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**THE INFLUENCE OF MANAGEMENT COMMITMENT, SAFETY
TRAINING, AND SAFETY RULES AND PROCEDURES TOWARDS OSH
KNOWLEDGE AMONG MANUFACTURING WORKERS.**

By

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Thesis Submitted to

School of Business Management

College of Business, University Utara Malaysia

In Fulfilment of the Requirement for the

Master of Occupational Safety and Health Management

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ABSTRAK

Banyak kajian lepas mendapati bahawa punca peningkatan kemalangan di Malaysia terutama sektor pembuatan adalah berpunca daripada kekurangan tahap pengetahuan berkaitan keselamatan dan kesihatan pekerjaan. Objektif kajian ini ialah untuk menilai tahap pengetahuan berkaitan keselamatan dan kesihatan pekerjaan di kalangan pekerja sektor pembuatan. Sebanyak 201 orang pekerja iaitu kilang pembuatan barangan getah dan kilang penghasilan ais kiub di Perlis telah menyertai kajian soal selidik pada Disember 2019. Analisis kolerasi Spearman telah dilakukan dengan menggunakan SPSS versi 26. Dapatan kajian membuktikan terdapat hubungan positif diantara pembolehubah. Nilai dapatan signifikan bagi pengetahuan keselamatan pekerjaan terhadap komitmen pengurusan adalah p bersamaan 0.022, bagi latihan keselamatan p bersamaan 0.000, dan nilai signifikan bagi penyediaan peraturan dan prosedur keselamatan pula adalah p bersamaan 0.000. Secara kesimpulan kajian ini membuktikan bahawa komitmen yang baik dari pihak pengurusan, penganjuran latihan keselamatan dan penyediaan peraturan keselamatan mendorong kepada pengetahuan berkaitan keselamatan dan pekerjaan yang optimum.

Katakunci : Pengetahuan, komitmen, latihan keselamatan, polisi dan peraturan keselamatan, kilang, pembuatan

ABSTRACT

On previous years, there were many studies simplified that occupational accidents especially in manufacturing sector occurred due to lack of safety knowledge. This research was subjected to study on safety knowledge among workers in manufacturing sector. There were 201 workers from rubber manufacturing factory and ice making factory are studied in the research. The study commenced in Perlis in December 2019. Spearman's Correlation Analysis has been used to analyse the collected data on all variables. Results obtained from the analysis showed that there are positive relationships between safety knowledge towards management commitment ($p= 0.022$), safety training ($p=0.000$), and safety rules and procedure ($p=0.000$). In conclusion, this study suggested that good management commitment towards safety, providing adequate safety training, and providing good safety rules and procedure for workers will lead to optimum occupational safety knowledge among workers.

Keywords: Awareness, safety commitment, safety training, rules and policy, factory, manufacturing

APPRECIATION

Alhamdulillah thanks to almighty God who gave me the strength and knowledge to finish the project paper. He is the one who freed my time so that I can focus on settling the research.

Then, millions of thanks to my parents, my wife and siblings who always put their prayers on me. They were very supportive emotionally and physically in helping me finishing the project paper. This success is dedicated to them all.

Tokens of appreciation also dedicated to my supervisor Dr. Marziah bt Zahar who always guide me on this paper. Lots of thanks to

Prof. Madya Dr. Mohd Faizal, Prof. Madya Dr. fadzli Syah, Prof. Madya Dr. Chandrakantan, Dr. Wan Shakizah, and Dr. Zuraida Hasan who dedicated their time to give extra lectures on all topics of the research.

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LIST OF ABBREVIATION

Dosh- Department of Occupational Safety and Health

Dv – Dependent Variable

FMA – Factories and Manufacturing Act

Iv – Independent Variable

Osh – Occupational Safety and Health

OSHA – Occupational Safety and Health Act



CHAPTER ONE

INTRODUCTION

This chapter will focus on the preliminary ideas of the research that outline its background, problem statement, objectives of the research, research questions or hypothesis, and more importantly, its significance. Chapter one will also discuss on the limitation and the organization of the research. A brief description of the research is presented in the last part of this chapter.

1.1 Background of the study

Industrial revolution, IR 4.0 has created an awareness for employers to improve productivity, higher quality products and innovative management. In general, an organization in the manufacturing industry tends to overlook the aspects of safety and health (Simard & Marchand, 1994). According to the Industrial Co-ordination Act (ICA) 1975, a 'Manufacturing Activity' is defined as "*The making, altering, blending, ornamenting, finishing or otherwise treating or adapting any article or substances with a view to its use, sale, transport, delivery or disposal; and includes the assembly of parts and hip repairing but shall not include any activity normally associated with retail or wholesale trade*".

In Malaysia, the Factory and Machinery Act (FMA) has been enforced in year 1967 as a commencement of workplace safety affairs. The FMA 1967 was enacted to protect employees that work in the general factory, quarry mining and construction

sectors. By operating on compliance to this act, industries will be more aware regarding the physical aspects of workplace safety such as hazards identification, equipment safety, how to prevent injuries in the workplace and ensuring safe machineries (Bakar, 2006).

1.1.1 Transitional of FMA1967 to OSHA 1994 In Manufacturing Industry Perspectives

The FMA 1967 act had successfully serves the manufacturing industries. However, FMA 1967 needs to be further improved following the aftermath of the Bright Sparklers incident in year 1991 which resulted in enormous workplace accidents, injuries, physical and mental losses and properties damages. The Bright Sparklers factory is a specialized manufacturing plant that produces firework – which contained ingredients such as potassium nitrate (an oxidiser and dust combustible material) located at Sungai Buloh, Selangor, Malaysia (citation). Such enormous hazard material requires a specific plant design to allows its production. However, from the accident investigations, it was revealed that the building of Bright Sparkler plant was not constructed accordingly to the standard specification. Therefore, the impact of Bright Sparkler explosion had destroyed the entire plantation, causing 23 mortalities and 103 injured employees with various degrees of severity (Shaluf, Ahmadun, Mustapha, Said and Sharif, 2002). The incident enticed the government to improve legislation on occupational safety, where the outcome is the establishment of Occupational Safety and Health Act 1994 (OSHA 1994). OSHA 1994 provides a legislative framework in promoting, stimulating and encouraging high standards of safety and health in the workplace (Yuen, 2006). The main aim of this act is to increase workers' safety awareness level and to facilitate the management in providing

effective safety management in the workplace (Bahari, 2002; Bakar, 2006; Yuen, 2006).

1.1.2 Overcoming Injuries in The Manufacturing Industries

Essentially the OSH related act around the world was designed to improve or create high safety knowledge to prevent occupational accidents and avoid injury, disability, and fatality to workers. Based on Tinney (2015) findings, injuries in the workplace will induce a negative impact to the ability and the quality of workers. In Malaysia, there are 4875 cases reported to DOSH in the year 2019 where it was contributed by the manufacturing sector which has resulted in disabilities. Some workers had lost their job, and some had been re-assigned to other task due to their disabilities in conjunction of workplace accidents. Incidents happened due to lack of awareness on safety and health. Being aware of the safety and health at the workplace will help workers to have propositional knowledge on the best safety practice of their given tasks.

Possessing good awareness or knowledge on proper safety and health at workplace is essential in all sectors. People including employers, employees, occupiers and community must have the knowledge on occupational safety and health in order to avoid accidents and health issues. Yankson (2012), stated that occupational safety and health mean the condition that affect the wellbeing of the employees, temporary workers, contractors, personnel, visitors and any other person at the workplace. Various safety guidelines and policies in ensuring employees' welfare and wellbeing to be taken care of at all times have been established by the Occupational Safety and

Health Act in Malaysia. The Department of Safety and Health (DOSH) is held responsible in enacting and implementing legislation of OSH so that safety and health issues are at their optimum compliance (Ibrahim, Muhammad Noor, Nasirun and Ahmad, 2012).

Based on DOSH (2019) statistics, as depicted in Table 1.1, there are 4948 cases has been reported due to accident in the manufacturing industry around Malaysia. This include 4661 cases resulted in non-permanent disability, 214 cases caused permanent disability and the other 73 are mortality cases. Therefore, DOSH had assumed that manufacturing sector presented the biggest issues on safety and health management, indirectly in risk to create a bad impression to Malaysian manufacturing industry in global eyes. The lowest cases reported from peninsular of Malaysia is from Perlis which only reported 44 total cases with 43 non-permanent disability cases and 1 mortality case.

There are factors that might affected the cases number in Perlis such as small numbers of manufacturing factories and workers. However, the numbers is large if it is measured in percentage of total workers in Perlis.

Table 1.1*Dosh Report 2019 by Sector*

SECTOR	NPD	PD	DEATH	TOTAL
Hotel and Restaurant	227	3	5	235
Utilities (Electricity, Gas, Water and Sanitary Service)	245	4	9	258
Finance, Insurance, Real Estate and Business Services	384	6	16	406
Construction	227	15	84	326
Transport, Storage and Communication	359	9	21	389
Manufacturing	4661	214	73	4948
Wholesale and Retail Trade	85	2	0	87
Public Services and Statutory Authorities	93	3	3	99
Mining and Quarrying	52	3	5	60
Agriculture, Forestry and Fishery	1111	22	43	1176
TOTAL	7444	281	259	7984

LEGEND:

PD - PERMANENT DOSABILITY

NPD- NON PERMANENT DISABILITY

Note. International Policy and Research Development Division

According to accident report, there is a significant rise on the accident occurrence which is a clear indication that awareness or knowledge on safety and health a workplace is a major role as the root cause as the escalating safety and health

issues in Malaysia and it is a potential threat to the individual productivity and social wellbeing of the nation whom aspired to achieve the developed nation status in the near future. It is therefore imperative that a research is carried out to reveal what are the causes of safety and health knowledge insufficiency, why it happens and how it affects people in their respective working environment.

1.2 Problem Statement

In this study, we are going to determine issues that might disrupted the effectiveness of safety knowledge in the manufacturing industries. Aforementioned before in Table 1.1, it is reported that the number of incidents in the workplace is hugely contributed by the manufacturing industries. Recent studies found that there are only three dimensions of safety management practices which are management commitment, safety training, and safety rules and procedures were significantly related to safety compliance (Subramaniam et al., 2016). Therefore, issues on OSH knowledge in the manufacturing industry; related to management commitment, safety training, and safety rules and procedure will be elaborated.

Table 1.2*Statistics of Accidents Reported to DOSH by State 2019*

STATE	NPD	PD	DEATH	TOTAL
JOHOR	1273	25	38	1336
KEDAH	299	19	8	326
KELANTAN	92	4	8	104
LABUAN	26	2	0	28
MELAKA	361	9	8	378
N SEMBILAN	464	11	8	483
PAHANG	446	19	21	486
PERAK	903	39	32	974
PERLIS	43	0	1	44
PULAU PINANG	805	22	21	848
SABAH	319	26	26	371
SARAWAK	410	28	32	470
SELANGOR	1595	69	33	1697
TERENGGANU	129	3	7	139
WPKL	279	5	16	300
TOTAL	7444	281	259	7984

LEGEND:

PD - PERMANENT DOSABILITY

NPD- NON PERMANENT DISABILITY

Note. International Policy and Research Development Division

1.2.1 Management commitment

Management commitment to safety is defined as managers' demonstrated value of and commitment to workers physical and health safety (Alyssa et al., 2016). Ideally, management who are willing to observe workers' behavioural aspects will promote positive safety behaviour among the workers - which in turn may lead to positive safety culture in the organizations. Based on a study conducted by Zohar (2020), he found out that commitment by management is a very important dimension of the safety climate, as it is known leading indicator of injuries and safety climate in various jobs' sector. Management commitment to safety should at least predict or at its best is to find out the job-related safety behaviour, risks, hazards and incidents or injuries (Zohar & Polachek,2014). It is found that support on safety by management indirectly affected safety behaviour through learning and safety improvement (Olsen,2010). Borstoff & Lowe (2010) had suggested that, workers will be less safety conscious and willing to risk their safety in order to get the work completed if the management does not show their interest in supporting workplace safety. There are many studies found internationally on management commitment, however it seems like insufficient studies or data found regarding Malaysian context. Therefore, this study will investigate issues of management commitment towards OSH knowledge, by adapting Vinodkumar and Bhasi (2010) study.

1.2.2 Safety Training

Safety training is an important aspect to look in-to because in several previous study, it has been reported that safety training plays an important role to reduce number of accidents. The effort of a sufficient safety training programs can be a beneficial instrument to change workers' safety behaviour, safety attitude (Cooper,1998) and improving safety awareness (Root, 2005). The National Institute of Occupational and Health (NIOSH) had taken initiative to enforced safety training as an indicator to improve general safety culture in Malaysia. Thye (2006) had cited that, NIOSH through education and safety training aimed to inculcate better safety culture among the country's workforces. However, safety training implementation is expensive, in regard to meeting the desirable safety training routine. Specifically, the extent of employee safety and health training depends upon company available resources to finance such training (Borstorff & Lowe, 2010). Without adequate and effective training, employees may not be aware of how to safely perform their job. Thus, it is impossible to reduce workplace injuries and fatalities. Safety training improves safety knowledge and helps reducing accidents, injuries and the compensation costing (Gillings & Kleiner, 1993; Marsh et al., 1995)

If the management provided sufficient safety training for their workers, then, workers are expected to possess adequate safety knowledge and skill. This statement was supported by Fender (2002), when he stated that safety knowledge can be possessed by undergoing adequate training. Yu and Hunt (2004), findings also significantly agreed that safety training promote an effective safety at the workplace. The ultimate goal of workplace safety training are prevention and control of accidents

and injuries (Johnston et al., 1994). There are many studies that incorporated the influence of safety training in safety climate measurement for example, Cheyne, Cox, Oliver and Tomas, 1998; Cooper and Phillips, 2004; Cox, Tomas, Cheyne and Oliver, 1998; Coyle, Sleeman and Adams, 1995; Griffin and Neal 2000; Lee, 1998; Ostrom, Wilhelmsen and Kaplan, 1993; Zohar, 1980) but few were done in Malaysia. In conclusion, a new study on relationship of safety training with OSH knowledge will strengthen one of research's hypothesis; there is significant relationship between safety training and safety knowledge level.

1.2.3 Safety Rules and Procedure

There are many acts or laws as jurisdiction in OSH such as Control of Industrial Major Accident Hazards (CIMAH) 1996 and Classification, Labelling and Safety Data Sheet of Hazardous Chemicals (CLASS) 2013. However, the main act and rules in OSH must comply with the OSHA 1994. In the OSHA 1994 act, Section 16, it is compulsory for the employers to have a written safety and health policy for their employees.

All employers (or self-employed persons) with more than five employees to develop written safety and health policy. It is important to note that non-compliance of this provision may inadvertently contribute to lack of safety culture since according to Health and Safety Executive (1997), safety policy captures the existence of a written declaration reflecting the organization's commitment to safety.

Excerpted from OSHA 1994, 16

The OSH 1994 section 16 excerpt is positively reflected with Fernandez-Muniz et al, (2007) findings, indicated that safety policy reflects the organization's principles and values towards safety culture. Furthermore, Hanip (2007) had also strengthened this perspective, stated that the employers' disability or failure to comply with Section 16 of OSHA 1994 in the manufacturing industries has shown significant weaknesses of the employers, who viewed aspects of occupational safety and health as not as important. Thus, it can be hypothesized that non-compliance behaviour towards OSH 1994 section 16 reflected a lack of safety culture among employers in the manufacturing industries. Saidin et al., (2006), cited that one of the elements in developing safety culture is good safety policy. It is believed that combination of rules, attitudes and safe practices will create positive safety culture at workplace.

Safety committee are mainly functioning to make recommendations in promoting and developing safety measures to ensure the safety and health at the workplace and to monitor the effectiveness of such measures (Xavier, 1996). He further adds that the establishment of such committee must not be restricted according to the number of workers because hazards and risks depend more on the nature of work at the workplace rather than the number of employees.

1.2.4 Selection of place of study

Based on Table 1.2, all state of Malaysia has workplace incident recorded by DOSH (2019). Interestingly, workplace safety can be also compromised even when working in the smallest state in Malaysia; Perlis. To date, most of the studies only focusing OSH issues in a big industrial zone like Selangor (Yeng, 2017), Perak (Majid

et.al., 2014), Johor (Suhaila Abd Hamid et, al. 2018). To date, lack of research conducted specifically to the assess OSH awareness and its' essences towards manufacturing sector in the northern region of Malaysia. A research done by Singer et al., (2003) and indicated that safety knowledge might be differ based on geographical and culture. A recent study only discovers workplace incident in the state of Kelantan (Ismail, N. N. H, 2020) where it had discussed workplace accident in the SME-based company. Therefore, it can be speculated that Perlis, a neighbour state, which is eight largest state by land in Malaysia might also have OSH knowledge issues. Therefore, this study is designed to assess any relations management commitment, safety training and safety rules and policy towards safety knowledge in manufacturing industry in the uppermost state in Malaysia compare to other state.

1.2.5 Problem Statement Conclusion

In this research, determination of OSH awareness in the new region can be adapted with three dimensions of safety management practices as proposed by Subramaniam et al., (2016) which are management commitment, safety training, and safety rules and procedures. It fits the context of generating ideas in contrasting OSH knowledge in different state of Malaysia. It is difficult to provide corrective measures in handling safety and health issues in Malaysia as it requires full cooperation between top management and its workers. Any data obtained is considered valuable. It is expected that this new research could cater insufficient studies to portray OSH awareness towards workers in remoted manufacturing sectors. The findings might not be able to address issues and its corrective measures in general perspectives or all type

industries. However, the findings it will be contributed based on the perspective of the smallest state in Malaysia and its neighbouring state. Indirectly, offers a benchmark for the much modern state to contrast and improves their safety compliances.

1.3 Research Questions

The problem statement presented raises a number of critical questions that addresses why safety knowledge is important, what are the factors influencing knowledge, and what the relationships are?

1. Is there a significant relationship between management commitment on safety and health, and safety and health knowledge?
2. Is there a significant relationship between safety training, and safety and health knowledge?
3. Is there a significant relationship between safety and health rules and procedure, and safety and health knowledge?

1.4 Research Objectives

The main aim for the research is to examine the safety and health awareness level among workers of the manufacturing workers from the stratified population. This may be achieved through three outlined objectives which are:

1. To investigate the significant relationship between management commitment on safety and health, and safety and health knowledge.
2. To investigate the significant relationship between safety training, and safety and health knowledge.
3. To investigate the significant relationship between safety rules and procedure, and safety and health knowledge.

1.5 Scope of The Study

Firstly, this study will focus on the safety and health knowledge and factors influencing the knowledge level. There are many factors that can influence safety and health knowledge, but researcher focused on just three factors which are managements' commitment on safety and health, safety and health training, and safety and health rules and policies. As explained earlier in the problem statement, there exists so many factors that contribute to safety and health knowledge but only three are selected to be examined which are managements' commitment, safety training, and safety rules and policy. This is due to the brevity of the duration of this project paper.

Secondly, study findings should be determined whether all the three factors mentioned above do influence the safety and health knowledge level of manufacturing workers. The targeted respondents are selected regarding based on these job criteria or scope/ responsibility:

1. Machine operator
2. Heavy lifter
3. Workers who do burdensome repetitive movement (eg. product grading and product packaging)

There are insufficient studies done on workers in manufacturing sectors which make it hard to provide corrective measures in handling safety and health issues. Therefore, this study is designed to address on the issue and its corrective measures.

1.6 Significant of The Study

The purpose of the study is to analyse the influencing factors towards knowledge level on safety and health among the factories' workers. There seems to be a number of research done to determine the factors influencing level of knowledge on safety and health, but only few are found done in Malaysia. Therefore, this topic is valued by the researcher as an important study to commence.

Management commitment, safety training, and safety rules and procedure were stated as related to safety compliance by Vinodkumar and Bhasi (2010) making the three safety management practice components as essential aspects to study. A study must be done in Malaysia prospective to ensure whether the three components are related to safety knowledge in Malaysia setting. Improvement towards safety measures can be made through-out the country if the outcome resulted positive relations.

This research can be used as a guide on assessing knowledge level among workers in all manufacturing sectors and improvement or corrective actions can be done to increase the level of knowledge among workers.

1.7 Definition of Key Term

Table 1.3

Definition of Key Terms

TERM	DEFINITION	SOURCE
Awareness	Perception or knowledge of a situation or fact of something that is happening or exist	Merriam Webster, 2019
Commitment	“Management commitment is direct participation by the highest level executives in a specific and critically important aspect or program of an organization”	Ganesh.V, 2019
Safety Training	“Safety training describes the set of activities aimed at providing workers with the knowledge and skills to perform their duties safely and effectively”	Trenchlesspedia, 2018
Hazard	Anything or anyone that can cause any harm such as temperature, chemical, electricity, biological agent and ladder.	
Risk	Probability or how great the chance of someone getting hurt by the hazard	Worksafe, 2013

Safety Rules And Procedure	“Safe job procedures are usually developed by management and workers as a result of a JSA/HRA, accident or incident investigation, and/or as a supplement to a safe work practice”	(Infrastructure health and safety Association, 2020).
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1.8 Organization of the Thesis

This research outlined five chapters. Firstly, Chapter One introduces the research background, its problem statement, research objectives, research questions, and limitation of the research. Chapter Two establishes the context by examining the literature review. Meta – analysis is done to specify the best factors to be used as the independent variables. Underpinning theory suitable for the research will also be briefed in this chapter. Chapter Three outlines research methodology adopted including research design, research instruments, sampling, population, and data screening. Then, Chapter Four elucidates the findings of the fieldwork and the upcoming discussions. Lastly, Chapter Five will be focusing on the summary, conclusions and recommendation for corrective actions.

1.9 Conclusion of Chapter 1

Chapter one introduces the research and establishes its background, the problem statement, research questions, research objectives, research methodology, scope of the study, the significant of the study, and structure of the research

CHAPTER TWO

LITERATURE REVIEW

2.1 Operational Definition: Knowledge

Graham (2000) described operational definition as a concise and clear detailed definition of a term or measure.

2.1.1 General Definition Knowledge (Psychology perspective) - Cognitive

Knowledge or awareness is defined by David (1997) as a state of knowing or conscious of information or something that brings to range of behavioural actions. Perception or knowledge of a situation or fact of something that is happening or exist (Merriam Webster, 2019).

2.1.2 Knowledge in Occupational Safety and Health

As numbers of factories in Malaysia are increasing along with the establishment of modern infrastructures and facilities, many studies on incidents, accidents, and infections were conducted to analyse the ethiology or causes. The statistical analysis on the incident rate of injury and illness can be made a benchmark to assess and evaluate the safety and health performance among manufacturing factories in Malaysia. Three factors or variables will be outlined by researcher to determine the relationship to safety awareness level. The factors are managements' commitment towards safety, safety training, and safety rules and policies.

Lots of studies conducted on the factors that contributed to accidents and mishaps at workplace. One of commitments that can be given by employers is to establish a safety and health committee. Knowing about or joining in safety and health committee can affect the awareness level on OSH. Workers can receive proper information about safety and even voice their needs or enquiries about safety and health at workplace. A study carried out by Karim and Chee (2000), cited most of the mishaps were as a result of carelessness, attitude and education level, discipline and willingness to comply with the regulation towards safe and healthy work environment. Knowledge on Osh or knowing the safe practice during work leads to good safety attitude and behaviour. Safety training must be organized to ensure safe work practice. Poor safety practice was found to be the one of the major incidents triggers and causes (Goswani, Soni, S.M. Patel, and M.K. Patel, 2011). The lack of understanding on the safety policies is also a factor that influent safety awareness. Workers always instructed to finish tasks without looking into safety rules and policies. Management must play their role in ensuring good safety knowledge among workers. This is the main cause that can influent workers' safety behaviour (Putra, Sari, Husna, 2018).

2.1.2.1 Factors Affecting Knowledge

There are four factors affecting knowledge which are physiological, preconception, abilities and system design.

2.1.2.1.1 Physiological

Factors such as illness and medication can have a drastic effect on information processing, and therefore on situational awareness. Pilots should use the IMSAFE model to monitor their health and well-being. Novak and Mrazova (2015), stated that

pilots can easily jeopardize their flight because physiology influenced their awareness and performance. Pilot awareness towards their flight can be distracted by current situation of the flight for example stormy weather.

2.1.2.1.2 Preconceptions

Often when we have a preconception about what is going to happen, we try and match information to this idea, instead of seeing what is actually going on. If we do not have a full level of situational awareness, this can lead to carrying out incorrect and potentially harmful actions. Some examples of this would be succumbing to a visual illusion, or not following an air traffic control clearance correctly.

2.1.2.1.3 Abilities/ Experiences/ Training

If you are trained for a situation, you are more likely to execute the correct actions when it occurs in real life. Also, if your training is current, it is more likely that this will be an automatic response. This is partly because you know what the situation looks like and able to anticipate of what is going to happen next. This is why exercise are repeated over and over again in a flight training especially involving critical respond such as Stalling and Engine failures.

2.1.2.1.4 System Design

The ergonomics of a system is very important. If the information is presented in a user-friendly way, the individual will be able to gain the information they require

more easily, improving situational awareness. A system failure leading to manual handler take-back which need good situational awareness and it is fatal if the handler failed to do so (Dexler et al., 2019).

2.2 Operational Definition: Management Commitment

Defining management commitment in general and safety perspective.

2.2.1 General Definition

Management commitment is defined by Cooper (2006) as to get engaged-in and being dedicated in helping employees to achieve their goals. “Management commitment is direct participation by the highest-level executives in a specific and critically important aspect or program of an organization” (Ganesh.V, 2009).

2.2.2 Management Commitment in Safety

Management commitment refers to how organizations demonstrated the value of and commitment towards their workers’ physical and mental safety (Zohar, 2000). It is the most important dimension of safety climate, in that it is a known leading indicator of worker safety behaviours and injuries (Zohar and Luria, 2003). Management commitment might predict workers’ job-related safety behaviours and incidents or injuries (Mullen and Kelloway, 2009).

One of the steps for the management to show their commitment is to establish a Safety and Health Committee (SHC) at the workplace. SHC plays important roles in managing occupational and health activities. Employers are required to corporate and

collaborate with employees in order to indoctrinate safety culture within the organization (Cameron et al., 2006). Feedbacks from employees cannot be assessed by employers without any mediators. Some organization use workers' union as mediator in collecting feedbacks. However, SHC operates efficiently in gathering feedback from employees and continuously increase the knowledge and awareness of occupational safety and health among employees (Wood, 2010). According to OSHA 1994, an employer or organization which employ 40 workers and above is mandated to form an SHC by following the guidelines of Safety and Health Committee Regulation of 1996 (Laxman and Soehod, 2007). SHC always consists of representative from both sides the employees and management of every established unit. According to Kwan, Hm, and Jiyun (2011), workplaces with Labour Management Council (LMC) showed lower accident rates compared with those without one. Occupational Injury and Illness Rate (OIIR) was found to be lesser in organizations SHC compared to those without one. However, Kristensen (2011), reported that integration between safety organization, safety councils and employees became ineffective unless employees were given opportunity to provide input in the safety council.

Despite having a well-equipped workplace with international standards and recognition, cooperation and understandings between workers and management are believed to be the key factors in promoting awareness and knowledge about OSH among personnel (Ibrahim et al., 2012). A study published by Jegathesan, Chin, and Lim (1988), concluded that, interest and full commitment are vital in promoting safety and health awareness. Furthermore, written policies and documents must be explained clearly to the employees and hospital-wide safety induction should be provided to all

beginners by the appointed safety officer (Wood, 2010). It is also mandated that management should organize a refresher safety course or training as an evident of them being committed towards their workers' safety (Hughes and Ferrett, 2011).

2.3 Operational Definition: Safety training

Defining training in general and safety perspective.

2.3.1 General Definition of Training

Goldstein and Ford (2002), defined training as the systematic acquisition of skills, rules, concepts or attitudes that results in improved performance in another environment.

2.3.2 Safety training

Identifying hazards and knowing how to control them are two elements that must be highlighted in every safety training. Hazard and risk could pose a threat to life, health, properties and environment. These hazard and risk could be from any objects or mechanisms such as machines, chemicals and environment. Risk is defined as the probability to be harm by hazards (WorkSafe,2013). Hazards and risks perceive behaviour evolved through physiological and genetic predisposition factors. Espiner (1999), cited that risks and hazards can also be socially or culturally constructed. In the study by Makin and Winder (2008), cited that discouraging the incident reporting can increase the risk of occupational hazard. Hazard and risk are difficult to entirely be eliminated but hey can be effectively control using OSH Management System(OSHMS). Makin and Winder (2008), highlighted that there are five

hierarchical options in controlling risk and hazard which are elimination, substitution, isolation, administrative controls, and finally by using personal protective equipment (PPE). Implementing the safe person, safe place and safe system strategies indicate the occurrences of hazards and risks and the smart measures in controlling them. Safe person strategy represents the interaction of people with people, and physical and psychological hazard. Safe place strategy refers to working condition or operating environment such as biohazard and physical environment. Safe system strategy signifies the safety policy of the organization including incident reporting and hazard management which are important towards controlling hazards and risks. Risks assessment and hazards control can only result in success if good safety training was given, and done in an organizational context. This is where employer-employee relation is essential for safety and health (Akpan, 2011).

Therefore, safety training is essential to be provided to all employees. Safety training will help employees to recognize hazards and do corrective measures. Trainings will help them know and practice the best safety in completing their tasks. Refresher training must also be held as it is also mandated that a refresher safety course or training should take place in every two or three years to ensure all employees are up-dated on the safety and health knowledge particularly on hazard identification, risk management, and safety measures at the workplace (Hughes and Ferrett, 2011).

2.4 Operational Definition: Safety Rules and Procedures

Defining rules and procedures in general and safety perspective.

2.4.1 General Definition of Rules and Procedures

Rules and procedures are principles used to govern the conduct, behaviour or a person. They can also be defined as instructions of doing something correctly (Surbhi. S, 2018).

2.4.2 Safety Rules and Procedure.

Safety rules and procedure are necessary parts of good safety programmes (Safety Info,2019). However, it is better for employers to train their employees on specific hazards of each work procedure. General rules stated by OSHA are that employers must provide safety and health to employees physically, emotionally and ensure their life well-being.

“It be the duty of every employer and every self-employed person to prepare and as often as may be appropriate revise a written statement of his general policy with respect to the safety and health at work of his employees and the organization and arrangements for the time being in force for carrying out that policy, and to bring the statement and any revision of it to the notice of all of his employees (OSHA, 1994)”.

Employees must follow the rules and policy appointed by employers and always ensure the safety and health of themselves and other people around them at the workplace. Saif Corperation (2014), stated that a safety policy provides both vision

and mission to the organization and highlight what is believed, valued and expected in enhancing safety. Safety rules are important in knowing the ‘can-do’ and ‘to-avoid’ for every given tasks.

Table 2.1

Generating Operational Definition

VARIABLE	OPERATIONAL DEFINITION	SOURCE
SAFETY AWARENESS	Awareness is defined by David (1997) as a state of knowing or conscious of information or something that brings to range of behavioural actions.	David (1997)
MANAGEMENT COMMITMENT	1.Cooper (2006) as to get engaged-in and being dedicated in helping employees to achieve their goals. 2.Management commitment refers to how organizations demonstrated the value of and commitment towards their workers’ physical and mental safety (Zohar,2000)	Cooper (2006) (Zohar,2000)
SAFETY TRAINING	1.Goldstein & Ford (2002), defined training as the systematic acquisition of skills, rules, concepts or attitudes that results in improved performance in another environment.	Goldstein & Ford (2002)

2.Refresher training must also be held as it is also mandated that a refresher safety course or training should take place in every two or three years to ensure all employees are updated on the safety and health knowledge particularly on hazard identification, risk management, and safety measures at the workplace (Hughes and Ferrett, 2011).

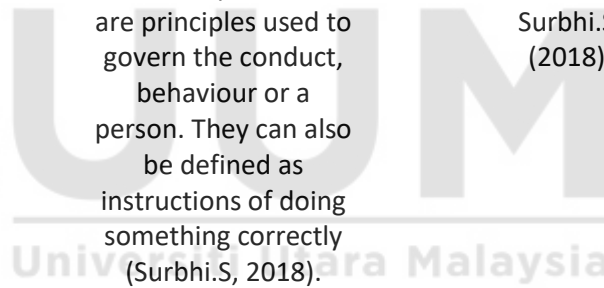
Hughes and Ferrett, (2011).

SAFETY RULES AND PROCEDURE



Rules and procedures are principles used to govern the conduct, behaviour or a person. They can also be defined as instructions of doing something correctly (Surbhi.S, 2018).

Surbhi.S, (2018).



RISKS AND HAZARD

RUBBER INDUSTRY

Workers in the rubber-manufacturing industry are exposed to dusts and fumes from the rubber-making and vulcanization processes. Potential exposures include *N*-nitrosamines, polycyclic aromatic hydrocarbons, solvents, and phthalates. Inhalation is the main route of

IARC, (1982)

exposure, although workers may have dermal exposure as well (e.g. to cyclohexane-soluble compounds).

ICE TUBE
MANUFACTURING

Serious violations include fall hazards due to the lack of handrails on stairways, failure to ensure authorized workers affixed lockout/tagout hardware on mechanical equipment under maintenance, and failure to provide permanent wiring in lieu of flexible cord sets, among other violations.

United State
Department
of Labor,
(2013)



2.5 Theory of Perceptual Cycle by Neisser, 1976

Most accidents are related to human factors. Murrell (1965), defined human factors as the scientific study of the relationship between man and his working environment. Woods (1988), stated that people must track the development of an event or task in order to be aware of the system.

2.5.1: The Concept

Vinodkumar & Bhasi (2010), cited that model of Perceptual Cycle presents situational awareness as a dynamic interaction between humans and their environment. This approach suggests interactions that define the situational awareness (Smith & Hancock, 1995; Adams, Tenney Pew,1995). People who lost situational

awareness might be slower in detecting problems and took more time in remedial action (Endsley & Kiris, 1995). Perception is a disambiguation that is not only the passive receipt of signals or information, but it is also shaped by learning, learning, memory, expectation, and attention (Bernstein & Douglas A.,2010).

Pederson (1988), showed that the Perceptual System has several levels of information processing. The first level requires people to detect signals and targets from an environment full of noise. People have to sift out the non-targeted information. Secondly, people have to organize the signals they have detected into meaningful patterns of information. Finally, people have to understand these patterns by sorting them into perceptual categories and incorporate them into their existing belief and knowledge networks. Vinodkumar & Bhasi (2010), stated the Perceptual Cycle mainly concentrate on the process, which make it is the best theory to be used by researcher in completing this project paper.

2.5.2 Procedure

The workers were interviewed individually. Each participant provides a high-level overview of the potential incident and the cognitive probes were asked in relation to the decision making during the incident. The interviews were audio recorded and later transcribed.

Table 2.2*Theory Implementation*

	Schema	Action	World
Defini tion	Mental structure held by individuals that organize their representation of the world.	The process of doing something, or the intention to do something	Externally Available information in the world (environment)
Descr iption (for codin g)	Statement relating to the prior knowledge and experience, i.e., Things based on experience, expectation or 'knowing' things (this could be implied information through the discussion of training and/ or standard operating procedure	Statements of doing an Action or discussion about potential actions that could be taken.	Statements relating to potential or actual information existing in the world (environment). These can be physical things, conditions or states of being.
Exam ple	I could slip on the wet floor	Use floor dryer	Use the caution signage

2.6 Development of Research Framework.

Critically design and form a framework appropriate to the study.

2.6.1. Management Commitment Vs Knowledge

A successful management practice implementation is able to facilitate safety and injury and incidents (Ali et, al. 2009). A study by Chandraseker (2011) derived that unsafe working environment can lead to accidents. It is known that employers are subjected provide safe workplace for workers according to OSHA 1994. Committed management will always look into the aspect of safety like design of the working system. Shell Oil Refinery Explosion in Louisiana on May the fifth 1988 was an example of system failure which the management failed to frequently check on the corroded pipelines.

2.6.2 Safety Training Vs Knowledge

Schleisinger (2017) stated in his study that safety training is the best measure to reduce human factor in occupational accidents. The statement can be supported according to a suggestion from a study by Said, et al., (2012) where they stated that training is a preventive measure to reduce the risk of workplace accident. Bright Sparkles incident was an example of lack of safety training. The accident costed many fatalities and many survivors with multiple burn injuries. Fatality and injury can be avoided if workers were adequately trained on safety measures during fire incident.

2.6.3 Safety Rules and Procedure Vs Knowledge

Safety rules and procedures must be provided by employers and followed accordingly by workers to prevent injuries. Improper safety procedure in handling jobs can lead to injuries and even fatal (Makin & Winder,2008). Bright Sparkles Accident was caused by human error in implementing safety rules and procedures which led to massive fire.

2.7 Research Framework

According to Figure 2.1, there are three independent variables that will be analysed whether they influenced the dependent variable. The framework is derived by meta-analysis done by researcher which includes reading of journals, articles, statistics and other sources related to safety knowledge.

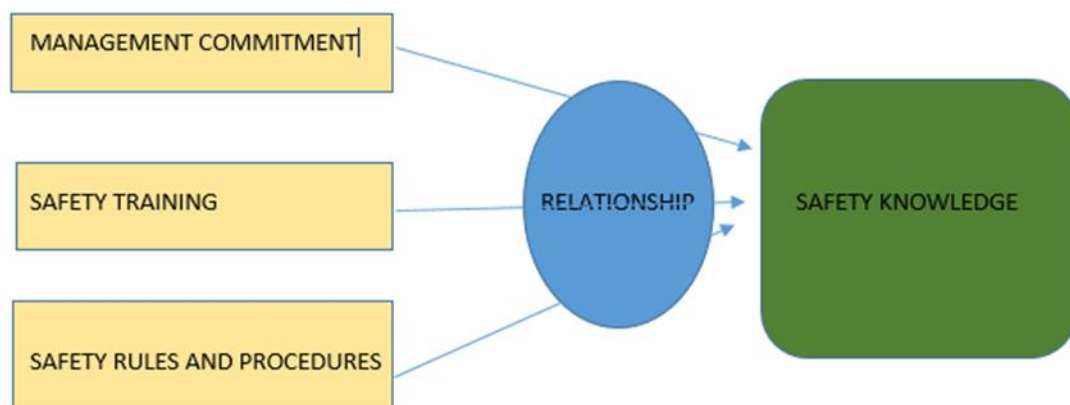


Figure 2.1

Research Framework

Based on operational definition discussed before, the research framework for this study was constructed by adapting Vinodkumar (2010) and Subramaniam (2016) studies. However, no mediator established for this study as the study objective only required to find direct relationship between issues of OSH and OSH awareness. The research framework has been established and depicted in the figure 2.1. It can be seen that the independent variables selected are management commitment, safety training and, safety rules and procedure. The dependent variable is the OSH safety knowledge. Based on the research framework, the ideal methodology for this study is correlation with can be obtained quantitatively with 5-point Likert scale questionnaire. The further discussion on methodology can be accessed in sub-point 3.6 (Instrument of Variables) and sub-point 3.7 (Measurement of variables).

2.8 Conclusion

This chapter had discussed the operational definition, factors that affecting safety awareness or knowledge and construction of research framework. The factors such as management commitment, safety training and, safety rules and procedure at workplace are identified as the independent variables. Meanwhile awareness or knowledge is identified as the dependent variable.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter will be discussing about the body of the research which are research framework, research design, research instrument, sample and sampling method, pilot study, data collection procedure, and data analysis.

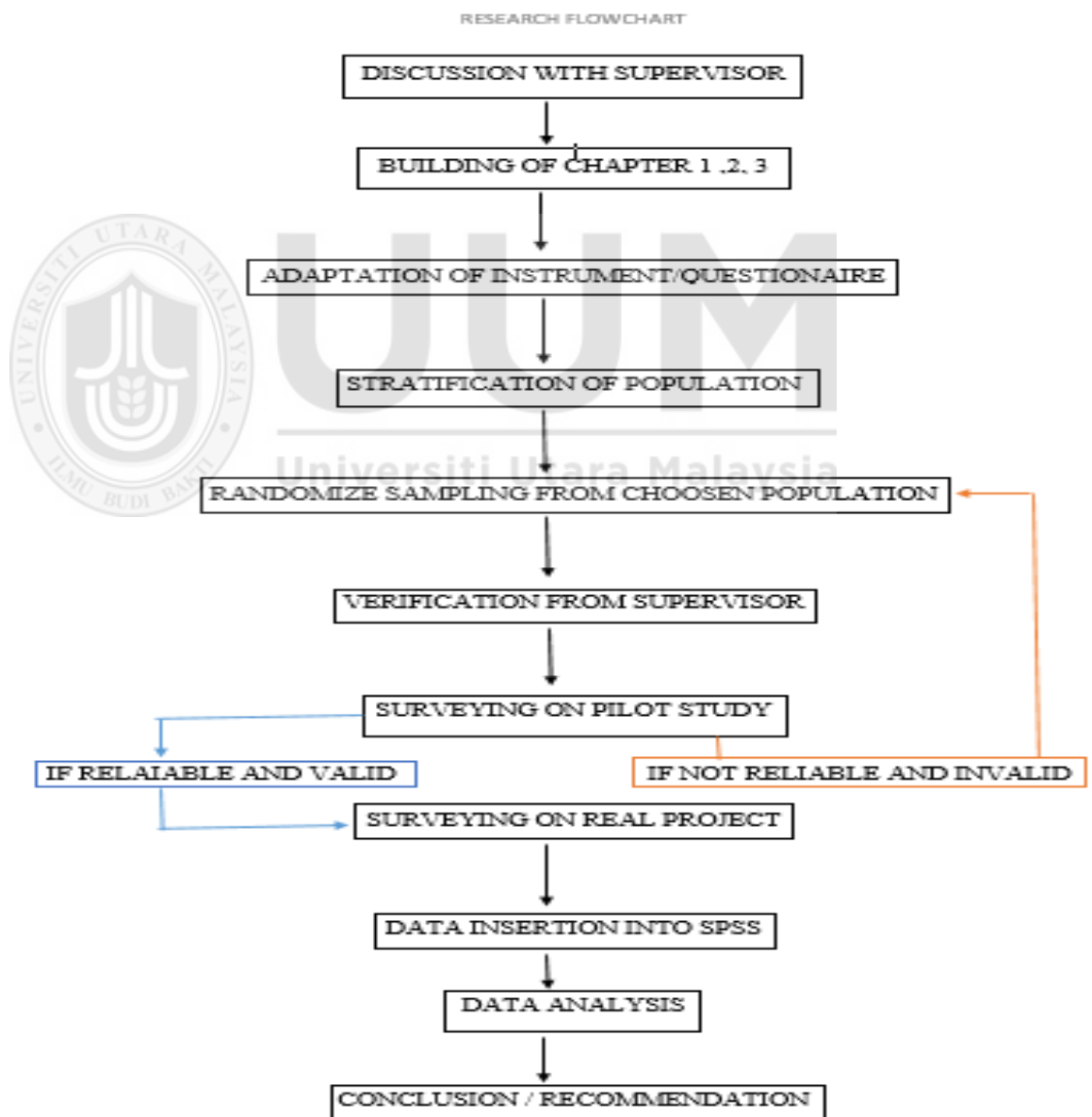


Figure 3.1
Research Flow

3.2 Research Framework

Research framework as sketched in Chapter Two shows correlation between dependant variables (DV) and independent variable (IV). The DV will be safety awareness and the IV conjugating the framework are management commitment, safety training, and safety rule and policy. All three IVs were derived from reviews of literature and sorted respectively. The IVs are defined as follows:

Table 3.1

Definition of Key Terms

Terms/ keywords	Definition	Sources
Management Commitment Towards Safety	“ Management commitment is direct participation by the highest level executives in a specific and critically important aspect or program of an organization”	Ganesh.V. (2009)
Safety Training	“Safety training describes the set of activities aimed at providing workers with the knowledge and skills to perform their duties safely and effectively”	Trenchlesspedia, (2018)
Safety rules and procedure	“Safe job procedures are a series of specific steps that guide a worker through a task from start to finish in a chronological order”.	IHSA, (2020)

3.3 Hypothesis Development

Based on the theoretical framework discussed in the previous subtopic, this research project will investigate and relate the relationship on the following hypotheses;

H1: There is significant and positive relationship between management commitment towards safety and safety knowledge.

H2: There is significant and positive relationship between safety training and safety knowledge.

H3: There is significant and positive relationship between safety rules and procedure, and safety knowledge.

The three hypotheses will be tested in order to understand whether there contains any significant contribution on any or all of the listed variables to the safety knowledge among employees.

3.4 Research Design

Research design is defined as the set of methods and procedures used in collecting and analysing measures of the variables specified in the research problem (Creswell, 2014). Creswell (2014), added that a framework that has been created in finding answers to research question is a research design. The framework or design of

study included data collection, measurement, and analysis of data (Cooper & Schindler, 2003). Qualitative study is chosen as the tools or design for the data to be collected by researcher. Questionnaires with close-ended technic will be used as the instrument in collecting data. Researcher has considered to use the paper-and-pencil administration technic as the questionnaires' mode.

3.5 Operational Definition

The underpinning theory for this research is Perceptual Cycle by Neisser (1976), which consist of three sections. The theory will determine workers' knowledge on their work process.

3.6 Variables and Instrumentals

Part one (1) of the questionnaires will be asking on personal information such as gender, age, education qualification and salary range.

First independent variable will be the instrument in Part two (2) which is management commitment. One of the commitments can be given is to establish a safety committee. The committee provides you with the opportunity to sit down with front line workers to discuss prominent safety concern (LSCI, 2017). This part was derived from Vinodkumar (2010), with minor adjustment to suit on the subject. The questionnaires will be evaluating on participant knowledge on safety and health relatively to management commitment.

Next, safety training aspects will be questioned in Part Three (3). The questions for Part Three were also outlined by Vinodkumar (2010), with some adjustment to suit on the population of the research. Likert Scale of Agreement will be used as the assessment tool for the questionnaire. This part will be questioning on the aspect of safety training and evaluating the relationship with safety knowledge.

Part Four (4) will enrol questions about the importance of safety rules and procedure which will assess on respondents' knowledge about safety rules and policy at their workplace. This part was also derived from Vinodkumar & Bhasi M.N. (2010).

Part Five (5) will enrol questions about the safety awareness or knowledge which will assess on respondents' knowledge about safety and health.

Table 3.2

Instrument Division

PART	VARIABLES	NO OF ITEM	TOTAL ITEM
A	Demographic	5	
B	Management Commitment	9	
C	Safety Training	6	31
D	Safety Rules And Procedure	5	
E	Safety Knowledge	6	

3.7 Measurement of Variables

Fundamentals of the questionnaires are qualitative close-ended questions with Likert Scale of Awareness and Likert Scale of Agreement as the responses to be chosen by participants. The item will consist of question and response scale. Likert Scale for Knowledge and Agreement consist of five levels (Wade, 2006). These scales will be used as the anchor in the questionnaires.

Table 3.3

Questionnaire

Section/ Part Total	Source	Items	
Personal		Q1. Are you a male or female? Q2. What is your age range? Q3. Years of working experience? Q4. Your highest education is? Q5. Your monthly salary range?	5
Management commitment	Vinodkumar & Bhasi 2010	Q1. Safety is given high priority Q2. Safety rules and procedures are strictly followed by the management. Q3. Corrective action is always taken when the management is told about unsafe practices. Q4. In my workplace managers/supervisors do not show interest in the safety of workers. Q5. Management considers safety to be equally important as production. Q6. Members of the management do not attend safety meetings	9

Safety Training		<p>Q7. feel that management is willing to compromise on safety for increasing production.</p> <p>Q8. When near-miss accidents are reported, my management acts quickly to solve the problems.</p> <p>Q9. My company provides sufficient personal protective equipment for the workers.</p> <p>Q1. My company gives comprehensive training to the employees in workplace health and safety issues.</p> <p>Q2.. Newly recruits are trained adequately to learn safety rules and procedures.</p> <p>Q3. Safety issues are given high priority in training programmes.</p> <p>Q4. I am not adequately trained to respond to emergency situations in my workplace</p> <p>Q5. Management encourages the workers to attend safety training programmes.</p> <p>Q6. Safety training given to me is adequate to enable to me to assess hazards in workplace</p>	6
Safety rules and procedures		<p>Q1. The safety rules and procedures followed in my company are sufficient to prevent incidents occurring.</p> <p>Q2. The facilities in the safety department are not adequate to meet the needs of my organization.</p> <p>Q3. My supervisors and managers always try to enforce safe working procedures.</p> <p>Q4. Safety inspections are carried out regularly.</p> <p>Q5. The safety procedures and practices in this organization are useful and effective.</p>	5
Safety awareness/knowledge		<p>Q1. I know how to perform my job in a safe manner.</p> <p>Q2. I know how to use safety equipment and standard work procedures</p> <p>Q3. I know how to maintain or improve workplace health and safety.</p> <p>Q4. I know how to reduce the risk of accidents and incidents in the workplace.</p>	6

		Q5. I know what are the hazards associated with my jobs and the necessary precautions to be taken while doing my job.	
		Q6. I don't know what to do and whom to report if a potential hazard is noticed in my workplace	

It was decided to give the questions in English language based on the feedback from the workers. Each item was measured on a Likert scale. A Likert scale is a type of response scale often used in questionnaires, and is the most widely used scale in questionnaire survey based research (Geller et al., 1996; Grote and Kunzler, 2000). In this research, respondents were asked to give their preference on a 5- point Likert scale (strongly disagree, disagree, neither disagree nor agree, agree, and strongly agree) in order to evaluate the respondents' level of agreement with each item. Most of the items were phrased positively and a few items negatively so that strong agreement in the former and strong disagreement in the latter resulted in a higher score in favour of safety for the concerned item.

Table 3.4

Likert Scale of Agreement

	LIKERT		SCALE		
SCALE	1	2	3	4	5
ITEM	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree

3.8 Sample and Population

Sample or population for this research was stratified into a category of people working in manufacturing factories. Then, they will be randomly picked to participate.

3.8.1 Sampling method

The research was stratified to manufacturing area however, sample were randomly selected without knowing their actual rank and task. It was to ensure no bias in selecting participant. Participants included workers and management.

Sample size was chosen according to Krejcie & Morgan Table as they cited that preferred method was planned in helping researchers decide suitable sample size which significant towards population number (Krejcie & Morgan, 1970).

There are 2 manufacturing factories at site with total population of 400 to 420 workers. Therefore, according to Krejcie & Morgan (1970), the number of sample must be 201 participants

Table 3.5*Population Table*

FACTORY	PROCESS	WORKERS
A	Latex gloves	370
B	Ice tube	50

Table 3.6*Krejcie & Morgan Table for Determining Sample Size from a Given Population*

TABLE I
Table for Determining Sample Size from a Given Population

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size.
S is sample size.

According to the table above, number of populations 420 with suitable number of samples is 201 persons. This makes about 47.85 percent of the population will be selected as sample.

(Sample size/ population) x 100% = percentage of sample size

$$(201/420) \times 100\% = \underline{47.85\%}$$

Salkind (2013), recommended at least 40 percent of the population should be chosen as participants. In addition, 10 percent from 201 samples is 20 persons. So, 20 persons will be randomly selected as samples in pilot study.

$$10\% \times \text{sample size} = \text{size of pilot study}$$

$$0.1 \times 201 \text{ people} = \underline{20.1} \text{ people}$$



3.9 Data Collection Procedure

Data was collected from stratified workers who work in random manufacturing factories. Researcher waited in front of the factories around the end of their working shift and approached every worker who passed by. Ethical issues like participants' personal data will be kept private was explained to every worker. Questionnaires were given as they agreed to participate. Participants will be given pencil and papers to answer meanwhile researcher tried to avoid them from other people so that no bias in answering the questionnaire.

3.10 Pilot study

Pilot study of a research is very important as it will ensure the validity and credibility of the instrument used which is the questionnaire. For this project paper, researcher apply pilot study to 10% of the number of samples. Total number of populations estimated around 420 workers and sample size is 201 participants, so the number of participants for pilot study should be at least 20 persons.

Raw data collected will be analysed using the *Statistical Package for Social Sciences* (SPSS) version 26 to gain the “Cronbach Alpha” values so that the validity of the questionnaire is gained. According to Hair, Black, Babin, Anderson & Tatham (2009), if the respondents’ answers are consistent, then the validity of the questionnaire is high. Sekaran (2000), cited that every instrument with value of “Cronbach alpha” bigger than 0.6 is acceptable.

Table 3.7

Range of Cronbach’s Alpha

Alpha Coefficient Range	Relationship strength
< 0.6	Weak
0.6 < 0.7	Average
0.7 < 0.8	Good
0.9	Best

Table 3.8

Cronbach's Alpha of Real Pilot Study

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.891	.883	26

3.11 Data analysis.

Data analysis was done to random workers that work at manufacturing factories. In order to analyse the data, a software called *Statistical Package for Social Sciences* (SPSS) version 20.0 is used. Data analysis included activities of data arrangement, data selection, combination of data and data scheduling (Majid, 2000). These include validity analysis, descriptive analysis, and statistical inference analysis which is the correlation test. Important information of the whole research can be derived from the data analysis. Statistical descriptive analysis will be done to gain the background info of all respondents.

3.11.1 Normality test

Normality test will be done to analyse if the data are normally distributed. The normal p value for the test is p greater than 0.05. If the p value less than 0.05, than the data is not normally distributed. Consequently, data must be further tested by using the non-parametric test.

Table 3.9

Normality test guidelines

NOT NORMAL	P VALUE	NORMAL
< 0.05	0.05	>0.05

3.11.2 Descriptive analysis

Descriptive analysis will be used to determine the value of min for data collected. Mean is the total count of spectacular data divided by number of data measured. Other than that, standard deviation (*sd*), will also be measured.

3.11.2.1 Frequency Analysis

Frequency analysis will be applied to measure the statistics of respondents' demography such as gender, race, marital status, age, highest academic, job experiences and other information.

3.11.3 Inferential Analysis

Inferential analysis is a method to relate between items by finding the significant result. The result will be used to correlate between the variables and to prove the acceptance or rejection of objectives and hypothesis. The analysis include correlation, and regression test.

3.11.3.1 Correlation

Correlation test is used to measure the significant relationship by according to significant value between variables. Based on Normality test result, if the data appears normally distributed, correlation test will be conducted by using Pearson analysis (Statistics Solutions,2020). If the data appears abnormal distributions correlation test is applied by using Spearman analysis (Statistics Solutions,2020). Contrary to Pearson analysis which runs by correlating of only two parameters to each other, Spearman correlation test is used to analyse the relationship between safety awareness towards management commitment, safety training and, safety rules and procedure. In the end, both methods should quantify relationship between independent variables and dependent variable where it uses the mean value of the IVs and DV measured from previous descriptive analysis. The results (p) signify the effects on safety knowledge among the two factories workers. The data will be considered as significance if the p value is less than 0.05.

3.12 Ethical Issue

In this study, the researcher has provided consent form for all the respondent to filled in. All respondents were briefed carefully and acknowledged that their confidential information and dignity is well protected. This study will not include the information of the selected factories such as real diagrams, pictures, excerpted company profile whatsoever. No special ethical declaration acquired from the Ministry of Health.

3.13 Conclusion

In conclusion, this chapter described on research design, research method, instruments, data collection and data analysis. Research background and sampling method were also discussed. Then, this chapter described on data analysis technic used which is quantitative method with questionnaire. All data collected will be entered and analysed using IBM SPSS version 26.



CHAPTER FOUR

DATA ANALYSIS

4.1 INTRODUCTION

This chapter present data obtained with tables and analysis according to the research objectives. The study was conducted among two factories workers from manufacturing sector in Perlis and the data were obtained through assisted questionnaire. The data was analysed using SPSS version 26 software in obtaining descriptive and inferential analysis. A short clarification has been provided to support the findings.

4.2 FINDINGS FROM DATA COLLECTION

Aforementioned in the sub-point 3.8.1, data was obtained from 201 manufacturing workers, was randomly selected from two manufacturing factories located in Perlis. Questionnaires was distributed in an assisted mode where researcher have been personally approached, asking for permission, and guided respondents in understanding questions asked in the questionnaire sets. Respondents were asked to sign the written consent attached before they answer the questionnaire. All data collected will be kept private to secure privacy of respondents. However, it is projected that not all workers approached agreed to participate in the study. Rejection boundaries has been set to 2 percent. The summary of Total data is depicted in Table 4.1. It can be seen that no rejection level has been occurred. as this research had

successfully obtained 100% of total respondents needed to support quantification process.

Table 4.1

Summary of Total Data

Case Processing Summary						
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
gender of respondent	201	100.0%	0	0.0%	201	100.0%
range of age	201	100.0%	0	0.0%	201	100.0%
years of experience	201	100.0%	0	0.0%	201	100.0%
education level	201	100.0%	0	0.0%	201	100.0%
range of salary	201	100.0%	0	0.0%	201	100.0%
mean_management_ommitment	201	100.0%	0	0.0%	201	100.0%
mean_safety_training	201	100.0%	0	0.0%	201	100.0%
mean_safety_rules_procedure	201	100.0%	0	0.0%	201	100.0%
mean_safety_awareness_knowledge	201	100.0%	0	0.0%	201	100.0%

Table 4.2*Descriptive Analysis Table*

	gender of respond ant	range of age	years of experi ence	educati on level	range of salary	mean_ma nagement _commitm ent	mean_saf ety_trainin g	mean_saf ety_rules_ procedure	mean_s afety_aw areness _knowle dge
N Valid	201	201	201	201	201	201	201	201	201
Missi ng	0	0	0	0	0	0	0	0	0
Mean	1.51	1.97	2.01	1.21	1.23	3.9154	3.9022	3.9184	3.9386
Std. Deviation	.501	.809	.592	.616	.572	.26719	.29785	.32697	.26214
Skewne ss	-.030	.694	.291	3.212	2.875	1.406	1.256	1.267	1.280
Std. Error of Skewne ss	.172	.172	.172	.172	.172	.172	.172	.172	.172
Kurtosis	-2.019	.235	-.889	10.182	8.746	2.512	3.082	2.186	2.417
Std. Error of Kurtosis	.341	.341	.341	.341	.341	.341	.341	.341	.341

4.3 NORMALITY TEST

Normality test is used to determine to distribution of data whether it was normally or abnormally distributed. The test will lead to next analysis technics to be used in inferential analysis. Normal result of normality test will suggest researcher to use parametric test and non- parametric test should be used if the result showed abnormal distribution. The next analysis is to compare and to relate between items

and variables. The significant values from Kolmogorov-Smirnov are referred as there were 201 respondents which is more than 50 respondents. The outcomes (as depicted in Table 4.3) showed that the questionnaire was not normally distributed because all the values show higher than 0.05. Therefore, according to figure 4.3, these data are subjected for non-parametric test (Spearman correlation) for further statistical investigation.

Table 4.3

Test of Normality

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
gender of respondent	.345	201	.000	.636	201	.000
range of age	.284	201	.000	.822	201	.000
years of experience	.348	201	.000	.752	201	.000
education level	.502	201	.000	.394	201	.000
range of salary	.486	201	.000	.454	201	.000
mean_management_ commitment	.182	201	.000	.871	201	.000
mean_safety_training	.197	201	.000	.881	201	.000
mean_safety_rules_ procedure	.257	201	.000	.859	201	.000
mean_safety_ awareness _knowledge	.218	201	.000	.870	201	.000

DATA ANALYSIS FLOW CHART

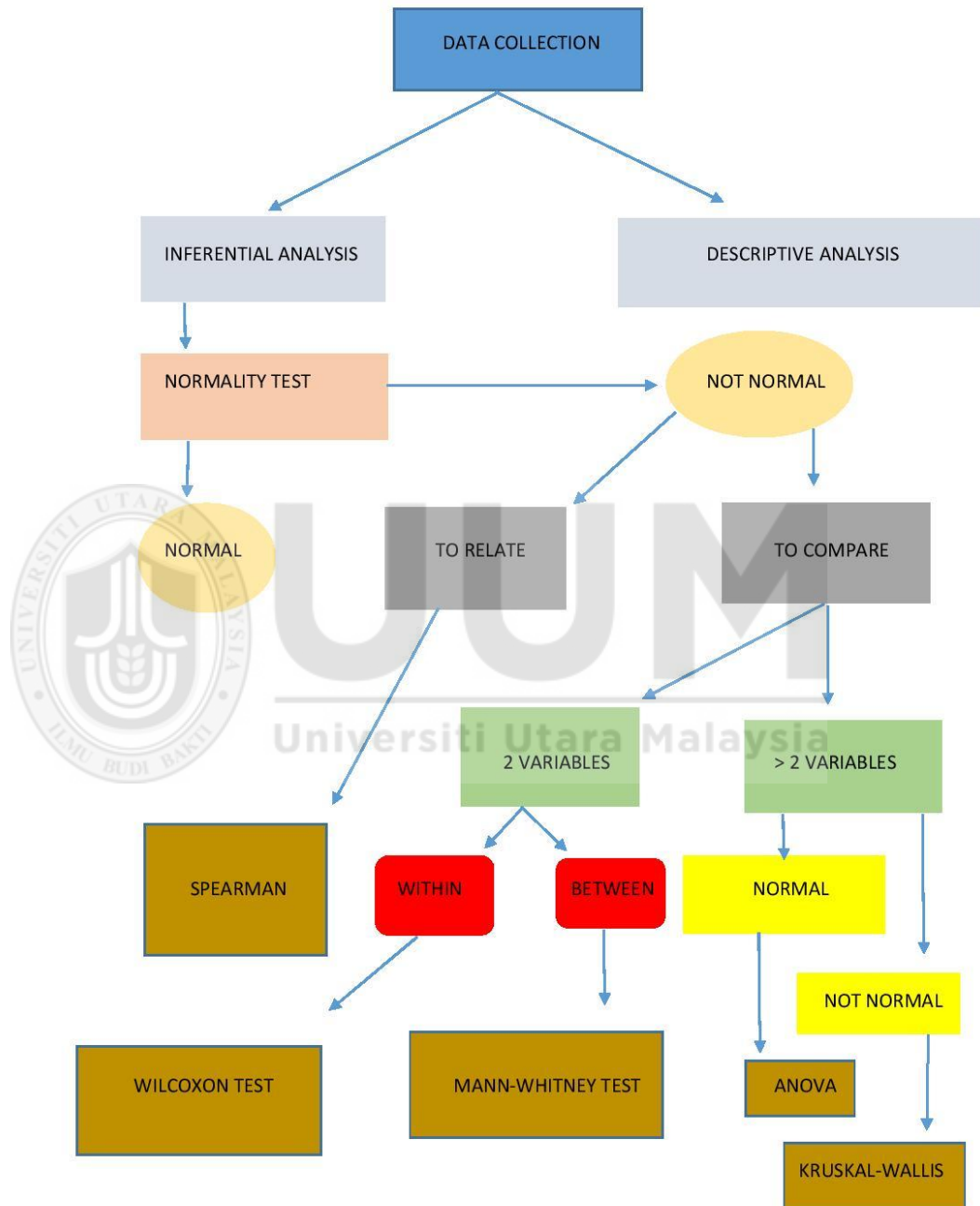


Figure 4.1: Non-Parametric Statistical Analysis Flow Chart

4.4 INFERENTIAL ANALYSIS- CORRELATION ANALYSIS

Correlation test is very important for every research to determine whether there are correlations between demographic data towards variables, and correlation between independent variables towards dependant variable. As the data is not normally distributed, Spearman test will be used in bivariate correlation test in determining results for this research.

4.4.1 CORRELATION BETWEEN INDEPENDENT AND DEPENDENT VARIABLES

This analysis is used to determine acceptance or rejection towards research objectives and hypothesis. Research's hypothesises are as follow:

H1: There is significant and positive relationship between management commitment towards safety and safety knowledge.

Management commitment finding is significant and correlate to dependant variable safety awareness as the value of p is less than 0.05. the result mean there is significant relationship between both variables. Hypothesis of "relationship between management commitment towards safety and safety knowledge is accepted

H2: There is significant and positive relationship between safety training and safety knowledge

Safety training found to be significant towards safety knowledge due to value of p is less than 0.05. Both variables are correlated and present positive relationship. Hypothesis of “relationship between safety training and safety knowledge” is accepted.

H3: There is significant and positive relationship between safety rules and procedure, and safety knowledge.

Table resulted significant value of p is less than 0.05 for correlation test between safety rules and procedures, and safety knowledge. There is positive and significant relationship between both variables. Hence, hypothesis of “relationship between safety rules and procedure, and safety knowledge” is now accepted. Table 4.4 had depicted a brief finding of correlation between variables

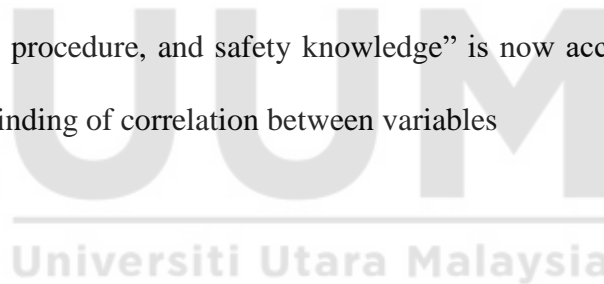
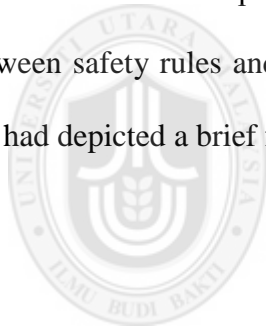


Table 4.4

Correlations Between Variables

			mean_manag ement_com mitment	mean_ safety_ trainin g	mean_saf ety_rules _procedur e	mean_saf ety_aware ness_kno wledge
Spearman's rho	mean_m anageme nt_com mitment	Correlati on Coeffici ent	1.000	.189**	.281**	.162*
		Sig. (2- tailed)	.	.007	.000	.022
		N	201	201	201	201
	mean_sa fety_trai ning	Correlati on Coefficie nt	.189**	1.000	.195**	.247**
		Sig. (2- tailed)	.007	.	.006	.000
		N	201	201	201	201
	mean_sa fety_rule s_proced ure	Correlati on Coeffici ent	.281**	.195**	1.000	.245**
		Sig. (2- tailed)	.000	.006	.	.000
		N	201	201	201	201
	mean_sa fety_aw areness_ knowled ge	Correlati on Coeffici ent	.162*	.247**	.245**	1.000
		Sig. (2- tailed)	.022	.000	.000	.
		N	201	201	201	201

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

* . Correlation is significant at the 0.05 level (2-tailed).

CHAPTER FIVE

DISCUSSION/ CONCLUSION/ RECOMMENDATION

5.1 INTRODUCTION

This chapter designated to deliberates and discuss all the results depicted in the Chapter 4. The flow of discussion will be categorised based on the research hypothesis as mentioned in Sub-point (4.4.1). Any clarification, critical views and argument are expected by either contrasting or supporting the findings based on literature review or addressing it as limitations. Recommendation and conclusion are suggested in the last section of this chapter.

5.2 BACKGROUND

The first purpose of the study is to determine the level of safety and health knowledge among manufacturing workers from two selected factories. This is as a result of large number of accidents recorded from that sector. The result was determined using three elements of safety management practice which are management commitment, safety training, and safety rules and procedures.

The other purpose of the research is to find correlation or relationship between those four variables. The three elements of safety management practice tried to be correlated towards safety awareness without any mediator between both. The result of the path analysis started by analysing the normality distribution of the study which resulted negative outcome. The study seems to be not normally distributed according

to the test. However, it is not a problem for furthering the study as data can be analysed using non-parametric test. It was proved that coefficient of the data is significant and overall model is fit to the data. As there is fewer research done in this area of study in Malaysia, this research can be used as a referral or insight in safety knowledge among manufacturing workers.

5.3 RELATIONSHIP BETWEEN VARIABLES

The all three safety management practices are positively related towards safety awareness and contribute to knowing how to do jobs in safe manners. The finding seems to be appropriated or in line with Burke et al. (2002) and Smith-Crowe et al. (2003). Significant value of p in all three management practices showed that they are directly related to safety awareness level. Vinodkumar (2010) described that management commitment, safety training and safety rules and procedure are all related to safety compliance. Being related to safety compliance means workers must have good safety awareness level. The finding provide evidence of good safety management practice will benefit in good safety compliance especially safety knowledge or awareness. A study by Mearns and Hope (2005) in offshore sector proved that greater commitment by organization towards safety and health resulted greater knowledge and compliance in safety among workers. Perception of workers on their management commitment towards safety might influence their performance on safety and this is also narrated by Vinodkumar (2010) that safety knowledge and safety implementation by workers are an indicator of their management commitment towards their safety.

5.3.1 IV1 = MANAGEMENT COMMITMENT

Management commitment on safety and health used as the first independent variable and its' relationship towards the other two independent variables and dependent variable is measured by using Spearman's Non-Parametric Correlation Test.

Management commitment measured p value is 0.008 towards safety training which means it is correlated or related with the second independent variable. Meanwhile, it is also related to the third independent variable which is safety rules and procedure as the value of significant p is 0.000. The most important result is that management commitment is also related to the dependent variable. Value of p of significant level between management commitment and safety knowledge measured at p is 0.024. management commitment is correlated to all variables as all p values are less than 0.05.

The relationship between management commitment and all other variables is a positive relation and they correlate directly as no mediator used between them. Good management commitment towards safety will increase safety awareness level among workers and makes them know how to do their job safely (Ali, et.al., 2009). Committed employers lead to good perception of workers thus motivate them to perform safely. The management must be dedicated in ensuring their employers' safety through few steps such as maintaining safe work environment and providing adequate personal protective equipment. By giving good commitment makes the

employer compliance to Section 15 of Occupational Safety and Health Act of Malaysia, OSHA 1994.

5.3.2 IV2=SAFETY TRAINING

This study is done to determine if safety training related to safety awareness and data on the safety training was measured to find its' significance. According to OSHA 1994 Section 15, paragraph 2(c), the employer must provide sufficient safety training for their employees to ensure they are committed on employers' safety and health. Based on findings, safety training is correlated to management commitment with p valued 0.008. It is also related to safety rules and procedure as the measured value of p is 0.005. Lastly, safety training is also found to be related to safety knowledge level due to the measured value of p is 0.001. It is the duty of employers to ensure safety and health of their workers. Sufficient safety training is essential in providing awareness on safety and health issues. Safety training should also be frequently provided to avoid workers from forgetting safety and health aspects at their workplace. Trainings on safety behaviour, safety job practice and even fire drills can also be organized in improving safety awareness among workers.

5.3.3 IV3=SAFETY RULES AND PROCEDURE

There is a section in OSHA 1994 which regulate employers to formulate safety and health policies. The Section 16 stated that all employers must formulate safety and health policies in ensuring safety and health of their workers. Safety rules and

procedures is selected as the last independent variable in the study and its' relationship towards safety awareness level is measured.

Measured values of p between safety rules and procedures and other variables shows significant results. The found value of p between safety rules and procedures towards management commitment is p equal to 0.000 which resulted them correlated against each other. Safety rules and procedure provided by management proved that they are committed to their workers' safety and health. Management must provide written rules and procedures on safety practice at workplace. The written rules and procedure must be made visible and literate to all workers. They can also use safety signage like "DANGER" or "CAUTION" if there are potential hazards. DePasquale and Geller (1999) were cited by Vinodkumar (2010) also suggested management to provide safety posters at workplace to help workers identify hazards.

Another p value is between safety rules and procedures, and safety training with measured p value at 0.005. It is a significant result and made them correlated. Safety training included safe practice for work procedures. Sufficient or appropriate safety training can help improve safe procedures.

Finally, p equal to 0.000 is the value measured for correlation between safety rules and procedures, and safety knowledge level. Good safety practice is a result of high safety awareness that gained by appropriate safety rules and procedures provided by the management. This was also agreed by Vinodkumar (2010), where he found that both safety rules and procedures, and safety awareness are related to each other.

Safety rules and procedures are now known to be related to all other variables studied. Good safety policies formulated will result in better safety compliance and safety climate.

5.3.4 DV=SAFETY KNOWLEDGE

Safety awareness level is very important to ensure safe and healthy workplace or work practice. According to Section 24(1) of OSHA 1994, it is understood that general duties of employees at work is to ensure safety and health among them while doing their job. Workers must possess good awareness level on safety and health in order to ensure good safety practice at workplace.

This study intended to determine whether management commitment, safety training, and safety rules and procedures are related or influencing safety knowledge level. It is found that management commitment is positively related to safety knowledge level as the significant value of p equal to 0.024. The more committed the management is, the higher safety knowledge their workers have. This made research hypothesis H1 accepted.

Another independent variable is safety training provided for workers. The determined value of p is 0.001 and that made safety training is positively related with safety knowledge level. The result concluded that the better safety training provided will increase safety knowledge level of workers making the second hypothesis H2, is now accepted. Good safety training as agreed by Harper et al. (1997), means that training is done frequently, sufficiently and holistic. Workers

must be trained on safety measures during emergencies like fire, risk assessment and risk analysis.

The last component measured to safety knowledge is safety rules and procedures. It is found that they correlate or positively related to each other. The measure value of p is 0.000 and it is a significant result. Hence, hypothesis H3 is accepted. Written rules must be put visible to workers so they can always refer to appropriate safety rules and procedures while they are in the workplace. This will result in good safety compliance among workers as it is now known to influencing safety knowledge level.

5.4 CONCLUSION

Referring to the statistical analysis done, it showed that overall study is significant. Management commitment towards safety was used as the first independent variable which relationship against safety knowledge level was to be measured. It was found that there is significant relationship between both and that proved the first hypothesis as accepted. Being committed towards workers' safety will increase the workers' level of safety knowledge thus prevent accidents from happening.

Safety training was also proved to be positively related with safety knowledge which makes second hypothesis is accepted. Proper safety training must be provided in ensuring good safety climate. Sufficient training will disclose workers to measures such as hazard and risk analysis, and incident reporting. Shannon et al. (1996, 1997)

suggested that frequent safety training must be provided for workers especially existing workers so that safety awareness and safety practice can always be improved.

Safety rules and procedure are important in ensuring good knowledge level on safety. It is now proved that both safety rules and procedure, and safety knowledge are positively related. Written policies and standard operating procedure must always be made visible to workers to make them able to refer to whenever they need to do so.

5.4.1 Implications to Workers

Everyone always wanted a healthy life be it physically, socially or mentally. People go to work as they need to earn for living and to feed their family needs. It is important for workers to have safe and healthy workplace and work practice. So, the government printed a legislation known as OSHA 1994 in helping the safety goal in achieved. There are two *Parts* in the legislation that highlight on duties of employers and workers. Employers must provide safe and healthy workplace and work environment for their workers. Meanwhile for the workers, they must care for their safety and their colleague. Workers must contain high level of safety knowledge and that will help them improve their life. Accidents causes injury, disability and permanent disability will surely affect their daily life especially if they cannot go to work. Accidents can cause damage the workers physically, socially and mentally. The worst-case scenario is if accident causes death because it will not only affect the worker but even their families.

5.4.2 Implications to Organization

Implementing safe and healthy work practice can also affect the organization. Large number of accidents will cost the organization more in their expenditures. Employers will have to spend capital on workers' treatment and in rare cases they got sued by their workers for not providing safe and healthy work environment. Employers can also be brought to court for violating or incompliance to OSHA 1994 and they can be sentenced to imprison, fine, or both. Productions will also get affected if accident tends to happen as labour or workmanship get short. Inability to produce or manufacture will decrease incomes thus causes them more loses.

In inversion of the situation above, employers will gain lots of profits if they deliver good commitment towards safety, organize sufficient safety training, and formulate safety rules and procedures for their workers. They can avoid lost days and lost labours which will prevent them from spending capitals on accidents. Workers will also be much motivated, and job will be done in safe practice resulting their output production can be maintained or even increased.

5.4.3 Implications to Country

Occupational safety and health is a global issue. It is discussed everywhere on earth. As for Malaysia, it is as important as other region looked into it. The government taken lots of initiatives in empowering safety and health through all sectors. It is the aim of the government to ensure workers have healthy life physically, socially and mentally. Safety and health of the people are the backbone of the country.

Disability or mortality will cause lost for the country especially in the aspects of labour and economy. People who work and earn will spend their money and the spending helps stabilize the economy. Insufficient labour due to many causes and one of them is as a result of occupational accidents urged the government to use foreign labourer in some sectors like constructions.

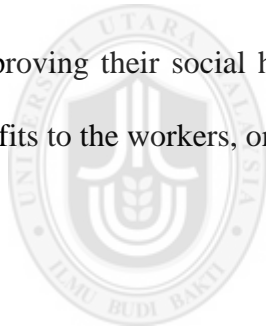
5.5 RECOMMENDATION

As discussed earlier, it is now known that safety and health issues do affect the workers, employers or organizations, and the country. The effect can be either negative or positive effects.

Responsible workers will always check on their safe work practice and care for their colleague. Workers must always get involved in safety and health programs organized by their employer. Ensure their knowledge level on safety is at a good level so that accidents can be prevented and loses can be avoided.

Good employers will provide safe and healthy work environment for their workers. Their commitment is always hoped by the workers. Employers can establish a safety committee so that workers will know how to channel their concern in safety issue at workplace. They can also reward workers that practice safety at workplace. Even the technic found to be not related to increase safety climate, but it is a traditional way used to promote safety among workers (Vinodkumar & Bhasi, 2010). Employers can also upgrade their machineries or tools with safer handling procedure.

A government must always look into the occupational safety and health issues because citizens are the future of a country. Lately, the government always urge employers to empower or upgrade their services in transitional of the industrial revolution 4.0. They must encourage employers to get into the new era of digitalization and use high-tech machineries as conventional work practice tends to higher accident occurrence. The government must also look back into the issue of minimum wages for workers. They should at least increase the minimum wages as cost of living seems to be worrying high. By doing so, workers can reduce their working hours by reducing overtime work. Their health will gradually improve, so they can concentrate more while doing their job and prevent accidents at workplace. Workers will also have more free time to spend with their families and friends improving their social health and mental health. Good safety knowledge will give profits to the workers, organizations, community and country.



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APPENDICES



SCHOOL OF BUSSINESS MANAGEMENT

QUESTIONNAIRE ON INFLUENCE OF MANAGEMENT COMMITMENT,
SAFETY TRAINING, AND SAFETY RULES AND PROCEDURES TOWARDS
OSH KNOWLEDGE AMONG MANUFACTURING WORKERS.

LATAR BELAKANG

Kajian ini adalah bertujuan untuk mengenal pasti pengaruh komitmen pengurusan, latihan keselamatan serta penyediaan peraturan dan prosedur keselamatan terhadap tahap pengetahuan keselamatan dan kesihatan pekerjaan dikalangan pekerja sektor pembuatan.

BACKGROUND

This study is intended to determine the influence of management commitment, safety training, and safety rules and procedures towards the level of OSH knowledge among manufacturing worker.

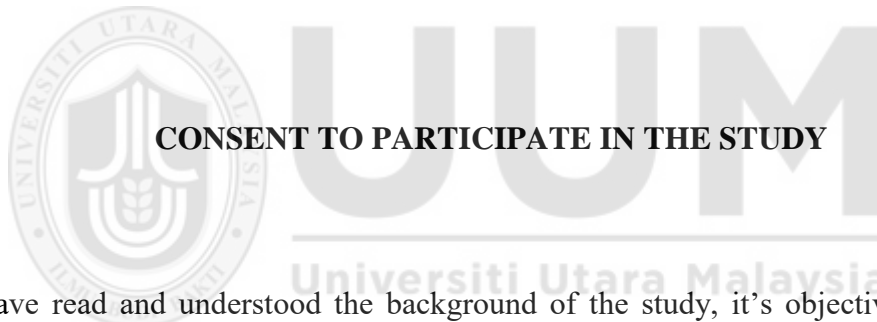
OBJECTIVES

Objectives of the study is to determine the influence of management commitment, safety training, and safety rules and procedures towards OSH knowledge among manufacturing workers.

ETHICS

Respondents will not be asked to disclose any personal information. All data collected from the study will be kept private and confidential. Data collection is only intended to be used in research study.

Researcher do not hold any stakes or relation with respondents' employers.



CONSENT TO PARTICIPATE IN THE STUDY

I have read and understood the background of the study, it's objectives and the research ethics hold by the researcher. I am now willing to participate and co-operate with the researcher by answering this question set.

Name:

Identification number:

Signature:

PART A: DEMOGRAPHIC

Please choose only one (1) answer and tick.

Q1. Are you a male or female?

Male		Female	
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Q2. What is your age range?

18-29 years old	
30-39 years old	
40-49 years old	
50 years old and above	

Q3. Years of working experience?

1-5 years	
6-10 years	
11-15 years	
More than 15 years	

Q4. Your highest education is?

School Certificate	
Diploma	
First degree and above	

Q5. Your monthly salary range?

RM 1000- RM 2000	
RM 2001- RM 3000	
RM3001- RM 4000	
More than RM 4000	

PART B: this section will be asking about your agreement on management commitment on safety at your workplace. Choose only one (1) answer.

Management Commitment	Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree
Q1. Safety is given high priority					
Q2. Safety rules and procedures are strictly followed by the management.					
Q3. Corrective action is always taken when the management is told about unsafe practices.					
Q4. In my workplace managers/supervisors do not show interest in the safety of workers.					
Q5. Management considers safety to be equally important as production.					
Q6. Members of the management do not attend safety meetings					
Q7. feel that management is willing to compromise on safety for increasing production.					
Q8. When near-miss accidents are reported, my management acts quickly to solve the problems.					
Q9. My company provides sufficient personal protective equipment for the workers.					

PART C: This section will be asking about safety training at your workplace. Choose only one (1) answer.

Safety training	Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree
Q1. My company gives comprehensive training to the employees in workplace health and safety issues.					
Q1. My company gives comprehensive training to the employees in workplace health and safety issues.					
Q3. Safety issues are given high priority in training programmes.					
Q4. I am not adequately trained to respond to emergency situations in my workplace					
Q5. Management encourages the workers to attend safety training programmes.					
Q6. Safety training given to me is adequate to enable to me to assess hazards in workplace					

PART D: This section will be asking about safety rules and procedures at your workplace. Choose only one (1) answer.

Safety rules and procedures	Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree
Q1. The safety rules and procedures followed in my company are sufficient to prevent incidents occurring.					
Q2. The facilities in the safety department are not adequate to meet the needs of my organization.					
Q3. My supervisors and managers always try to enforce safe working procedures.					
Q4. Safety inspections are carried out regularly.					
Q5. The safety procedures and practices in this organization are useful and effective.					

PART E: This section will be asking about safety knowledge at your workplace.
Choose only one (1) answer.

Safety knowledge	Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree
Q1. I know how to perform my job in a safe manner.					
Q2. I know how to use safety equipment and standard work procedures					
Q3. I know how to maintain or improve workplace health and safety.					
Q4. I know how to reduce the risk of accidents and incidents in the workplace.					
Q5. I know what are the hazards associated with my jobs and the necessary precautions to be taken while doing my job.					
Q6. I don't know what to do or whom to report if a potential hazard is noticed in my workplace					

End of questions set