957). (Fishbein and Ajzen, 1975). As a result, attitudes and behaviours can be influenced directly or indirectly by person-based and behavior-based approaches to altering individuals. In their attempts to modify a person's knowledge, abilities, attitudes, or behaviours, most parents, teachers, first-line supervisors, and safety managers employ both approaches.

- i. When we lecture, counsel, or educate people one-on-one or in groups, we are essentially employing a person-based method

- ii. When we identify, correct, or discipline others for their actions, we are essentially using a behavior-based approach.

Behavior-based psychotherapy, on the other hand, was created to be delivered by those with little or no professional training. From the beginning, the goal was to reach out to people in places where problems arise, such as the home, school, rehabilitation centre, or workplace, and teach parents, teachers, supervisors, friends, or coworkers the most likely behaviour change approaches to use in such situations (Ullman & Krasner, 1965).

More than three decades of study has demonstrated that this on-site strategy is cost effective, owing to the simplicity and ease with which behavior-change strategies may be implemented, as well as the ability to track intervention progress through continual monitoring of target behaviours. A behavior-based process can be continuously updated or altered by collecting objective feedback on the impact of intervention strategies.

For large-scale applications, behavior-based approaches are highly cost-effective. As a direct outcome of this method to intervention, many community-based and organisational research has shown significant improvements in environmental, transportation, productivity, and health-related concerns (e.g., see comprehensive research reviews by Elder et al., 1994; Geller et al., 1982; Goldstein & Krasner, 1987; Greene et al., 1987). And there's plenty of evidence that a behavior-based strategy may enhance a company's safety performance considerably (e.g., DePasquale and Geller, 1999; McSween, 1995; Petersen, 1989; Ward, 2000).

2.5.7 Reason's Swiss Cheese Model

The Swiss cheese model, first published in 1990 by James Reason, is possibly the most widely accepted systems theory on accident causation. According to this notion, every stage of a process has the potential to fail. A slice of Swiss cheese represents each layer of defence, with the holes in the cheese reflecting probable issues or failures in that tier. The two sorts of failures that can occur are active and latent failures. Active failures are dangerous behaviours that immediately cause an accident. A situation known as latent failure might go undiagnosed for a long time until it causes an accident. A latent failure is the absence of a policy that specifies how a certain job task should be performed properly.

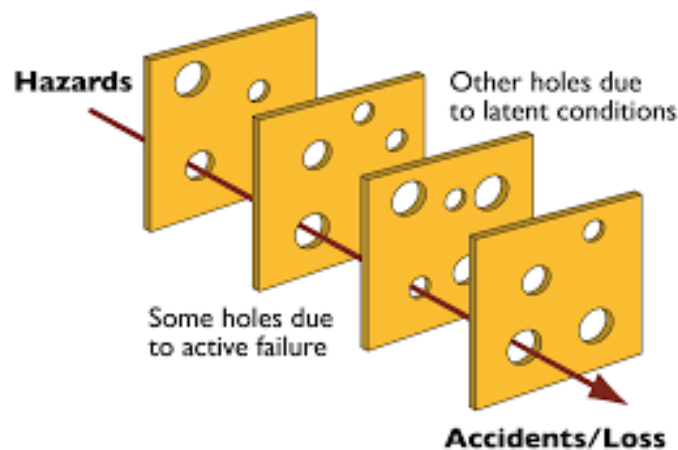


Figure 2.8: Reason's Swiss Cheese Model

For an accident to happen, the holes must line up; no layer of defence can detect the problem. If the holes do not line up, the problem has been discovered (present tense), and there will be no accidents. A policy that covers duties that must be accomplished, for example, could be the first layer. The next layer could be the personal protective equipment (PPE) that must be worn to complete the task. The problem gets through the first line of defence if the policy doesn't address PPE or demands the wrong PPE. If the

PPE is not worn or is worn incorrectly as specified in the policy, passage through the next hole is conceivable. In these circumstances, an accident will occur if there are no further layers of defence. Figure 2.8 depicts this model. Despite the presence of multiple layers of defence, tiny flaws in each layer render the defence ineffective. If the circumstances are right, these defects can align and cause an accident.

2.5.8 The Integration of Theories and General Safety Program Implications

It's vital to remember that no single explanation of accident causation can account for every single incident. Each hypothesis only explains a subset of accidents, and all of them are flawed, as proven by the number of published papers refuting each theory. As a result, it's critical to understand that effective accident prevention—the decrease of the likelihood of an accident—can only happen when all potential causes are addressed. Concentrating on only one or two hypotheses is insufficient. Furthermore, there are a number of theories that are not even included in this chapter. Additional information about accident cause should be sought by safety specialists and those with relevant responsibilities.

Even from the few theories addressed in this chapter, there are various programme implications that may be drawn. Many of these are common sense and well-known practises. To begin with, most theories and models agree that human error is always a factor in accidents. Employee training that is thorough and ongoing is an effective method. Better safety training, as well as enhanced knowledge and awareness of potential hazards, can only help to reduce the risk of an accident.

Second, a common thread in accident causation is socialisation and subculture. This emphasises the importance of ongoing training and safety procedures. A risky employee not only raises the likelihood of an accident, but he or she can also corrupt future employees, exacerbating the situation. A good example of how to handle this challenge is a safety awareness programme. An awareness programme can employ strategies such as regular meetings and positive safety posters. Another aspect of an effective safety programme is keeping staff motivated to be safe. Employees should be exposed to motivators (positive rewards) and hygiene aspects, according to the two-factor theory of motivation, often known as the Motivator-Hygiene theory¹¹ (routine parts of a job, such as a good working environment, that prevent dissatisfaction). Management should be aware of the necessity of maintaining a positive workplace culture and be trained in problem employee intervention tactics. The importance of management buy-in to the safety programme cannot be overstated.

Third, an essential part of accident causation that must be addressed is the physical environment. Aside from the apparent consequences (guard rails, safety signs, hardhats, etc.), the subtle relationships between man and the environment must also be taken into account. Ergonomic designs, which are frequently utilised to boost productivity, can also boost a worker's comfort. Because stress and boredom can contribute to human mistake, it's also a good idea to reduce agitators to a minimum and use ergonomic designs.

Finally, don't just rely on popular wisdom. Safety, like security, is generally reactive; being proactive and thinking outside the box can significantly improve a safety programme. Offering incentives and awards to safety-conscious employees is a relatively

new strategy that, at the very least, attracts attention. The status quo can also be questioned by asking if there is anything else that can be done to keep employees safe. A frequent evaluation is a vital aspect of any programme to ensure that it is working. Statistical assessments of accident statistics, surveys of people's safety views, and safety specialist inspections are all examples of potential programme effectiveness indicators. It is critical to validate findings by confirming them using numerous indicators. If at all possible, multiple programmes should be applied in diverse situations to compare their efficacy (or lack thereof). If a software isn't working, inquire about how it could be improved. If it's working, repeat the process.

2.6 Practical Discussion

For palm oil producing countries, the expanding palm oil sector has been a significant source of economic growth. Palm oil exports in Malaysia, for example, totaled RM 45.6 billion in 2015, accounting for 5.8% of total exports and ranking fifth among the top five exports after electrical and electronic products, chemical and chemical products, petroleum products, and liquefied natural gas (MITI, January 2017). Nonetheless, issues of reliability and safety remain critical areas that must be addressed by all stakeholders involved in this business, including mills, refineries, and oleochemicals.

Although rules and guidelines exist to ensure dependability, safety, and health, such as OHSA 1994, OHSAS 18001, and MS 1722 (Hong, 2013), the palm oil sector lags behind in process safety, with multiple tragic accidents attributed to process breakdowns (DOSHS, January 2017). As a result, to reduce the risk of a process-related event in the palm oil business, Process Safety Management (PSM) must be improved to a higher level.

In terms of occupational safety and health (OSH), the palm oil sector complies with the Occupational Safety and Health Act of 1994, and some companies are voluntarily implementing OHSAS 18001 and MS 1722 to manage their OSH risks and improve their OSH performance. Nonetheless, despite the fact that some mishaps have resulted in fatalities and severe injuries as a result of process-related incidents, there are few research on process safety.

Although the PSM has become an industry standard as a result of catastrophic industrial tragedies and the subsequent implementation of stringent safety and environmental regulations in many countries, it is still regarded relatively new in Malaysia, particularly in the palm oil industry. Nonetheless, (Hamidah et al., 2014) proved that the chemical process sector and the palm oil industry share not just process equipment and operational conditions, but also process dangers. As a result, it is prudent to introduce PSM to the palm oil business, especially because several tragic catastrophes have happened in recent years that have been attributed to process failures.

For palm oil producing countries, particularly Malaysia, the expanding palm oil sector has been a significant source of economic growth. As a result, process safety should not be compromised in order to ensure corporate viability. According to the findings, proactive efforts are unquestionably necessary to address the process safety issue in the palm oil business, as some tragic accidents have been blamed on process breakdowns. Relevant parties, with the full support of the Malaysian government, should play a key role in ensuring that the industry begins to implement Process Safety Management in order to

improve industry standards and prevent major hazard accidents that can result in fatalities, asset damage, and environmental impact.

2.7 Chapter Summary

There are various ideas and metrics that have been beneficial in examining employee perceptions of safety, and this will present good predictors of workplace safety. Certain policies and procedures may have a significant impact on compliance behaviour and management safety policies. Other than WSS, all other tools will be used merely as a reference in this study to achieve the intended aims and answer all research questions. The methodological features of this investigation will be discussed in the following chapter.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter focuses on the study's research methods. The first step was to conduct a survey to collect relevant and primary data, which was then analysed to determine positive and negative study findings. The research philosophy, instrumentation, location, population and sample, data collection procedures, pilot study, validity and reliability, data analysis procedures, and ethical consideration are all covered in this chapter.

3.2 Research Design

According to Easterby-Smith, Thorpe, and Lowe (2012), Leavy (2017), and Creswell (2018), the efficacy of considering philosophy in research stands in clarifying research designs. As a result, management research suffers from a severe decline in quality when philosophy is absent. Ontology and Epistemology are two aspects of this philosophical belief system. Ontology is concerned with the orientation or attribute of reality, as well as what can be learned from it. On the other hand, epistemology, the other facade, directs the observer's role enactment and relationship with the observed.

Despite the fact that both Leavy (2017) and Creswell and Creswell (2018) admit the presence of various paradigms, four are generally used: post-positivism, interpretative or constructivist, transformative, and pragmatic paradigms. Constructivism or social constructivism is often acknowledged as a typical approach for qualitative investigation,

according to Pruzan (2016), Gliner et al. (2017), Edmonds and Kennedy (2017), Leavy (2017), and Creswell and Poth (2018). The social construction of reality and naturalistic inquiry that emphasises people's subjective experiences gave rise to this philosophical belief system (which is sometimes linked to interpretivism). Knowledge is socially mediated and influenced by continually shifting political and social situations as well as individually produced knowledge.

The survey method is commonly connected with the deductive approach, according to Saunders et al. (2016). The most common questions are who, what, where, how much, and how many, and it is a popular and commonly used method in business and management research. Surveys are popular because they allow for the inexpensive collection of vast amounts of data from a large number of people. These data are often collected through the distribution of a questionnaire to a sample, and they are standardised to allow for easy comparison. Furthermore, the survey method is often regarded as authoritative and is relatively straightforward to explain and comprehend. The survey method allows us to gather quantitative data, which we may subsequently analyse with descriptive and inferential statistics. Furthermore, survey data can be used to provide reasonable explanations for specific interactions between variables, as well as to develop models of such relationships. It is possible to obtain results that are representative of the full population at a lower cost than gathering data for the entire population when sampling is utilised. Figure 3.1 depicts the study steps in further detail.

This study, on the other hand, would collect data using a survey questionnaire. The statistical explanations, descriptions, and correlations of the research issue would be

provided by the study (Schumacher & McMillan, 1993). This is related to the fact that survey research produces data or findings based on assumptions about the real social environment (ontology) (Burrell & Morgan, 1979).

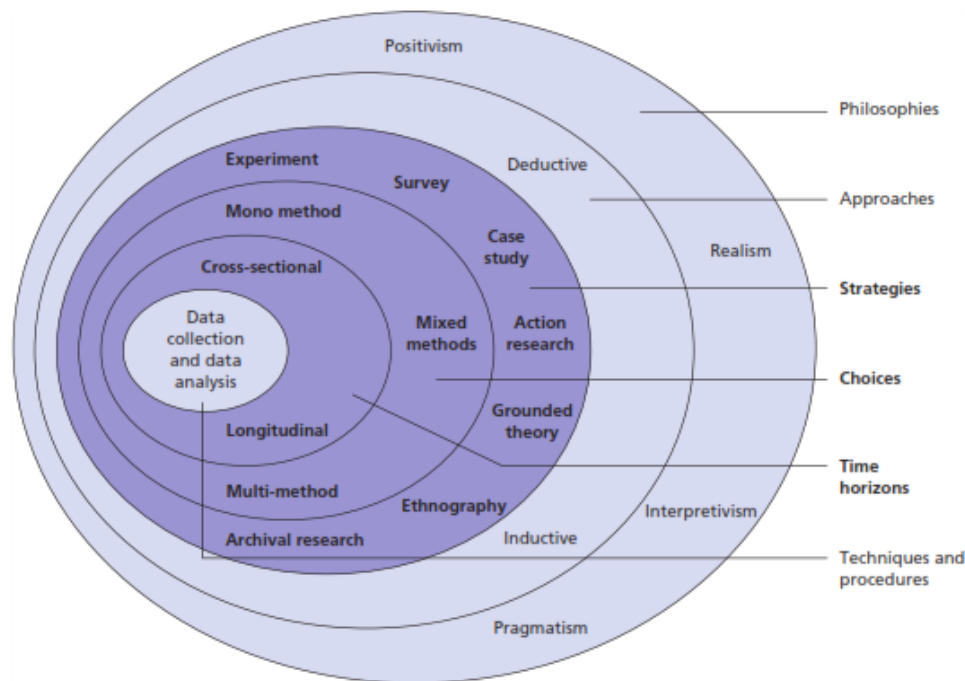


Figure 3.1: The research 'onion'
Source: Saunders, Lewis and Thornhill (2016)

Based on the data gathered through a representative sample, it is more likely to extrapolate the research findings to the understudied population (Johnson & Kuby, 2004). As a result, the positivist philosophy, quantitative technique, and survey method were used to support this study (questionnaire and interview guide). In other words, a self-report questionnaire and an interview guide were utilised to assess and measure employee views of elements that influence training transfer. The data for this study was acquired via administering a questionnaire and conducting interviews with the respondents/informants. Respondents would indicate how much they agreed with the statements in the

questionnaire form. This strategy would make it easy for the audience to learn, collect, and receive the information they require.

In addition, descriptive and inferential statistics were utilised to analyse the data. The link between the independent, dependent, and mediator factors was determined using inferential statistics, whereas the demographic variables were described using descriptive statistics. Furthermore, data gathering methods such as sample surveys, questionnaires, and interviews are appropriate for learning about objective reality. Statistical approaches, storytelling, or computer modelling can be used to examine and interpret data collected by such 'objective' techniques (Burrell & Morgan, 1979).

A research design is a blueprint or framework for carrying out a research study. It outlines the specifics or techniques for gathering the data required to structure and solve a research challenge (Malhotra, 1999). The research design allows the researcher to define his or her boundaries, which aids in selecting the kind of investigations that need to be conducted, study settings, and other concerns that are relevant to the current study. The structure, methodology, and tactics of study that are imagined to be employed and executed in an attempt to obtain findings from the research hypothesis are referred to as research design (Babbie, 1990). It is significant because it aids in the development of a mental image of the structure as well as plans for data collection and analysis.

The correlation research is a descriptive sort of research that uses the correlation coefficient to describe the degree of relationship between variables. The information is gathered using a questionnaire that will be distributed to the respondents. The goal of

correlation research is for the researcher to be able to describe the source of the link between the components under investigation and to make predictions about it. Furthermore, the researcher will not be required to change any of the study's variables.

3.3 Location, Population and Sample

The location of the research was the Sarawak oil palm plantations. According to Malaysian Palm Oil Board (MPOB) statistic, 52 plantations in Sarawak has more than 3,000 hectares and estimated every plantation has 18 to 20 non-executive local employees. Therefore, the estimated population was about $20 \times 52 = 1,040$ people. According to Krejcie and Morgan's (1970) table based on a given population, if considering the total population of 1,040, the sample size shall be 278 employees. A sample size of 300 employees will be used in this research instead of 278 because during sample collection, maybe some respondents' data errors, incomplete, or missing responses. 10 respondents from every selected plantation (30 plantations) for equal number of samples taken and easy to monitor. Respondents were selected from the name list of local non-executive employees (i.e. clerk, storekeeper, mechanic, field conductor and etc.) from the selected plantations in Sarawak.

The population can be described as the group of people who the researcher is interested in generalising the study's findings to (Sekaran, 2000). A population can be defined as all people or items (firms, products, etc.) that share the attribute being studied (Rusli et al., 2014). The population for this study was made up of all of the non-executive local employees of the selected Sarawak plantation enterprises because they are dealing with 5 variables of WSS. Simple random sampling, according to Rusli, Hasbee, Azman,

Sopian, and Nur Naha (2014), all of these subsets of the frame are given an equal chance or probability of inclusion, which is a critical aspect of such a sample. Since the frame is neither divided or partitioned, each element has an equal chance of being chosen. Every element pair, including identical triples, has the same chance of being chosen as every other element pair. This reduces prejudice and makes it easier to analyse the results. It is relatively simple to evaluate the accuracy of results since, in particular, the variance between individual outcomes within the sample is a reliable indicator of variance in the total population. Simple random sampling has the benefit of being simple to comprehend and use in research projects.

In addition, Hair, Wolfinbarger, Ortinau, and Bush (2008) also suggested that increasing the sample size by two can lower the sampling error, which is bias caused by errors in either the choice of potential sampling units or the calculation of the sample size. Hence, if the sample size of 88 is doubled to 176 sample size, the researcher sample size of 300 is adequate for the sampling.

The sample size of 300 was deemed appropriate in consideration of the suggestion of Roscoe (1975) that for most researches, a sample size of between 30 and less than 500 is appropriate. Additionally, according to Roscoe's (1975) proposed rule of thumb for determining sample size for multivariate research, the sample size should be "ten times or more" than the number of the variables in the study. The current study had seven variables and multiplying it by 10 gives 70: hence the sample size of 300 had been adequate and acceptable. Unit of analysis involved are among oil palm plantation workers from non-executive local workers.

Sampling error can be decreased by enhancing population homogeneity or increasing sample size, according to Smith (1986). This study employs simple random sampling to ensure that all individuals of the population have an equal and independent probability of being chosen as responders. Because simple random sampling is likely to give the researcher a representative sample of the population, the researcher chose it as a sampling strategy. One of the challenges in executing the simple random sample approach is that every member of the population must be identified, which can be done by collecting the names of all local non-executive employees from the Human Resource Department of chosen Sarawak plantation companies. In a simple random sampling procedure, every person of the population has an equal chance of being chosen as a possible research respondent. The destructive nature of the test is the sampling approach. It is physically impossible to verify all of the objects, therefore producing a representative sample is exceedingly unlikely. However, there will be a sampling error, because the sample mean is likely to be similar to the population mean if the sample is taken. The disparity between the sample of statistic and the population parameter is known as sampling error.

Although there are no specific rules of deciding on a representative sample size from a given population which is unidentified, especially under the situation where the conditions involved limited information to be obtained on the studied population to clearly project the actual number of participants in Lean effort, this study took a step further to decide on a minimum sample size. This study followed the guidelines by Krejcie and Morgan (1970) which did not require any user's calculation. Based on the "Table for Determining Sample Size from a Given Population" by Krejcie and Morgan (1970), the required sample size to be the representative of the perceptions of an estimated population

size, $N=1,040$, is 278. According to Krejcie and Morgan (1970), the determination of the “minimum sample” size according to their published guidelines is “applicable to any defined population”.

3.4 Instrumentation

The researcher uses a questionnaire form as an instrument to collect as much data as possible from the desired sample size. By adopting previous questionnaires established by researchers and enlisting the help of a supervisor, the questionnaires' validity and reliability were improved. Questions were written in both English and Bahasa Malaysia. The primary questions and statements were written in English, with Bahasa Malaysia translations provided for each. After evaluating the sample group and ensuring full participation of respondents from varied backgrounds and educational levels, the researcher opted to present the questionnaires in two languages. To ensure that respondents answered the questions completely, clear instructions for filling out the surveys were supplied.

Furthermore, all of the questions in the surveys were classified as closed-ended questions because this sort of question helped respondents comprehend what was being examined and made it easier for them to reply to the questions. The questionnaires were adopted from previous research' questionnaires established by Hayes et al. (1998). A pilot study will be conducted in Sarawak by one of the selected plantation company. The goal of this study is to see if the questions are legitimate and should be answered. The instructions for filling out the questionnaire are also supplied to provide responders with a clear guideline for answering the questions.

Table 3.1: The Likert Scale: composition of scores according to the response given by the respondents.

SCORE	RESPONSES
1	Strongly Disagree
2	Disagree
3	Not Sure
4	Agree
5	Strongly Agree

The surveys were created using a Likert Scale as illustrated in Table 3.1, is used to determine how strongly respondents agree or disagree with statements on a five-point Likert scale ranging from “strongly disagree” to “strongly agree”. The responses to a series of items focusing on a single topic or variable can be studied item by item, but summing across items can also yield a total or summated score for each responder. Because the summated approach is so popular, the Likert scale is often known as a summated scale.

3.5 Pilot Study

Before the questionnaire was issued to the actual respondents, it was pre-tested to guarantee that the questions used in the research were reliable and that the items chosen would truly measure what the researcher wanted to evaluate. The degree of consistency with which the measuring device measures whatever it is measured is referred to as reliability (Wallen & Fraenkel, 2001).

The goal of a pilot study is to increase the validity and reliability of questionnaire items and determine whether independent variable exploitation in the research triggered

the intended state (De Ruyter et al., 2001). It looked at the key indicators and double-checked that the questionnaire instructions were complete and easy to understand for the responders (Cheng et al., 2008). Pre-testing allowed the researcher to detect ambiguous questionnaire wording in this study (Choi et al., 2000), resulting in revisions and ensuring that the items were appropriate for the study (Osman et al., 2010). The pilot study also minimised instrument bias in terms of format and content (Hussein et al., 2010). According to Saunders et al. (2016), when a pilot study was conducted to pre-test the generated questionnaire, respondents had no difficulty understanding the questions (Malin et al., 2009). The questionnaire design was finished only after the pilot study.

The pilot study's next step was to distribute it to the survey's target respondents, who worked in oil palm plantations. Respondents were asked to comment on the measurement items, describe any difficulties they had while filling out the questionnaire, and, if feasible, finish and submit the questionnaire right away. This allowed the researcher to make changes to the suggested questions based on the response of the respondents or to eliminate ambiguity. As a result, the researcher had to carefully inspect each returned questionnaire to avoid the problem of questionnaire trash. The purpose of this pilot study was to ensure that the questionnaire was straightforward, easy to complete and comprehend by respondents, and well-designed. As a result, the questionnaire was amended, and the final form was accepted by specialists and a supervisor.

The pilot study was done in Miri, Sarawak, using 30 sample oil palm plantation employees. The pre-test poll was conducted over a two-week period, from March 10 to March 24, 2018. The proposed questionnaire was provided in English and Bahasa

Malaysia, and respondents were assigned at random by inquiring if they had experience dealing with plantation safety and health issues. The twelve-page questionnaire was presented to respondents who validated their experience and consented to participate in the study. Before answering the questions, the respondents were asked to take a few moments to reflect on their most recent work experience. Each of the items was assessed on a five-point Likert scale ranging from '1' (strongly disagree) to '5' (strongly agree). Respondents who completed and returned the questionnaire successfully received the rewards (a pen).

This study was able to use all of the returned questions. Overall, the pre-test results suggested that the questionnaire was easy to comprehend, that the sequencing of items in the questionnaire was good, and that there was no need to revise it. However, some respondents claimed that the questionnaire was too long, that the font size of the material was too small, and that completing the questionnaire took too long. Due to these issues, the researcher did not make any changes to the questionnaire in the study.

The pilot test is important to this dissertation since it provides valuable information about the questionnaire's reliability and validity. The degree to which measures are devoid of random error and hence produce consistent results is known as reliability. The goal of pre-testing is to ensure that the questionnaire meets the researcher's expectations for the information it will yield. Furthermore, the purpose of this pre-testing is to detect and correct the questionnaire's flaws, particularly for this on-design questionnaire.

Cronbach's Alpha can be used to determine a questionnaire's reliability. When the reliability coefficient was closer to 1.0, it was better because the higher the internal

consistency reliability, the better (Sekaran, 1992). According to Fung (2015), pre-tests are commonly utilised in connection with quantitative experimental studies, in which experimental and control groups are given a pre-test before being exposed to an experiment. This is to see if the queries are understandable from the standpoint of the administrator. Aside from that, the length of time it takes the respondents to answer the question is also measured in the test. The comments of the respondents can also be used to determine whether or not the surveys are user-friendly. The typeface and pages used for these questions are then evaluated to see if they are easy to read and understand by the responders. This test can be used because previous researchers' questionnaires have been used and altered to fit the situation. Cronbach's Alpha was used to analyse the data acquired from previous researchers. As previously stated, if the Cronbach's Alpha score is close to 1.0 and greater than 0.7, the questionnaire is credible. However, if Cronbach's Alpha's data value is less than 0.7, it is not reliable.

3.6 Validity And Reliability

The reliability test is used to quantify and indicate the degree to which the measures are error-free; as a result, it provides a consistent measurement throughout time and among different items in the measurement (Cavana et al., 2000). Reliability is also used to examine the accuracy of measurements in a study and to reflect the instrument's stability and consistency (Haque & Khatibi, 2005).

The Alpha number indicates whether or not the data from the questionnaire is credible (Ho & Oh, 2009). The values of the alpha coefficients range from 0 to 1. Cronbach alpha is used to measure the internal reliability of items, and the appropriate

threshold is 0.7, according to the literature (Nunally & Bernstein, 1994). A Cronbach alpha value of 0.7 is considered optimal; anything less is considered poor, and anything more is considered excellent (Sekaran, 1992). Cronbach's alpha score of 0.8 indicates that items are highly linked and dependable (Cavana et al., 2001). As a result, higher Cronbach's alpha values suggest greater consistency among the items for each questionnaire variable. Before moving on to the next analysis, all of the questionnaire items were tested.

Table 3.2: The Reliability (Chronbach' Alpha) of the Variables in the pilot Study

Variable	Cronbach's Alpha
Job safety	0.992
Co-worker safety	0.993
Supervisor safety	0.991
Management safety	0.992
Satisfaction of safety programme	0.993
Safety behavior	0.992
Safety performance	0.991

3.7 Data Collection Procedures

Before proceeding to data collection, the researcher has obtained permission from the company's management where the study was conducted. After that, the instrument was first reviewed by the management if the instrument contravenes with the company's confidentiality or not. After getting approval, the researcher requested the help to identify potential informants who possesses different demographics in terms of age, gender, level of education and working experiences, to satisfy the need of the research. Next, the

informants were required to read and understand as well as acknowledge their participation, by signing the consent form. After the questionnaires have been distributed, the informants were given two weeks to complete the questionnaire before it is collected by the researcher.

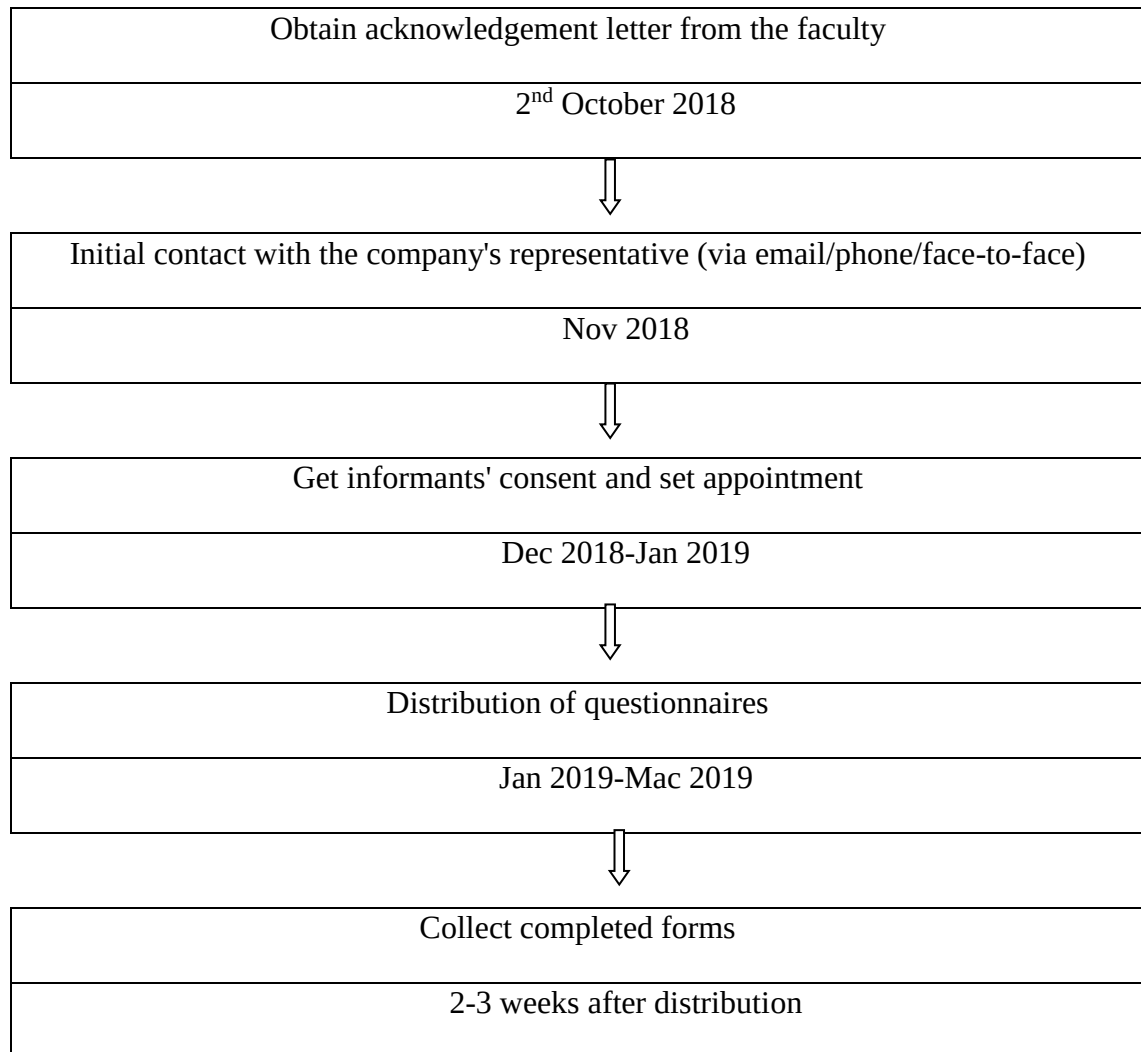


Figure 3.2: Data collection procedures

Before arriving at a final study outcome, the researcher had to go through a number of steps. Following the collection of data from questionnaires, data preparation is required, which includes validating or logging the data, double-checking the data for accuracy, putting the data into the computer, and building and documenting a database structure that

integrates the numerous metrics (Rusli et al., 2014). The questions were coded to allow for analysis using Statistical Packages for Social Science (SPSS) Version 23 to perform descriptive and inferential analyses on the collected data. The data acquired would be analysed utilising quantitative research methods in this study.

Table 3.3: Pearson Correlation Coefficient 'r' Interpretation.

Value of Coefficient ('r')	Interpretation
0.90 – 1.00	Very high relationship
0.70 – 0.90	High relationship
0.50 – 0.70	Moderate relationship
0.30 – 0.50	Low relationship
0.00 – 0.30	Very low relationship

Source: Schumacher & McMillan, 1993

Statistical inferential is a set of procedures for determining the validity of conclusions drawn about a population based on data from a sample or a population. Inferential analysis is divided into three categories: correlation, regression, and ANOVA (Barrow, 2001). The Pearson Correlation will be used to determine the degree of link between the independent factors and the dependent variable in this study. The Pearson Correlation Coefficient (Table 3.3) was basically looking at the strength and relationship between the variables, according to Marlow (1993). The greater the association between the variables, the larger the value of the coefficient. In other words, the greater the link between the variables, the closer the 'r' values are to one. The Pearson Correlation Coefficient, 'r' interpretation designed in this investigation is shown in Table 3.3.

3.8 Data Analysis Procedures

The data acquired from the distributed questionnaires was subjected to quantitative analysis to test the hypothesis. Partial Least Squares (PLS) and SPSS statistical tools were used as computer statistics programmes. PLS is the most recent statistical technique for data analysis that provides researchers with comprehensive results and is suitable for creating huge complex models. Pilot test, factor analysis, descriptive analysis (e.g., mean, mode, and standard deviation), reliability test, Pearson Correlation, and multiple regression analysis are some of the statistical procedures used to arrange and test the data in SPSS (MRA). The researcher could easily read the results from the output of these analyses, which were presented in the form of tables. As shown in Table 3.4, several statistical methods were employed to analyze the data in this research study.

Table 3.4: Statistical Methods

Objective/Purpose	Statistical methods
To test for reliability of the variables	Reliability analysis (Cronbach's Alpha)
To test the frequency of means of demographic profile	Descriptive statistic (mean, mode, and standard deviation)
To measure the items are loaded in appropriate factors	Factor analysis
To examine the positive impacts of independent variables safety performance mediated by safety behavior	Partial Least Square
To confirm the model fit of the study with a large amount of endogenous and exogenous variables by the mediating effects of safety behavior	Partial Least Square

3.8.1 Descriptive Analysis

Means, medians, modes, frequencies, percentages, maximums, minimums, ranges, and standard deviations (SD) were used in descriptive analysis for the demographic profile. The goal of descriptive analysis was to look into the data and summarise a large amount of information from the respondents (Burn, 2000). The results of the descriptive analysis in

this study gave basic summaries of the respondents' demographic profile data. Gender, age, education level, occupation, income level, ethnicity, Internet experience, credit card ownership, and the purpose of accessing the Internet were used to categorise the responses. As a result, the output provides a clear view of the normal and abnormal data in the form of a histogram and a curve line (Coakes & Steed, 2003).

Barrow (2001) claims that descriptive statistics are used to modify data in order to answer the original research questions or issue statement. It is used to summarize or describe the distribution of a single variable (dependent variable) and helps to understand the relationship between the studied variables (independent variables and dependent variable). It contains the mean, median, and mode as measures of central tendency, as well as the range, variance, standard deviation, and quartiles as measures of dispersion. The results of the analysis can be displayed in graphical form towards the conclusion. The histogram, bar chart, pie chart, and box plot are examples of graphical structures that can be utilised to simplify the analysis process. As a result, the descriptive analysis is best suited to analysing the research's Part I questionnaire form. The distribution of responders is based on their ages, gender, educational level, and year of service.

3.8.2 Factor Analysis

The exploratory technique of factor analysis summarises the structure of variables (Coakes & Steed, 2003). Davis (1982) defined it as a linear technique to data reduction and summarising that establishes certain patterns in a group of multiple variables. The goal of factor analysis is to see if the dimensions' measurement items can produce expected factors, as well as to see if the items are loaded in the right factors (Chang & Chen, 2008). It

condenses an existing data set into a new one in order to condense a big list of things into a manageable number (Churchill, 1999; Oliver, 1997). Furthermore, component analysis entails the identification of constructs in order to verify observable variables (Churchill, 1999).

The Kaiser-Meyer-Olkin (KMO) test is used in factor analysis to assess sample sufficiency (Hair et al., 2006). It also looks at the strength of correlations between variables and predictors (independent variables), as well as whether the data is suitable for factor analysis (Haque et al., 2009). KMO has a range of 0 to 1, with a value of 0.6 or higher being preferred (Haque et al., 2009). If the KMO value is less than 0.6, the lowest-valued variables must be dropped until the KMO increases above 0.6.

Bartlett's test of sphericity, in addition to KMO value, also assesses validity (Haque et al., 2009) and overall significance of correlations (Hair et al., 2006) with significant value, $p < 0.05$. The statistical probability that the correlation matrix has substantial correlation among the variables is indicated by the Bartlett test of sphericity with $p = .00$. (Luarn & Lin, 2003). It also implies that the data set is eligible for factor analysis if there is a significant association (Mokhlis, 2009).

The term "Eigenvalue" refers to the degree of variance between the factors, and it must be more than one (Hair et al., 2006). The number of components extracted in each analysis is determined using the minimal eigenvalue of 1.0 and screen plots (Littrell, Ma, & Helepete, 2005). The loading items are more than 0.5 on a single factor, while all other factors have a minimum difference of 0.2 (Littrell et al., 2005).

Furthermore, rotation implies that the variables are inextricably related (Hair et al., 2006). Rotation analysis is chosen to make factor interpretation easier (Coakes & Steed, 2003), and it is also used to examine the correlation between the study's constructs (Hussein et al., 2010). It has two components: orthogonal and oblique. The components that are orthogonal to each other are not related; nevertheless, the factors that are co-related within each other are oblique (Coakes & Steed, 2003). As a result, in factor analysis, varimax rotation analysis was performed.

Item reliability, composite reliability, and variance extraction are the three approaches used to assess convergent validity. Factor loading will be used to determine the construct item's reliability. If factor loadings are between 0.3 and 0.4, the minimum level of interpretation is achieved; nevertheless, 0.5 is the desired loading level, and 0.7 (exceeding an ideal level) is the best interpretation for the factors (Hair et al., 2006). Hair et al. (2006) also recommended that researchers employ variance extracted (VE) to assess convergent validity (CV). If VE is greater than 0.5 or constant (Teo, Wong, & Chai, 2008), convergent validity is utilised to determine the level of sufficiency. It supposedly represents the underlying constructs and gives researchers confidence in the investigation.

3.8.3 Factor Independence Analysis

Correlation determines how well the assumed linear relationship may explain the dependent variables (Sapsford, 1999). Pearson's Correlation Test is the most often used sort of linear connection measurement. It explains how two continuous variables are related (Coakes & Steed, 2003). Pearson's Correlation Coefficient (r) is a statistic that is used to determine the strength of a direct linear relationship between dependent and

independent variables in a population (Bolboaca & Jantschi, 2006; Grimm & Wozniak, 1990; Puri, 2002). The correlation coefficient squares (r^2), on the other hand, show how much of the variation in Y is explained by changes in X. (Grimm & Wozniak, 1990). It ranges from -1 (which indicates that the variables are exactly linearly related in a decreasing connection) to +1 (which indicates that the variables are perfectly linearly related in an increasing relationship) (Bolboaca & Jantschi, 2006; Hair et al., 2006). Aside from that, when $r = 0$, it signifies there is no correlation between the two variables (Grimm & Wozniak, 1990; Bolboaca & Jantschi, 2006). Table 3.5 shows the r , which is presented in a wide range of values with varying correlations.

There is a strong relationship if r is greater than 0.8, conversely, a weak correlation is when r is less than 0.5 (Bolboaca & Jantschi, 2006). A correlation coefficient is not significant except when the p value is less than corrected significance level ($p < 0.05$). In a general rule of thumb, $p < 0.05$ means significant, however, if $p < .000$ it means it is highly significant among the variances relationship.

Table 3.5: The Range of Value of Correlation Coefficient r

Range of Value	Explanation
$r = 1$	Perfect positive
$0 < r < 1$	Positive though not perfect correlation
$r = 0$	No correlation
$-1 < r < 0$	Negative though not perfect correlation
$r = -1$	Perfect negative correlation

Source: Puri (2002)

3.8.4 Multiple Regression Analysis (MRA)

Multiple regression analysis was used to investigate the impact of safety performance. MRA stands for multiple regression analysis, and it is a statistical approach for analysing the relationship between dependent and independent variables (Hair et al., 2006). It's a bivariate alternative correlation (Coakes & Steed, 2003). The most significant predictor of dependent variables is identified using MRA (Calisir, Gummusoy, & Bayram, 2009). The researcher investigates the link between predictors (job safety, co-worker safety, supervisor safety, management safety, and satisfaction of safety programmes) and dependent variables in this study (safety performance). The significant factors, on the other hand, are examined in PLS with the mediator (safety behaviour).

The following are the four assumptions that are addressed in MRA testing:

- i. Identifying outliers- An outlier is a difference between the actual and anticipated values of a dependent variable that can be found using a regression model (Hair et al., 2006).
- ii. Linearity of the phenomenon being studied- Linearity refers to the fact that the relationship between the dependent and independent variables corresponds to the degree of change in the dependent variable and is closely linked to the independent variable (Hair et al., 2006). The concept of correlation in MRA is based on a linear relationship (Hair et al., 2006).
- iii. Normality- When using the normal probability plots of the residuals to conduct regression analysis, normal data is required (Hair et al., 2006). The primary way for determining the normality of entered data is to plot the residual (Hair et al., 2006). One

of the analytical tools for independent variables is the histogram of residuals with a curve (Hair et al., 2006).

- iv. Homogeneity (constant variance) and the independence error terms- Homogeneity refers to the consistency of the residual across predictor values (Hair et al., 2006). Plotting the residuals against the possible sequencing variables will reveal the independent residual (Hair et al., 2006).

During the statistical analysis, other factors such as sample size come into play. This must be considered because it has a direct bearing on the suitability and statistical power of multiple regressions (Hair et al., 2006). The sample size must be greater than 30 samples and less than 1,000 samples (Hair et al., 2006). The statistical significance tests become overly sensitive when the sample size surpasses 1,000. (Hair et al., 2006).

In multiple regression analysis, determining multicollinearity is crucial. Variation Inflation Factors (VIF) were used by Kleinbaum, Kupper, and Muller (1988) to assess multicollinearity for each of the study's independent variables (Mphil et al., 2007). The goal of determining multicollinearity is to determine the correlation relationships between all of the predictors entered. Tolerance and VIF are used to detect multicollinearity. Both of these methods are commonly used to determine whether the independent variables (predictors) are highly connected. Although tolerance is used to assess collinearity and multicollinearity, VIF is a measure of the impact of additional independent variables on the standard error of the regression coefficient (Hair et al., 2006). The tolerance levels will be lower and the VIF values will be higher if there is a high degree of multicollinearity (Hair et al., 2006). The greater the VIF score, the more collinearity or multicollinearity there is

among the predictors (Hair et al., 2006). According to Myers (1990), if the VIF score is greater than 10, the regression analysis suffers from multicollinearity (Evanschitzky et al., 2004), and the variables are extremely collinear (Mphil et al., 2007). However, if the Eigenvalues are zero, there is an issue, and if they are greater than 30, there is a significant problem.

The correlation coefficient squared, or coefficient of determination, is known as R^2 (Hair et al., 2006). In a regression study, the R^2 values show the percentage of total variation in the dependent variable that is explained by the independent variables (Hair et al., 2006). R^2 indicates how much of the entire variation (predictors) in the dependent variables can be explained by all of the independent variables (Grimm & Wozniak, 1990). The R^2 could be improved by adding another predictor (Hair et al., 2006).

3.8.5 Structural Equation Modeling (SEM)

In non-experimental research, SEM is a useful statistical tool for addressing the research topic (Byrne, 2001), and it determines the strength of a relationship among the variables in the theoretical model (Maruyama, 1997). According to Hair et al. (2006), SEM investigates the direct and indirect interactions between endogenous and external factors. SEM is a multi-level model that gives goodness-of-fit indices and answers a number of interconnected research issues (Gefen et al., 2000). SEM has been used in a variety of applications, including mediating relationships, confirmatory factor analysis, longitudinal designs, and missing data handling (Ilias et al., 2008). As a result, SEM is a test of data quality as well as the statistical assumptions that underpin the estimation methods utilised in the research (Bagozzi & Yi, 1988).

The t-test is used to determine convergent validity and factor loading (Olorunniwo et al., 2006). The maximum standardised loading value that can be used is 0.05, but the higher the standardised loading, the better (Hair et al., 2006). Furthermore, with the acceptance threshold of 0.05, Variance Extracted (VE) is used to show an accurate validity of the investigation (Hair et al., 2006). The acceptable level of composite reliability and Cronbach alpha, according to Fornell and Larcker (1981), is 0.7, and the factor loading must attain a significant level of $p < 0.05$.

SEM can handle a big sample size in terms of sample size (Ullman & Bentler, 2004). Hair et al. (2006) state that if the study contains five or less constructs, each construct has more than three items, and the communality is 0.60, 150 samples can be calculated (Teo et al., 2008). The minimal sample size suggested by Ballon (1989) was 100, although Anderson and Gerbing (1988) suggested 200. (Teo et al., 2008). The study's sample size difference would have an impact on the reliability value (Teo et al., 2008). As a result, the researcher must select 500 samples for this study in order to avoid erroneous results. These figures are thought to be reasonable (Roscoe, 1975 as cited in Sekaran, 1992).

3.8.6 Partial Least Squares (PLS)

Herman Wold (1982, 1985) invented the Partial Least Squares (PLS) soft modelling technique, which is effective in theoretical understanding. PLS is a latent variable modelling technique that acknowledges measurement mistakes and combines many dependent constructs (Karim, 2009). It employs two modelling methods.

To begin, models are used to identify manifest variables (MV) and latent variables (LV). Second, it compares endogenous LV to other LV models (Tenenhaus et al., 2005). In this scenario, latent variables are also referred to as unobservable variables; manifest variables, on the other hand, are referred to as observable variables or indicators.

PLS (Barroso et al., 2010) is an exploratory and confirmatory analysis method. Rather than focusing on model fitness, it focuses on exploratory analysis by maximising the variation explained in the constructs (Barclay et al., 1995). PLS is a predictive-based analysis, according to Wold (1979, as referenced in Barroso et al., 2010), in which it explores a complicated model with a large number of variables and the link between exogenous and endogenous variables. It can assess the formative and reflective constructs in a research model (Helm et al., 2010). Furthermore, the criteria for residual distributions of covariance-based SEM (e.g., Lisrel, Amos, etc.) are not limited by PLS (Luo et al., 2010). PLS increases the study's validity (Tenenhaus et al., 2005), necessitates fewer distributional assumptions and a smaller sample size (Chin, 2010), or does not limit the sample size for the underlying data (Tenenhaus et al., 2005). (Marcoulides & Saunders, 2006). PLS route modelling can provide accurate information even with a sample size of 20 people, according to Chin and Newsted (1999) and Henseler et al. (2009).

PLS has the potential to be more valuable to researchers than SEM and SPSS. When compared to SPSS, it is more robust and easier to generate and analyse a research model (Halawi & McCarthy, 2008). PLS can determine whether a path association is statistically significant (Goodhue et al., 2006). To assess the study's credibility, validity, and model fit, a researcher must use SPSS to do factor analysis, Cronbach alpha, and

multiple linear regression analysis. PLS route modelling, on the other hand, assesses the model fit in a basic method, tests the presented hypotheses (Luo et al., 2010), and gives a more precise estimation of the mediating effects by looking at the free measurement errors (Luo et al., 2010; Chin et al., 2003). As a result, PLS was chosen to create the sophisticated research model for this investigation (Chin & Newsted, 1999). It ensures more theoretical parsimony and model simplicity (Chin et al., 1998), as well as the prediction of complex relationships between variables (Chin, 2010; Law et al., 1998). (Chin, 2010). As a result, the best acceptable statistical analysis tool for this research topic is PLS.

In this research, PLS was used for data analysis based on the guidelines provided by Hair et al. (2011). PLS is suitable for data analysis in this research for the following reasons:

- (a) All the hypotheses formulated in this research are prediction oriented and more focused on theory development compared to theory testing,
- (b) PLS can be used to analyse a research model that consists of both reflective and formative constructs and a combination of either reflective or formative constructs at the same time,
- (c) PLS is the most robust approach and can be used to analyze data with non-normal distribution. Using PLS (SEM) data normality is not a required aspect because PLS (SEM) uses a calibration mechanism, which transforms any non-normal data into data that adheres to the central limit theorem.

Factor loadings, composite reliability, and convergent validity were studied in the measurement model results. The reliability of numerous measurement items is assessed

using composite reliability (CR) and Cronbach alpha (Karim, 2009). Internal consistency is assessed (Chin, 2010) and the variations shared by specific respected indicators are estimated using CR (Hair et al., 2006). Convergent validity (CV) is a criterion that is related to the AVE criterion (Average Variance Extracted). The variance explained errors are used to calculate the amount of variation explained by indicators (Barroso et al., 2010). CV has a loading value greater than 0.7. (Chin, 1998). Hair et al. (2006) proposed that 0.7 for both factor loading and composite reliability is acceptable. However, Fornell and Larcker (1981) claimed that the lowest AVE loading value is 0.5, indicating that the level is acceptable (Halawi & McCarthy, 2008). If the AVE is more than 0.5, the latent variables can account for more than half of the variance in the indicators on average (Karim, 2009).

The R² value and path coefficients are also provided by PLS (Halawi & McCarthy, 2008). The R² endogenous LVs thumb rule is 0.67 (substantial), 0.33 (moderate), and 0.19 (weak) (Chin, 1998). The Beta (β) value and the significance level of $p \leq 0.005$ explain the R² value. In other words, the degree of impact of independent variables on dependent variables is indicated by the R² (Chin, 2010), and a model with low R² and low factor loading can yet bear great GOF (Chin, 2010). PLS coefficients are comparable to regression and LISREL coefficients, indicating the strength of correlations between components (Gefen, Straub, & Boudreau, 2000). More variables are permitted if the path coefficients are between 0.20 and 0.30. (Chin, 1998).

The geometric mean of average communality and the average of R² endogenous LVs is used to measure overall modelling fit (Tenenhaus et al., 2005), and it is defined as the geometric mean of average communality and the average of R² endogenous LVs. The

GOF value ranges from 0 to 1, with a greater value indicating better path model estimate (Karim, 2009). The t-value is used to estimate GOF when bootstrapping is used (Gefen et al., 2000). Bootstrapping, according to Fornell and Larcker (1981), assesses the stability of estimates (Chin, 2010) by providing standard errors and t-statistics (Halawi & McCarthy, 2008).

3.9 Ethical Consideration

"Action research," according to Sagor (2000), is "a disciplined process of inquiry undertaken by and for those taking action." The basic goal of action research is to aid the actor in bettering or refining his or her activities." Action research, according to Rusli, Hasbee, Azman, Sopian, and Nur Naha (2014), is a systematic action conducted in an attempt to improve practise by participants through their own practical acts and reflections on the effects of those actions. Because action research takes place in real-world situations and requires intimate and open contact among participants, researchers must keep ethical considerations in mind when they perform their research. Winter (1996) outlined the following ethical principles:

- i. Ensure that all necessary people, committees, and authorities have been consulted, and that everyone has agreed to the work's guiding principles in advance.
- ii. All participants must have the opportunity to influence the work, and those who do not choose to engage must be respected.
- iii. The progress of the project must be apparent and accessible to suggestions from others.
- iv. Before making observations or studying papers, permission must be obtained.
- v. Before being published, descriptions of other people's work and points of view must be agreed with individuals involved.

- vi. The confidentiality of the data must be maintained by the researcher.
- vii. Collective decisions are made on the research's direction and likely outcomes.

3.10 Chapter Summary

The research methodology used to meet the study's objectives was detailed in this chapter, as well as the research framework. It covers the research design, quantitative research method, and data analysis procedures in depth. In addition, this chapter discussed the factors that influence the methodologies and tools used in analysis. The outcomes of the hypotheses and the research's outcome were described in the next chapter.

CHAPTER 4

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

This chapter examines and interprets the statistical analysis of the data in this survey, as well as the demographics of the respondents. In order to obtain accurate results, several experiments were conducted. The researcher used the statistical analysis tools SPSS version 23.0 to perform the descriptive statistic analysis to obtain the demographic profile of the respondents. In contrast, SmartPLS (version 2.0 M3) was utilised to evaluate the assumptions. The report also gives a summary of the path analyses' findings.

4.2 Demographic Profile of Respondents

The data was analyzed using SPSS statistical software and SmartPLS (version 2.0 M3). A total of 300 questionnaire sets were distributed to plantation local non-executive workers (i.e. clerk, storekeeper, mechanic, field conductor and etc.) which yielded 277 respondents. Out of the 277 returned questionnaires, 260 questionnaires were suitably completed with valid information, and each of these was screened for errors, incomplete, or missing responses. This process discarded 17 questionnaires, as they contained more than 25 percent of the questions unanswered or in-correctly answered. After discarding incomplete questionnaires, 260 were found to be usable and this represents a valid response rate of 86.67 percent. A complete demographic profile of the respondents is presented in Table 4.1

Table 4.1: Profile of Respondents

Profile	Groups	Frequency	Percentage
Age Category	18-25 years	5	1.9
	26-30 years	30	11.5
	31-35 years	57	21.9
	36-40 years	63	24.2
	41-45 years	57	21.9
	46-50 years	25	9.6
	50 years and above	23	9.0
Gender	Male	149	57.3
	Female	111	42.7
Higher Education	PhD	0	0
	Master	0	0
	Degree	34	13.1
	Diploma/ STPM	38	14.6
	SPM/ Below	188	72.3
Duration of Service	1-5 years	114	43.9
	6-10 years	81	31.2
	11-15 years	49	18.8
	16-20 years	11	4.2
	21-25 years	5	1.9

The questionnaire contained a range of questions to determine the respondents characteristics. Firstly, the researcher utilized descriptive statistics to obtain the general information of the respondents. Of the 260 respondents, females recorded 111 (42.7%) and males stood at 149 (57.3%). Academically, the respondents who had a degree holder were

only 13.1 percent (n=34). The highest percentage were minimum secondary school level (n=188, 72.3%) followed by diploma holders/ STPM (n=38, 14.6%).

As for respondents age, the majority were 36 to 40 years old (n=63, 24.2%), 1.9 percent (n=5) of respondents were 18 to 25 years old and 11.5 percent (n=30) were 26-30 years old. The sample also consisted of 57 respondents (21.9%) from 31-35 years old and 41-55 years old groups. 25 respondents (9.6%) in the age group ranging from 46-50 years old and 9 percent (n=23) were 50 years old and above.

Based on the respondents by duration of services in plantation, the majority year of service were from 1 to 5 years with the 114 respondents (43.9%). There was 81 of respondents (31.2%) serving for 6 to 10 years, 49 of respondents (18.8%) serve for 11 to 15 years, 11 of respondents (4.2%) serve for 16 to 20 years and 5 of respondents (1.9%) serve for 21 to 25 years.

4.3 Preliminary Data Analysis

The researcher verified the central tendency and dispersion of data in the study after the questionnaire was screened and validated. The mean and standard deviation statistics give a clear picture of how respondents replied to the questionnaire items, as well as how well the items were measured. The data revealed that the allowed level of standard deviation (which runs from zero to one) had been surpassed (so, how to deal with this issue?) as indicated by Nunnally (1978). The results of the descriptive statistic are presented in Table 4.2.

Table 4.2: Mean and Standard Deviation

Variables	Mean	Standard Deviations	Validity & Reliability
Job Safety	4.2512	0.58319	0.926
Co-worker Safety	4.1896	0.57604	0.931
Supervisor Safety	4.2623	0.59194	0.936
Management Safety	4.2188	0.55757	0.927
Satisfaction of Safety Programmes	4.2342	0.58510	0.936
Safety Behavior	4.2392	0.58620	0.931
Safety Performance	4.2431	0.57401	0.990

Note: Scale used 1 = Strongly Disagree, 5 = Strongly Agree

The summary of the mean and standard deviation of the major variables statistics in Table 4.2 were analyzed based on 260 valid responses. In summary, standard deviations for the variables were closer to 1.0. The lowest score recorded 0.55757 (Management Safety) and the highest score was 0.59194 (Supervisor Safety). Also, these empirical findings revealed that the mean level of supervisor safety scored the highest value, which was 4.2623, demonstrating that the majority of the respondents agreed with the construct of safety supervisor. On the other hand, the standard deviation value of safety supervisor was 0.59194. This demonstrated that a few respondents had different opinions on supervisor safety. The second highest mean value was job safety, which stood at 4.2512, with standard deviation 0.58319. This was followed by the value for safety performance, 4.2431 with the standard deviation value which stood at 0.57401.

4.4 Confirmatory Factor Analysis (CFA)

4.4.1 Measurement Model Results

The findings of loading and cross-loading among the variables using the SmartPLS statistical analysis technique are shown in Table 4.3. According to Hair et al. (2010), because the cut-off value for loading was 0.5 (significant), the researchers should eliminate all lower loading value items that are less than the cut-off value, 0.5. Cross-loadings were also computed to see if the items loaded on the other contrast. As demonstrated in Table 4.3, all of the items measured had a substantial cross-loading on their own construct rather than any other constructions. It can be concluded that the model's architecture was enough for the research project.

Table 4.3: Loading and Cross Loading

	Co- worker Safety	Job Safety	Manage ment Safety	SSP	Safety Behavior	Safety Performance	Supervisor Safety
CS2.1	0.815	0.646	0.772	0.710	0.629	0.714	0.666
CS2.10	0.848	0.686	0.803	0.799	0.730	0.814	0.735
CS2.2	0.810	0.660	0.771	0.778	0.687	0.773	0.703
CS2.3	0.734	0.608	0.731	0.702	0.627	0.715	0.672
CS2.4	0.771	0.696	0.769	0.703	0.712	0.733	0.724
CS2.5	0.668	0.613	0.678	0.548	0.657	0.601	0.598
CS2.6	0.637	0.686	0.679	0.565	0.653	0.622	0.656
CS2.7	0.738	0.699	0.748	0.665	0.693	0.713	0.694
CS2.8	0.708	0.774	0.721	0.710	0.746	0.762	0.785
CS2.9	0.832	0.639	0.767	0.729	0.647	0.758	0.667
JS1.1	0.574	0.597	0.576	0.578	0.636	0.578	0.567
JS1.10	0.578	0.721	0.601	0.525	0.616	0.589	0.628
JS1.2	0.798	0.850	0.817	0.727	0.800	0.793	0.841

Table 4.3 Continued

JS1.3	0.670	0.775	0.696	0.665	0.678	0.732	0.756
JS1.4	0.697	0.755	0.711	0.733	0.754	0.769	0.788
JS1.5	0.609	0.730	0.621	0.661	0.672	0.685	0.739
JS1.6	0.636	0.781	0.668	0.745	0.696	0.727	0.786
JS1.7	0.720	0.761	0.742	0.767	0.751	0.767	0.778
JS1.8	0.724	0.828	0.758	0.787	0.815	0.805	0.833
JS1.9	0.574	0.642	0.585	0.491	0.542	0.549	0.558
MS4.1	0.670	0.680	0.746	0.742	0.730	0.725	0.701
MS4.10	0.708	0.774	0.721	0.710	0.746	0.762	0.785
MS4.2	0.795	0.753	0.851	0.846	0.829	0.836	0.795
MS4.3	0.815	0.646	0.772	0.710	0.629	0.714	0.666
MS4.4	0.810	0.660	0.771	0.778	0.687	0.773	0.703
MS4.5	0.734	0.608	0.731	0.702	0.627	0.715	0.672
MS4.6	0.771	0.696	0.769	0.703	0.712	0.733	0.724
MS4.7	0.668	0.613	0.678	0.548	0.657	0.601	0.598
MS4.8	0.637	0.686	0.679	0.565	0.653	0.622	0.656
MS4.9	0.738	0.699	0.748	0.665	0.693	0.713	0.694
SB6.1	0.816	0.772	0.811	0.728	0.780	0.795	0.780
SB6.10	0.754	0.744	0.811	0.781	0.799	0.784	0.768
SB6.2	0.687	0.773	0.700	0.637	0.761	0.731	0.760
SB6.3	0.744	0.754	0.772	0.691	0.777	0.738	0.742
SB6.4	0.664	0.750	0.683	0.695	0.789	0.740	0.757
SB6.5	0.609	0.669	0.652	0.633	0.739	0.628	0.679
SB6.6	0.544	0.578	0.569	0.643	0.669	0.605	0.583
SB6.7	0.678	0.728	0.706	0.788	0.786	0.751	0.744
SB6.8	0.751	0.807	0.774	0.796	0.846	0.817	0.822
SB6.9	0.504	0.504	0.572	0.644	0.627	0.597	0.522

Table 4.3 Continued

SP71	0.933	0.932	0.950	0.949	0.961	0.976	0.951
SP72	0.928	0.944	0.940	0.957	0.940	0.989	0.968
SP73	0.946	0.930	0.954	0.955	0.934	0.984	0.959
SP74	0.934	0.898	0.942	0.928	0.897	0.971	0.919
SS3.1	0.617	0.497	0.615	0.555	0.525	0.589	0.566
SS3.10	0.724	0.828	0.758	0.787	0.815	0.805	0.833
SS3.2	0.808	0.778	0.832	0.792	0.781	0.815	0.826
SS3.3	0.574	0.597	0.576	0.578	0.636	0.578	0.567
SS3.4	0.798	0.850	0.817	0.727	0.800	0.793	0.841
SS3.5	0.670	0.775	0.696	0.665	0.678	0.732	0.756
SS3.6	0.697	0.755	0.711	0.733	0.754	0.769	0.788
SS3.7	0.609	0.730	0.621	0.661	0.672	0.685	0.739
SS3.8	0.636	0.781	0.668	0.745	0.696	0.727	0.786
SS3.9	0.720	0.761	0.742	0.767	0.751	0.767	0.778
SSP5.1	0.658	0.731	0.676	0.756	0.709	0.734	0.764
SSP5.10	0.784	0.743	0.788	0.793	0.771	0.806	0.772
SSP5.2	0.710	0.760	0.714	0.762	0.770	0.778	0.776
SSP5.3	0.680	0.752	0.719	0.784	0.708	0.733	0.762
SSP5.4	0.676	0.771	0.708	0.779	0.734	0.752	0.786
SSP5.5	0.567	0.551	0.627	0.691	0.609	0.642	0.567
SSP5.6	0.710	0.676	0.758	0.832	0.754	0.786	0.714
SSP5.7	0.768	0.640	0.743	0.745	0.691	0.721	0.659
SSP5.8	0.786	0.687	0.763	0.808	0.688	0.759	0.724
SSP5.9	0.700	0.629	0.715	0.744	0.701	0.719	0.663

Note: Bold values are loadings for items that are above the recommended value 0.5

The statistical analysis was performed in the first stage of the measurement model to discover the causal linkages between the observed variables (items) and the underlying constructs. Confirmatory factor analysis (CFA), which included convergent validity and discriminant validity, was used to assess the validity of the study's constructs. Composite reliability (CR) was used to test convergence validity, and average variance was calculated (AVE).

In general, reliability ensured that the item ratings were accurate (Kline, 2005). AVE was used as a criterion of convergent validity by Fornell and Larcker (1981) (Henseler et al., 2009). Discriminant validity emerges when the square root of AVE exceeds the correlation level. Discriminant validity is defined by Barroso, Carrion, and Roldán (2010) as the degree to which one construct differs from another.

The convergent validity test results are shown in Table 4.4. The composite dependability value is shown in Table 4.4. All of these CR construct findings were within the required ranges of 0.3 and 0.7, as specified by Hair et al. (2008), Gefen et al. (2000), and Nunnally and Bernstein (1994), indicating that the model constructs were appropriately convergent. In other words, the pieces in each construct may be utilised to reliably quantify the value.

The AVE value should theoretically exceed the permitted level of 0.50. (Halawi & McCarthy, 2008). In this situation, safety performance received the greatest AVE score of 0.960, while management safety received the lowest score of 0.560. In other words, on average, all of the latent variables in this study could explain more than half of the variance

in indicators (Karim, 2009). In conclusion, in the current investigation, all indicators met the AVE minimum of 0.5. (Henseler et al., 2009).

Table 4.4: The Results of Measurement Model

Model Construct	Measurement Items	Factor loading (Outer loading)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Co-worker Safety	CS2.1	0.815	0.931	0.576
	CS2.10	0.848		
	CS2.2	0.810		
	CS2.3	0.734		
	CS2.4	0.771		
	CS2.5	0.668		
	CS2.6	0.637		
	CS2.7	0.738		
	CS2.8	0.708		
	CS2.9	0.832		
Job Safety	JS1.1	0.597	0.926	0.559
	JS1.10	0.721		
	JS1.2	0.850		
	JS1.3	0.775		
	JS1.4	0.755		
	JS1.5	0.730		
	JS1.6	0.781		
	JS1.7	0.761		
	JS1.8	0.828		
	JS1.9	0.642		
Management Safety	MS4.1	0.746	0.927	0.560
	MS4.10	0.721		
	MS4.2	0.851		

Table 4.4 Continued

	MS4.3	0.772		
	MS4.4	0.771		
	MS4.5	0.731		
	MS4.6	0.769		
	MS4.7	0.678		
	MS4.8	0.679		
	MS4.9	0.748		
SSP	SSP5.1	0.756	0.936	0.594
	SSP5.10	0.793		
	SSP5.2	0.762		
	SSP5.3	0.784		
	SSP5.4	0.779		
	SSP5.5	0.691		
	SSP5.6	0.832		
	SSP5.7	0.745		
	SSP5.8	0.808		
	SSP5.9	0.744		
Safety Behavior	SB6.1	0.780	0.931	0.577
	SB6.10	0.799		
	SB6.2	0.761		
	SB6.3	0.777		
	SB6.4	0.789		
	SB6.5	0.739		
	SB6.6	0.669		
	SB6.7	0.786		
	SB6.8	0.846		
	SB6.9	0.627		

Table 4.4 Continued

Safety Performance	SP7.1	0.976	0.990	0.960
	SP7.2	0.989		
	SP7.3	0.984		
	SP7.4	0.971		
Supervisor Safety	SS3.1	0.566	0.928	0.569
	SS3.10	0.833		
	SS3.2	0.826		
	SS3.3	0.567		
	SS3.4	0.841		
	SS3.5	0.756		
	SS3.6	0.788		
	SS3.7	0.739		
	SS3.8	0.786		
	SS3.9	0.778		

Note:

Composite Reliability (CR) = (square of the summation of the factor loadings) / {(square of the summation of the factor loadings) + (square of the summation of the error variances)}

Average Variance Extracted (AVE) = (summation of the square of the factor loadings) / {(summation of the square of the factor loadings) + (summation of the error variances)}

In terms of factor loading, the item loadings in each construct ranged from 0.566 to 0.989, above Hair et al.'s recommended value of 0.5 (significant at $p < 0.005$). (2006). No items were deleted because their loadings were below the allowed level. Table 4.4 shows all factor loadings that are more than 0.5 and are regarded the best interpretation for the factors (Hair et al., 2006). This demonstrates that the questionnaire replies were accurate. Overall, the findings indicated that the measurement model used in this investigation was sufficient.

To confirm discriminant validity, the square root of AVE was also assessed on the inter-correlations of the constructs with the other components (Fornell & Larcker, 1981). Both loading and cross-loading matrices were investigated in this study, as shown in Table 4.3. In theory, all measurement items in the loading and cross-loading matrices should load higher than the respective construct than other constructs. The square root of AVE in a correlation matrix should be greater than the inter-construct correlation cut-off value (Fornell & Larcker, 1981). Table 4.4 shows that all of the structures met both of the conditions. In conclusion, the measuring model used in this investigation met all of the criteria for reliability, convergent validity, and discriminant validity.

Table 4.5: Results of Reliability Test

Model Construct	Measurement Item	Cronbach's	Loading range (Outer Loading)	Number of items
Co-worker Safety	CS2.1	0.917	0.637-0.848	10
	CS2.10			
	CS2.2			
	CS2.3			
	CS2.4			
	CS2.5			
	CS2.6			
	CS2.7			
	CS2.8			
	CS2.9			
Job Safety	JS1.1	0.911	0.597-0.850	10
	JS1.10			
	JS1.2			
	JS1.3			

Table 4.5 Continued

	JS1.4 JS1.5 JS1.6 JS1.7 JS1.8 JS1.9			
Management Safety	MS4.1 MS4.10 MS4.2 MS4.3 MS4.4 MS4.5 MS4.6 MS4.7 MS4.8 MS4.9	0.912	0.678-0.851	10
SSP	SSP5.1 SSP5.10 SSP5.2 SSP5.3 SSP5.4 SSP5.5 SSP5.6 SSP5.7 SSP5.8 SSP5.9	0.924	0.691-0.832	10

Table 4.5 Continued

Safety Behavior	SB6.1	0.918	0.627-0.846	10
	SB6.10			
	SB6.2			
	SB6.3			
	SB6.4			
	SB6.5			
	SB6.6			
	SB6.7			
	SB6.8			
	SB6.9			
Safety Performance	SP7.1	0.986	0.971-0.989	50
	SP7.2			
	SP7.3			
	SP7.4			
Supervisor Safety	SS3.1	0.913	0.566-0.833	10
	SS3.10			
	SS3.2			
	SS3.3			
	SS3.4			
	SS3.5			
	SS3.6			
	SS3.7			
	SS3.8			
	SS3.9			

Note: Final items numbers (initial numbers)

Cronbach's alpha coefficient, in general, measures the measuring items' inter-tem consistency (Ramayah et al., 2011). Cronbach's alpha value was used to analyse the internal reliability of seven constructs with 110 items based on indicator inter-correlations in this study. The loadings and Cronbach's Alpha reliability coefficients for the seven determinants, including job safety, coworker safety, supervisor safety, management safety, satisfaction with the safety programme, safety behaviour, and safety performance, are shown in Table 4.5. All indicators were believed to be continuously dependable. In summary, all of the determinants exceeded Nunnally and Bernstein's (1994) recommended alpha value of 0.7, and Sekaran (1992). Cronbach alpha values ranged from 0.911 to 0.986 for job safety, coworker safety, supervisor safety, management safety, satisfaction with the safety programme, safety behaviour, and safety performance. This shows that the many measurement items in this study were suitable, reliable, and acceptable. As a result, the internal consistency dependability of the measures utilised in this study is acceptable.

Table 4.6: Summary Results of the Model Constructs

Model Construct	Measurement Items	Standardized Estimate (Outer Loading) Algorithm	t-value (Outer Loading) Bootstrap
Co-worker Safety	CS2.1	0.815	40.234
	CS2.10	0.848	43.304
	CS2.2	0.810	34.726
	CS2.3	0.734	16.855
	CS2.4	0.771	26.267
	CS2.5	0.668	10.324
	CS2.6	0.637	11.323
	CS2.7	0.738	25.483
	CS2.8	0.708	18.337

Table 4.6 Continued

	CS2.9	0.832	38.192
Job Safety	JS1.1	0.597	7.469
	JS1.10	0.721	17.049
	JS1.2	0.850	42.462
	JS1.3	0.775	18.158
	JS1.4	0.755	26.134
	JS1.5	0.730	17.858
	JS1.6	0.781	24.816
	JS1.7	0.761	22.009
	JS1.8	0.828	40.474
	JS1.9	0.642	13.560
Management Safety	MS4.1	0.746	27.248
	MS4.10	0.721	19.814
	MS4.2	0.851	42.311
	MS4.3	0.772	32.315
	MS4.4	0.771	30.272
	MS4.5	0.731	16.749
	MS4.6	0.769	23.571
	MS4.7	0.678	10.745
	MS4.8	0.679	13.768
	MS4.9	0.748	26.358
SSP	SSP5.1	0.756	27.826
	SSP5.10	0.793	29.900
	SSP5.2	0.762	28.430
	SSP5.3	0.784	30.622
	SSP5.4	0.779	18.182
	SSP5.5	0.691	18.441
	SSP5.6	0.832	31.285

Table 4.6 Continued

	SSP5.7	0.745	24.478
	SSP5.8	0.808	29.638
	SSP5.9	0.744	18.150
Safety Behavior	SB6.1	0.780	27.196
	SB6.10	0.799	27.325
	SB6.2	0.761	19.167
	SB6.3	0.777	18.921
	SB6.4	0.789	29.171
	SB6.5	0.739	20.837
	SB6.6	0.669	14.317
	SB6.7	0.786	31.791
	SB6.8	0.846	49.068
	SB6.9	0.627	9.810
Safety Performance	SP7.1	0.976	179.246
	SP7.2	0.989	508.139
	SP7.3	0.984	346.430
	SP7.4	0.971	154.307
Supervisor Safety	SS3.1	0.566	8.477
	SS3.10	0.833	37.327
	SS3.2	0.826	41.857
	SS3.3	0.567	6.620
	SS3.4	0.841	40.567
	SS3.5	0.756	16.107
	SS3.6	0.788	29.838
	SS3.7	0.739	16.758
	SS3.8	0.786	22.859
	SS3.9	0.778	22.846

Note: Final items numbers (initial numbers)

Table 4.6 summarises the measurement model's findings, which show that all of the proposed constructs in this study are legitimate measures based on parameter estimates and statistical significance (Chow & Chan, 2008).

Table 4.7: Discriminant Validity of Constructs

Fornell-Larcker Criterion

	Co-worker Safety	Job Safety	Management Safety	SSP	Safety Behavior	Safety Performance	Supervisor Safety
Co-worker Safety	0.759						
Job Safety	0.886	0.747					
Management Safety	0.983	0.913	0.748				
SSP	0.916	0.904	0.937	0.770			
Safety Behavior	0.896	0.939	0.934	0.929	0.760		
Safety Performance	0.954	0.945	0.966	0.967	0.952	0.980	
Supervisor Safety	0.913	0.983	0.938	0.936	0.949	0.969	0.754

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the correlations

Discriminant validity was used in the data analysis procedure to see how well items differentiated between domains and to look at correlations between measurements of possibly overlapping constructs. The correlations for each of the constructs were less than the average variance recovered (in bold) by the indicators, as shown in Table 4.7. This suggests that the highlighted constructs had sufficient discriminant validity. Table 4.8 shown Heterotrait-Monotrait Ratio (HTMT).

Table 4.8: Heterotrait-Monotrait Ratio (HTMT)

	Co-worker Safety	Job Safety	Management Safety	SSP	Safety Behavior	Safety Performance	Supervisor Safety
Co-worker Safety							
Job Safety	0.868						
Management Safety	0.877	0.898					
SSP	0.892	0.876	0.816				
Safety Behavior	0.872	0.817	0.815	0.807			
Safety Performance	0.802	0.891	0.816	0.811	0.897		
Supervisor Safety	0.889	0.871	0.828	0.818	0.833	0.822	

4.4.2 Structural Model Results

The structural model was to be tested by examining the inner model after all of the constructs in the measurement model had been validated. The structural model is being tested in this study to test the underlying hypotheses in order to address the research questions listed in Chapter 1.

4.4.2.1 Bootstrapping

The bootstrap method is a nonparametric method for determining the precision of PLS estimates (Chin, 2010). The researcher employed the bootstrapping technique to obtain the significant t-statistic in order to test path analyses and hypotheses. Bootstrapping is a statistical re-sampling strategy for determining confidence intervals (Kline, 2005, Manly, 2001). (Henseler et al., 2009). According to Fornell and Larcker (1981), bootstrapping looked at the consistency of estimations (Chin, 2010). Bootstrapping was used in this investigation to determine t-values for each hypothesised association and the potential impact of variables. To evaluate the path coefficient (β) and presented

hypotheses, the researcher utilised a bootstrapping approach with 500 samples and 0 cases per sample. According to Manly (2001), the bootstrapping approach with 200 samples produces a modest error margin in bootstrapping estimation. This allowed the researcher to calculate the path coefficients' statistical significance.

Table 4.9: R², Communality and Redundancy

Constructs	R ²	Communality (H2)/ AVE	Redundancy (F2)
Safety Behavior	0.932	0.577	
Safety Performance	0.981	0.960	
Co-worker Safety		0.576	
Job Safety		0.559	
Management Safety		0.560	
SSP		0.594	
Supervisor Safety		0.569	

PLS generated R² value in addition to path coefficients (Halawi & McCarthy, 2008; Verhagen & Van Dolen, 2009). R² can be used to determine the structural model's predictive power, according to Chin (2010). The percentage of constructs is indicated by R², but the path coefficient also reveals the strength of the links between the constructs in the study (Chin, 1998). The R² endogenous LVs thumb rule was 0.67 (substantial), 0.33 (moderate), and 0.19 (weak) (Chin, 1998). The degree of impact of independent variables on the dependent variable is measured by the R² value (Chin, 2010). The researcher

discovered that the R2 value for the two indicators was 0.932 for safety behaviour and 0.981 for safety performance, as shown in Table 4.9. Job safety, coworker safety, management safety, supervisor safety, and satisfaction with safety programmes were able to explain 98.1 percent of the variance in safety performance in this way. These two indicators revealed that the suggested model fit the aggregate data well, and the R2 values were high in this study.

4.4.3 Predictive Relevance (Q2)

After computing R2, the researcher uses the blindfolding procedure in PLS statistical analysis to access Q2. Q2 is a metric for how effectively the model and its parameter estimations reproduce observed values (Chin, 2010). Relevance prediction Q2 evaluates the predictive validity of endogenous constructs in a complicated model in general (Chin, 1998; Chin, 2010). Q2 can be evaluated specifically using cross-validated communality and cross-validated redundancy. Cross-validated communality is measured by predicting problematic blocks using latent variables from prediction (Akter, D'Ambra, & Ray, 2011a). The communality index was used to assess the quality of the measurement model in this study (Tenenhaus et al., 2005). Among these two types of prediction algorithms, cross-validated redundancy is useful for estimating the predictive relevance of a complicated model (Chin, 2010). The predictive relevance formula is as follows:

$$Q^2 = 1 - \frac{\sum_D E_D}{\sum_D O_D}$$

The sum squares of prediction error is 'E,' the sum of squares error using the mean for prediction is 'O,' and the omission distance is 'D,' according to the formula above. If a

cross-validated redundancy reaches $Q^2 > 0$ or the cut-off value of $Q^2 > 0.5$, as indicated by Chin (1998), the model of research has predictive significance, however if $Q^2 < 0$, the model lacks predictive relevance (Barroso et al., 2010). In this research study, safety performance is predicted by five major independent variables (job safety, co-worker safety, supervisor safety, management safety, and satisfaction of safety programmes) and the only mediator (safety behavior). This study obtained a highly predictive model.

4.4.4 Analysis of Global Fit Measures

PLS path analysis modelling was used to test the overall fit-of-path model. The geometric mean of average communality and average R^2 (particularly for endogenous variables) is used to calculate the goodness of fit (GoF) (Chin, 2010; Tenenhaus et al., 2005). The degree of freedom, goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative fit index (CFI), and root-mean-square error of approximation are commonly used to determine the overall prediction power of a complex model by looking at the performance of measurement and structural parameters (Akter et al., 2011a) (RMSR). GFI and AGFI must normally reach a benchmark of 0.8 or higher (Scott, 1994), whereas CFI should be above 0.9. (Bentler & Bonett, 1980). The GoF value ranges from 0 to 1, with higher GoF values indicating better path model estimate (Akter et al., 2011a; Karim, 2009). According to Cohen (1988), the R^2 effect's baseline values are tiny = 0.03, medium = 0.13, and big = 0.26, as quoted by Akter et al (2011a). The formula for determining GoF is as follows:

$$GoF = \sqrt{AVE \times R^2}$$

GoF small = 0.1, GoF medium = 0.25, and GoF large = 0.36 are the recommended values (Akter et al., 2010). In this study, the GoF value for safety behaviour was 0.557 ($R^2 = 0.932$, average AVE = 0.577) and for safety performance was 0.951 ($R^2 = 0.981$, average AVE = 0.960). These graphs show that the GoF values for safety behaviour and safety performance exceeded the greatest cut-off value of 0.36, indicating that the proposed model of this study is capable of accurate prediction. As a result, the proposed PLS model in this study was found to be adequate.

PLS is a solid, practical, and powerful analysis tool that has been used in a wide range of disciplines. SmartPLS was used to create the research model displayed in Figure 4.1 and structural model in Figure 4.2. Because of the study's complexity and numerous variables, PLS route modelling was applicable (Henseler et al., 2009). These variables were convenience, customization, interactivity, character, empathy, assurance, tangibility, responsiveness, reliability, website design, website content, website structure, perceived usefulness, perceived ease-of-use, perceived enjoyment, security, and privacy. The measurement and structural model results are discussed in next section.

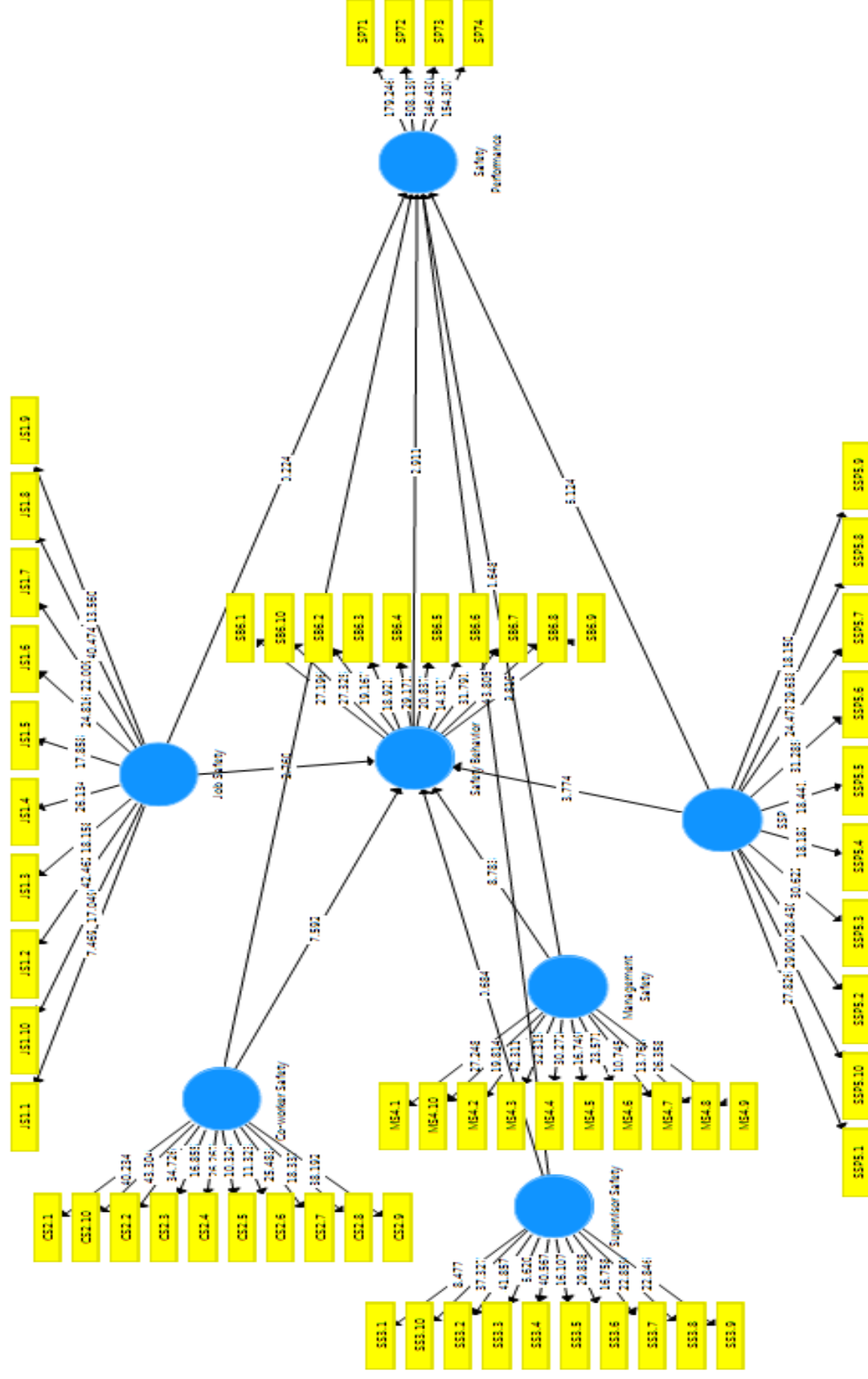


Figure 4.1: Research Model with PLS Coefficient

4.5 Structural Model

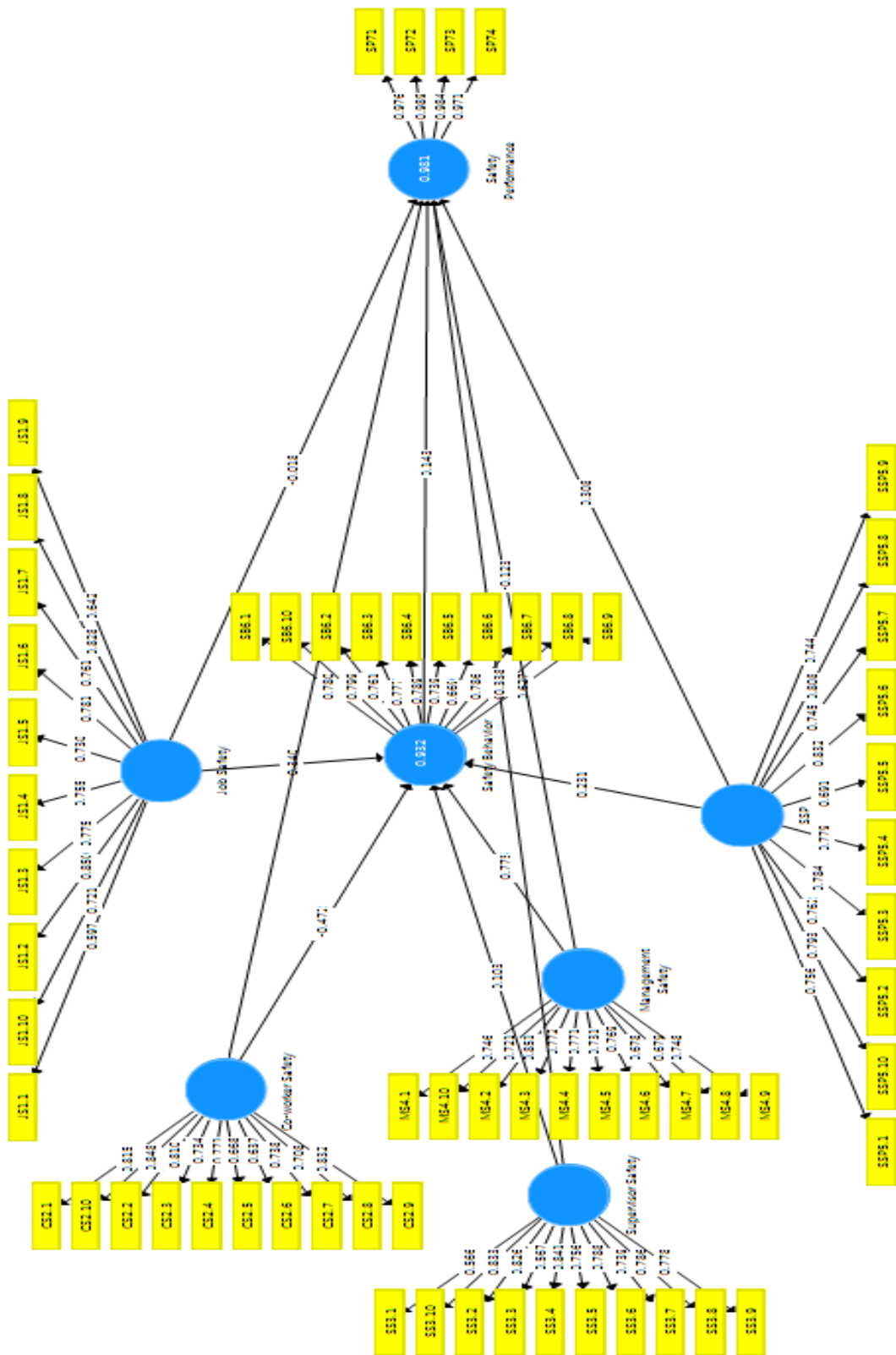


Figure 4.2: Structural Model

4.6 The Variance Accounted For (VAF)

To estimate the size of the indirect effect or total effect, the researcher has used the variance accounted for (VAF) value that represents the ratio of indirect effects to the total effect (Helm et al., 2010). The formula of VAF is:

$$VAF = \frac{a \times b}{a \times b + c}$$

The VAF value indicates the percentage of the total effect of job safety on job performance, explained by indirect effect (safety behavior), and are summarized in Table 4.10. In this research study, the highest VAF value was **1.589**, which indicates that **158.9** percent of the total effect of reliability on job safety was explainable by the indirect effect of safety behavior. To summarise, the degree of the indirect effect of reliability via safety behaviour was illustrated by the high VAF value. However, the lowest indirect effect was management safety, **-9.103**, which indicated that **910.3** percent of the total effects of management safety on safety performance was explainable by indirect effect of safety behavior.

Table 4.10: The Value of VAF

Variables	Independent-Mediator (a)	Mediator-Dependent (b)	Independent-Dependent (c)	Variance Accounted For (VAF)
Job Safety	0.340	0.143	-0.018	1.589
Co-worker Safety	-0.472	0.143	0.372	-0.222
Supervisor Safety	0.103	0.143	0.338	0.042
Management Safety	0.775	0.143	-0.123	-9.103
SSP	0.231	0.143	0.308	0.097

4.7 Hypothesis Testing

PLS modeling was applied to test and validate the proposed hypotheses. SmartPLS was used to test 19 proposed hypotheses and determine the antecedents and mediating effects of safety behavior on safety performance in the Sarawak context. The empirical findings from data testing that supported and or not supported the proposed hypotheses are presented in Table 4.11 below.

Table 4.11: Path Coefficients and Hypothesis Testing Between Independent Variables, Mediator and Dependent Variables (direct impact)

H	Relationships	Path Coefficient (β)	t-value	P-Value	Confidence Lower Limit	Confidence Upper Limit	Supported
Ha1	Job Safety -> Safety Behavior	0.340	2.760	0.006	0.113	0.593	Supported
Ha2	Co-worker Safety -> Safety Behavior	-0.472	7.592	0.000	-0.579	-0.342	Not Supported
Ha3	Supervisor Safety -> Safety Behavior	0.103	0.684	0.494	-0.181	0.396	Not Supported
Ha4	Management Safety -> Safety Behavior	0.775	8.783	0.000	0.585	0.924	Supported
Ha5	SSP -> Safety Behavior	0.231	3.774	0.000	0.125	0.356	Supported
Ha6	Job Safety -> Safety Performance	-0.018	0.224	0.823	-0.128	-0.187	Not Supported
Ha7	Co-worker Safety -> Safety Performance	0.372	7.143	0.000	0.218	0.373	Supported
Ha8	Supervisor Safety -> Safety Performance	0.338	3.805	0.000	0.177	0.529	Supported
Ha9	Management Safety -> Safety Performance	-0.123	1.648	0.100	-0.112	0.099	Not Supported
Ha10	SSP -> Safety Performance	0.308	6.124	0.000	0.249	0.426	Supported
Ha11	Safety Behavior -> Compliance With Safety work	0.976	179.246	0.000	0.035	0.223	Supported
Ha12	Safety Behavior -> Using PPE as Prescribed	0.989	508.139	0.000	0.035	0.223	Supported
Ha13	Safety Behavior -> Increased awareness of hazards	0.984	346.430	0.000	0.035	0.223	Supported
Ha14	Safety Behavior -> Executing emergency procedures	0.971	154.307	0.000	0.035	0.223	Supported

Note: * $P < 0.01$, $p < 0.05$

4.7.1 Direct Effects

4.7.1.1 Ha1: Job safety is positively related to safety behavior.

Hypothesis 1 investigated the relationship between job safety and safety behavior. Referring to the path coefficients, presented in Table 4.4, the results disclosed that job safety was positively related to safety behavior ($\beta = 0.340$; $t = 2.760$; $p = 0.006$) which exceeded the recommended value, 1.96 (< 0.05). This confirms that job safety was positively related to safety behavior, therefore, Hypothesis 1 was supported.

4.7.1.2 Ha2: Co-worker safety is positively related to safety behavior.

Hypothesis 2 stated that co-worker safety is positively related to safety behavior. The results of the PLS analysis indicated that co-worker safety was negatively related to safety behavior ($\beta = -0.472$; $t = 7.592$; $p = 0.000$) Hypothesis 2 was therefore not supported.

4.7.1.3 Ha3: Supervisor safety is positively related to safety behavior.

It was hypothesized in hypothesis 3 that supervisor safety is positively related safety behavior. After the analysis, as unexpected, empirical results from the research postulated that supervisor safety was negatively related to the safety behavior ($\beta = 0.103$; $t = 0.684$; $p = 0.494$). Thus, it showed that Hypothesis 3 was not supported in this study.

4.7.1.4 Ha4: Management safety is positively related to safety behavior.

For hypothesis 4, the researcher expected that management safety factors had a positive and direct impact on safety behavior. The empirical results of the analysis showed that management safety was positively related to safety behavior ($\beta = 0.775$; $t = 8.783$; $p = 0.000$). In this respect, Hypothesis 4 was supported.

4.7.1.5 Ha5: Satisfaction of safety programme is positively related to safety behavior.

Hypothesis 5 looked at the direct impact of satisfaction of safety programme and safety behavior. Empirical findings showed that satisfaction of safety programme was positively related to safety behavior ($\beta = 0.231$; $t = 3.774$; $p = 0.000$). In short, this concluded that satisfaction of safety programme was positively related to safety behavior, and Hypothesis 5 was supported.

4.7.1.6 Ha6: Job safety is positively related to safety performance.

Hypothesis 6 investigated the relationship between job safety and safety performance. Referring to the path coefficients, presented in Table 4.4, the results disclosed that job safety was negatively related to safety behavior ($\beta = -0.018$; $t = 0.224$; $p = 0.823$) which exceeded the recommended value, 1.96 (< 0.05). This confirms that job safety was negatively related to safety performance, therefore, Hypothesis 6 was not supported.

4.7.1.7 Ha7: Co-worker safety is positively related to safety performance.

Hypothesis 7 stated that co-worker safety is positively related to safety performance. The results of the PLS analysis indicated that co-worker safety was positively related to safety performance ($\beta = 0.372$; $t = 7.143$; $p = 0.000$) Hypothesis 7 was therefore supported.

4.7.1.8 Ha8: Supervisor safety is positively related to safety performance.

It was hypothesized in hypothesis 8 that supervisor safety is positively related to safety performance. After the analysis, as expected, empirical results from the research

postulated that supervisor safety was positively related to the safety performance ($\beta = 0.338$; $t = 3.805$; $p=0.000$). Thus, it showed that Hypothesis 8 was supported in this study.

4.7.1.9 Ha9: Management safety is positively related to safety performance.

For hypothesis 9, the researcher expected that management safety factors had a positive and direct impact on safety performance. The empirical results of the analysis showed that management safety was negatively related to safety performance ($\beta = -0.123$; $t = 1.648$; $p= 0.100$) which exceeded the recommended value, 1.96 (< 0.05). In this respect, Hypothesis 9 was not supported.

4.7.1.10 Ha10: Satisfaction of safety programme is positively related to safety performance.

Hypothesis 10 looked at the direct impact of satisfaction of safety programme and safety performance. Empirical findings showed that satisfaction of safety programme was positively related to safety performance ($\beta = 0.308$; $t = 6.124$; $p= 0.000$). In short, this concluded that satisfaction of safety programme was positively related to safety performance, and H10 was supported.

4.7.1.11 Ha11: Safety behavior is positively related to compliance with safety work.

Hypothesis 11 investigated the relationship between safety behavior and compliance with safety work. Referring to the path coefficients, presented in Table 4.4, the results disclosed that safety behavior was positively related to compliance with safety work ($\beta = 0.976$; $t = 179.246$; $p= 0.000$). This concluded that safety behavior was positively related to compliance with safety work. Therefore, Hypothesis 11 was not supported.

4.7.1.12 Ha12: Safety behavior is positively related to using PPE as prescribed

Hypothesis 12 stated that safety behavior is positively related to using PPE as prescribed. The results of the PLS analysis indicated that safety behavior was positively related to using PPE as prescribed ($\beta = 0.989$; $t = 508.139$; $p = 0.000$) Hypothesis 12 was therefore supported.

4.7.1.13 Ha13: Safety behavior is positively related to increased awareness of hazards

It was hypothesized in hypothesis 13 that **Safety behavior** is positively related to the **increased awareness of hazards**. After the analysis, as expected, empirical results from the research postulated that **Safety behavior** was positively related to the increased awareness of hazards ($\beta = 0.984$; $t = 346.430$; $p = 0.000$). Thus, it showed that Hypothesis 13 was supported in this study.

4.7.1.14 Ha14: Safety behavior is positively related to executing emergency procedures

Hypothesis 14 looked at the direct impact of safety behavior and **executing emergency procedures**. Empirical findings showed that safety behavior was positively related to executing emergency procedures ($\beta = 0.971$; $t = 154.307$; $p = 0.000$). In short, this concluded that safety behavior was positively related to **executing emergency procedures**, and Hypothesis 14 was supported.

4.7.2 Mediating Effects

The researcher then looked at the role of safety behaviour in mediating the relationship between job safety, coworker safety, supervisor safety, management safety, and satisfaction of the safety program's with safety performance. According to McKinnon, Warsi, and Dwyer (1995), mediating effects only exist when:

- (i) Independent variables have a significant impact on mediator;
- (ii) Independent variables have a significant impact on dependent variables in the absence of mediator;
- (iii) Mediator has a significant impact on dependence variables; and
- (iv) The effect of independent variables and dep (Ramayah et al., 2011).

In the absence of the mediator's influence, predictors of job safety, coworker safety, supervisor safety, management safety, and satisfaction of the safety programmes have a positive impact on safety performance. Second, safety behavior has a positive impact on safety performance (functioning as the only mediator).

The indirect effects of the model were measured using the bootstrapped confidence interval and the product of coefficient method with the second order (SE) estimate (Karim, 2009). Table 4.15 shows the results of the mediating path from safety behaviour to safety performance.

4.7.2.1 Ha15: Safety behavior mediates the relationship between job safety and safety performance

As shown in Table 4.12, job safety had a significant impact on safety behavior (0.340, $p < 0.01$) as well as safety behavior on safety performance (0.143, $p < 0.01$). Next, there was **no significant** direct impact of job safety on safety performance (**-0.018**, $p > 0.01$). In this respect, safety behavior has not played the role as mediator in this study and, H15 was **not supported**.

Table 4.12: Safety behavior mediates the relationship between job safety and safety performance

	Relationships	Path Coefficient (β)	t-value	P-Value	Confidence Lower Limit	Confidence Upper Limit	Supported
(a)	Job Safety -> Safety Behavior	0.340	2.760	0.006	0.113	0.593	Supported
(b)	Safety Behavior -> Safety Performance	0.143	2.911	0.004	0.035	0.223	Supported
(c)	Job Safety -> Safety Performance	-0.018	0.224	0.823	-0.169	0.140	Not Supported
	a x b	0.049	Full Mediation since direct effect (c) is not support				
	a x b > c	Mediation occur					

4.7.2.2 Ha16: Safety behavior mediates the relationship between co-worker safety and safety performance

On the basis of testing the mediating effect, co-worker safety **not significantly** impacted safety behavior (**-0.472**, $p < 0.01$). Differently, safety behavior had a significant impact on safety performance (0.143, $p < 0.01$). Next, there was a significant direct impact of co-worker safety on safety performance (0.372, $p > 0.01$). Therefore, safety behavior was not shown to be a mediator in this study, and H16 was **not supported**.

Table 4.13: Safety behavior mediates the relationship between co-worker safety and safety performance

	Relationships	Path Coefficient (β)	t-value	P-Value	Confidence Lower Limit	Confidence Upper Limit	Supported
(a)	Co-worker Safety -> Safety Behavior	-0.472	7.592	0.000	-0.579	-0.342	Not Supported
(b)	Safety Behavior -> Safety Performance	0.143	2.911	0.004	0.035	0.223	Supported
(c)	Co-worker Safety -> Safety Performance	0.372	7.143	0.000	0.264	0.459	Supported
	a x b	-0.068	No Mediation since one of the indirect effect (a) is not supported				
	a x b < c	No Mediation occur					

4.7.2.3 Ha17: Safety behavior mediates the relationship between supervisor safety and safety performance

After examining the mediating effects on supervisor safety, the researcher also found that supervisor safety not significant impact on safety behavior (0.103, $p > 0.01$), safety behavior on safety performance (0.143, $p < 0.01$). There was also a direct impact of supervisor safety on safety performance (0.338, $p < 0.01$), and thus H17 was **not supported**.

Table 4.14: Safety behavior mediates the relationship between supervisor safety and safety performance

	Relationships	Path Coefficient (β)	t-value	P-Value	Confidence Lower Limit	Confidence Upper Limit	Supported
(a)	Supervisor Safety -> Safety Behavior	0.103	0.684	0.494	-0.181	0.396	Not Supported
(b)	Safety Behavior -> Safety Performance	0.143	2.911	0.004	0.035	0.223	Supported
(c)	Supervisor Safety -> Safety Performance	0.338	3.805	0.000	0.166	0.518	Supported
	a x b	0.015	No Mediation since one of the indirect effect (a) is not supported				
	a x b < c	No Mediation occur					

4.7.2.4 Ha18: Safety behavior mediates the relationship between management safety and safety performance

The empirical findings confirmed that management safety had a significant impact on safety behavior (0.775, $p < 0.01$). Similarly, there was a significant impact on safety behavior (0.143, $p < 0.01$) and safety performance. In addition, management safety had not direct impact on safety performance (**-0.123, $p > 0.01$**). Therefore, these results established that H18 was **supported**.

Table 4.15: Safety behavior mediates the relationship between management safety and safety performance

	Relationships	Path Coefficient (β)	t-value	P-Value	Confidence Lower Limit	Confidence Upper Limit	Supported
(a)	Management Safety -> Safety Behavior	0.775	8.783	0.000	0.585	0.924	Supported
(b)	Safety Behavior -> Safety Performance	0.143	2.911	0.004	0.035	0.223	Supported
(c)	Management Safety -> Safety Performance	-0.123	1.648	0.100	-0.253	0.030	Not Supported
	a x b	0.111	Full Mediation since direct effect (c) is not support				
	a x b > c	Mediation occur					

4.7.2.5 Ha19: Safety behavior mediates the relationship between satisfaction of safety programmes and safety performance

Finally, the analysis revealed the mediating effect of safety behavior on **satisfaction of safety programmes**, which showed a significant impact by satisfaction of safety programmes factors on safety behavior (0.231, $p < 0.01$), safety behavior on **satisfaction of safety programmes** (0.143, $p < 0.01$). The researcher also found that satisfaction of safety programmes factors had a significant and direct impact on safety performance

(0.308, $p < 0.01$). Therefore, safety behavior was shown to be a mediator in this study, and H19 was **supported**.

Table 4.16: Safety behavior mediates the relationship between satisfaction of safety programmes and safety performance

	Relationships	Path Coefficient (β)	t-value	P-Value	Confidence Lower Limit	Confidence Upper Limit	Supported
(a)	SSP -> Safety Behavior	0.231	3.774	0.000	0.125	0.356	Supported
(b)	Safety Behavior -> Safety Performance	0.143	2.911	0.004	0.035	0.223	Supported
(c)	SSP -> Safety Performance	0.308	6.124	0.000	0.198	0.400	Supported
	a x b	0.033	No Mediation since Indirect effect < direct effect				
	a x b < c	No Mediation occur					

Table 4.17: The Mediating Impact of Safety Behavior on Independent Variables with Dependent Variable (indirect impact)

H	Relationships	Path Coefficient (β)	t-value	P-value	Confidence Lower Limit	Confidence Upper Limit	Supported
Ha15	Job Safety -> Safety Behavior -> Safety Performance	0.049	1.846	0.065	0.006	0.105	Supported
Ha16	Co-worker Safety -> Safety Behavior -> Safety Performance	-0.068	2.836	0.005	-0.107	-0.018	Not Supported
Ha17	Supervisor Safety -> Safety Behavior -> Safety Performance	0.015	0.684	0.494	-0.027	0.061	Not Supported
Ha18	Management Safety -> Safety Behavior -> Safety Performance	0.111	3.026	0.003	0.026	0.171	Supported
Ha19	SSP -> Safety Behavior -> Safety Performance	0.033	2.165	0.031	0.007	0.065	Not Supported

Note: * $P < 0.01$, $p < 0.05$

4.8 Chapter Summary

The results of the numerous analyses that tested the hypotheses were reported in this chapter. Descriptive analysis, factor analysis, reliability test, coefficient path analysis, and modelling fit were the statistical studies employed. The findings from the analysis included five out of seven direct impact hypotheses showing direct and positive impact on safety performance. In addition to the direct impact hypotheses, this study included five indirect impact hypotheses. The results from the analysis testing of these hypotheses showed that there were indirect effects of safety behavior through co-worker safety, supervisor safety, and satisfaction of safety programmes on safety performance. This study has contributed additional empirical evidence on safety performance in the Sarawak plantation industry. In Chapter 5, the supported, partially supported, and unsupported hypotheses are thoroughly discussed.

CHAPTER 5

DISCUSSIONS, IMPLICATIONS , RECOMMENDATIONS AND CONCLUSIONS

5.1 Introduction

This chapter offers an overview of the study, starting from the introduction, literature review, research methodology, findings and discussion as well as summary, conclusion and recommendations. Besides, it includes important discussion on the contributions of the study to the theory, methodology, and practice. It further highlighted limitations of the study and provide critical recommendations for future researchers in building rigorous empirical research frameworks.

5.2 Research Summary

The main objective of the present study is to determine the dominant factors and recommendations of Work Safety Scale (WSS) that contribute to Safety Performance in Sarawak's plantation industry. This also includes how these five facets of WSS- job safety, co-worker safety, supervisor safety, management safety, and satisfaction of safety programme contribute to safety performance. In this respect, the researcher has explored the determinants that most likely affect safety performance, and developed a model of safety performance in Sarawak's plantation industry.

For chapter 1 had discussed about the background of the study. The importance of Work Safety Scale (WSS) that contributing to safety performance in Sarawak's plantation industry. Because these 5 WSS may occur in every organization, it is very important to be

more careful and aware in every organization. Therefore, the proposed action on how to increase the safety performance among employees must be provided by the organization's leaders or employer. This chapter also included problem statement, research objectives and research hypotheses. In problem statement, theoretical studies, empirical studies, and practical study have been discussed. This chapter also examined conceptual framework, definitions of terms and study significance.

For chapter 2 reviewed related literatures regarding the prior empirical studies and past theories. The literature review was conducted on analyzing the related journal articles and texts. In this chapter issues that are relevant to the concept of safety performance were discussed to explain support and argue about the relationships between 5 facets of WSS towards the safety performance and safety behavior as a mediating variable. In addition, past studies were identified and discussed in order to articulate the hypotheses and conceptual framework of this study. In other words, reviews of relevant papers were conducted in order to develop the theoretical and conceptual frameworks for this research. Past literatures were thoroughly researched in order to determine the scope and direction of the current investigation, as well as the background and concepts of the study, the empirical and textual foundations of the research, and the predicted relationship between the proposed variables (Hayes et al., 1998). These served as evidences which further strengthened the suggested roles of safety behavior as a mediator in the relationship between selected 5 facets of WSS in safety performance.

The third chapter presented the methodology employed in carrying out this study. The research philosophy, research design, study population and sample, data collection

methods and procedures, instruments, data collection, pilot study, and data analysis procedures were all covered in this chapter. Explicitly, this study employed cross-sectional technique of collecting data and the data collection phases was divided into questionnaire and in-depth focus group interview. In addition, simple random and purposive sampling methods were utilized for data collection. The results of the confirmatory factor analysis and reliability test were presented to demonstrate the questionnaire's validity and reliability. The research hypotheses generated in this study were tested using SPSS and PLS-SEM, and the data was then evaluated. However, content analysis was used to analyse interview data.

The fourth chapter discuss about findings of this study, the chapter contained the data screening and preliminary analysis, demographic profile of the respondents, descriptive analysis of constructs, measurement scale of the research variables, result of reliability test and psychometric analysis (actual study), revision of the proposed theoretical model, analysis of the direct effects, analysis of mediator effects, and analysis of qualitative data. From the results, this study found that there is a significant relationship between co-worker safety, supervisor safety, satisfaction of safety programme and safety performance. It also revealed that safety behavior acted as mediator in relationships between facets of job safety and management safety in safety performance in Sarawak plantation industry.

The fifth chapter is concerned with the summary, conclusion and recommendations of this study, this chapter summarized every chapter that had been discussed earlier in this study. The important and interesting findings of this study are included in this chapter.

Additionally, the contribution of this study to theory, methodology, practitioners and local are discussed. More so, the limitations of this research and several recommendations for future studies are also discussed.

5.3 Discussions

The discussion had made up according to research objectives as followed:-

5.3.1 To determine the relationship between job safety and safety behavior

The results indicated that job safety did contributed to the safety behavior. This is probably due to the nature of the job itself. People working with plantation have not being exposed and trained well in performing the job. Besides that, there are no rules and regulations on plantation safety which are mandatory to be followed. This would increase and higher the risk to accident when performing the job. Other than that, the results of the survey may also be affected due to the feedback from respondents. As mentioned earlier in chapter 3, the respondents for the survey were from non-executive local workers. Therefore, the job nature of local worker is more routine and based in plantation where the risks for injury or accident are at very high level. According to Human Factor Theory, Accident causation links overload, inappropriate behaviour, and unsuitable actions to a series of events that were eventually brought about by human error. If the workload placed on plantation employees is excessive, this will make it difficult for them to do their tasks, which will result in incorrect actions and responses that could result in accidents. The impression of workplace safety by employees is linked to factors that affect the frequency of industrial accidents. Employees who believe their jobs are comparatively less unsafe likely to have fewer mishaps than those who believe their jobs are relatively more dangerous. (Guastello & Huastello, 1988; Harrell, 1990; Smith et al., 1992).

Employees who felt comfortable at work reported reduced levels of anxiety and stress connected to their jobs as well as less exposure to environmental hazards (Guastello, 1992), variables that have been strongly linked to accident rates (Guastello, 1989, 1991)

5.3.2 To determine the relationship between co-worker safety and safety behavior

The result indicated that co-worker safety did not contributed to the safety behavior. This would probably due to the teamwork and team concepts were very strong among the workers in the daily operations and therefore this variable was not significant to the safety behavior. Employees that form a bonding relationship at work are more likely to look out for one other's well-being and safety in order to avoid accidents or fatalities at work in the plantation industry. According to Heinrich (1920), 88% of industrial accidents are caused by unsafe acts committed by fellow workers. In plantation, every individual will be accountable to one another to ensure that each is fit and competent to do the duty with wonderful results. Therefore, the co-workers in plantation were not caused the unsafe act maybe because of very wide of plantation areas. If refer to the Domino Theory under easy fix being defining properties, almost everyone who works in a business has been exposed to Domino theory's processes. It signifies that anyone can readily establish and conduct the line of the theory. Furthermore, an experienced worker would serve as a socialising agent (Mullen, 2004). Co-workers are totally accountable for maintaining a safe and suitable work environment. Indeed, they play an important role in persuading the team to adopt healthy and safe working practises. As a result, the socialisation process will provide newbie or junior staff with informal education on safe conduct and practises. It would later be instilled as a culture in the organisation, where safety would be given priority in

everyday plantation operations, through regular administration of safety measures and knowledge.

5.3.3 To determine the relationship between supervisor safety and safety behavior

The results of the findings indicated that supervisor safety did not contribute to the variance in compliance safety behavior. This is because of the responsibility and integrity were not given to the supervisor to ensure the workplace is always in a safe condition in plantation industry. Supervisors have little effect over their subordinates' behaviour. Supervisors are not members of a team who have minor responsibilities such as monitoring and ensuring that safety protocols are followed. In plantation industry, the Safety & Health Officer is in charge of workers safety and health issues perhaps the supervisor lack of dealing with workers regarding this issue. Plantation industry is different with other industries. This was not supported by Heinrich's Axioms of Industrial Safety which the supervisor is the key person in the prevention of industrial accidents. Workers' willingness to adopt safety measures and follow rules was predicted by supervisor commitment to safety (O'Dea, 2002). Supervisors played a significant part in the accident prevention process, according to Tomas et al. (1999), by conveying elements of the safety climate to members of the workforce. In fact, an Israeli maintenance plant experimented with several of these approaches and discovered that simply emphasising safety in interactions might drastically enhance safety performance (Zohar, 2002).

5.3.4 To determine the relationship between management safety and safety behavior

In the study, the result depicted that management safety practices were strongly correlated with compliance safety behavior. This could be because management has the

authority to impose safety rules and regulations. Employees will have no choice but to follow safety procedures and regulations if management places a high emphasis on them. Furthermore, the research was conducted at Sarawak plantations, where safety precautions are prioritised and taken into account by the management team. Large corporations feel that workplace accidents or fatalities will harm the company's reputation, which will eventually affect the company's performance. As a result, safety regulations are extensively documented to guarantee that all safety rules and procedures are followed. According to Heinrich's Axioms of Industrial Safety, because it is in the best position to provide results, management should take charge of safety. This is consistent with earlier studies demonstrating the value of management safety in foretelling accident-related variables. (Murphy et al., 1993; Zohar, 1980). The management safety subscale was among the best predictors of accidents and adherence to safety behaviours, it is crucial to mention. Therefore, paying attention to management's role in safety should be part of improving the company's safety record (i.e. raising employees' compliance with safety behaviours, decreasing accident rate). (Murphy et al, 1993).

5.3.5 To determine the relationship between satisfaction of safety programme and safety behavior

Result of the study indicated that satisfaction of safety programmes did contribute to the variance in compliance safety behavior. This is most likely owing to the employees' high degree of satisfaction with the safety programmes given by the management or company. Training plays most contributing role in explaining management practices to improve safety performance. Heinrich's Axioms of Industrial Safety also mentioned that the best accident prevention techniques are analogous with the best quality and

productivity techniques. According to Hayes et al. (1998), there was a link between management safety measures and compliance safety behaviour. This can be linked to the organization's excellent safety measures by previous validation study on these five elements of the Work Safety Scale (WSS) on compliance safety behaviour found that employees who received their safety training during their pre-employment phase had a safer work environment than those who did not receive any safety orientation (Hayes et al, 1998). As per argued by Ali, Abdullah & Subramaniam (2009), employees make decisions based on safety concerns, however because these decisions are made by employees rather than management, they are not followed by the entire organisation. As the management does not enforce the safety code of laws and regulations, the influence on the over employees is relatively low. Additionally, their findings imply that safety training may not be helpful in reducing occupational accidents and injuries. (Ali et al., 2009)

5.3.6 To determine the relationship between job safety and safety performance

Based on the finding, showed that there is negative relationship between job safety and safety performance. The job itself does not guarantee the safety performance in plantation industry. Government should enforce the laws (i.e. OSH department) for the companies to comply in order to achieve the safety performance. According to Domino Theory, Vincely argues that the management system permits the factors to remain unchecked and uncontrolled, resulting in an incident, while the new model characterises unsafe acts and conditions as symptoms of root causes that arose from domino theory. In addition, insufficient work, normal or excessive wear and tear, low-quality equipment, and poor design or maintenance are examples of these issues that can cause an accident happen. According to Ferrell's Human Factor Model, overburden, incompatibility, and

inappropriate activity can all result in human error, which can lead to an accident. According to previous studies, between 5% and 15% of accidents are caused by intrinsic occupational hazards, while 85 percent to 95 percent are caused by what employers do or fail to do (Encarta, 1999; Darby et al., 2005). It was also reported that there is a strong link between safety and production, as well as cost and suffering (Williams, 1984; Duignan, 2003; Fayad et al., 2003; Inegbenebor and Olalekan, 2002). For most companies, the case for improved safety performance may be made on financial, legal, and moral reasons. However, the process by which the business goals are transformed into a programme that will accomplish the targeted safety performance is more significant than the case for improvement. An established and strong safety management system (Health and Safety Executive, 1997; Smith et al., 1978), which offers the means for managing and monitoring performance, is widely recognised as the foundation for acceptable safety performance. According to the Chemical Industries Association's responsible care programme (Chemical Industries Association, 1998), over 80% of organisations reported having a certified or formal safety management system in place in 1997.

As a result, if these were the only criteria for obtaining accepted safety performance, these and many other companies would have already met their goals. However, performance in any management role is dependent not just on management policies and procedures, but also on the development of effective operational practises that are relevant to the working environment and are also regarded to be appropriate by the workforce that implements them. Employers must audit and assess their management systems and optional practises to identify current strengths and deficiencies in order to maintain good

performance. Only then can actions to identify and mitigate sources of significant residual risk in the workplace be implemented.

5.3.7 To determine the relationship between co-worker safety and safety performance

Based on the finding, showed that there is positive relationship between co-worker safety and safety performance. In plantation industry, coworker exchanges have an impact on work attitudes. Higher variety in coworker exchange connections was found to have a detrimental impact on organisational commitment and job satisfaction. On the other hand, it was unrelated to relationship quality diversification. According to Heinrich's Axioms of Industrial Safety, an accident can occur only at the result of an unsafe act by a person or a physical or mechanical hazard. Heinrich's Domino Theory also supported that negative character traits that may lead people to behave in an unsafe manner can be inherited (ancestry) or acquired as a result of the social environment. Sherony and Green (2002) investigated the connections between leadership-member exchanges (LMXs) and coworker interactions (CWX), only 67 of the 110 respondents to this study returned surveys that could be used. The survey's five components make up the measures. The study's first discovery was that different sorts of exchanges existed, such as leadership-member interactions and coworker exchanges, but that these might impact each other. To be more explicit, when both had high-quality of LMX relationships with their supervisor or vice versa, they had a high-quality CWX relationship with each other. According to what we see here, leaders are responsible for enhancing positive coworker relationships because they can affect organisational commitment and also improve team development, group functioning, and cohesiveness. However, if he fails, this can lead to subgroup polarity,

which can lead to problems managing coworker tension and reduce organisational commitment and safety performance.

5.3.8 To determine the relationship between supervisor safety and safety performance

Based on the finding, showed that there is positive relationship between supervisor safety and safety performance. Supervisors play an increasingly important role in delegating job tasks, managing subordinate performance, and juggling competing demands for productivity, quality, and safety in plantation companies. Supervisor are also seen as having a key role in communications between management and hourly employees (Therkelsen & Fiebich, 2003).

Supervisors are becoming increasingly vital in the functioning of manufacturing operations, owing to their leadership position. While supervisors' relationships and communication with their subordinates are recognised to have an impact on their conduct, nothing is known about how these two characteristics affect subordinates' safety (Michael, Guo, Wiedenbeck, & Ray, 2006). The previous study looked at how much each aspect influences the safety of blue-collar production workers. Respondents in the study were production personnel from five Pennsylvania wood firms who completed a survey during their shift. A total of 598 employees contributed information on leader-member exchange (LMX), safety communication, and safety-related occurrences. The producers' human resources database also yielded archival information on OSHA recordables. According to the findings, the influence of LMX on predicting safety-related occurrences was stronger than that of safety communication. OSHA recordables have no meaningful relationship

with LMX or safety communication. The findings of the study highlight the relevance of production supervisors and highlight the potential role of leader-member exchange in improving workplace safety. To assist prevent workplace injuries, firms should create healthy social exchange between employees and supervisors, as well as improve supervisors' leadership characteristics especially in plantation industry.

A study on the effects of leadership characteristics, safety climate, and assigned priorities on minor injuries in work groups was undertaken in 2002 (Zohar, 2002). The goal of this study was to find the links between safety climate and leadership, as well as the consequences of supervisory practises as a source of safety climate and safety priority by higher superiors, all of which influence supervisory safety practise in the free leadership style. A total of 411 production workers from a metal processing factory took part in this investigation. During work hours, each of them was given a series of safety-climate and leadership questionnaires. The five aspects of the questionnaire were group-level safety climate, leadership, assigned safety priority, risk level, and statement of experienced injuries. According to Zohar, the group-level safety atmosphere consists of ten items rated on a five-point scale ranging from "completely agree" to "completely disagree" (2000). This finding demonstrated that injury rate in organisational subunits is predicted by transformational and constructive (contingent-reward) leadership, which mediates the impacts of the climate preventative actions (PA) subscale. The leadership-climate link is tempered by higher superiors' safety priorities, which vary depending on leadership dimension.

Luria, Zohar, and Erev (2008) conducted research on employee visibility to supervisors in order to determine the safety-related interactions and behaviours of employees. The goal of this study was to see how visibility affected supervisory interventions. In five plants, 955 line workers and 57 managers were polled. The study's first tool was a one-page questionnaire based on Zohar et al. (2003) work activities and supervisory exchange to assess the safety of supervisory contacts. This questionnaire includes a description of work-related activities over the last two hours, an open-ended question on verbal/nonverbal interactions with the supervisor over that time, a checklist of subject exchanges, and a single-sentence quotation for verbal encounters. The poll also included a measure of worker safety behaviour, which was observed by trained observers on a random basis. The survey findings identified an important moderator of supervisory safety interventions, recommending that ongoing dialogues between leaders and members have a substantial impact on leadership as a factor in improving safety performance. The impact of leaders' interactions on subordinates' safety atmosphere and behaviour is similar to that of their safety orientation.

5.3.9 To determine the relationship between management safety and safety performance

Based on the finding, the result showed that there is negative relationship between management safety and safety performance. In plantation industry, there are no proper administrative policies, practices and attitudes to follow. In addition, injuries are low on the administrators and workers skilled or highly experience in working. Management practices are aimed to prevent occupational accident at work, which is an approach to control the workplace accident (Cabrera, Feraud, & D'laz, 2007). Idoro (2004) completed

a study to determine the extent to which Nigerian contractors make efforts to maintain a healthy and safe working environment. The goals are to figure out how much effort contractors put into health and safety management and how that relates to health and safety performance. The survey was conducted with a sample of 40 contractors chosen by stratified random sampling from the contractors registered with the Nigerian Federation of Construction Industry. Six health and safety management factors and seven health and safety performance variables were chosen for the study. The health and safety management variables are respondents' assessments of the performance of structures for managing health and safety in head and site offices, accident, injury, accident per worker, injury per worker, and injury per accident rates, while the health and safety performance variables are respondents' assessment of the performance of structures for managing health and safety in head and site offices, provision of PPE, and health and safety incentives."

The information was gathered through structured questionnaires and analysed using the mean and Spearman correlation test. Contractors' efforts on structures for managing health and safety on site are the best predictors of health and safety performance, although their level is low, according to the findings. Contractor efforts in providing PPE and complying with health and safety standards are strong, however these efforts do not correspond with health and safety performance. Contractor efforts in head office structures for managing health and safety and providing health and safety incentives are poor, and they have no link with health and safety performance. These findings are interpreted by the study as indicating that Nigerian contractors' efforts to create a healthy and safe working environment have yet to bear fruit. As solutions for increasing safety in the Nigerian construction industry, it advises enhanced emphasis on local health and safety rules,

frameworks for administering health and safety in both head and site offices, and the supply of health and safety incentives.

Another study was done to evaluate the effects of management and organisation on safety (Dejoy, Gershon & Schaffer, 2004). Two studies on the safety climate were done in two separate fields. This was the first study to look into the function of environmental and contextual factors in the compliance process. There were 1,716 HCWs who responded to this poll, with nurses being the largest occupational group. They were given a questionnaire using a 4- and 5-point Likert scale rating system ranging from "strong agree" to "strongly disagree." The study found that health care workers (HCWs) with more positive views toward HIV patients had greater general compliance because they had reduced risk-taking tendencies and were well knowledgeable about HIV transmission mechanisms in healthcare. Aside from that, two enabling characteristics were shown to be strongly associated to compliance with personal safety equipment (PPE), namely, convenient availability of PPE and having fewer job hindrances.

To summarise the findings of this study, the PRECEDE Model provides a valuable framework or instrument for analysing individual and environmental/organizational aspects related to UP compliance among health care workers (HCWs). The second study was conducted in the retail industry with the goal of determining the components of safety climate and determining the extent to which safety climate acts as a mediator between various work scenario elements and safety-related outcomes. A survey of 2,208 employees from 21 retail locations of a prominent retailer in the southeast United States was conducted. To conceive an organization's climate of safety, organisational support,

coworker support, communication, involvement with supervisors, and participation with coworkers, five multi-item measures have been incorporated.

The tests looked at general worker perceptions in the workplace, but not explicitly on workplace safety. Store walkthroughs and exposure to hazards such as high heat, noise, and inadequate lighting were used to assess environmental conditions. Safety policies and programmes are evaluated in terms of safety training, danger communication, and personal protective equipment. To research safety climate, a seven-item version of the NIOSH Safety Climate Scale was used, which was a combination of DeJoy et al. (1995). As a result, the perception of workplace safety is influenced by environmental factors, safety policies and programmes, organisational support, and the safety atmosphere.

The integration of other standard programming such as environmental control and safety policies and programmes was found to be important in terms of safety related results. Both studies imply that organisational and management elements play a key role in achieving effective safety performance in practise. If the compliance usage of PPE is necessary and required, it must be made available. The 50-item Work Safety Scale (WSS) was used to assess employees' perceptions of workplace safety as part of a larger study on Perceived Organizational Support (POS), which was also measured for the first time with Eisen, Fasolo, and LaMastro's (1990) survey, and job satisfaction was measured with Porter and Lawler's one-item global measure (Gyekye & Salminen, 2007 a) The goal of this research is to determine the association between job satisfaction, worker compliance with safety management regulations, and the incidence of accidents.

Workplace safety, coworker safety, supervisor safety, management safety practises, and safety programmes were all included as independent variables. Job satisfaction and adherence to safe work standards, on the other hand, were dependent factors. Regression and t test analyses were used to examine the data. According to the findings, employees with high ratings of perceived organisational support (POS) were also enthusiastic about the safe climate. Workers will believe the company values their safety, which will influence their adherence to safety procedures. Ali et al. (2009) has conducted research to see what level of management practises in safety culture are effective in reducing workplace injuries. On a scale of 1 (not severe) to 24, 12 physicians had responded to rank injuries (extremely severe). Days off from work, permanent or long-term inability to execute job tasks, medical expenses, and life-threatening injury conditions were all considerations to be considered in the ranking instructions.

Mclver et al. (1981) used Thurstone's Discriminate Model to rank injury severity data, which was then translated into an interval scale. Following that, these rating scales were utilised to weight overall injury data provided by study participants. Through a questionnaire, companies participating in the study were asked to provide injury data for the previous three years as well as details on six management strategies. The management procedures were assessed using 18 items from a comparable survey conducted in US institutions by Vredenburg (2002). This diagnostic tool included a five-point scale ranging from 1 (no extent) to 5 (very severe) (A great extent) Each management practise is divided into three subscales. The findings corroborated the regression results, indicating that regular feedback on safety can lower injury rates.

5.3.10 To determine the relationship between satisfaction of safety programme and safety performance

Based on the finding, showed that there is positive relationship between satisfaction of safety programme and safety performance. According to Petersen's Accidents/ Incident Model, lack of training and even bad policy can cause a system failure, which doesn't prevent an accident from happening due to a human error. The ability to make accidents more predictable is made possible by the safety training, which is highly helpful. In plantations, the two groups of people—those who are injured and those who are not—may be identified as dangers and hazardous behaviours, and the repercussions can be understood. An organisation should create a systematic, all-encompassing safety programme and health training programme, especially for new employees, in order to improve the quality of safety and health for all employees in the plantation. to increase knowledge of these risks, and it will aid in orienting new hires to safety and health quality standards. Training enhances the ability to address safety issues by reducing and retaining hazards (Roughton, 1993). Employee education and workplace safety are influenced by the level of risk that is assumed, and caution and warnings are crucial in preventing exposure to those dangers (Young, Brelsford & Wogalter, 1990). As discussed by Vredenburg and Cohen (1995) discovered that the degree of perceived danger increased adherence to instructions and warnings; as a result, it is crucial that all employees are properly trained to recognise and respond to the risks connected with their employment (Vredenburg & Cohen 1995). The organisation can define and attain goals, innovate and change, and enhance technical and professional abilities with the aid of training programmes. The organisation can prevent accidents and injuries by training its employees to follow safety rules and procedures, while also identifying training needs, creating changes to work

procedures, and revising work objectives to make the workplace safer (Cabrera et al., 2007).

5.3.11 To determine the relationship between safety behavior and compliance with safety work

Based on the finding, showed that there is positive relationship between safety behavior and compliance with safety work. Safety behaviour is critical for reducing workplace injuries and indirectly affecting event outcomes before injuries or accidents occur (Johnson, 2003). Glendon and Litherland (2001) conducted a study that used observation behavioural sampling of critical behaviour checklist to assess safety performance. Thus, trained observers randomly sample employee behaviour to determine the proportion of risky working behaviours such as non-compliance with manual handling and the use of personal protective equipment (PPE). Safety compliance is graded from good to poor, with good safety compliance denoting compliance with safety regulations and poor safety compliance denoting noncompliance with safety criteria. Frederick (1982), as mentioned in Abang Abdullah et al., (2005), proposed the ABC model of behaviour, which said that behaviour is influenced by two distinct factors: activators and repercussions. The first is that activators tell individuals what they should do, such as highway signs instructing drivers to obey speed limits, and the second is that activators urge drivers to take shortcuts, such as witnessing others break the posted speed limit. When confronted with these conflicting activators, the driver will engage in particular behaviours that result in the desired outcomes. As a result, enforcing safety behaviour variables is critical in encouraging safety compliance before negative consequences emerge.

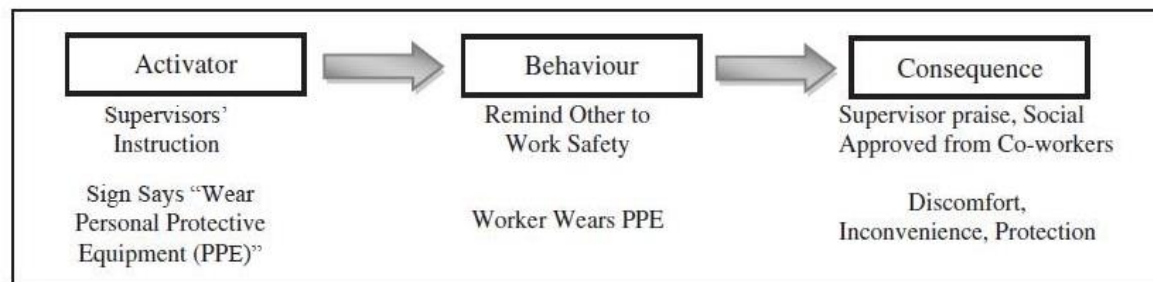


Figure 5.1: Behaviour Change Intervention

According to occupational literature, noncompliance with safety rules is the key contributory factor in incident and accident incidence across a wide range of industries. OSHA 1994, for example, is a demonstration of the government's dedication to regulatory compliance and is being recognised as a critical defence against dangers in the building industry in Malaysia. Compliance with safety regulations will aid in the efficient and safe completion of the work. One of the most promising lines of research into the behavioural antecedents of accidents is the link between these procedural instructions governing work and how labour is done (Che Hassan et al., 2007). As a result, much might be improved with enough space for improvement in terms of behavioural safety compliance by both employers and employees making a concerted effort to comply with safety regulations.

5.3.12 To determine the relationship between safety behavior and using PPE as prescribed

Based on the finding, showed that there is positive relationship between safety behavior and using PPE as prescribed. The employer must also supervise employees on a regular basis to ensure that they obey the regulations for the use of safety equipment and that their safety is always a top priority when working at plantation sites. According to Frank Harris and Ronald McCaffer (1982), employers must provide workers with protective personal equipment (PPE), particularly for those who work on construction sites,

to lessen the risk of mortality. In a study of the construction industry in the United Kingdom, Duff et al., 1993 discovered percentages of noncompliance with specific categories ranging from 22-38 percent noncompliance in housekeeping, 12-43 percent noncompliance in scaffolding, 20-26 percent noncompliance in access-to-heights, and 21-65 percent noncompliance in using PPE in six construction sites. In a research conducted in the United Kingdom, Robertson et al. (1999) discovered that non-compliance was roughly 19 percent for housekeeping, 16 percent for scaffolding, 15 percent for access to height, and 21 percent for PPE. Lingard et al. (1997) found that in Hong Kong, non-compliance with PPE ranged from 30-49 percent for cleaning, 30-66 percent for bamboo scaffolding, 50-74 percent for access to heights, and 49-69 percent for housekeeping. The element of Personal Protective Equipment (PPE), for example, has a significant percentage of non-compliance especially in plantation industry.

5.3.13 To determine the relationship between safety behavior and increased awareness of hazards

Based on the finding, showed that there is positive relationship between safety behavior and increased awareness of hazards. The Occupational Safety and Health Act (OSHA) 1994 is an example of safety guidelines and regulations that provide a legislative framework for promoting and encouraging high standards of safety and health at work. The act's primary goal is to raise safety and health awareness and instil a safety culture among all Malaysian workers (Ismail, 2010). Furthermore, an employee's negative opinion of their employer's compliance with safety rules can lead to bad behaviour and poor safety performance, both of which have serious ramifications for the individual and the company where they work (Jamal Khan, 2003). According to a research conducted by McDonald

(2003) on 18 construction sites in Ireland, the level of safety compliance with safety criteria was highly diverse, and most sites could make some improvement. In plantations, if workers behave to compliance with safety rules, that will increase the awareness of hazards in workplace and could avoid the accident happen.

5.3.14 To determine the relationship between safety behavior and executing emergency procedures

Based on the finding, showed that there is positive relationship between safety behavior and executing emergency procedures. The occupational, safety and health (safety and health officer) regulation 1997 explicitly states that the employer of the following class or description of industries must employ a suitable, knowledge, experience, and skills safety and health officer for the specific execution of the specified work. The safety and health officer has broad authority to alter or improve the company's safety performance. According to a study conducted by McDonald (2003) on construction sites, all sites should have safety and health offices, as the position of the safety and health officer can impact both employee behaviour and compliance with safety regulations. He went on to say that the existence of a safety and health officer correlates with better safety management performance, such as responding to audits and reporting hazards, ensuring better safety compliance on site in the future. As a result, the job of the safety and health officer should be strengthened, and their duty as part of the safety management system should be reinforced.

5.3.15 To examine the effect of Safety Behavior in the relationship between job safety and safety performance

The result of this test showed that safety behavior fully mediated the relationship between job safety and safety performance. With the present of safety behaviour as a mediator, the job safety in the plantation can effect the safety performance. A study was conducted in 1980 to characterise a specific sort of organisational environment and to investigate the effects (Zohar, 1980). This study consists of a series of questionnaires based on the following dimensions: (a) perceived management's attitude toward safety, (b) perceived effects of safe conduct on promotion, (c) perceived effects of safe conduct on social status, (d) perceived organisational status of safety officer, (e) perceived importance and effectiveness of safety training, (I) perceived risk level at work, and (g) perceived effectiveness of enforcement versus guidance in promoting safety. A 40-item questionnaire was created utilising a five-likert scale based on the dimensions. The scale ranges from 1 (strongly disagree) to 5 (strongly agree) (highly agree). The questionnaire was then given to workers from four different production categories who were chosen at random from five different factories. Metal fabrication, food processing, chemical industry, and textile industry were the four categories. From the literature on organisational climate and safety procedures, two hypotheses were developed. The results that supported the first hypothesis showed that chemical facilities have the safest climate scores, followed by metal processing, textile industries, and food processing plants. The most influential component in influencing safety climate levels was perceived relevance of safety to occupational behaviour. The perceived management attitude toward safety was the second most influential factor. The second hypothesis can be supported by these two extremely

influential dimensions. Workers have their own perspectives about safety features of their workplace, as a conclusion to fit in this subtopic of job safety.

A study on cause attribution of Ghanaian industrial workers for accident occurrences was undertaken on 320 respondents (Gyekye & Salminen, 2004) with the cooperation of their supervisors a few years after the establishment of WSS. The study included two methodologies: interviews and questionnaire distribution. To protect respondents' privacy, each interview was performed individually and lasted 15 to 20 minutes, depending on the environment and educational background of the respondents. The questionnaire contained 30-items on respondents' attributions for accident cause by dispositional features of accident victims (internal factors) or situational and environmental circumstances on a 5-point likert scale ranging from 1 (very little) to 5 (very much) (external). External factors had an alpha of 0.89, whereas internal factors had an alpha of 0.79. ANOVA, t-test value, and item-by-item comparison were the three types of statistical analyses used. To confirm differences in statistical significance on the external and internal variables scale, a one-way ANOVA was utilised. On the internal and external causal factors scale, the T-test value was used to see if there were any statistically significant variations between the victims' and Supervisors' causality attitudes. On the external and internal causal scales, the final component of the measures involved item-by-item comparisons between victims and supervisors' cause attributions. According to the ANOVA results, common workers attributed accident aetiology to external sources more than to internal factors. In the comparison analysis, it was observed that worker and supervisor attributions appeared to be in the middle. Furthermore, compared to their supervisors, the victim's (worker) responsibilities for accident occurrences were lower. The

item-by-item comparison resulted in a two-factor causal scale. The findings of the study show that workplace accidents are caused by human error and environmental factors, with human factors serving as the primary antecedent to the accident process.

In the next study, the content and qualities of a work, as well as occupational safety, were compared at various levels of automation (Mattila & Kivinitny, 1993). The research was carried out at two machine shops. The first company, A, makes process automation equipment, whereas the second, B, makes crushing machines. The Safety Diagnosis Questionnaire (SDQ) is a tool for describing demands for safety behaviour in a systematic and accurate manner. It has 256 questions divided into seven sections: organisation, work environment, dangers and exposures, information processing, accomplishing work tasks, cooperation and communication, and working in dangerous situations. The rating item was created using a five-point likert scale and observations. Other details on job safety aspects were discovered through job safety analysis. This knowledge is essential in identifying any job-related hazards in various work circumstances. The findings revealed that safety equipment were the most essential safety criteria, with work environment features coming in second. Presentation of information, informing, communication, cooperation, conflicts, and disturbances were the other essential safety characteristics listed. Other findings revealed that better working conditions boost the ability to compete for highly trained young professionals with other industries. Accidents investigated in this study demonstrated the proof problem that the operator was unable to forecast the machine's current state. The study's most important finding is that adopting a modern-oriented machine rather than manually controlled machinery improved job safety. Another

significant finding of this study was that safety engineering knowledge, as well as proper handling of the safety system, becomes increasingly vital.

A local study on Occupational Safety and Health Management System (OSHMS) guideline compliance among medical laboratories in Klang Valley was undertaken in terms of job technical elements (Anuar et al., 2008). The goal of this study was to determine how well medical laboratories in Malaysia followed national occupational safety and health management system requirements. What's fascinating about this study is that it goes into great detail about occupational safety and health metrics in work management areas like policy, organising, planning, and implementation, as well as assessment and improvement action. It was conducted on 17 governmental medical laboratories and 17 private medical laboratories in the Klang Valley, with seven executives, 52 managers, and 53 supervisors chosen as samples. According to OSHMS-ILO 2001, each sample was given a self-administered OSHMS checklist based on MS 1722:2003. This survey has five sections, 16 measurements, and 225 indicators to assess the level of compliance in medical laboratories with national OSHMS recommendations. Items were categorised with "compliance" and "non compliance" for each element in the OSHMS checklist. Respondents were asked open-ended questions about laboratory staff compliance with each factor. The internal reliability of OSHMS compliance received a score of 0.9943. The significant value mean score of commercial and public medical laboratories was found to be 0.05. The significant difference score was 0.01 when comparing medical laboratories that were accredited and non-certified with MS ISO 15189. Furthermore, there was no discernible difference between laboratories that were ISO 9000 certified and those that were not. In comparison to non-accredited medical laboratories, the five OSHMS elements of policy, organising,

planning, and implementation, evaluation, and action for improvement received good marks. According to the findings, obtaining accredited or qualified under either of the ISO programmes can increase personal awareness among laboratory staff.

5.3.16 To examine the effect of Safety Behavior in the relationship between co-worker safety and safety performance

The results illustrated that safety behavior was found to have no mediating effect on the relationship between co-worker safety and safety performance. The majority of definitions of organisational commitment discuss the amount to which an employee identifies with and participates in the organisation (Curry et al., 1986). Employees' work-related behaviour has been identified as a crucial aspect in understanding and explaining organisational commitment (Bakshi et al., 2009). In a study of manufacturing employees producing commercial heating and air-conditioning systems, Hofmann et al. (1999) discovered that the organization's support and commitment to employee safety, as well as the quality of exchange relationships between supervisors and subordinates, resulted in safer behaviour and fewer accidents.

Many construction mishaps are discovered to be the result of non-compliance with safety regulations. To have a safe and productive workplace, effective communication is critical. Leaders communicate their vision and values through engagement and communication (Ismail, 2007), and good communication leads to shared goals and strategies for achieving them at all levels. In a study of line employees and supervisors working in heavy-duty equipment maintenance, Zohar (2002) discovered that enhanced communication channels led in fewer micro accidents and more use of personal computers.

Personal Protection Equipment (PPE). There are three methods for communicating:

- (i) Employers can communicate the importance of safety and health through visible behaviour. Employees quickly learn what matters to their bosses and adapt their conduct accordingly. As a result, an employer's poor behaviour can jeopardise the organization's safety and health culture.
- (ii) Written communication of health and safety policy statements, statements about roles and duties in health and safety, performance requirements, and risk assessment findings.
- (iii) Employee-employer face-to-face dialogues allow employees to make a personal contribution and help them feel involved in the organization's safety and health. Employees should be permitted to speak with their boss during a safety check.

5.3.17 To examine the effect of Safety Behavior in the relationship between supervisor safety and safety performance

The results illustrated that safety behavior was found to have no mediating effect on the relationship between supervisor safety and safety performance. Senior management leadership displaying to managers plays a critical role in determining management behaviour, which in turn influences employee behaviour (Cooper, 2010). Other safety management objectives are highly dependent on management's quality and consistency of leadership, which serves as a role model for safety exercises (Ismail, 2007). Leadership allows the employer to energise the employees in order to take OSH to the next level, and leadership is all about people, not things. Leadership is the ability to turn good intentions into constructive action, transforming a group of people into a team (Warmick, 2006). In a study of blue collar employees in wood product manufacturing plants, Michael, Guo, Wiedenbeck, and Ray (2006) discovered that good leadership enhanced employee safety

behaviour. Supervisors have an important role in improving safety performance while avoiding safety behaviour.

5.3.18 To examine the effect of Safety Behavior in the relationship between management safety and safety performance

The result of this test showed that safety behavior fully mediated the relationship between management safety and safety performance. Many scholars in the occupational literature believe that management commitment is the most important component. By demonstrating that the organisation is serious about safety, top management should actively guide the business and its employees toward achieving the organization's safety goals. This remark is supported by Jaselski et al., (1996), who reported that top management commitment and support would greatly improve safety performance. Employers could also demonstrate their commitment by demonstrating strict adherence to safety rules and ensuring that everyone in the organisation understands their safety and health obligations (Fernando et al., 2008). He summarised manager commitment factors in the Petrochemical Processing Area, including properly constituted joint safety and health committees at the site and departmental level, managers' accountability to the joint safety and health committee, engagement of safety and health representatives with health and safety practitioners, and dialogue among local area and line managers within the establishment of safety and health representatives (Walters & Nicholas, 2006). As a result, management commitment to workplace safety and health might influence employee behaviour (Thye, 2006). Management safety and safety performance are mediated by safety behaviour. Petersen' Accident/ Incident Theory of Accident Causation has mentioned that a variety of pressures such as deadlines, peer pressure, and budget factors

can lead to unsafe behaviour. The systems failure component is an important contribution of Petersen's theory. First, it shows the potential for a causal relationship between management decisions or management behaviour and safety. Second, it establishes management's role in accident prevention as well as the broader concepts of safety and health in the workplace.

5.3.19 To examine the effect of Safety Behavior in the relationship between satisfaction of safety programmes and safety performance

The results illustrated that safety behavior was found to have no mediating effect on the relationship between satisfaction of safety programmes and safety performance. Effective safety training is essential for informing employees about the risks of accidents, how to avoid them, and potential hazards in their jobs. As a result, training and education programmes are vital for increasing safety awareness (Ghani et al., 2010) and changing employee behaviour in the construction industry (Wong et al., 2000). According to a research conducted by McDonald (2003) at 18 construction sites in Ireland, safety training is conducted on an ad hoc basis in order to "cover themselves" and protect the corporation if something goes wrong, with little expectation of influencing staff knowledge and behaviour. As a result, it becomes evident that the majority of employees must learn about the hazards of their jobs through their work experience. Inadequate safety training among personnel is a common cause of construction site accidents because they lack the knowledge, education, and skills to spot possible hazards on the job (Toole, 2002). In a 1980 study of vehicle maintenance staff, Komaki, Heinzman, and Wyld discovered a robust correlation between safety instruction and improved safety behaviour. Hopton (1969) claims that worker and operator training will not only prevent accidents, but will also save

money and lives. Satisfaction with safety programmes will have a direct impact on safety performance/acquiring sufficient knowledge, skill, and ability (KSA) from training programmes to achieve safety performance requirements.

5.3.20 To identify the dominant factors among the five safety facets that contributes the most on the safety behavior

Management safety would be the dominant factor among the five safety facets that contributes the most on the safety behavior (Beta=0.775). Employer or top management participation, such as relationships with employees, safety discussions, and safety advice, is linked to improving safety motivation and encouraging employees' safety behaviour (Che Hassan, 2007). According to Evelyn (2005), there are two types of motivation: positive reinforcement, which involves giving employees monetary rewards, bonuses, and job promotions, and negative reinforcement, which involves criticising, punishing, and threatening employees in order to motivate them to perform their jobs safely. Many safety practitioners, on the other hand, believe that reinforcing positive motivation is a better way to keep employees' good safety habits. Improvements in safety will only be realised if incentive programmes are implemented to encourage employees to change their habits (Vrenderburgh, 2002). Higher levels of employee motivation, dedication, and job satisfaction will benefit organisations that build and maintain effective employer-employee relationships, which will have a favourable impact on staff retention and performance (Leung et al., 2004).

Management must demonstrate that they have taken active steps to implement a sound OSH management system, which includes proper risk assessments, reporting

systems, a safety plan, clear delegation of responsibilities, adequate resources, and ensuring that all relevant information is disseminated to workers and other people who may be exposed to hazards. Muhammad (Muhammad, 2006). The documenting of risk assessments appears to play an important role in ongoing management actions, and their main purpose appears to be to satisfy statutory requirements related to site activities. Varied sites have different tasks and functions for their safety management systems, such as safety plans that are unique to potential hazards that may arise during site activities. Some or all management levels at several overseas construction sites have completed CIF/CEF training courses, which appeared to improve safety compliance. It is suggested that management take a special training course, focusing on behavioural aspects, to provide them with a foundation for managing the uncertainty of human behaviour, as well as a training course in safety and health management systems to ensure that they can effectively supervise employees toward behavioural safety compliance.

5.3.21 To identify the dominant factors among five safety facets that contributes the most on the safety performance

Co-worker safety would be the dominant factor among five safety facets that contribute the most on the safety performance. In plantation industry, teamwork would be the best practice of task performance in the work place. This is possibly because a team would represent a task to be completed by individuals in a required time and standards of outcomes. Each and every one in the team had their own responsibilities to oblige and sometimes, back-ups for other team member are necessity for uncertainties such as absences or emergencies. The Maslow's theory had supported the form of teamwork through his pyramid of needs that indicated esteem needs for individual to gain respects

from others (Berry, 1998). In the description of work cohorts group of Generation X and Nexters, bonding relationships with co-workers are one of the most essential characteristics to describe most of the respondents in this plantation industry.

Therefore, the best practice could be suggested that staff should be working in pairs or teamwork in the plantation areas as there might be a mutual understanding among peers to comply on the safest work practice when performing the assigned tasks. Communications among team members are essential thing to be look after because information exchanges on each other would be necessary so that many ideas and knowledge can be passing through. Other than communications, close proximity also played a part in creating a good bonding as workers would tend to watch over among themselves and caring for other's safety (Drafke & Kossen, 1998).

5.4 Implications

5.4.1 Theoretical Implications

The results of this study have important implications to theory, methodology, and practice. These findings are in line with the generalizability of the theory across different settings. It is also critical to consider how the methodological approach as well as Sarawak plantation industry and other part of the world are improved their employee's level of occupational safety.

The purpose of this study was to see how the Work Safety Scale (WSS) affected safety performance in the Sarawak plantation industry. Similar studies on safety compliance have been conducted in a variety of industries, including telecommunications,

hospitality, construction, and even government agencies. The more study done to demonstrate compliance safety performance, the more accurate and reliable the results will be. As a result, this study has been expanded to include the plantation business in order to assess the dependability of the five facets, which will improve the study's academic stability. Furthermore, this study was done in Sarawak plantations, providing a fresh opportunity for eastern researchers to demonstrate compliance with local safety performance. Apart from that, because it was conducted in a high-risk industry, this study would be worthwhile and valuable to the academic community.

5.4.2 Empirical Implications

The Work Safety Scale (WSS) was a 50-item instrument that looked at employees' work safety perceptions by looking at five content domains: (a) job safety, (b) co-worker safety, (c) supervisor safety, (d) management safety practices and (e) satisfaction with the safety program as well as an 11-item compliance of safety behaviour tool (Hayes et al, 1998). The major goal of this study was to create a useful instrument with three functions: (a) suitable psychometric integrity-reliability and validity; (b) comprehensive assessment of critical characteristics of workplace safety perception; and (c) easy to complete. The researcher conducted three trials with distinct operations in order to validate the use of WSS. The best predictors of accidents, according to the stepwise regression analysis, were job safety, co-worker safety, management safety, and satisfaction with the safety programme.

The purpose of the second study was to cross-validate the results of the first. The WSS was then rationally connected with job-related attitudes as well as health-related

factors in this study, which included measures of job satisfaction, job stress, and psychological, physical, and sleep complaints. WSS subscales were found to be linked to health-related measures of general health complaints, physical complaints, and sleep complaints when the relationship between them was measured. The best predictors of accidents were management safety and job safety, while the best predictors of compliance safety behaviour were supervisor safety and so-worker safety, according to stepwise regression analyses.

The third study used a sample of employees acquired via a more traditional manner of data collecting to provide additional confirmations of the WSS's internal consistency and validity. The WSS was given to the respondents together with additional materials such as questions about their work, self-reported accidents, and self-reported near-accidents. Management safety was found to be the best predictor of near accidents in hierarchical regression analysis, whereas management safety and so-worker safety were the top predictors of compliance safety behaviour. Finally, management safety procedures and supervisor safety subscale were among the best predictors of accidents, job satisfaction, and compliance with safety behaviour in all studies on this WSS subscale. However, various empirical ways to examine multiple attitudes within a specific restricted domain on safety performance can be supported by this five facets and compliancy description on workplace safety perceptions. All of the research can be compared to find a unique approach to determining workplace safety performance.

Dov Zohar, a well-known safety researcher, published a study in 2002 called *The Effects of Leadership Dimensions, Safety Climate, and Assigned Priorities on Minor*

Injuries in Work Groups (Dov Zohar, 2002). The study's goal was to investigate the links between safety climate and leadership, two dimensions that are related to leader conduct but have different views. This research builds on two prior studies that looked at leadership and atmosphere as variables in workplace safety (Zohar, 2000; Hoffman et al., 1999). The results showed that a leadership dimension that involves group members' welfare from stronger relationships, as well as the promotion of supervisory safety procedures, has resulted in greater safety climates and safer conduct. Clarke (2006) investigated the impact of the workplace environment, job communication, and safety attitudes on accidents and dangerous conduct in a car manufacturing plant. The goal of this study, which began in 2006, was to look into the attitudes of workers, supervisors, and managers in a UK-based car manufacturing company toward risky behaviour and accidents. Due to its past successful use and wide variety of measures, a set of questionnaires originally prepared for the offshore oil sector (OSQ) by Flin et al. (1996) was employed among the 185 respondents with slight revisions to accommodate the study. The data show that factors such as safety climate have little bearing on plant accidents. Nonetheless, it was revealed that having an uncertain perspective of the workplace was linked to the likelihood of being involved in an accident. According to the data, perceptions of work pressure and work clarity are linked to accident involvement, but not to workers' attitudes toward safety.

A set of studies in 2007 looked at the empirical analysis of ethical climates and workplace safety habits (Parboteeah et al., 2007). This research involved 137 employees from five manufacturing plants in the Midwest of the United States of America. The study's goal was to see how different local ethical climates are associated to injuries caused by two forms of safety-enhancing behaviours: safety compliance and safety participation.

The first finding was that the egoist-local climate had no effect on safety motivation or injury rates. The second finding demonstrated that there were no links between benevolent-local climate and motivation to participate in or comply with safety-related activities. Positive connections between principled-local environment and safety-enhancing actions were found, but they were mediated by individual incentive to behave safely.

Individual differences are another issue that could influence safety performance. A study was conducted to uncover this issue in order to discover it (Henning et al. 2009). The study's major goal was to look at the links between safety attitudes and a number of individual variables that represent risk and control preferences and dispositions. One hundred and ninety engineering and occupational safety students from two universities were chosen as the sample. This study looked at five different categories of individual differences. According to John et al., the authors termed it The Big Five personality, which was assessed using the 44-items of The Big Inventory (1991). Risk propensity was assessed using Goldberg's (1999) nine-item scale from The International Item Pool, sensation-seeking was assessed using Zuckerman's (1979) 10-item thrill and adventure seeking subscale, both promotion and prevention regulatory focus were assessed using Wallace and Chen's (2006) six-items, fatalism in relation to accident prevention was assessed using Rundmo and Hale's (2003) seven-items, and (1987). Individual differences variables are important in each of the attitudes, according to the findings of this study, particularly overall safety attitudes and attitudes toward management's obligations, worker's responsibilities, and discipline. Agreeableness, prevention emphasis, and fatalism appear to have the most important role in predicting safety attitudes, and could be useful in job selection to reduce workplace accidents in the future. Furthermore, having personnel

that are prone to safety attitudes would result in a more positive company safety culture (Schneider, 1987).

The evolved Minnesota Safety Perception Survey, which includes: (a) management's demonstration of commitment to safety, (b) workforce education and knowledge, (c) supervisory effectiveness, and (d) employee involvement and commitment, is another measurement that can be used to survey perceptions on safety performance (Carder et al., 2003). The goal of this instrument was to increase safety performance. Furthermore, there are two additional data sources to ensure that this useful diagnostic tool is used to create measures to improve safety performance. Increases in recognition and management commitment were statistically significant, but improvements in education, knowledge, and off-the-job were not. This result verified the survey's use and suggested that it may be used as a diagnostic tool for safety improvement efforts. It was discovered through two distinct research that perceptions of safety climate may be distinguished from perceptions of knowledge and motivation, as well as self-reported safety compliance with participation (Neal et al., 2002). This study was a follow-up to the prior one, which focused on the same root cause in terms of safety climate. It proposes a research programme that would examine the causes and consequences of safety climate and behaviour. Individuals' work behaviours were used to represent the job performance components. Factors that affect behaviour through their effect on knowledge, skill, and motivation were portrayed as performance antecedents. One of several potential antecedents of safety behaviour has been proposed: the safety atmosphere. Leadership and conscientiousness are two examples of sub-dimensions. The antecedents of safety climate sub-dimensions can be split into two situations: internally and outside, to make this

framework understandable. The framework offered in this study also defined two key concepts related to safety performance: safety compliance and safety involvement. These research, on the other hand, indicated that knowledge and motivation influence the link between the two components. It indicates that a successful safety programme will have a significant impact on workers' safety climate by increasing their knowledge, ability, and motivation, resulting in desired safety behaviour.

5.4.3 Methodological Implications

There are several methodological limits to the current study's strength due to the following factors:

- (i) The respondents were asked to indicate their level of agreement with statements about safety performance and items for job safety, coworker safety, supervisor safety, management safety, and satisfaction with the safety programme using a 5-point Likert-type scale. According to Brown (1990), the usage of a Likert-type scale may lead to patterned response, which is a propensity for respondents to reply mechanically to statements or questions without paying attention to what the statement or question is intended to address. This issue stems from different people's interpretations of the numbers allocated to the Likert-type scale. Although the survey tries to define these numbers, it is hard to ensure that all participants have the same understanding of the score definitions.
- (ii) The study's design included qualitative approaches and analyses. It's worth noting that qualitative methodologies have limitations, particularly when it comes to turning people's emotions into figures (Abas, 1999). It is suggested that qualitative techniques

be used in future studies. When attempting to capture information relevant to the cognitive process, values, and belief systems in the Sarawak plantation industry, using both qualitative and quantitative methodologies can help to balance the weaknesses of one technique and vice versa.

- (iii) Data was collected solely through surveys and questionnaires. Due to the reasons outlined under Data Collection and Rate of Return, other methods such as observation and interviews were not used.

5.4.4 Practical Implications

The study of safety compliance is important not just in academia but also in business operations. In order to maximise production and profitability, it is important for every industry to observe and execute a safe working environment without fail. As a result, this research will be useful in determining the success of the company's safety implementation. The management could observe the floors and lack of enforcement to improve the quality of work and provide a safe working environment for the employees by undertaking more research on safety compliance. Aside from that, safety training should be held more frequently to raise awareness and guarantee that safety procedures are fully applied in the workplace. As a result, the management system has a significant impact on the recruitment and selection process. Candidates should be offered training and simulation on safety measures and emergency response in advance of the workshop. Indeed, there should be more programmes promoting workplace safety culture.

5.5 Limitation of the Study

Despite the fact that the findings of this study have contributed in various ways and have supported several hypothesised correlations between the understudied factors, it is not without limits. To begin with, the current study only looked at a few predictors of specific aspects of WSS and left out additional variables from the predicted model. The study's absence of several key predictor variables may limit our overall understanding of the elements that influence safety behaviour and performance. As a result, future research should look into elements other than WSS, such as incentives, staff involvement, safety commitment, employee awareness, safety motivation, employee competency, and other aspects that influence safety performance. Incorporating these critical characteristics into future studies could help researchers gain a better understanding of the effects of WSS on safety behaviour and performance in the plantation business.

Only employees working in the Sarawak plantation business responded to the poll, and their safety behaviour reflects the hazards and risks that come with working in a plantation. Because of the differences in hazards and risks, behaviour in different states or industries may differ. Construction workers, for example, may behave differently from plantation workers when it comes to safety. Because risk is calculated by multiplying the chance and severity of failure, construction workers have a larger risk of being hurt, permanently crippled, or dying than plantation workers (DOSH, 2018). As a result, the applicability of this results to other industries with similar risks may be limited.

5.6 Recommendation for Future Study

The purpose of this study is to look at the impact of the Work Safety Scale (WSS) on worker safety in the plantation business. For future study, further research may be conducted into the actual number of accidents and fatal cases in the business, as well as the effectiveness of safety policies and organisational implementation. This could improve the reliability of WSS applications.

Aside from that, future studies on safety can use accident rates or injury severity caused by industrial accidents as the dependent variable instead of conformity to safety performance. This could provide data and evidence on actual accident rates in various Malaysian businesses. In addition to the five independent variables mentioned, the study should look into how an individual's personality influences their safety performance. The study looked into how the community and surroundings influenced one's safety performance. As a result, studying personality as an independent variable would have been more complete.

5.7 Conclusions

Employee safety is paramount in any workplace, regardless of whether it is in the utilities, manufacturing, construction, hospitality, or plantation industries. The significance of workplace safety cannot be overstated. It is especially noticeable in the plantation business, where workers are constantly exposed to risk in their daily operations. Adapting safety measures assures the protection of not only the worker but also their dependents. As a result, a study was done to determine the impact of the Work Safety Scale (WSS) on safety performance among Sarawak plantation workers. Employee safety

performance is influenced by coworker safety, supervisor safety, and satisfaction with safety programmes held in the Sarawak plantation business, according to the study's findings. Only job and management safety, which is mediated by safety behaviour, contribute to overall safety performance. As a result, everyone should play their part in assessing safety and contributing to the continual improvement of a plantation's integrated safety management system.

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APPENDICES

Fakulti Sains Kognitif dan Pembangunan Manusia
Faculty of Cognitive Sciences and Human Development



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2 October 2018

To Whom It May Concern

Dear Sir/Madam

Permission to Conduct Research in the Fulfillment of Postgraduate Degree

With reference to the above matter, I would like to request permission for the following student from the Faculty of Cognitive Science and Human Development, Universiti Malaysia Sarawak, to conduct a survey and a series of interviews at the state ministries, departments, statutory agencies, local authorities, district and resident officers.

Student Name/ID : Wong Ling Nguong [14010105]
Telephone No. : 016 8920104
Program : PhD by Research, Human Resource Development
Research Title : Improving Safety Behaviour and Performance in Sarawak's
Plantation Industry.
Research Phases : Data Collection [Interviews, Discussions, Observation and
Document Analysis]
Supervisor : Prof Dr Rusli bin Ahmad
Email : arusli@unimas.my
Telephone No : 012 8729248

His research is purely for academic purpose and all information will be kept secure and treated as strictly confidential. The support and cooperation given by your organisation for the success of this research is highly appreciated.

Thank you.

Your sincerely

Assoc Prof Dr Zaiton binti Hassan
Post Graduate Coordinator [by Research]
Faculty of Cognitive Sciences and Human Development
Universiti Malaysia Sarawak



QUESTIONNAIRE SURVEY FORM

I am a Doctor of Philosophy candidate at the Faculty of Cognitive Sciences and Human Development, Universiti Malaysia Sarawak (UNIMAS) and the main objective of my study is to do a survey on Improving Safety Behaviour and Performance in Sarawak's plantation industry.

The questionnaire survey forms shall be used only to collect all the needed information and data for the study and not for the other purposes. All the collected data shall be kept as confidential and for the use of academic purpose only. Please do not hesitate to contact me at 14010105@siswa.unimas.my should you require any addition information or have questions in the course of completing the survey.

Thank you very much for your participation.

Warmest Regards,

Wong Ling Nguong
Candidate for Doctor of Philosophy
Faculty of Cognitive Sciences and Human Development
Universiti Malaysia Sarawak (UNIMAS)

PART 1: PERSONAL DETAILS

BAHAGIAN 1: BUTIR-BUTIR PERIBADI

Please do fill in or ticking the appropriate column:

Sila isi atau tanda di dalam kurungan yang disediakan:

1. Age/ *Umur* : _____ years/ *tahun*

2. Gender/ *Jantina* : (Male / Female)
(*Lelaki / Perempuan*)

3. Highest Educational / Academic Level: PhD ()
Tahap Kelulusan Akademik Tertinggi: Master ()
Degree ()
Diploma/STPM ()
SPM/ Below ()

4. Duration of services in this organization : _____years
Tempoh Perkhidmatan di dalam organisasi ini : _____*tahun*

PART II: WORK SAFETY SCALE (WSS)
BAHAGIAN II: SKALA KESELAMATAN KERJA

Please **circle** the number that indicated the degree to which you feel each item is descriptive about your current job in the organization.

Sila bulatkan nombor yang menunjukkan sejauh mana anda rasa setiap item adalah deskriptif mengenai pekerjaan anda sekarang dalam organisasi.

Strongly Disagree (Sangat Tidak Bersetuju)	Disagree (Tidak Bersetuju)	Not Sure (Tidak Pasti)	Agree (Setuju)	Strongly Agree (Sangat Bersetuju)
1	2	3	4	5

1. Job Safety/ Keselamatan Kerja

Think about your job you indicated above. Do you agree or disagree that each of the following words or phrases describes your job? Circle one answer for each statement using the scale at the top of the page. *Fikirkan tentang kerja anda ditunjukkan di atas. Adakah anda bersetuju atau tidak bersetuju bahawa setiap perkataan atau frasa yang berikut menerangkan kerja anda? Bulatkan satu jawapan untuk setiap penyata menggunakan skala di bahagian atas halaman.*

1.1 Dangerous/ <i>Bahaya</i>	1	2	3	4	5
1.2 Safe/ <i>Selamat</i>	1	2	3	4	5
1.3 Hazardous/ <i>Berbahaya</i>	1	2	3	4	5
1.4 Risky/ <i>Berisiko</i>	1	2	3	4	5
1.5 Unhealthy/ <i>Tidak Sihat</i>	1	2	3	4	5
1.6 Could get hurt easily/ <i>Boleh tercedera dengan mudah</i>	1	2	3	4	5
1.7 Unsafe/ <i>Tidak Selamat</i>	1	2	3	4	5
1.8 Fear for safety/ <i>Takut untuk keselamatan</i>	1	2	3	4	5
1.9 Chance of death/ <i>Boleh membawa maut</i>	1	2	3	4	5
1.10 Scary/ <i>Menakutkan</i>	1	2	3	4	5

Strongly Disagree (Sangat Tidak Bersetuju)	Disagree (Tidak Bersetuju)	Not Sure (Tidak Pasti)	Agree (Setuju)	Strongly Agree (Sangat Bersetuju)
1	2	3	4	5

2. Coworker Safety/ Keselamatan Rakan Sekerja

Think about the people you work with. Do you agree or disagree that each of the following words or phrases describes these people? Circle one answer for each statement using the scale at the top of the page. *Fikirkan tentang rakan sekerja anda. Adakah anda bersetuju atau tidak bersetuju bahawa setiap perkataan atau frasa yang berikut menerangkan rakan sekerja anda? Bulatkan satu jawapan untuk setiap penyata menggunakan skala di bahagian atas halaman.*

2.1 Ignore safety rules/ Mengabaikan peraturan keselamatan	1	2	3	4	5
2.2 Don't care about other's safety/ Tidak mengambil berat tentang keselamatan orang lain	1	2	3	4	5
2.3 Pay attention to safety rules/ Beri perhatian kepada peraturan keselamatan	1	2	3	4	5
2.4 Follow safety rules/ Ikut peraturan keselamatan	1	2	3	4	5
2.5 Look out for others' safety/ Perhatikan keselamatan orang lain	1	2	3	4	5
2.6 Encourage others to be safe/ Menggalakkan orang lain untuk keselamatan	1	2	3	4	5
2.7 Take chances with safety/ Mengambil peluang terhadap keselamatan	1	2	3	4	5
2.8 Keep work area clean/ Pastikan kawasan kerja adalah bersih	1	2	3	4	5
2.9 Safety-oriented/ Berorientasikan Keselamatan	1	2	3	4	5
2.10 Don't pay attention/ Tidak memberi perhatian	1	2	3	4	5

Strongly Disagree (Sangat Tidak Bersetuju)	Disagree (Tidak Bersetuju)	Not Sure (Tidak Pasti)	Agree (Setuju)	Strongly Agree (Sangat Bersetuju)
1	2	3	4	5

3. Supervisor Safety/ Keselamatan Penyelia

Think about your immediate supervisor. Do you agree or disagree that each of the following words or phrases describes your immediate supervisor? Circle one answer for each statement using the scale at the top of the page. *Fikirkan tentang penyelia terdekat anda. Adakah anda bersetuju atau tidak bersetuju bahawa setiap perkataan atau frasa yang berikut menerangkan penyelia terdekat anda? Bulatkan satu jawapan untuk setiap penyata menggunakan skala di bahagian atas halaman.*

3.1 Praises safety work behaviors/ <i>Memuji kelakuan kerja keselamatan</i>	1	2	3	4	5
3.2 Encourages safety behaviors/ <i>Menggalakkan tingkah laku keselamatan</i>	1	2	3	4	5
3.3 Keeps workers informed of safety rules/ <i>Memastikan pekerja dimaklumkan mengenai peraturan keselamatan</i>	1	2	3	4	5
3.4 Rewards safety behaviors/ <i>Diberi ganjaran untuk tingkah laku keselamatan</i>	1	2	3	4	5
3.5 Involves workers in setting safety goals/ <i>Melibatkan pekerja dalam menetapkan matlamat keselamatan</i>	1	2	3	4	5
3.6 Discusses safety issues with others/ <i>Membincangkan isu-isu keselamatan dengan orang lain</i>	1	2	3	4	5
3.7 Updates safety rules/ <i>Kemas kini peraturan keselamatan</i>	1	2	3	4	5
3.8 Trains workers to be safe/ <i>Melatih pekerja untuk keselamatan</i>	1	2	3	4	5
3.9 Enforces safety rules/ <i>Menguatkuasakan peraturan keselamatan</i>	1	2	3	4	5
3.10 Acts on safety suggestion/ <i>Bertindak ke atas cadangan keselamatan/ Bertindak ke atas cadangan keselamatan</i>	1	2	3	4	5

Strongly Disagree (Sangat Tidak Bersetuju)	Disagree (Tidak Bersetuju)	Not Sure (Tidak Pasti)	Agree (Setuju)	Strongly Agree (Sangat Bersetuju)
1	2	3	4	5

4. Management Safety/ Keselamatan Pengurusan

Think about your management. Do you agree or disagree that each of the following words or phrases describes your management? Circle one answer for each statement using the scale at the top of the page./ *Fikirkan tentang pengurusan anda. Adakah anda bersetuju atau tidak bersetuju bahawa setiap perkataan atau frasa yang berikut menerangkan pengurusan anda? Bulatkan satu jawapan untuk setiap penyata menggunakan skala di bahagian atas halaman.*

4.1 Provide enough safety training programs/ <i>Menyediakan program latihan keselamatan yang mencukupi</i>	1	2	3	4	5
4.2 Conducts frequent safety inspections/ <i>Menjalankan pemeriksaan keselamatan yang kerap</i>	1	2	3	4	5
4.3 Investigates safety problems quickly/ <i>Menyiasat masalah keselamatan dengan cepat</i>	1	2	3	4	5
4.4 Rewards safety workers/ <i>Memberi ganjaran pekerja keselamatan</i>	1	2	3	4	5
4.5 Provides safe equipment/ <i>Menyediakan peralatan yang selamat</i>	1	2	3	4	5
4.6 Provides safe working conditions/ <i>Menyediakan keadaan kerja yang selamat</i>	1	2	3	4	5
4.7 Responds quickly to safety concerns/ <i>Bertindak balas dengan cepat terhadap kebimbangan keselamatan</i>	1	2	3	4	5
4.8 Helps maintain clean work area/ <i>Membantu mengekalkan kawasan kerja bersih</i>	1	2	3	4	5
4.9 Provides safety information/ <i>Menyediakan maklumat keselamatan</i>	1	2	3	4	5
4.10 Keeps workers informed of hazards/ <i>Memastikan pekerja dimaklumkan mengenai bahaya</i>	1	2	3	4	5

Does your company have a formal safety program (policies)? (circle answer) Yes, No, Don't know. If you answered "Yes" please answer the following questions about the safety program (policies). *Adakah syarikat anda mempunyai program keselamatan formal (polisi)? (Bulatkan Jawapan) Ya, Tidak, Tidak tahu. Jika anda menjawab "Ya" sila jawab soalan-soalan berikut mengenai program keselamatan (polisi).*

Strongly Disagree (Sangat Tidak Bersetuju)	Disagree (Tidak Bersetuju)	Not Sure (Tidak Pasti)	Agree (Setuju)	Strongly Agree (Sangat Bersetuju)
1	2	3	4	5

5. Satisfaction of Safety Programmes/ *Kepuasan Program Keselamatan*

Think about your safety program at work. Do you agree or disagree that each of the following words or phrases describes the safety program? Circle one answer for each statement using the scale at the top of the page. *Fikirkan tentang program keselamatan anda di tempat kerja. Adakah anda bersetuju atau tidak bersetuju bahawa setiap perkataan atau frasa yang berikut menerangkan program keselamatan ini? Bulatkan satu jawapan untuk setiap penyata menggunakan skala di bahagian atas halaman.*

5.1 Worthwhile/ <i>Berbaloi</i>	1	2	3	4	5
5.2 Helps prevent accidents/ <i>Membantu mencegah kemalangan</i>	1	2	3	4	5
5.3 Useful/ <i>Berguna</i>	1	2	3	4	5
5.4 Good/ <i>Baik</i>	1	2	3	4	5
5.5 First-rate/ <i>Kadar Pertama</i>	1	2	3	4	5
5.6 Unclear/ <i>Tidak Jelas</i>	1	2	3	4	5
5.7 Important/ <i>Penting</i>	1	2	3	4	5
5.8 Effective in reducing injuries/ <i>Berkesan dalam mengurangkan kecederaan</i>	1	2	3	4	5
5.9 Doesn't apply to my workplace/ <i>Tidak digunakan untuk tempat kerja saya</i>	1	2	3	4	5
5.10 Does not work/ <i>Tidak berfungsi</i>	1	2	3	4	5

PART III: SAFETY BEHAVIOR/ GELAGAT KESELAMATAN

Please **circle** the number that indicates the degree to which you feel each item is descriptive of the safety behavior towards work safety scale./ *Sila bulatkan nombor yang menunjukkan sejauh mana anda rasa setiap item adalah deskriptif tingkah laku keselamatan ke arah skala keselamatan kerja.*

Strongly Disagree (Sangat Tidak Bersetuju)	Disagree (Tidak Bersetuju)	Not Sure (Tidak Pasti)	Agree (Setuju)	Strongly Agree (Sangat Bersetuju)
1	2	3	4	5

6.1 Employees are engaged in identifying safety-related behaviours. <i>Pekerja yang terlibat dalam mengenal pasti tingkah laku yang berkaitan dengan keselamatan.</i>	1	2	3	4	5
6.2 Upper management participates in the safety behavior modification programmes. <i>Pengurusan atasan mengambil bahagian dalam program pengubahsuaian tingkah laku keselamatan.</i>	1	2	3	4	5
6.3 Upper management behavior in safety programmes is very positive. <i>Tingkah laku pengurusan atasan dalam program keselamatan adalah sangat positif.</i>	1	2	3	4	5
6.4 Your company places high importance on workplace analyses of hazard prevention. <i>Syarikat anda meletakkan kepentingan yang tinggi kepada analisis kerja pencegahan bahaya.</i>	1	2	3	4	5
6.5 Safety behavior modification is important to this company. <i>Keselamatan pengubahsuaian tingkah laku adalah penting untuk syarikat ini.</i>	1	2	3	4	5
6.6 Punishment for safety rule violation is consistent. <i>Hukuman bagi peraturan keselamatan pelanggaran adalah konsisten.</i>	1	2	3	4	5
6.7 The punishment fits the safety violation that occurred. <i>Hukuman yang sesuai dengan pelanggaran keselamatan yang berlaku.</i>	1	2	3	4	5
6.8 Disciplinary actions are taken almost immediately when safety violation takes place. <i>Tindakan disiplin diambil dengan serta-merta apabila pelanggaran keselamatan berlaku.</i>	1	2	3	4	5
6.9 Sympathy is displayed when disciplinary action is taken. <i>Simpati dipaparkan apabila tindakan disiplin diambil.</i>	1	2	3	4	5
6.10 Employees will be reprimanded for their disregard to good safety practices. <i>Pekerja akan ditegur kerana mereka tidak mengambil kira terhadap amalan keselamatan yang baik.</i>	1	2	3	4	5

PART IV: SAFETY PERFORMANCE
BAHAGIAN IV: PRESTASI KESELAMATAN

Please **circle** the number that indicates the degree to which you feel each item is descriptive of the safety performance towards work safety scale. *Sila bulatkan nombor yang menunjukkan sejauh mana anda rasa setiap item adalah deskriptif prestasi keselamatan ke arah skala keselamatan kerja.*

Strongly Disagree (Sangat Tidak Bersetuju)	Disagree (Tidak Bersetuju)	Not Sure (Tidak Pasti)	Agree (Setuju)	Strongly Agree (Sangat Bersetuju)
1	2	3	4	5

7.1 Compliance with Safety Work/ Pematuhan Keselamatan Kerja					
1. Safety policy is effective in this company. <i>Polisi Keselamatan adalah berkesan dalam syarikat ini.</i>	1	2	3	4	5
2. The management places high importance on safety management. <i>Pihak pengurusan meletakkan kepentingan utama dalam menguruskan keselamatan.</i>	1	2	3	4	5
3. Top management initiates safety planning. <i>Pengurusan atasan memulakan perancangan keselamatan.</i>	1	2	3	4	5
4. Safety is a strategic concern of the top management. <i>Keselamatan adalah satu kesedaran strategik pengurusan atasan.</i>	1	2	3	4	5
5. The management communicates safety goals to workers. <i>Pengurusan berkomunikasi matlamat keselamatan kepada pekerja.</i>	1	2	3	4	5
6. The management assigns safety accountability to individual workers. <i>Pihak pengurusan memberikan akauntabiliti keselamatan kepada individu pekerja.</i>	1	2	3	4	5
7. Employees are rewarded for their safety work performance. <i>Pekerja diberi ganjaran untuk prestasi kerja keselamatan mereka.</i>	1	2	3	4	5
8. The incentives systems for safety performance are fair. <i>Sistem insentif untuk prestasi keselamatan adalah adil.</i>	1	2	3	4	5
9. Safety incentives are given out on a regular (at least once a year) basis. <i>Insentif Keselamatan telah disediakan secara tetap (sekurang-kurangnya setahun sekali).</i>	1	2	3	4	5
10. Rewards for safety competition winners are given out consistently. <i>Ganjaran untuk pemenang pertandingan keselamatan diberi secara konsisten.</i>	1	2	3	4	5

11. Employees highly value the incentives awarded. <i>Pekerja amat menghargai insentif yang diberikan.</i>	1	2	3	4	5
12. Incentive recipients are announced in the company's bulletin. <i>Penerima Insentif diumumkan dalam buletin syarikat.</i>	1	2	3	4	5
13. Safety rules are enforced even when no accident has occurred. <i>Peraturan keselamatan telah dikuatkuasakan walaupun tiada kemalangan yang berlaku.</i>	1	2	3	4	5
14. The safety personnel monitor employees' good safety practices. <i>Anggota keselamatan memantau amalan keselamatan pekerja dengan baik.</i>	1	2	3	4	5
7.2 Using PPE as Prescribed/ Menggunakan PPE yang Ditetapkan					
1. The appropriate personal protective equipment (PPE) as indicated in the safety manuals are used. <i>Peralatan pelindung diri (PPE) yang sesuai seperti yang ditunjukkan dalam manual keselamatan telah digunakan.</i>	1	2	3	4	5
2. The PPE are correctly inspected before being used. <i>PPE diperiksa dengan betul sebelum digunakan.</i>	1	2	3	4	5
3. The PPE are correctly stored after being used. <i>PPE disimpan dengan betul selepas digunakan.</i>	1	2	3	4	5
4. Work can be properly performed while wearing the PPE. <i>Kerja boleh dilakukan dengan betul ketika memakai PPE.</i>	1	2	3	4	5
5. While wearing PPE, a worker can communicate perfectly with other workers. <i>Semasa memakai PPE, pekerja boleh berkomunikasi dengan baik dengan pekerja lain.</i>	1	2	3	4	5
6. This company disposes materials that pose a safe risk properly. <i>Syarikat ini melupuskan bahan-bahan yang menimbulkan risiko keselamatan dengan betul.</i>	1	2	3	4	5
7. Manager conducts PPE training regularly (at least once a year). <i>Pengurus menjalankan latihan PPE dengan kerap (sekurang-kurangnya sekali setahun).</i>	1	2	3	4	5
8. Employees attend PPE training before commencing a job. <i>Pekerja menghadiri latihan PPE sebelum memulakan pekerjaan.</i>	1	2	3	4	5
9. PPE education for employees is planned for. <i>Pendidikan PPE untuk pekerja adalah dirancang.</i>	1	2	3	4	5
10. New employee received PPE and orientation training.	1	2	3	4	5

<i>Pekerja baru menerima PPE dan latihan orientasi.</i>					
11. The training techniques used for safety training are effective. <i>Teknik-teknik latihan yang digunakan untuk latihan keselamatan adalah berkesan.</i>	1	2	3	4	5
12. The current PPE training curriculum is recently updated. <i>Kurikulum latihan PPE semasa telah dikemaskini.</i>	1	2	3	4	5
13. Employees training and education using of PPE involved “in-house” personnel. <i>Latihan dan pendidikan pekerja terhadap penggunaan PPE melibatkan kakitangan dalaman.</i>	1	2	3	4	5
7.3 Increased Awareness of Hazards/ Peningkatan Kesedaran Terhadap Bahaya					
1. Safety management is important to this company. <i>Pengurusan Keselamatan adalah penting untuk syarikat ini.</i>	1	2	3	4	5
2. Your company’s actions portray a true commitment to safety. <i>Tindakan syarikat anda menggambarkan komitmen sebenar terhadap keselamatan.</i>	1	2	3	4	5
3. Your company takes responsibility for the safety welfare of employees. <i>Syarikat anda mengambil tanggungjawab terhadap kebajikan keselamatan pekerja.</i>	1	2	3	4	5
4. Your company enforces safety rules and regulations equally to all employees. <i>Syarikat anda menguatkuasakan kaedah-kaedah dan peraturan-peraturan keselamatan sama rata kepada semua pekerja.</i>	1	2	3	4	5
5. Material Safety Data Sheets (MSDS) that may provide additional safety information are appropriately used. <i>Bahan Lembaran Data Keselamatan (MSDS) yang boleh memberikan maklumat keselamatan tambahan adalah sesuai digunakan.</i>	1	2	3	4	5
6. Employee’s right to safety welfare is maintained. <i>Kebajikan untuk keselamatan pekerja dikekalkan.</i>	1	2	3	4	5
7. Potential hazard exposures to employees involved are communicated. <i>Potensi pendedahan bahaya terhadap pekerja yang terlibat telah disampaikan.</i>	1	2	3	4	5
8. Employees place high importance on safety management. <i>Pekerja meletakkan kepentingan utama terhadap pengurusan keselamatan.</i>	1	2	3	4	5
9. Employees participate in giving feedback to enhance workplace safety. <i>Pekerja mengambil bahagian dalam</i>	1	2	3	4	5

<i>memberi maklum balas untuk meningkatkan keselamatan di tempat kerja.</i>					
10. Employees are empowered to improve safety performance. <i>Pekerja diberi kuasa untuk meningkatkan prestasi keselamatan.</i>	1	2	3	4	5
11. Employees' suggestions in safety is sought during production planning stage. <i>Keselamatan yang diminta oleh pekerja diambil kira semasa peringkat perancangan pengeluaran.</i>	1	2	3	4	5
12. The management makes appropriate decisions about the type of control mechanism to monitor hazards. <i>Pihak pengurusan membuat keputusan yang sesuai tentang jenis mekanisme kawalan untuk memantau kebahayaan.</i>	1	2	3	4	5
7.4 Executing Emergency Procedures/ Melaksanakan Prosedur Kecemasan					
1. This company applies appropriate work practices including Safety Operating Procedure to reduce exposure to hazards./ <i>Syarikat ini terpakai amalan kerja yang sesuai termasuk Keselamatan Prosedur Operasi untuk mengurangkan pendedahan kepada bahaya.</i>	1	2	3	4	5
2. The Department of Occupational Safety is contacted when the company is facing problems on safety issues./ <i>Jabatan Keselamatan dihubungi apabila syarikat itu sedang menghadapi masalah mengenai isu-isu keselamatan.</i>	1	2	3	4	5
3. Accidents are appropriated to the relevant authorities./ <i>Kemalangan itu diuntukkan kepada pihak berkuasa yang berkaitan.</i>	1	2	3	4	5
4. Appropriate methods are engaged to notify workers, supervisors, and /or emergency coordinator in an emergency situation./ <i>kaedah yang sesuai terlibat untuk memberitahu pekerja, penyelia, dan / atau penyelaras kecemasan dalam situasi kecemasan.</i>	1	2	3	4	5
5. Information of the current safety activities are communicated to employees./ <i>Maklumat aktiviti keselamatan semasa disampaikan kepada pekerja.</i>	1	2	3	4	5
6. Safety responsibilities are clearly assigned to designated safety personnel./ <i>Tanggungjawab Keselamatan jelas diberikan kepada anggota keselamatan yang ditetapkan.</i>	1	2	3	4	5
7. It is the safety committee's rights to function without infringement from the management./ <i>Ia adalah hak jawatankuasa keselamatan untuk fungsi tanpa</i>	1	2	3	4	5

<i>melanggar daripada pihak pengurusan.</i>					
8. Applicable hazard control mechanisms are correctly used./ <i>Mekanisme kawalan bahaya berkenaan digunakan dengan betul.</i>	1	2	3	4	5
9. Appropriate action is taken to prevent recurrence of injuries, illness, accidents, and / or near misses. <i>Tindakan yang sesuai diambil untuk mencegah berulangnya kecederaan, penyakit, kemalangan, dan / atau kejadian yang hampir</i>	1	2	3	4	5
10. Appropriated steps are taken in assisting employee to exercise one's rights to safety under the law, policies and procedures. <i>Langkah-langkah yang sesuai telah diambil dalam membantu pekerja untuk melaksanakan hak-hak seseorang untuk keselamatan di bawah undang-undang, polisi dan prosedur.</i>	1	2	3	4	5
11. Appropriate steps are taken to adhere with the safety policy statement. <i>Langkah-langkah yang sesuai telah diambil untuk mematuhi dengan pernyataan dasar keselamatan.</i>	1	2	3	4	5

THANK YOU

TERIMA KASIH