ANALYZING THE ACCIDENT RISK FACTORS IN THE MANUFACTURING INDUSTRY

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DECLARATION OF ORIGINAL WORK

"I hereby declare that this report is entirely my own work with project title "The Effectiveness of Augmented Reality towards E-commerce platforms" and with the exception of a few clarifications and passages where every source is clearly cited.

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DEDICATION

I would like to dedication my gratitude to my dear parents, who have supported me have both spiritually and monetarily

Hazani bin Sahak @Ishak

Sofiaariyati binti Abdul Manaf

A big thanks to my supervisor and panel for guiding me throught my research study.

Ts Dr. L. Ganagambegai (Supervisor)

Dr. Hasan bin Saleh (Panel)

Thank you so much for always being understanding, as well as to my friends who supported and assisted me, without their support and blessing, this study would be difficult to accomplish in the time allotted. Thank you very much!

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ABSTRACT

This study examined the risk factors of accidents at work in the manufacturing industry sector. Occupational Safety and Health Act 1994 (Act 514) is an act responsible for establishing the Department of Occupational Safety and Health (DOSH). With the benefits of installing this department to protect the safety, health and employees at work, accidents at work cannot be avoided entirely. This government body aims to control the rate of accidents that occur. This study's main goal was to increase awareness about occupational safety and health among workers. The research instrument used is to distribute a survey questionnaire involving workers from manufacturing factories. This study was conducted in one of the industries in Malaysia that use chemical materials to manufacture electrical goods, namely Jinko Solar Sdn. Bhd. The findings of this study and the methodology might be useful for research at other construction sites in other regions and countries. This work provides useful information for project managers and safety practitioners who desire to improve safety and heath performance on manufacturing factories.

Keywords: *occupational safety and health (OSH) management; education/training; occupational safety health practices, work permission; hazard assessment; personal protective equipment*

ABSTRAK

Kajian ini mengkaji faktor risiko kemalangan di tempat kerja dalam sektor industri pembuatan. Akta Keselamatan dan Kesihatan Pekerjaan 1994 (Akta 514) adalah akta yang bertanggungjawab untuk menubuhkan Jabatan Keselamatan dan Kesihatan Pekerjaan (JKKP). Dengan faedah memasang jabatan ini untuk melindungi keselamatan, kesihatan dan pekerja di tempat kerja, kemalangan di tempat kerja tidak dapat dielakkan sama sekali. Badan kerajaan ini bertujuan mengawal kadar kemalangan yang berlaku. Matlamat utama kajian ini adalah untuk meningkatkan kesedaran tentang keselamatan dan kesihatan pekerjaan di kalangan pekerja. Instrumen kajian yang digunakan adalah mengedarkan borang soal selidik yang melibatkan pekerja dari kilang pembuatan. Kajian ini dijalankan di salah satu industri di Malaysia yang menggunakan bahan kimia untuk menghasilkan barangan elektrik iaitu Jinko Solar Sdn. Bhd. Dapatan kajian dan metodologi ini mungkin berguna untuk penyelidikan di tapak pembinaan lain di rantau dan negara lain. Kerja ini menyediakan maklumat berguna untuk pengurus projek dan pengamal keselamatan yang ingin meningkatkan prestasi keselamatan dan kesihatan di kilang pembuatan.

Kata kunci: *pengurusan keselamatan dan kesihatan pekerjaan (OSH); pendidikan/latihan; amalan kesihatan keselamatan pekerjaan, kebenaran bekerja; penilaian bahaya; alat pelindung diri*

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CHAPTER 1
INTRODUCTION

1.1 Background

In a manufacturing plant, workers or staff must wear personal protective equipment while in a place that carries the risk of accidents, for example, a place that uses chemicals that can cause health problems. However, not everyone complies with this directive which is a factor in accidents at work.

There are two causes of accidents: individual factor and nature of job, all of which will be discussed in more detail. These accidents resulted in the loss of valuable workers and high health care costs. Those who experience occupational hazards may experience occupational diseases or loss of life (Ya-huei Wang, 2021).

An uncomfortable and unconducive workplace environment is also one of the factors to the occurrence of accidents at work (Azam & Zilan, 2021). Employees who are less care about personal safety and do not comply with what has been set by the company, will be more vulnerable to dangers that can cause injury or, worse, death at work. The compliance of all workers in the manufacturing company on this safety issue needs to be taken seriously to reduce fatalities and accidents in the workplace. Awareness of personal safety in the workplace is the main criterion for preventing accidents. If there is no safety-prioritizing attitude among workers can increase accidents and injuries in the workplace

In the past, the manufacturing industry did not look at occupational safety and health as they were only pursuing profit which was their main goal. Still, if they continue not to comply with these occupational safety and health issues, they will also incur losses from expenses to pay. reparation. BLS also reports workplace accident statistics among industrial workers as 25% of injuries are caused by slipping, tripping, and falling (EHS Daily Advisor, 18 October 2019, Emma Voss)

1.2 Problem Statement

According to data from the Department of Occupational Safety and Health of the Ministry of Human Resources Malaysia, occupational accidents involved 6933 cases, of which 6446 cases were permanent disability, 274 cases involving permanent disability, and 213 cases involved death in 2020 alone. This explains that the case of worker safety and health in Malaysia is quite severe. Subsequently, manufacturing sector sales grew 4.5 per cent in December 202, which is the highest growth since March 2020 (Najib Aroff, 2020).

In Malaysia, the total labour force in February 2021 was over 16.05 million people (Department of Statistics Malaysia, 2021). This amount is a significant amount that deserves attention, especially regarding their safety and health. In hiring, the industry chooses Malaysians because, in the manufacturing industry, it is easiest to get a job with only a minimum achievement of Sijil Pelajaran Malaysia (SPM) to work in this sector. According to Bank Negara Malaysia (BNM), In terms of sector performance, all sectors of the economy recorded improvements. Powered by strong E&E product output and ongoing recovery in the consumer, resource, and construction-related clusters, the manufacturing sector grew at a faster rate of 6.6%.

In Malaysia, the Ministry of Human Resources introduced Act 514 to all companies under the occupational safety and health act 1994. an act responsible for establishing the Department of Occupational Safety and Health (DOSH) (Azam & Zilan, 2021). If all workers know about these laws and acts, why is there still dumping of accident cases involving this manufacturing industry? Do employees in the manufacturing industry know about this law? If the company does not follow this law, they have the right to report to a higher authority that can make a report to the Malaysian Labor Office (Siti Faridah, Laila Affiyani, 2019)

This employee safety and health issue are critical, especially in the manufacturing industry, where it involves hazardous materials and equipment according to the type of goods produced by the company. Workplaces that use these dangerous materials need to use proper clothing or equipment to reduce the accident factor in the workplace. Either directly or indirectly, every employee involved must prioritise safety to prevent accidents. The employer must ensure that all employees follow the correct steps to run a good job.

The question that is a question mark during the preparation of this report is, do employees know about the occupational safety and health act 1994? Do they work to earn a fixed monthly salary, be able to survive in the age of modelling or be someone who has the purchasing power to meet their wants and needs without thinking about the consequences behind the accident that will happen if they continue to think so? According to the case accident reports, a clear act on their safety and health while working does not indicate they know about personal safety.

Despite the many reports of accidents in the workplace. From reading on the internet, there are various ways to curb this problem, for example by wearing equipment in the right way, ensuring a comfortable workplace area, giving bonuses and rewards as appropriate to inspire them to work well and many other ways that submitted (Azhar, Rizwan, and Kamalesh, 2015)

Turning to employees' views, why are there other employees who do not want to follow the rules set by employees? What is the reason they do so? In a workplace with chemicals that can be harmful to health, the superiors will inevitably provide adequate equipment such as PVE clothing, supply face masks, gloves and others. Is it this equipment that makes them uncomfortable for them to continue working or the employees themselves who underestimate the ethics of wearing it?

1.3 Research Question

The question for this study is to meet the goal of the study, which is to improve the level of awareness of occupational safety and health among workers, especially in the manufacturing industry, where the question of the study is how to ensure the rate of accidents at work in the manufacturing industry can be reduced. The question of this study is to answer the following questions:

i. How to measure individual factors with workplace accidents among employees there factors influencing workers' accidents in the manufacturing industry?
ii. How to measure nature of job with workplace accidents among employees there factors influencing workers' accidents in the manufacturing industry?

1.4 Research Objective

There are research objectives to be achieved from this study.

i. To measure individual factors with workplace accidents among employees.
ii. To measure nature of job with workplace accidents among employees.

1.5 Scope of the Research

The scope of this study is implemented in the area of the manufacturing industry. This involves chemicals that can endanger human health, one of the Chinese companies in Malaysia, namely Jinko Solar Company in Perai, Penang. This study focuses only employees.

1.6 Summary

In this chapter, an overview of the overall research context that describes the background of research that mentions the causes of accidents can be divided into two parts: individual factors and nature of job. This chapter describes the risks to the organization if it does not take early steps to curb the problem of accidents at work.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The term research describes the meaning of the title of the study presented by the researcher and the researcher's understanding of the matter to be studied. This chapter will explain the literature review in the study in depth which will explain the issues related to the study's title. This study involves the Occupational Safety and Health Act (OSHA), which is the main emphasis of this study. The end of the chapter will show the theoretical framework of the research.

2.2. Overview Occupational Safety and Health in Malaysia

According to the National Health Morbidity Survey Report in 2015, a total of 4.2 million Malaysians aged 16 years and above suffer from various health problems, especially mental health, and most are workers. The statistical frequency of mental health problems among civil servants is 24.6 per cent, lower than that of private employees, which is 29.3 per cent. In 2016, a total of 24 688 employees received SOCSO health programs to ensure employees receive free guidance and treatment to prevent risky diseases, especially diabetes, high blood pressure, heart attack, cervical cancer and breast cancer. Especially for women (SOCSO, 2017). Apart from the work environment, employers should take note of the stress experienced by employees and the level of employee health in their organization. Therefore, employee welfare, which includes employee safety and health, should be paid attention to by employers and organizations involved.

Accordingly, an ergonomic work environment can enhance work quality and productivity (Selamat, 2016; Selamat & Mukhiffun, 2018). Aspects of work that cause muscle fatigue, limb injuries or skeletal muscle disease (MSD) and carpal tunnel syndrome (wrist) are considered ergonomic risk factors. However, an ergonomic work environment does not lie in the furniture or

tools used alone. Employees can create an ergonomic work environment if desired. According to a Berita Harian newspaper clipping, among the adverse effects of the work environment are not ergonomic: company productivity, job dissatisfaction and high accident risk. Stress experienced due to the work environment can affect the well-being of employees and the way they cope with workloads in the workplace (Edwards, 1998; Safe, 2013).

An ergonomic workstation environment is one way of alleviating stress problems in the workplace (Murphy, 2002; Zafir et al., 2013). Stress or stress in the workplace can change human psychology and physiology. Workplace stress can damage the body's immune system and cause risky illnesses including high blood pressure and heart disease. If stress is not relieved, death can occur in the individual due to coronary failure or heart disease (Zafir & Fazilah, 2006). Therefore, employers should provide an ergonomic workspace so as not to cause employees stress and, at the same time, affect their health (Selamat, 2016).

As is well known, the manufacturing sector is no exception to manual handling that requires the activities of pushing, pulling, lifting, lowering, carrying, and bearing weight without any mechanical assistance. Improper manual handling can cause a person to get musculoskeletal disease disorders (Ministry of Health Malaysia). This task manual requires specific techniques so that employees are spared from any occupational safety and health problems such as accidents, injuries, overload and the like. All these elements are classified as aspects of ergonomic work systems (Selamat & Mukhiffun, 2018). The need to look at this aspect in the organization is highly encouraged so that the continuity of employee work can be implemented better and more perfectly.

2.3. Occupational Safety and Health (OSH) Training

OSHA 1994 places a strong emphasis on training and another OSH programmed. A type of training called occupational safety and health (OSH) training attempts to provide participants the abilities they need to operate safely and prevent workplace accidents. Capacity may be developed through occupational health education, protective skills, and increased risk awareness. When someone learns the skills necessary to execute a task safely while on the job, this is when informal OSH training first started in highly industrialised countries like the United States. (Surienty et al., 2019). The OSHA was established in the 1970s, and health and safety training became

standardized. Law and policy now guarantee that employers give health and safety training to their employees. Meanwhile, OSH training and practices spread around the world throughout this 'industrial' era and continues to this day. Nowadays, OSH training is a crucial component of the sector. A safety and health officer and an occupational health specialist are necessary to maintain effective workplace supervision in processes in industrial sectors that use hazardous materials. These activities necessitate qualified persons to perform carbon emissions and medical inspection. To the greatest degree practicable, employers will protect their employees' welfare, health, and safety. Additionally, OSH training is one of the components in the safety environment, according to another study. The firm's systems and procedures should incorporate OSH training programmes, and corporate goals and safety awareness should be aligned in the organization's strategic plan. The results suggest that initiatives should be incorporated into the organization's methods and practises, and OSH training should be integrated into the overall business approach and goals. Training programmes should be tailored to the business's specific training needs (as determined by health and safety evaluation methods).

examined whether employees benefit from OHS training and whether more intensive training had a greater impact than less intensive training. OHS training for employees has been shown to be helpful in changing attitudes, but there is little proof that it improves health (i.e., symptoms, accidents, diseases) (lynsa S Robson, 2011). Employers should aim to give workers with OHS training, according to the study team, because preparedness improves job performance. However, significant health benefits from training are unlikely (Damon L. Swift, 2014). New hires frequently receive "informal" training from more experienced workers in small and medium-sized organisations, and they are occasionally required to carry out their tasks. Another study looked at the relative effectiveness of several workplace OSH training programmers aiming at increasing safety awareness and efficiency while reducing negative outcomes (accidents, diseases, and injuries).

2.4. Worker‘s Perception Towards OSH Training

The best means for employees to promote adherence to OSH standards at work are through knowledge sharing and OSH training. Workers who receive workplace training are more likely to be directly involved in the safety programmed. Workers who have completed OSH training are

taught to recognize risks and dangerous behaviors and to assess the consequences. Workers who are qualified to spot relevant job concerns should have a better awareness of the risks. This will improve their adherence to warnings and instructions. We may conclude from this analysis that workers' attitudes regarding OSH training must be investigated. The findings of James's (2011) Greater understanding is closely correlated with better safety training, according to a sample of construction workers from throughout the United States, thus whether the training's material is relevant and intelligible to the employees enhances the learning potential. This consistent with that of Hallowell (2010), who claims that good health and safety training reduces the number of recordable injuries. Mojopelo et al. (2016) investigate employee views of occupational health and safety requirements in the steel sector in South Africa. The findings show that workers in the steel sector believe OSH standards are adequate in all seven parameters examined in this study (Mohammad Alamgir, 2015). This covered knowledge and training, health and safety awareness, employee behaviour, supervisory positions, health and safety monitoring systems, occupational inspection, and workplace circumstances. Health and safety awareness has emerged as the most important factor for employees (Mojopelo et al., 2016)

Training, work environment, mechanical, ergonomics, personal protection equipment (PPE), electrical, and noise were among the seven factors examined in the study. The largest mean rating was given to the perception on training element of perception, indicating that workers' knowledge of training is stronger than other factors. According to certain OSH research, safety training is one of the most essential aspects in enhancing safety performance (Surienty & Lilis. 2019). Another study examines the necessity of worker training in the lodging industry for the protection of their physical and mental health. They were produced as a result of a detailed questionnaire-based investigation. The data from the lodging firms revealed that workers' OSH training had positive results. This may be seen more directly in their own phrases, which state that OSH is frequently offered and kept through training, and that some form of training to lessen the dangers of working hours is frequently recognised as appropriate preventative measures. Specifically, a SME accommodation firm, someone who has observed the chaos and accidents that occur when there is no training knows the benefits of training very well, especially when it comes to the safety and health of workers.

2.5. Summary

Safety and health factors are the essential indicators that can assure workplace safety and health. Furthermore, the company is responsible for ensuring that occupational safety and health are incorporated into employee routines and habits to fulfil the organisation's vision and objective. Organisations' difficulty in dealing with this component can be short-term and long-term. Organisations with record-high workplace injury rates are likelier to lose talented personnel in the short run. The likelihood of qualified people moving to an organisation where they feel comfortable is higher. New employees will be hesitant to try their luck in a company with a high accident rate in the long run. Indirectly, such records will impact the organisation's reputation. It is the organisation's job to ensure safe and healthy working conditions by carefully executing safety and health measures and making such measures the cornerstone of moving ahead.

2.6. Workplace Accident

Heinrich's definition of an accident from the 1930s is frequently used. According to Heinrich, an accident is an unexpected and uncontrollable incident in which a person sustains personal damage or the likelihood of such injury as a result of the action or response of an item, material, person, or radiation (Karla & Rik, 2022). Successful intervention techniques that lessen the high human and societal costs of occupational accidents may result from an efficient causal analysis methodology. However, it is a Herculean undertaking and practically impossible to achieve the target of zero workplace accidents (Zakaria, 2012)

It is frequently maintained in more recent research that the terms "unplanned" and "uncontrolled" are deceptive. This can suggest that fate or chance played a role in the incident. It is uncontrollable. However, it is typically discovered that many occurrences were predicted and could have been avoided if the appropriate steps had been taken when the causes are established. This suggests that fate or chance were not factors in the incident (Karla & Rik, 2022)

According to Gyekye (2010), occupational accidents are often linked to two main causes: internal causal factors (worker dispositional qualities) and external causative factors (workplace characteristics). In the United States, there are over 1.6 million industrial accidents per year, and

mild to permanently disabled injuries, and occasionally even death. The distinction with these incidents is that they immediately impact a person's employment, and accidents that occur at work are the employer's responsibility (Dacanay, 2011)

2.7. Stress and Fatigue

Chronic fatigue and sleep issues brought on by long-term stress might diminish energy levels. For instance, a recent research of more than 7,000 working individuals discovered that weariness and work-related stress were "substantially correlated." Stress-related insomnia and disturbed sleep can also lead to low energy. (Link, 2021).

Due to a lack of energy while working will cause their focus to decrease and will cause accidents at work. Workload in the sense of HF psychology has been shown to be a major factor in determining stress and tiredness levels among workers undertaking monotonous manufacturing jobs (MacDonald, 2003).

Joshua (2022), the co-founder and CEO of the Six Seconds Emotional Intelligence Network, stated that there are four ways to deal with stress: first, by practising mindfulness, which entails taking a breath and observing behaviour and feelings without judgement or reaction; second, by using the label effect; third, by re-framing thoughts to view the current situation from a different perspective, the last method is to go from anxiety to enthusiasm, which transforms the former into the latter.

2.8. Unsafe Acts

Any employee behaviour that contravenes a recognised safety standard or practise, endangers oneself or others while carrying out work-related tasks, damages company property, and incurs reputational and monetary losses on the employer's part is deemed dangerous conduct. These human behaviours may be the consequence of employees' callous attitudes, a lack of awareness of safety precautions, or a disregard for safe working practises. (Green World Group, 2021)

Generally, workplace accidents occur either due to unsafe working conditions and unsafe acts of employees. Examples of unsafe acts that can cause accidents in the workplace are not following

proper work methods, using damaged equipment, not wearing personal protective equipment (PPE), working under the influence of drugs and alcohol, etc (Aksorn & Hadikusumo, 2007).

2.9. Machineries/tools

According to Payne (2011), accidents involving risky or malfunctioning machinery are much too frequent in the UK. Effective risk assessments in the industrial sector have recently been a focus of the Health and Safety Executive. While mechanical handling mostly eliminates the risks associated with manual handling, it also creates additional risks. Personnel injuries are less common but typically more serious. Transport or equipment used at work is the leading cause of industrial accidents, accounting for roughly 70 fatalities annually. Most of these accidents may be avoided (HSE, 2005).

Workers who are required to use that machinery, equipment, or tools to carry out their responsibilities are placed in a dangerous situation. Being caught in or crushed by tools or objects is one of the top 10 leading causes of occupational accidents, according to the U.S. Bureau of Labor Statistics. In 2019, 93 workers died as a result of being "caught in running equipment or machinery." One of the OSHA requirements that is frequently found to be violated is machine guarding. (Silverman, McDonald & Friedman, 2021)

2.10. Design of Workplace

As Beasley (2011) points out, older buildings may contain asbestos, which will affect all occupants. Damaged electrical wires or wiring can literally shock office workers. The arrangement of workplaces or machines and so on that are not suitable can also cause accidents in which workers who work in such places are likely to be hit or fall while working. The next step that employers can take is to provide a protection plan for employees in the event of an accident. With this protection plan, employees can make the choice to exit safely and quickly during an accident at work which with this plan will reduce accidents (Great Eastern, 2022).

According to Zakaria, Mansor, and Abdullah (2012), it is not difficult to prevent workplace transportation accidents with appropriate workplace design. But once a hazardous plan has been

constructed, fixing it is significantly more difficult. Therefore, it is essential that the design phase in the workplace receive greater attention. The lighting conditions are one of the particular suggestions made by Zakaria, Mansor, and Abdullah (2012) for minimising workplace transportation accidents. These conditions must be met by drivers in order for them to see clearly and identify dangers and pedestrians as fast as possible. Proper illumination is crucial. As individuals become older and lose their vision, this becomes even more crucial. To encourage a pleasant workplace, the element of noise level should be monitored. Others include the working environment, which enables easy transit operations, which require the help of traffic control signs. Signage and high-visibility lines used to mark edges (such as on ramps) are useful. In order to give the driver's eyes time to adjust, he draws attention to the usage of stop signs and suggests that they can be employed while moving between regions with varying illumination levels. Where people and cars interact, there has to be obvious markings; ideally, designate zones on the floor for stock storage spaces, traffic areas, and pedestrian paths.

2.11. Training Procedures

An employer provides workers with the training and educational opportunities designed to provide them the skills they need to do their jobs effectively. After the training is through, the employee will be competent and skilled and able to do his duties thanks to the training. Depending on the sort of employment, training might last a few days or many weeks. The trainee is free to ask questions at any time, and the trainer should provide the trainee with as much hands-on teaching as feasible (Clark, 2017).

According to Public Health Foundation (2022), Effective training continues after a one-on-one training session has ended and begins well before it does. The training process is made up of five interconnected phases or activities: assessment, motivation, design, delivery, and evaluation. This online resource offers recommendations for enhancing training efforts in each of these five areas, steps for putting those recommendations into practise, and references to related studies. Each chapter of the book builds on the one before it, demonstrating how trainers progress through the stages of creating, delivering, and assessing training.

2.12. Theoretical Framework

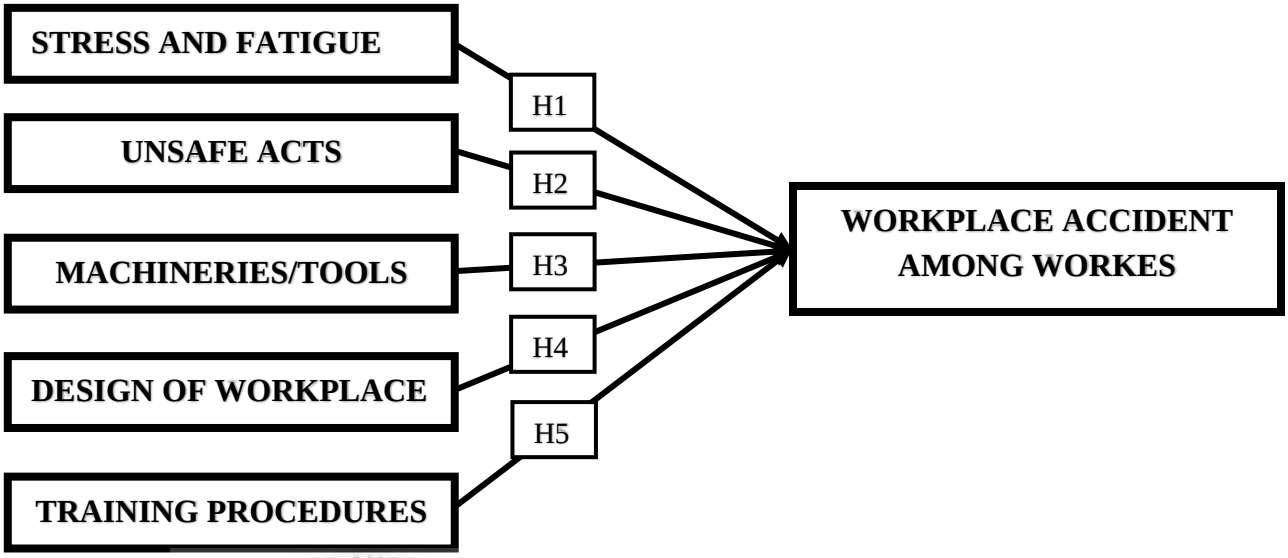


Figure 2.1: Theoretical Framework

2.13. Hypothesis of Study

Based on the theoretical in figure 2.12 the hypotheses are formed to define the concept formulated is valid or invalid. The researcher had been present the following hypotheses.

Hypothesis 1 (H1)

H1: There is significant relationship between stress and fatigue and workplace accident among workers.

H0: There is no significant relationship between stress and fatigue and workplace accident among workers.

Hypothesis 2 (H2)

H2: There is significant relationship between unsafe acts and workplace accident among workers.

H0: There is no significant relationship between unsafe acts and workplace accident among workers.

Hypothesis 3 (H3)

H3: There is significant relationship between machineries or tools and workplace accident among workers.

H0: There is no significant relationship between machineries or tools and workplace accident among workers.

Hypothesis 4 (H4)

H4: There is significant relationship between design of workplace and workplace accident among workers.

H0: There is no significant relationship between design of workplace and workplace accident among workers.

Hypothesis 5 (H5)

H5: There is significant relationship between training procedures and workplace accident among workers.

H0: There is no significant relationship between training procedures and workplace accident among workers.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the researcher's methodology in reviewing what this study will use. The purpose is to explain how this study was conducted. The data were obtained and analysed to get accurate information. Researchers distribute pilot tests before distributing to actual respondents.

3.2 PHILOSOPHY AND APPROACH OF THE STUDY

There are various philosophical patterns and methods of research. Referring to the theory of Saunders et al. (2012), there are six layers of research methods, namely philosophy, process, preferred methodology, strategy, time horizon and techniques and procedures. In this study, the research adopted Saunder Research Onion Model 2011 version as the basis of the methodological approach.

3.2.1 Research Philosophy

The research philosophy has four types, namely positivism, realism, interpretivism and pragmatism. According to Dr Jasim (2017), the philosophy of pragmatism type study only accepts concepts relevant to the existence of an action. The idea of pragmatism type study philosophy has three types of pragmatism approach, namely deductive approach, inductive approach and abductive approach, which are found in the second step of onion philosophy.

a) Deductive Approach

Quantitative techniques are used in deductive research. Deductive methodology enables research to create hypotheses based on ideas already in existence and then conduct research to test those assumptions. The best methodology for quantitative design is the deductive approach.

3.3 RESEARCH DESIGN

The researchers used the creation of this study to determine the methods used by the survey in their research. According to Maxwell's (2011) theory, the study design has five components. The five components found in Maxwell's (2011) theory are objectives, theoretical framework, research questions, method and validity.

These five components can answer all the research questions studied by the researcher. This goal is related to the theoretical framework and research method because, through the plan, a theoretical framework and method selection can be made to obtain accurate information and answer research questions. At the same time, validity has a relationship between the goals, theoretical framework, methods and research questions. All components must be validated through questionnaires or structured questions to experts to obtain accurate information or use software systems that other researchers widely use to prove the validity and reliability of studies that have been made (Maxwell, 2012).

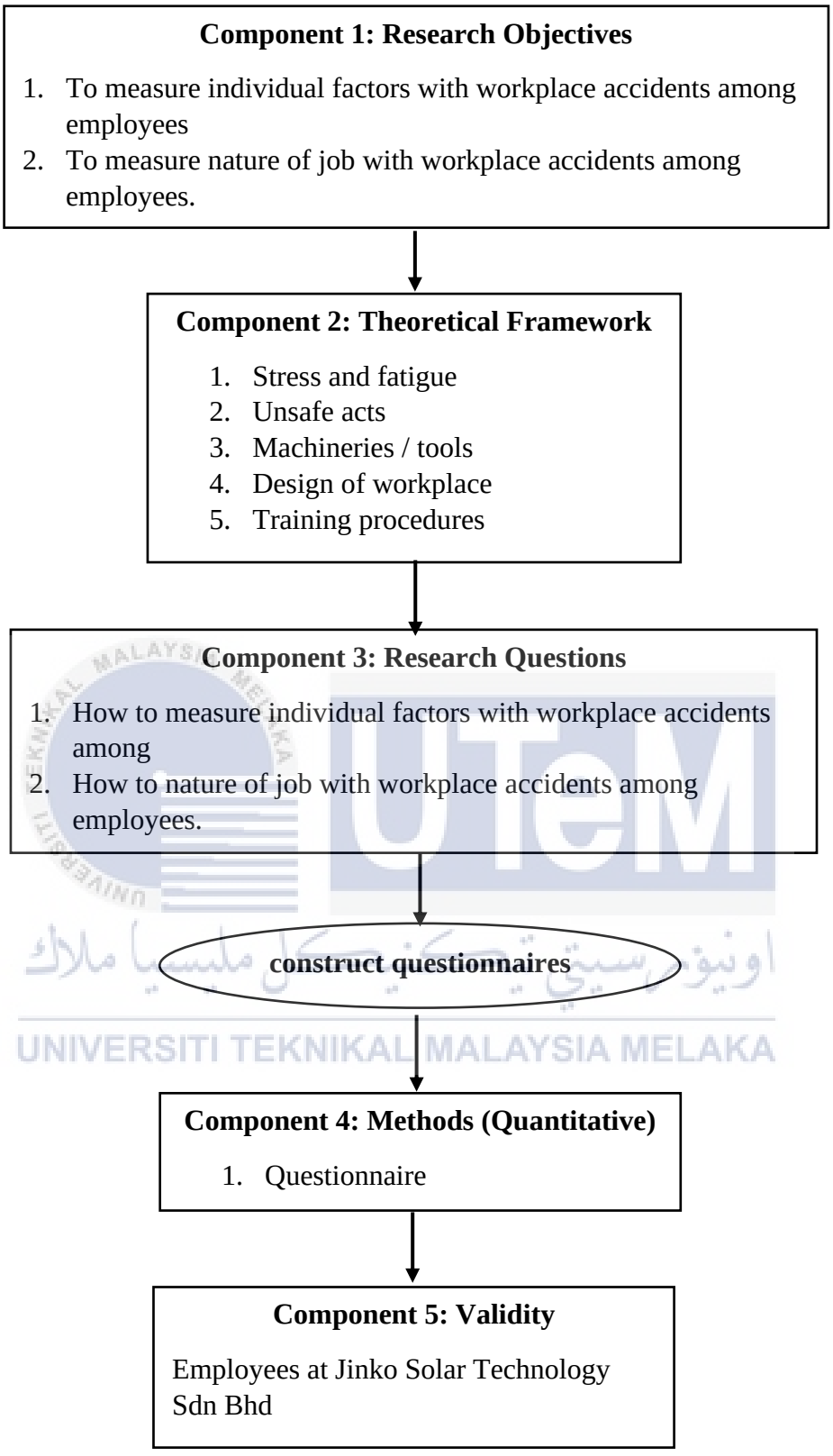


Figure 3.1: Research Design

3.3.1 Research Objective

The study's objective is a combination of the purpose, goals, and overall things that have been examined in the previous chapter. This study aimed to propose a program or policy on safety and health among employees.

3.3.2 Theoretical Framework

This theoretical framework has five constructs that represent factors that influence risk factors that contribute to workplace accidents, which five constructs have been classified into two, namely individual and nature of job.

The first construct of the theoretical framework of this study is the individual aspect that explains stress and fatigue which are the causes of workplace accidents among employees.

The second construct is still under the individual aspect explaining unsafe acts, which is the behavior of workers before, during and after doing work that may cause an accident.

The third construct under the nature of job aspect which explains the existence of machines and tools that can lead to workplace accidents among employees

The fourth construct is the design of the workplace which focuses on the layout of the workplace, arrangement of items such as machines and so on and also on a good protection plan.

The fifth construct is training procedures that need to be given attention and emphasis by superiors by providing sufficient training to each level of employee position.

3.3.3 Research Questions

To carry out this study, several research questions are issues that need to be seen in detail. Research questions are essential in conducting research. This study aims to find a solution to the following:

1. How to measure individual factors with workplace accidents among employees there factors influencing workers' accidents in the manufacturing industry?
2. How to measure nature of job with workplace accidents among employees there factors influencing workers' accidents in the manufacturing industry?

3.3.4 Methods

This study uses techniques to obtain authentic information from the respondents involved. The method used was the questionnaire method.

3.3.4.1 Questionnaire

A written list of inquiries or things is referred to as a questionnaire. It is a tool created especially for gathering data for analysis and answering research queries. This questionnaire must be created by a knowledgeable individual in order for the questions to be suitable, trustworthy, and emotion-free. For the questionnaire to obtain an optimistic response, it must be implemented carefully and over an extended period of time.

Therefore, this study uses a questionnaire method to obtain information on risk factors that contribute to workplace accidents that are focused on the manufacturing industry.

3.4 Methodological Choices

According to Saunders et al. (2016), there are three sorts of methodological choices: quantitative, quantitative, or mixed techniques, which are distinguished by whether they focus on textual, numerical, or mixed data. The research approach is a framework for explaining how research is carried out. It includes the techniques and methods for carrying out certain investigations or research. An analytical approach is a collection of approaches used in a variety of research projects (Walliman, 2015). As a result, it's critical to pick a technique that's appropriate for the study's goals. The quantitative research technique was employed in this study since holding an questionnaire session helped the researcher to better grasp the respondents' thoughts and viewpoints. It is a complete research technique since it allows researchers to get information and expertise by participating in current events. (Williams, 2007; Creswell, 2003).

The researcher will perform research investigations at Jinko Solar when the research difficulties and emphasis have been defined and established. The researcher has chosen a

quantitative technique in which he will distribute questionnaires to employees about their experiences regarding workplace accidents that may occur at Jinko Solar. One of the company's management has given permission to the researcher to carry out the questionnaire activity. Due to the spread of the epidemic, the virtual questionnaire was conducted via WhatsApp in the form of a link which will directly lead to the Google form. The questions produced are bilingual because it is feared that some employees may not understand the meaning of the question if it is made in English only.

At Jinko Solar, quantitative methodology will be used to ask various questions in the google form, the link will be given randomly and only involve employees at Jinko Solar only regarding the cause of accidents at work which consists of two aspects namely individual and nature of job. The purpose of using this quantitative approach is to ensure that the researcher obtains the correct information related to the objectives of the study and extract that information for use in research writing.

3.5 Primary Data Sources and Secondary Data Sources

Data collection is essential to the success of the investigation. Primary data and secondary data are two types of data sources used in research. Observational, semi-structured, in-depth and survey group questionnaires can be used to collect primary data. Documentary secondary data, multi-source secondary data, and survey secondary data are three categories of secondary data. The researcher uses primary and secondary data to identify the right direction and advice to complete the research in this study. According to Ghauri et al. (2020), primary data can be used to collect data for specific research objectives and questions. As a result, original data may help researchers in solving certain challenges. The main data for this study was obtained from employees who were respondents to the questionnaire from Jinko Solar Malaysia, who are Jinko Solar employees themselves from various departments.

Secondary data, according to Saunders et al. (2016), are resources that were obtained for a different reason and then analysed to give extra or different knowledge, interpretations, or conclusions. Meanwhile, the source's significance stems from the fact that its gathering and examination might yield more or different information, interpretations, or conclusions (Bishop and Kuula- Luumi, 2017). The secondary data is used to support the thesis's research goals. Extra information is gathered through social media networks and the official website. As a result,

information research aided in the accurate comprehension of the study issue. Finally, the validity and trustworthiness of this inquiry are ensured by the analysed data acquired from secondary and primary sources.

3.6 Location of research

In this study, the researchers looked at Jinko Solar, a firm that uses chemicals to create solar panels. The headquarters of Jinko Solar are in Shanghai, China. Penang, Malaysia, has opened a branch. Jinko Solar is a new type of firm that focuses on beneficial products, such as solar panels that utilise chemicals that produced. The study's respondents only took into account management and executive roles for which they were aware with the industry's operational procedures. As a consequence, the researcher was able to acquire enough data and summarise the study's objectives.

3.7 Sampling Design

The phrase "sample design" refers to both the formula for computing the sample statistics using the estimate methodology as well as the plans and methods for selecting a sample from the target population. These statistics are employed to draw conclusions about the characteristics of the population (Syed, 2016).

3.7.1 Sampling Technique

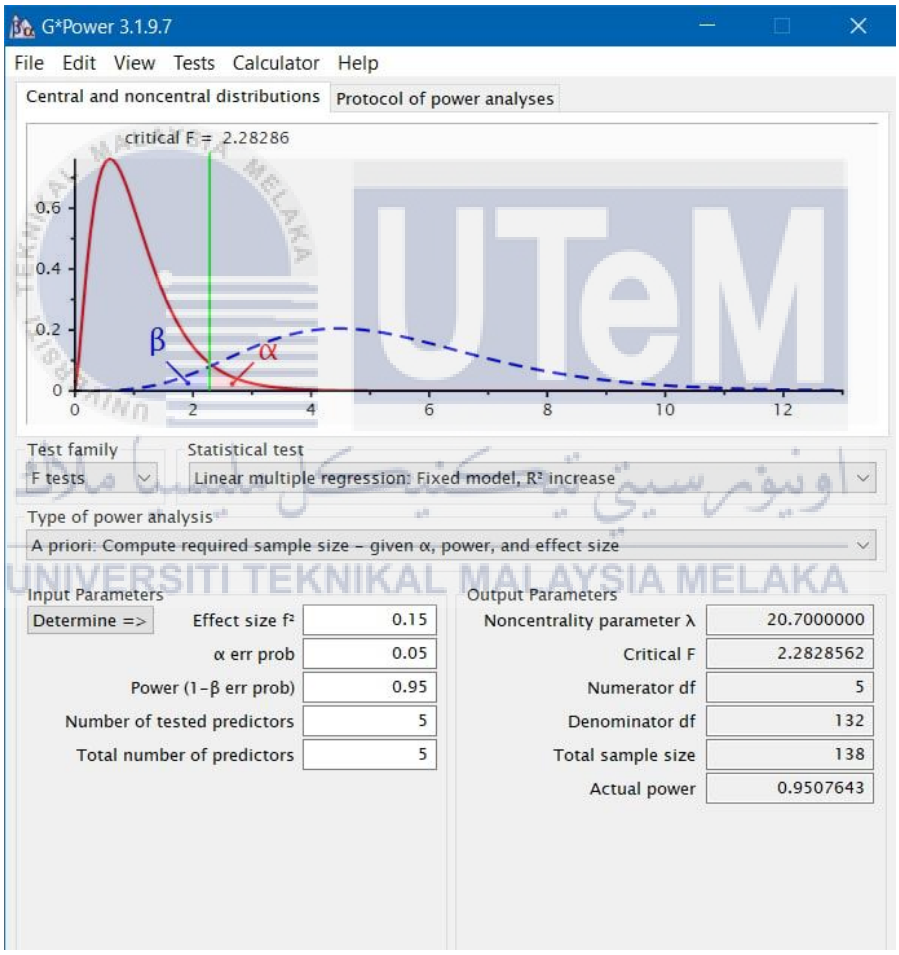
Probability Sampling and Non-Probability Sampling are two essential sampling methods. Probability sampling is frequently referred to as random sampling or opportunity sampling, according to Syed (2016). While non-probability sampling uses the sampler's own discretion or judgement to choose the population items that make up the sample, it is a non-random and subjective sampling approach.

In this study, the researcher chose to use a non-probability sampling technique, which is quota sampling. This technique is suitable for this research because it focuses on workers who work in manufacturing plants using chemicals. It will focus on all states throughout Malaysia and all populations between 18 and 60 years old can be selected to be respondents.

3.7.2 Sampling Size

According to Statiska (2021), the number of people working in the manufacturing industry in Malaysia is 2,618. Data will be collected from workers in the manufacturing industry who use chemicals at work. Therefore, the sample size of this study is 150 respondents based on the sampling method using G*power.

A free power analysis tool for several statistical tests is G*Power. In the area of correlation and regression analysis, we propose updates and enhancements to the version first introduced by Faul, Erdfelder, Lang, and Buchner (2007).



Based on the table from the result of calculating G*power above found the number of respondents that need to be found as many as 132 respondents, but made as many as 150 respondents in addition in case of problems and others. The number of respondents is obtained by filling in the input parameters to obtain the output parameters as above

3.8 Research strategy

According to Sekaran and Bougie (2016), strategy is one of the components in achieving a goal. A research strategy will assist the researcher in meeting the study aim and answering the research questions. Experiment, survey, documentary research, case study, ethnography, action research, grounded theory, and narrative inquiry are some of the research methodologies that may be used in the study. As a result, the researcher must select a research strategy based on the study purpose and questions.

A case study was the research strategy used by the researcher to finish this study. According to Sekaran and Bougie (2016), a case study is a research technique that focuses on gathering data about a specific item, event, or activity, such as a specific business unit or company. Aside from that, the quantitative exploratory approach may be used to do a case study. As a result, the case study is significant for Jinko Solar Malaysia to research the causes of workplace accidents and how to address the problem of workplace accidents.

The quality of the sampling positively impacted the reliability and validity of the collected data and findings of the research. According to Saunders et al. (2019), the volume of data gathered can be reduced by collecting information from a selected subset rather than all prospective respondents and candidates. If the researcher were to analyse and collect data from the entire population, it would take a long time and be very expensive. As a result, the researcher chose Jinko Solar executives and managers with at least one year of experience as respondents since their understanding of the subject may help improve the quality and accuracy of the data in this study. In addition, the researcher chose the best potential respondents to answer the research questions using the judgmental sampling approach. This will be quite precise, with a very little margin of error.

3.8.1 Questionnaire Design

For this study, the researcher will create a questionnaire to gather information and find an answer to the problem statement. Based on earlier study on this area, the researcher will create a questionnaire. The researcher will come up with inquiries. Workers who utilise chemicals in industrial factories provided the data for the study's respondents.

The research questionnaire will have seven components. The first part will contain information about the demographic characteristics of the respondents, such as gender, age and others. The second part contains various workplace accident among workers. the third part has the causes of stress and fatigue. the fourth part has the causes of unsafe acts. the fifth part has the causes of accidents related to the machinery and tools used. the sixth section has the causes of accidents based on workplace design and the last section has the causes of accidents based on training procedures.

According to M. Williamson (2002), the questionnaire is graded on a 5-point Likert scale. It is a sufficient scale to determine the attitude of the respondents. The Likert scale has a response range from "strongly disagree" (1) to "strongly agree" (5). The questions asked are based on several other journals that the researcher will choose from those journals. Completed questionnaires will be generated in the form of Google Forms which is a web application for online techniques to which a boring link will be sent and given to all manufacturing plant workers who use chemicals at work.

3.8.2 Pilot test

Cronbach's Alpha has been utilized to gauge the internal consistency and assess the validity of the data sets for each variable in this study. which are workplace accidents, stress & fatigue, unsafe act, machineries and tools, design of workplace and training procedures. The table shows the results of the pilot test.

Reliability Statistics

Cronbach's Alpha	N of Items
.960	35

Table 3.2: Reliability Test for 30 Respondent

[Sources: Data Analysis of SPSS]

The acceptable Cronbach's Alpha value, according to Hair et al. (2017), is between 0.60 and 0.80, and a value greater than 0.80 is regarded as outstanding. Table 3.2 shows a Cronbach's Alpha is 0.960 for 35 items with this value if according to Hair et al. (2017), this value exceeds the minimum rate and is a very good value for the pilot test.

Variable	No of Items	Cronbach's Alpha
Workplace accident	13	0.916
Stress & fatigue	6	0.803
Unsafe act	6	0.861
Machineries & tools	6	0.896
Design of workplace	2	0.624
Training procedures	2	0.731

Table 3.3: Reliability of Each Variable

[Source: Data Analysis of SPSS]

The highest Cronbach's Alpha value in independent variable is machineries & tools with 0.896 followed by unsafe act with 0.861, stress & fatigue with 0.803, training procedures with 0.731, and the lowers alpha value design of workplace with 0.624. Lastly, the dependent variable, workplace accident with 0.916 is a highest alpha value for all the data that has been used using SPSS. Overall, the internal reliability coefficient of independent variables can be considered as excellent since the alpha values are greater than 0.80 as suggested by Hair et al. (2017). Therefore, The outcomes demonstrated the consistency and dependability of the measurements for each variable.

3.9 Method of Data Analysis

Predictive analysis is a scientific approach for analysing massive amounts of numerical data to summarise the significant results of future trends, characteristics, and engagement. Its goals are to generalise behavioural study patterns and the current effects of future trends (Lucey R., 1999). The Statistical Package for Social Science (SPSS), version 26, must thus be used by the researcher to analyse the information gathered from the respondents. The Statistical Package for Social Science (SPSS) is a windows-based programme that may be used to look for and analyse knowledge sections, as Howell, D. C. (2014) notes. It may also be used to make tables and charts.

Three tools—descriptive analysis, Pearson Correlation analysis, and linear regression analysis—will be used in the analysis.

3.9.1 Descriptive Analysis

According to Saunders et al. (2019), there are three techniques for determining central tendency: mode, median, and mean. Dispersion, on the other hand, is used to determine the distribution of data values within the normal distribution. Descriptive analysis is a technique for converting unstructured data into understandable information. The data has been reorganised, structured, and modified to provide descriptive information. The frequency percentage was used to explain the calculation of data on demographic variables.

3.9.2 Pearson Correlation Analysis

To check the intensity of the relationship between two variables, Pearson's Correlation analysis was used. Independent variable (IV) and dependent variable (DV) are variables. The researcher used Pearson's Correlation analysis to evaluate the strength between the factors that influence the cause of the accident (IV) and the workplace accident among workers (DV). A strong positive correlation is indicated by a correlation coefficient value of +1, while -1 reflects a low negative correlation. The closeness of the correlation is determined by the greater difference in the results from the fitted side. The coefficient, r, to zero, while the higher the value of the correlation coefficient, r, +1 or -1, the lower the difference in the best-fit line results.

Correlation Coefficient, r	Interpretation
± 0.80 to ± 1.00	Very Strong
± 0.60 to ± 0.80	Strong
± 0.40 to ± 0.60	Moderate
± 0.20 to ± 0.40	Low
± 0.00 to ± 0.20	Very Low

Table 3.4: The rules of Thumbs Interpretation Correlation

3.9.3 Linear Regression Analysis

In order to determine the link between one dependent variable and one or more independent variables, Utilizing linear regression analysis will be the researcher. The five independent variables in this study include stress and exhaustion, dangerous acts, machinery or tools, workplace design, and training processes, all of which have an impact on worker accidents in the industrial sector. The researcher intends to apply linear regression analysis as a result.

$y = a + bx_1 + cx_2 + dx_3 + ex_4 + fx_5$

Which: y = dependent variable value (workplace accident among workers)

a = constant

b, c, d, e, f = coefficient

x_1 = independent variable (stress and fatigue)

x_2 = independent variable (unsafe act)

x_3 = independent variable (machinery or tools)

x_4 = independent variable (design of workplace)

x_5 = independent variable (training procedures)

3.10 Validity and Reability

To provide a reliable result, researchers must take into account validity and reliability. The validity and reliability of the data collection are necessary to minimise the risk of developing a random questionnaire and receiving inaccurate replies (Saunders et.al, 2019). The researcher will look for other strategies to get over these limitations in order to improve the study's quality and measurement accuracy and reliability. The foundation of excellent research, according to Mohajan, H. K. (2017), is the trustworthiness (reliability and validity) of the data utilised to draw conclusions; without this, no meaningful conclusion can be drawn. In quantitative analysis, measurements can be accurate but not valid; however, if they are unreliable, they cannot be valid (Thatcher, 2010; Twycross & Shields, 2004).

3.10.1 Validity

The three types of validity are construct, internal, and external. Ghauri and Gronhaug (2005) defined internal validity as the presence of a causal relationship between two variables that are dependent on and independent of one another. Therefore, the study's content must be simple so that respondents may easily understand it and respond to it. The ability to generalise findings from a specific context and a small group to a wide variety of circumstances and a large population is another definition of external validity (Neuman, 2003; Ghauri and Gronhaug, 2005; Cohen et al., 2007). According to Gardenier JS and Resnik DB (2002), it has been demonstrated that the researcher's bias in the research study may, either knowingly or unconsciously, be a barrier to the construction of validity.

3.10.2 Reliability

Cronbach's alpha coefficient testing was used by the researcher to assess dependability. It is a method for figuring out how reliable and consistent a variable is. The error of participants and analytical error are two risks that might jeopardise the validity of study. Researchers should find some qualified respondents to increase the surveys' trustworthiness. Factor loading, mean, and standard deviation are all considered during the reliability evaluation.

The precision and reliability of a system are assessed using the Cronbach's Alpha or Alpha coefficient. The coefficient is between 0 and 1. The independent and dependent variables must be in a relationship if the outcome is more than 0.6 or almost equal to 1.0.

Cronbach's Alpha Coefficient	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.7 \leq \alpha < 0.9$	Good
$0.6 \leq \alpha < 0.7$	Acceptable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

Table 3.5: Conbach'Alpha Coefficient

3.11 Summary

The researcher will describe the procedures employed to perform this study in this chapter. Because it covers workplace safety, which is a major subject every year, exploratory research methodologies were chosen as the study design. For the Jinko Solar firm, which manufactures items that include particular chemicals, exploratory research approaches allow researchers to investigate and explore the reasons of workplace accidents and the best strategy to address the problem. A quantitative study was chosen as the tool for gathering and collating data and information in this investigation. Furthermore, quantitative research is the best approach for gathering, compiling, and analysing data and information for this study since it allows the researcher to do in-depth analysis while avoiding neutral bias throughout the data collection process.

In addition, crucial data for this study was gathered through questionnaires with six respondents from Jinko Solar headquarters, including experienced staff and executives. To accomplish this study, the researcher used secondary material from papers, journals, websites, and books as a reference. The research technique adopted for this study is case study, which is a real-world context that enables for analysis and study of real-world instances. The research technique was chosen because it allows the researcher to evaluate and study genuine situations in order to gather real data in order to answer the study's objectives and research questions. Furthermore, cross-sections were chosen as the temporal horizon for this study since most academic research is conducted over short periods of time. The researcher also addressed the study's validity and reliability, and he stuck to it in order to generate a valid and reliable study.

3.12 Research framework

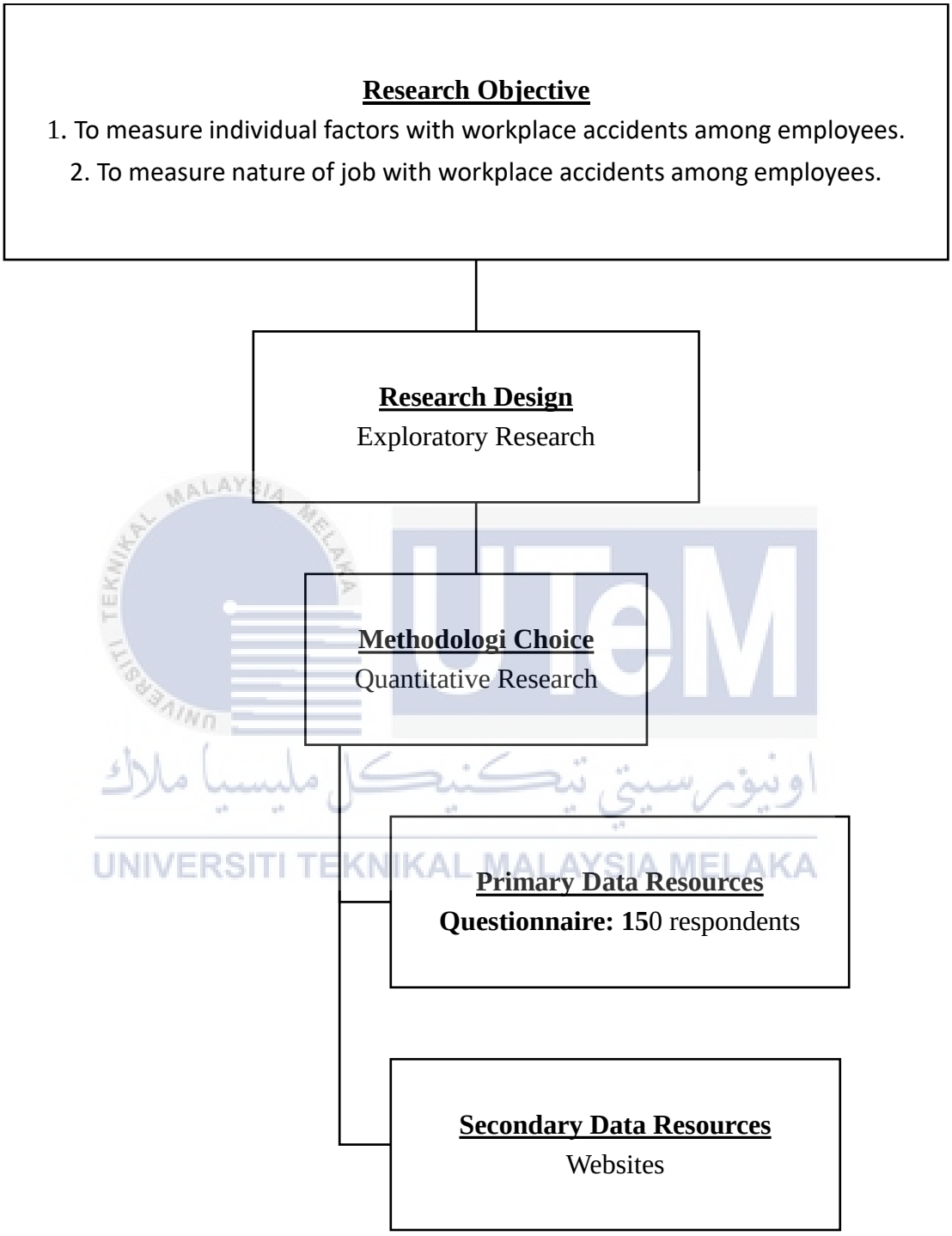


Figure 3.6: Research frameworks

CHAPTER 4

DATA RESULT AND FINDING

4.1 Introduction

The survey results that were sent to the target respondent data are examined in this chapter. The bulk of this chapter was written using the 150 respondents' responses, which were also utilized for the study's objectives and final analysis. The survey is broken up into three sections, each of which contains demographic data about the respondents as well as dependent and independent variables. The poll is intended for workers who have worked in or are now employed in chemical manufacturing businesses. Therefore, descriptive statistics, pearson correlation coefficients, and multiple regression data were produced and assessed using the Statistical Package for Social Science (SPSS) 26 program.

4.2 Descriptive Analysis

The gathering of a data collection that reflects the complete population or a sample is known as descriptive analysis. It displays an overview of the sample and findings. Every sample of data has also been assessed, along with a sample graphic analysis.

One kind of descriptive analysis is preliminary analysis, which includes data gathering through surveys. This analysis explains how the sample data functions and the data that is shown. Tables, diagrams, and summaries are used in descriptive analysis methodologies to characterise, describe, and explain data sets. In this study, the researcher decided to disseminate questionnaires to workers in the manufacturing business using the Google form approach.

The first component, Section A, has questions about 'Gender'. 'Age', 'Work experience', 'Educational level', 'Marital level', 'Smoking-related status' and 'Drinking-related status'. Section B is a dependent variable that focuses on ‘Workplace accident among workers’. Section C is the first

independent variable which consists of 'Causes of accidents due to stress and fatigue' while working. Section D is the second independent variable which consists of 'Causes of accidents due to unsafe acts'. Part E is the third independent variable which consists of 'Causes of accidents caused by machinery or tools'. Section F is the fourth independent variable which consists of 'Causes of accidents due to design of workplace' and Section G is the last independent variable which consists of 'Causes of accidents due to training procedures'.

4.2.1 Respondent Demographic Analysis

The researcher used demographic analysis to measure respondents who have been and are currently working in the manufacturing industry that uses chemicals. In addition, data analysis shows that the basic demographic data collected from 150 people who answered the questionnaire

DEMOGRAPHIC	DROPDOWN	FREQUENCY	PERCENT (%)
Gender	Male	82	52.6%
	Female	74	47.4%
Age	18-19	66	42.3%
	30 – 39	53	34%
	40 – 49	28	17.9%
	50 above	9	5.8%
Work experience	< 2 years	44	28.2%
	2-5 years	37	23.7%
	6-10 years	43	27.6%
	> 10 years	32	20.5%
Education level	PMR	8	5.1%
	SPM	74	47.4%
	Diploma	45	28.8%
	Degree	29	18.6%
Marital status	Married	71	45.5%
	Divorced or widowed	12	7.7%
	Not married	73	46.8%
Smoking	Never	76	48.7%

	Former	24	15.4%
	Current	56	35.9%
Drink alcohol	Never	128	82.1%
	Former	23	14.7%
	Current	5	3.2%

Table 4.1: Summary of Total Demographic Information

4.2.1.1 Gender

Gender / Jantina

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female / Perempuan	74	47.4	47.4	47.4
	Male / Lelaki	82	52.6	52.6	100.0
	Total	156	100.0	100.0	

Table 4.2: Gender of Respondents

[Source: Data Analysis of SPSS]

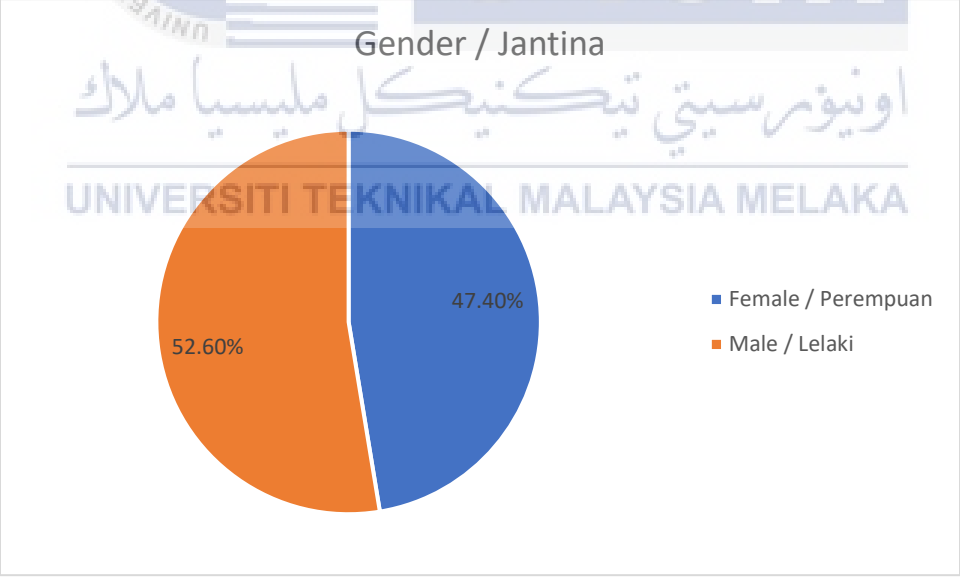


Figure 4.3: Gender of Respondents

[Source: Developed from the research]

The gender of respondents is show in Table 4.2 and Figure 4.3. According to the table and figure, male constituted most of the sample, accounting for 82 out of 156 respondents which is 52.6%. the next category is female, which had 74 respondent out of 156 total respondents, representing 47.4%.

4.2.1.2 Age

Age / Umur

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 29	66	42.3	42.3	42.3
	30 - 39	53	34.0	34.0	76.3
	40 - 49	28	17.9	17.9	94.2
	50 above / ke atas	9	5.8	5.8	100.0
	Total	156	100.0	100.0	

Table 4.4: Age of Respondents

[Source: Data Analysis of SPSS]

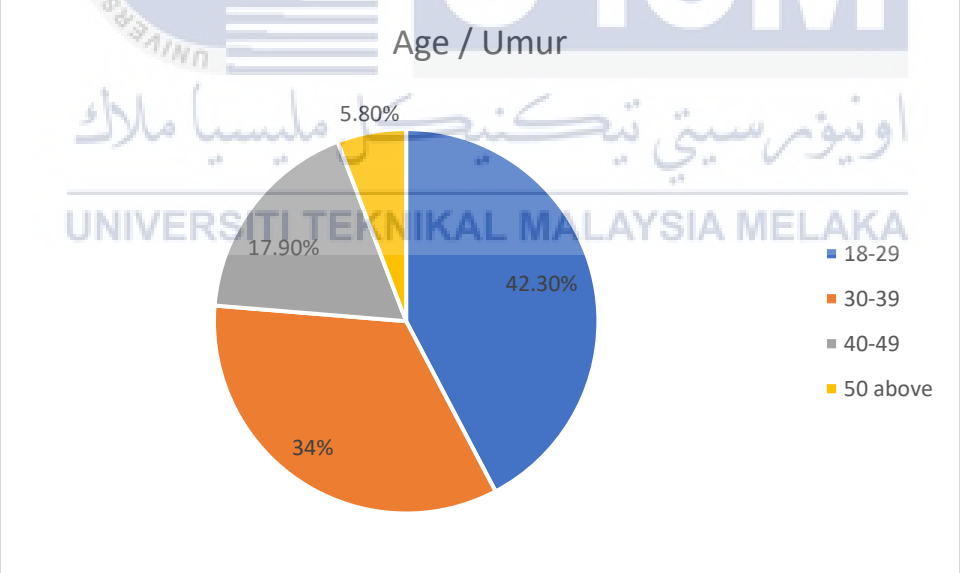


Figure 4.5: Age of Respondents

[Source: Develop from the Research]

Table 4.4 and Figure 4.5 shows that there are four age groups: 18 – 29 years old, 30 – 39 years old, 40 – 49 years old, and 50 years old and above. According to the statistic, the highest

respondents are made of 66 respondents, with 42.3% of respondents between the age group of 18 - 29 years old. second, age group 30 - 39 years with 53 respondents with 34%. Next is from the 40 - 49 year old group with 28 respondents accounting for 17.9%. lastly the least is from the group of 50 years and above with a record of 9 respondents 5.8%.

4.2.1.3 Work experience

Work experience / Pengalaman bekerja

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 2 years / tahun	44	28.2	28.2	28.2
	> 10 years / tahun	32	20.5	20.5	48.7
	2 - 5 years / tahun	37	23.7	23.7	72.4
	6 - 10 years / tahun	43	27.6	27.6	100.0
	Total	156	100.0	100.0	

Table 4.6: Work Experience of Respondents

[Source: Data Analysis of SPSS]

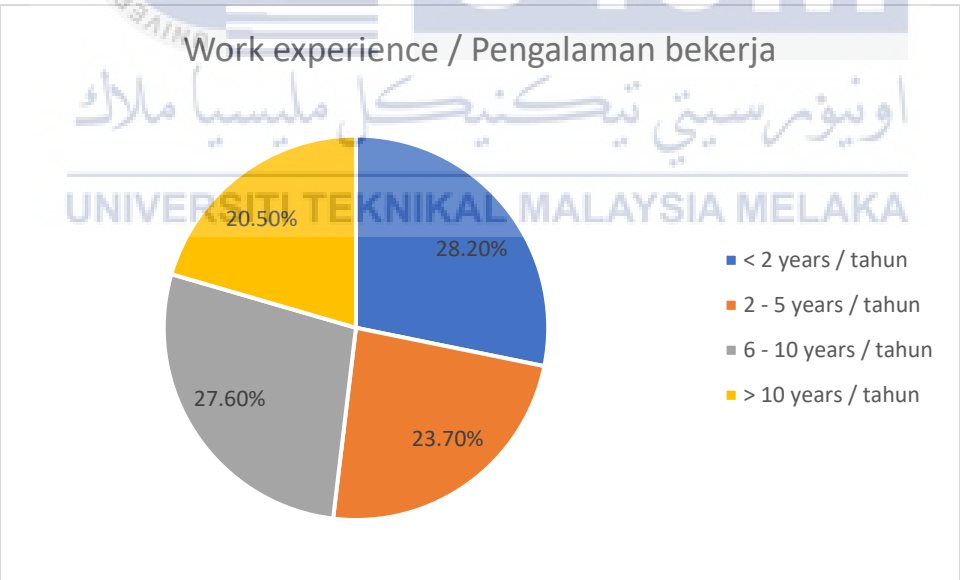


Figure 4.7: Work Experience of Respondents

[Source: Developed from the Research]

Table 4.6 and Figure 4.7 shows the work experience of respondents. according to the data obtained, working experience of less than 2 years is the highest recorded by 44 respondents out of

156 respondents with a total of 28.2%. then followed by 6 - 10 years of work experience with a slight difference with 43 respondents out of 156 respondents with 27.6%. next is working 2 - 5 years which recorded more than 37 respondents out of 156 respondents with 23.7%. the last one which is the lowest is the work experience of more than 10 years with only 32 respondents out of 156 respondents with 20.5%.

4.2.1.4 Education level

Education level / Taraf pendidikan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Degree	29	18.6	18.6	18.6
	Diploma	45	28.8	28.8	47.4
	PMR	8	5.1	5.1	52.6
	SPM	74	47.4	47.4	100.0
	Total	156	100.0	100.0	

Table 4.8: Education Level of Respondent

[Source: Data Analysis of SPSS]

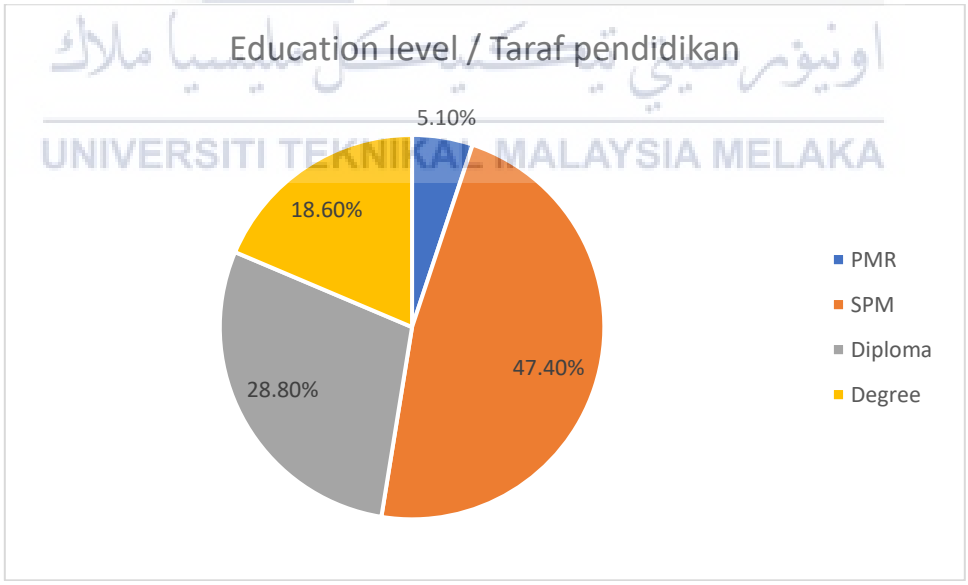


Figure 4.9: Education Level of Respondents

[Source: Develop from the Research]

Table 4.8 and Figure 4.9 show the education level of respondents. in the data obtained, it was found that the most respondents were from SPM level with more than 74 respondents out of 156 respondents with 47.4%. followed by education level diploma by recording 45 respondents out of 156 respondents with 28.8%. next is degree level with 29 respondents out of 156 respondents with 18.6%. lastly, education level PMR with only 8 respondents out of 156 respondents which is the least which only recorded 5.1%.

4.2.1.5 Marital status

Marital status / Taraf perkahwinan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Divorced or widowed / Bercerai atau janda	12	7.7	7.7	7.7
	Married / Berkahwin	71	45.5	45.5	53.2
	Not married / Tidak berkahwin	73	46.8	46.8	100.0
	Total	156	100.0	100.0	

Table 4.10: Marital Status of Respondents

[Source: Data Analysis of SPSS]

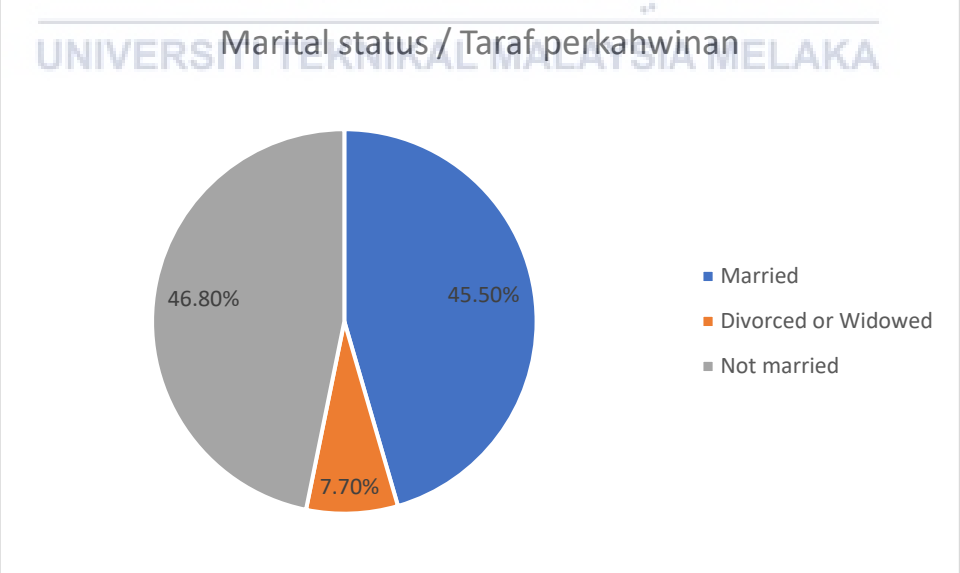


Figure 4.11: Marital Status of Respondents

[Source: Developed from the Research]

Table 4.10 and Figure 4.11 show the marital status of respondents. From the data obtained, it was found that the highest was the unmarried group which recorded more than 73 respondents out of 156 respondents with 46.8%. next is married with 71 respondents out of 156 respondents with 45.5%. last but not least is divorced or widowed with 12 respondents out of 156 respondents worth 7.7%.

4.2.1.6 Smoking

Smoking / Merokok

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Current / Masih	56	35.9	35.9	35.9
	Former / Bekas	24	15.4	15.4	51.3
	Never / Tidak pernah	76	48.7	48.7	100.0
	Total	156	100.0	100.0	

Table 4.12: Smoking of Respondent

[Source: Data Analysis of SPSS]

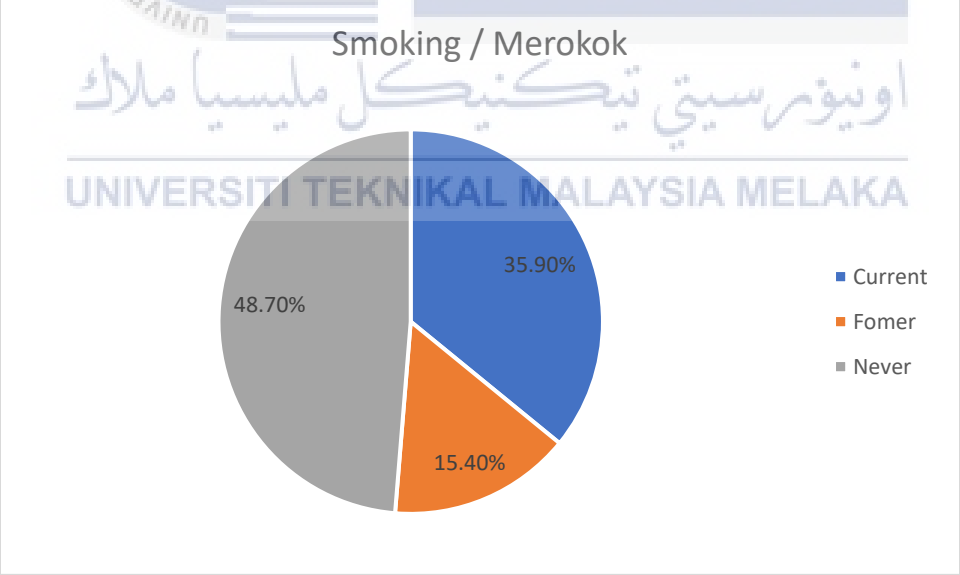


Figure 4.13: Smoking of Respondent

[Source: Develop from the Research]

Table 4.12 and Figure 4.13 show smoking of respondents. referring to the data of never smoking is the highest which recorded 76 respondents out of 156 respondents with 48.7%. next is

current with 56 respondents out of 156 respondents with 35.9%. lastly the least is former by recording only 24 respondents out of 156 respondents which is the least data with 15.4%.

4.2.1.7 Drink alcohol

Drink alcohol / Minum alcohol

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Current / Masih	5	3.2	3.2	3.2
	Former / Bekas	23	14.7	14.7	17.9
	Never / Tidak pernah	128	82.1	82.1	100.0
	Total	156	100.0	100.0	

Table 4.14: Drink Alcohol of Respondent

[Source: Data Analysis of SPSS]

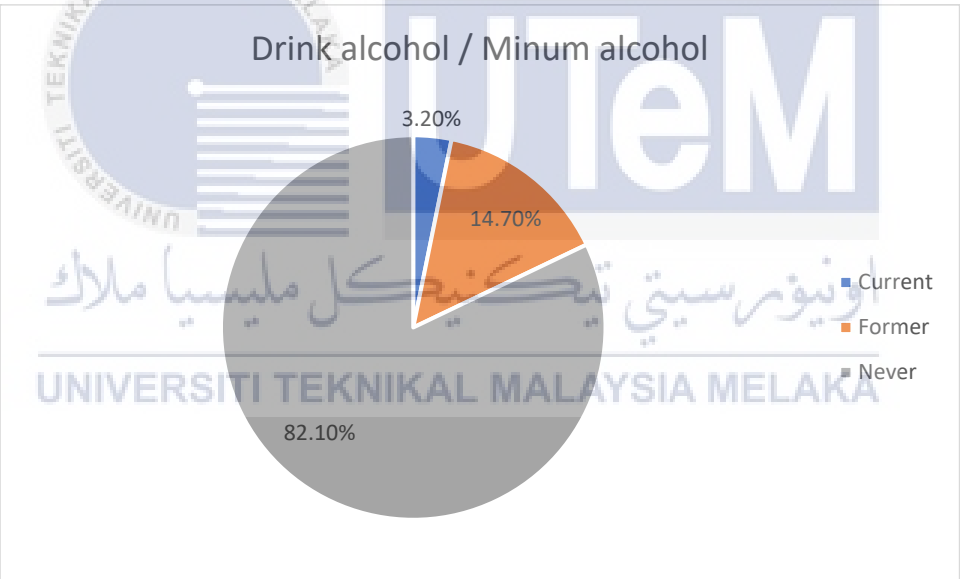


Figure 4.15: Drink Alcohol of Respondent

[Source: Developed from the Research]

Table 4.14 and Figure 4.15 show the alcohol drink of respondents. referring to the data above found that the never group was the highest which recorded 128 respondents out of 156 respondents with 82.1%. next is from the former group who recorded 23 respondents out of 156 respondents with 14.7%. The last one is from the current group with only 5 respondents out of 156 respondents which is the lowest with only 3.2%.

4.2.2 Research Question Analysis

4.2.2.1 Dependent Variable: Types of Accidents in The Manufacturing Industry Among Workers

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Fall from height / Jatuh dari tempat tinggi	156	1	5	2.85	1.261
Fall or trip on the floor / Jatuh atau tersadung di lantai	156	1	5	2.90	1.036
Hit by falling object / Cedera dari objek yang jatuh	156	1	5	2.76	1.183
Bump into stationary object / Terlanggar objek pegun	156	1	5	2.94	1.143
Being cut or scratched / Terpotong atau terluka	156	1	5	2.96	1.149
Being trampled / Tertindih	156	1	5	2.54	1.155
Injury from extreme temperature / Kecederaan daripada suhu yang melampau	156	1	5	2.49	1.183
Contacting hazardous material / Berhubung dengan bahan berbahaya	156	1	5	2.66	1.167
Electric shock / Kejutan elektrik	156	1	5	2.37	1.103
Injury from explosion / Kecederaan akibat letupan	156	1	5	2.34	1.242
Fire / Kebakaran	156	1	5	2.29	1.148
Valid N (listwise)	156				

Table 4.16: Types of Accidents in The Manufacturing Industry Among Workers [Source: Data Analysis SPSS]

Table 4.16 shows the dependent variable which is the workplace accident among workers based on 156 respondents. first, the highest mean value among the questions is 'cut or scratched' with a mean value of 2.96. Second is the question 'hitting a stationary object' with a mean value of

2.94. Third is the question 'falling or tripping on the floor' with a mean value of 2.90. fourth is the question 'falling from a height' with a mean value of 2.89. the fifth is the question 'hit by a falling object' with a mean value of 2.76. sixth is the question 'contacting dangerous substances' with a mean value of 2.66. seventh is the 'stepped on' question with a mean value of 2.54. The eighth is the question 'injuries from extreme temperatures' with a mean value of 2.49 which is the same as the question 'traffic related accident'. ninth is the 'improper action' question with a mean value of 2.44. the tenth is the 'electric shock' question with a mean value of 2.37. The eleventh is the question 'blast injury' with a mean value of 2.34. the last one is the 'fire' question with a mean value of 2.29.

In addition to this result, for the standard deviation, the highest value among the questions was 'traffic related accident' with a standard deviation of 1.327. the second is the 'fall from height' question with a standard deviation of 1.261. the third is the 'injury from explosion' question with a standard deviation of 1.242. fourth is the question 'hit by falling object' with a standard deviation of 1.183 which is the same value as the question 'injury from extreme temperature'. fifth is the question 'contacting hazardous material' with a standard deviation of 1.167. sixth is the 'being trampled' question with a standard deviation of 1.155. seventh is the question 'being cut or scratched' with a standard deviation of 1.149. The eighth is a 'fire' question with a standard deviation of 1.148. the ninth is the 'bump into stationary object' question with a standard deviation of 1.143. the tenth question 'improper action' with a standard deviation of 1.120. The eleventh 'electric shock' with a standard deviation of 1.103. the last is the least question which is 'fall or trip on the floor' with a standard deviation of 1.036.

4.2.2.2 Independent Variable: Stress and Fatigue

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Not proud with my job / Tidak berbangga dengan pekerjaan saya	156	1	5	2.83	1.203
An unpleasant or unsafe workplace / Tempat kerja yang tidak menyenangkan atau tidak selamat	156	1	5	2.51	1.161

My job negatively affects my physical or emotional well-being / Pekerjaan saya memberi kesan negatif kepada fizikal dan emosi saya	156	1	5	2.71	1.164
Lots of work to do or unreasonable deadlines / Banyak kerja yang perlu dilakukan atau tarikh akhir yang tidak munasabah	156	1	5	2.80	1.161
Difficult to express my opinion or feelings to superiors / Sukar untuk menyatakan pendapat dan perasaan saya kepada pihak atasan	156	1	5	2.90	1.201
Work pressure interferes with my family or personal life / Tekanan kerja menganggu keluarga atau kehidupan peribadi saya	156	1	5	2.70	1.204
Valid N (listwise)	156				

Table 4.17: Stress and Fatigue

[Source: Data Analysis SPSS]

The table 4.17 shows the descriptive statistic of independent variable stress and fatigue. first, the question 'difficult to express my opinion or feelings to superiors' has the highest mean value of 2.90. Second is the question 'not proud with my job' with a mean value of 2.83. Third is the question 'lots of work to do or unreasonable deadlines' with a mean value of 2.80. Fourth is the question 'my job negatively affects my physical or emotional well-being' with a mean value of 2.71. The fifth is the question 'work pressure interferes with my family or personal life' with a mean value of 2.70. Lastly is the least mean value which is 2.51 which is the question 'an unpleasant or unsafe workplace'

Another result is for the standard deviation of stress and fatigue, the highest value among the questions is 'work pressure interferes with my family or personal life' with a standard deviation value of 1.204. Second is the question 'not proud with my job' with a standard deviation value of 1.203. Third is the question 'difficult to express my opinion or feelings to superiors' with a standard deviation value of 1.201. Fourth is the question 'my job negatively affects my physical or emotional well-being' with a standard deviation value of 1.164. Lastly is the question 'an unpleasant or unsafe workplace' with a standard deviation value of 1.161 which standard deviation value is the same as the question 'lots of work to do or unreasonable deadlines'

4.2.2.3 Independent Variable: Unsafe Acts

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Inadequacy of alertness as a result of mind overload / Ketidakcukupan kewaspadaan akibat daripada beban kerja	156	1	5	2.74	1.129
Challenges in remembrance of information related to work / Cabaran dalam mengingati maklumat berkaitan kerja	156	1	5	2.68	1.124
Problem-solving difficulties / Kesukaran menyelesaikan masalah	156	1	5	2.57	1.137
Circumstantial rule disobedience / Ketidaktaatan peraturan mengikut keadaan	156	1	5	2.71	1.142
Inadequacy of persons' resilience / Ketidakcukupan daya tahan seseorang	156	1	5	2.57	1.119
The inability of emotion management / Ketidakupayaan pengurusan emosi	156	1	5	2.56	1.181
Valid N (listwise)	156				

Table 4.17: Unsafe Acts

[Source: Data Analysis SPSS]

Table 4.17 show the descriptive statistics of independent variables unsafe acts. the first is the question with the highest mean value which is the question 'inadequacy of alertness as a result of mind overload' with a mean value of 2.74. Second is the question 'circumstantial rule disobedience' with a mean value of 2.71. Third is the question 'challenges in remembrance of information related to work' with a mean value of 2.68. fourth is the question 'problem-solving difficulties' with a mean value of 2.57 which is the same as the question 'inadequacy of persons' resilience'. finally, is the question 'the inability of emotion management' with a mean value of 2.56.

In addition to this result, for the standard deviation. The first is the question with the highest standard value which is the question 'the inability of emotion management' with a standard deviation of 1.181. Second is the 'circumstantial rule disobedience' question with a standard deviation of 1.142. Third is the 'problem-solving difficulties' question with a standard deviation of 1.137. Fourth is the question 'inadequacy of alertness as a result of mind overload' with a standard deviation value of 1.129. The fifth is the question 'challenges in remembrance of information related to work' with a standard deviation value of 1.124. Sixth is the question 'inadequacy of persons' resilience' with a standard deviation value of 1.119.

4.2.2.4 Independent Variable: Machineries or Tools

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
All equipment is checked regularly at the workplace / Semua peralatan diperiksa secara berkala di tempat kerja	156	1	5	2.69	1.258
Manual guidelines are provided on how to use the equipment / Garis panduan manual disediakan tentang cara menggunakan peralatan	156	1	5	2.95	1.348

Join short term courses or online courses to develop knowledge about each machinery used / Menyertai kursus jangka pendek atau kursus dalam talian untuk mengembangkan pengetahuan tentang setiap jentera yang digunakan	156	1	5	3.65	1.243
Machinery operation is assisted by a procedure manual / Kendalian jentera dibantu oleh manual prosedur	156	1	5	3.65	1.117
Have a safer place for products or chemicals in the workplace / Mempunyai tempat yang lebih selamat untuk produk atau bahan kimia di tempat kerja	156	1	5	3.42	1.164
Only trained workers will operate certain machinery / Hanya pekerja terlatih akan mengendalikan jentera tertentu	156	1	5	3.37	1.234
Valid N (listwise)	156				

Table 4.18: Machineries or Tools

[Source: Data Analysis SPSS]

Table 4.18 shows the descriptive statistics of independent variables machinery or tools. among all the questions shown above, the highest mean value is for the question 'join short term courses or online courses to develop knowledge about each machinery used' with a mean value of 3.65 which is the same as the question 'machinery operation is assisted' by a procedure manual'. Next is the question 'have a safer place for products or chemicals in the workplace' with a mean value of 3.42. The third highest mean value is the question 'only trained workers will operate certain machinery' with a mean value of 3.37. Fourth is the question 'manual guidelines are provided on how to use the equipment' with a mean value of 2.95. Lastly, which is the lowest mean

value is the question 'all equipment is checked regularly at the workplace' with a mean value of only 2.69.

Another result is for the standard deviation of machinery or tools. the question with the highest standard deviation value is the question 'manual guidelines are provided on how to use the equipment' with a standard deviation value of 1.348. Second is the question 'all equipment is checked regularly at the workplace' with a standard deviation value of 1.258. Third is the question 'join short term courses or online courses to develop knowledge about each machinery used' with a standard deviation value of 1.243. Fourth is the question 'only trained workers will operate certain machinery' with a standard deviation value of 1.234. Fifth is the question 'have a safer place for products or chemicals in the workplace' with a standard deviation value of 1.164. the last is the question 'machinery operation is assisted by a manual procedure' with a standard deviation value of 1.117.

4.2.2.5 Independent Variable: Design of Workplace

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Little space available to work / Sedikit ruang tersedia untuk bekerja	156	1	5	3.01	1.267
Working on unstable or irregular surfaces / Bekerja pada permukaan yang tidak stabil atau tidak teratur	156	1	5	2.72	1.242
Valid N (listwise)	156				

Table 4.19: Design of Workplace

[Source: Data Analysis SPSS]

Table 4.19 shows the descriptive statistics of independent variables design of workplace which only shows two questions where the question with the highest mean value is the question 'little space available to work' with a mean value of 3.01 and the least mean value is the question 'I will do manual handling as long as I don't feel any pain' with a mean value of 2.72.

In addition to this result, for the standard deviation. The question with the highest standard deviation value is the question 'little space available to work' with a standard deviation value of 1.267 and the least standard deviation value is the question 'working on unstable or irregular surfaces' with a standard deviation value of 1.242.

4.2.2.6 Independent Variable: Training Procedures

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Procedures for emergencies at my workplace have supported the prevention of fatal work accidents / Prosedur untuk kecemasan di tempat kerja saya telah menyokong pencegahan kemalangan kerja yang membawa maut	156	1	5	2.99	1.280
I will do manual handling as long as I don't feel any pain / Saya akan melakukan pengendalian secara manual selagi saya tidak berasa sakit	156	1	5	2.76	1.267
Valid N (listwise)	156				

Table 4.20: Training Procedures

[Source: Data Analysis SPSS]

The table 4.12 show the descriptive statistics of independent variable training procedures. First of all, between these two questions the highest mean value is the question 'procedures for emergencies at my workplace have supported the prevention of fatal work accidents' with a mean value of 2.99 and the lowest mean value is the question 'i will do manual handling as long as I don't feel any pain' with a mean value of only 2.76.

Another result is for the standard deviation of training procedures. Between these two questions, the highest standard deviation value is for the question 'procedures for emergencies at my workplace have supported the prevention of fatal work accidents' with a standard deviation value of 1.280 and the question with the least standard deviation value is 'i will do manual handling as long as I don't feel any pain' with a standard deviation value of only 1.267.

4.3 Reliability Analysis

Additionally, to assess internal consistency and variable reliability, the researcher will carry out a Cronbach's Alpha study. Consequently, SPSS will be used to calculate Cronbach's Alpha.

A five-point rating system is used to score the reliability test. Sekaran (2000) states that a number more than 0.9 indicates extremely high reliability, a value between 0.7 and 0.9 indicates strong reliability, a value between 0.5 and 0.7 indicates moderate reliability, and a value less than 0.5 indicates low reliability. The surveys are not very reliable if the value is less than 0.5. Therefore, the study's Cronbach's Alpha value is displayed below.

Case Processing Summary

		N	%
Cases	Valid	156	100.0
	Excluded[a]	0	.0
	Total	156	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.899	35

Table 4.21: Reability Statistic

[Source: Data Analysis SPSS]

From the table above, the cronbach's alpha value is 0.899. An acceptable level of alpha value is 0.70 and above. According to Sekaran (2000), construct to show reliable data collected if alpha value is more than 0.7. So, it can be concluded that all the items in the questionnaire have strong reliability because Cronbach's Alpha is between 0.7 and 0.9. In addition, after testing the validity and reliability is proof that the results in the questionnaire are valid and reliable.

4.4 Pearson Correlation Analysis

Pearson Correlation by strength of the association between the independent and dependent variables is assessed using the coefficient analysis, which is also used to quantify the relationship between the variables. The intensity of the correlation coefficient is displayed in Table 4.22. (Saunders et al., 2016).

Correlation Ceofficient	Correlation Strength
0.80 – 1.00	Very Strong
0.60 – 0.79	Strong
0.40 – 0.59	Moderate
0.20 – 0.39	Weak
0.00 – 0.19	Very Weak

Table 4.22: Strength of the Correlation Coefficient

Correlations

		DV_AVE	SF_AVE	UA_AVE	MT_AVE	DW_AVE	TP_AVE
DV_AVE	Pearson Correlation	1	.663**	.631**	.207**	.279**	.076
	Sig. (2-tailed)		.000	.000	.010	.000	.345
	N	156	156	156	156	156	156
SF_AVE	Pearson Correlation	.663**	1	.692**	.429**	.449**	.398**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	156	156	156	156	156	156
UA_AVE	Pearson Correlation	.631**	.692**	1	.377**	.429**	.328**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	156	156	156	156	156	156
MT_AVE	Pearson Correlation	.207**	.429**	.377**	1	.427**	.528**
	Sig. (2-tailed)	.010	.000	.000		.000	.000
	N	156	156	156	156	156	156

DW_AVE	Pearson Correlation	.279**	.449**	.429**	.427**	1	.532**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	156	156	156	156	156	156
TP_AVE	Pearson Correlation	.076	.398**	.328**	.528**	.532**	1
	Sig. (2-tailed)	.345	.000	.000	.000	.000	
	N	156	156	156	156	156	156

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

Table 4.23: Pearson Correlations Analysis

[Source: Data Analysis SPSS]

Table 4.23 shows the Pearson Correlations Analysis of independents and dependent variable in this research. According to Saunders (2016) states less than 0.05 value is significant and while less than 0.05 is not significant while the pearson correlation value is according to the correlation strength in table 4.22. Based on the result, is shows correlation analysis between the dependent variable and the independent variable stress and fatigue [r (156) = .663, p = .000] means that it is significant and in a strong correlation. next for the independent variable unsafe acts [r (156) = .631, p = .000] also means it is significant and is in strong correlation. next is the independent variable machinery or tools [r (156) = .207, p = .010] meaning it is still significant but has a weak correlation. For the independent variable design of workplace [r (156) = .279, p = .000] means that it is significant but has a weak correlation. And the last one is the independent variable training procedures [r = (156) = .076, p = .345] which means it is not significant and is at very week correlation.

Next, the relationship between the independent variable and other independent variables. The relationship between stress and fatigue with unsafe acts [r (156) = .692. p = .000] means it is significant and in strong correlation. Next, stress and fatigue with machinery or tools [r (156) = .429, p = .000] means that it is still significant but at a moderate correlation. The relationship between stress and fatigue with the design of the workplace [r (156) = .449, p = .000] means that it is a significant and moderate correlation. The relationship between stress and fatigue with training procedures [r (156) = .398, p = .000] means that it is significant but in weak correlation. The relationship between unsafe acts and machinery or tools [r (156) = .377, p = .000] means significant and weak correlation. The relationship between unsafe acts and design of workplace [r (156) = .429, p = .000] means that it is a significant and moderate correlation. The relationship

between unsafe acts and training procedures [r (156) = .3.28, p = .000] means that it is significant and has a weak correlation. The relationship between machinery or tools and the design of the workplace [r (156) = .427, p = .000] means that it is significant and is at a moderate correlation. The relationship between machinery or tools and training procedures [r (156) = .528, p = .000] means that it is significant and is in moderate correlation. Finally, the relationship between the design of the workplace and training procedures [r (156) = .532, p = .000] means that it is significant and is at a moderate correlation.

4.5 Multiple Regression Analysis

A method for estimating a value based on two or more independent and dependent variables is multiple regression analysis. Four independent variables and one dependent variable are utilised in this study's multiple regression analysis to assess the effects of the independent variables on the dependent variables. The results of the multiple regression analysis using SPSS demonstrate that there is one dependent variable (types of manufacturing industry accidents) and five independent factors (stress and fatigue, unsafe acts, machinery or tools, design of the workplace, training procedures).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.740[a]	.548	.533	.46921

a. Predictors: (Constant), TP_AVE. UA_AVE, MT_AVE, DW-AVE, SF_AVE

Table 4.24: Model Summary

[Source: Data Analysis SPSS]

Table 4.24 shows the modal summary result of Multiple Regression Analysis. Based on the table 4.24, the r value is .740, means that there was a relationship between dependent and independent variables. Next, the r square value is .548, this means that the five independent variables are accounted for 0.55 (55%) of variation in dependent variable. This also can be explained that 55% variation in types of manufacturing industry accidents can influence by the

factors stress and fatigue, unsafe acts, machinery or tools, design of the workplace, training procedures.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.053	5	8.011	36.386	.000[b]
	Residual	33.024	150	.220		
	Total	73.077	155			

a. Dependent Variable: DV_AVE

b. Predictors: (Constant), TP_AVE, UA_AVE, MT_AVE, DW_AVE, SF_AVE

Table 4.25: Anova

[Source: Data Analysis SPSS]

Table 4.25 shows the ANOVA analysis by using SPSS. The result show that model has more systematic variation that non-systematic variation because the p value is .000 which is less than 0.05.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.899	.192		4.680	.000
	SF_AVE	.480	.075	.514	6.416	.000
	UA_AVE	.327	.073	.350	4.512	.000
	MT_AVE	-.031	.063	-.033	-.490	.625
	DW_AVE	.030	.047	.045	.644	.521
	TP_AVE	-.156	.044	-.249	-3.515	.001

a. Dependent Variable: DV_AVE

Table 4.26: Coefficients

[Source: Data Analysis SPSS]

Table 4.26 shows the coefficient of multiple regression analysis. Based on the result, stress and fatigue has highest beta which is .514. second is unsafe acts, which is .350. This followed by the design of workplace, which is .045. Next is machinery or tools, which is -.033. The last is training

procedures, which is -.249. Therefore, the equation is formed as shown $y = a + bx_1 + cx_2 + dx_3 + ex_4 + fx_5$

$y = a + bx_1 + cx_2 + dx_3 + ex_4 + fx_5$

a = 0.899,
b = 0.480,
c = 0.327,
d = - 0.031,
e = 0.030,
f = - 0.156

Thus, $y = 0.899 + 0.480x_1 + 0.327x_2 + (-0.031)x_3 + 0.030x_4 + (-0.156)x_5$

According to the linear regression above, there are negative and positive relationship between all independent variables toward dependent variable. However, there are three independent variables that are lower than 0.05 and two independent variables that are higher than 0.05. based on the table 4.26, stress and fatigue has 0.000 of significant value, unsafe acts has 0.000 significant value and training procedures has 0.001 significant value which are all below 0.05 but machinery or tools and design of workplace had significant value higher than 0.05 which is 0.625 and 0.521. This means that stress and fatigue, unsafe acts and training procedures have a relationship with the workplace accident among works. While machinery or tools and design of workplace has no relationship with the workplace accident among workers.

4.6 Hypothesis Testing

Hypothesis 1 (Stress and Fatigue)

H1: There is significant relationship between stress and fatigue and workplace accident among workers.

H0: There is no significant relationship between stress and fatigue and workplace accident among workers.

Reject H0, if p lower than 0.05

Based on table 4.26, the relevant value of efficiency is 0.000 which is lower than 0.05. Thus, H1 is accepted. There is a significant relationship between stress and fatigue with the workplace accident among workers

Hypothesis 2 (Unsafe Acts)

H2: There is significant relationship between unsafe acts and workplace accident among workers.

H0: There is no significant relationship between unsafe acts and workplace accident among workers.

Reject H0, if p lower than 0.05

Based on table 4.26, the relevant value of efficiency is 0.000 which is lower than 0.05. Thus, H2 is accepted. There is a significant relationship between unsafe acts with the workplace accident among workers

Hypothesis 3 (Machineries or Tools)

H3: There is significant relationship between machineries or tools and workplace accident among workers.

H0: There is no significant relationship between machineries or tools and workplace accident among workers.

Reject H0, if p lower than 0.05

Based on table 4.26, the relevant value of efficiency is 0.625 which is higher than 0.05. Thus, H0 is accepted. There is a no significant relationship between machineries or tools with the workplace accident among workers

Hypothesis 4 (Design of Workplace)

H4: There is significant relationship between design of workplace and workplace accident among workers.

H0: There is no significant relationship between design of workplace and workplace accident among workers.

Reject H0, if p lower than 0.05

Based on table 4.26, the relevant value of efficiency is 0.521 which is higher than 0.05. Thus, H0 is accepted. There is a no significant relationship between design of workplace with the workplace accident among workers

Hypothesis 5 (Training Procedures)

H5: There is significant relationship between training procedures and workplace accident among workers.

H0: There is no significant relationship between training procedures and workplace accident among workers.

Reject H0, if p lower than 0.05

Based on table 4.26, the relevant value of efficiency is 0.001 which is lower than 0.05. Thus, H5 is accepted. There is a significant relationship between training procedures with the workplace accident among workers

Hypothesis	Result
Hypothesis 1	Accepted
Hypothesis 2	Accepted
Hypothesis 3	Rejected
Hypothesis 4	Rejected
Hypothesis 5	Accepted

Table 4.27: Hypothesis Results

4.7 Summary

In this chapter, the study's findings were discussed. In this section, four different test types—descriptive analysis, Pearson analysis, reliability analysis, and multiple regression tests—have all been analysed. SPSS was used to conduct the analysis. It is recognised that the results of the relationship between the independent and dependent variables using data in SPSS and evaluated the relationship of the hypothesis stated in Chapter 2 are accurate. Following this, a further section of Chapter 5 covered the conclusion and recommendations.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 Introduction

This chapter explains all of the findings and presents the analysis and data results from the preceding chapters. According to the study's purpose, this chapter's discussion and explanation are divided into categories. In addition, this chapter discussed why the hypothesis and study topic were accepted or rejected. As a result, this chapter will also discuss some suggestions for additional research as well as the implications and constraints. The goal of this study's research is to reach that goal.

5.2 Summary of Descriptive Analysis

Demographic	Frequency with Highest Value	Frequency	Percent (%)
Gender	Male	82	52.6
Age	18 - 29	66	42.3
Work experience	< 2 years	44	28.2
Education level	SPM	74	47.4
Maritial status	Not married	73	46.8
Smoking	Never	76	48.7
Drink alcohol	Never	128	82.1

Table 5.1 Summary of Descriptive Analysis of Respondent's Demographic

Jinko Solar is a manufacturing industry that produces solar panels that use several chemicals to produce them and there are many factors that can affect the health and safety of the workers there. from Table 5.1, the highest number of employees working at Jinko Solar is male because according to Ryu (2017) women who work non-standard shifts for extended periods have a greater

risk of work-related injuries than men. Jinko Solar is also a company that working shifts which proves that women are less interested in working shifts at Jinko Solar where most of them are still young to do heavy work in the factory after they have finished studying at the high school level. so this reason also makes them tend to change jobs which causes many of the factory workers to lack experience and not last long in a company. According to Polosa (2015), Due to their numerous parallels to smoking, electronic cigarettes (or "e-cigs") are an appealing long-term alternative supply of nicotine to traditional cigarettes for most smokers who wish to stop.

5.3 Summary of the study

The aim of this study is to find out the role of workplace accidents among employees. There are five independent variables that come from this research namely stress and fatigue, unsafe actions, machines or tools, workplace design and training procedures that have been selected to find out the causes of accidents in the manufacturing industry among workers.

RO1: To measure individual factors with workplace accidents among employees.

RO2: To measure nature of job with workplace accidents among employees.

A Hypothesis was also created to investigate the relation between the independent and dependent variable. the hypothesis was used to know the relationship between stress and fatigue, unsafe actions, machines or tools, workplace design and training procedures with workplace accidents among employees

5.4 Discussion of Objective and Hypothesis Testing

In order to explore the link between the independent and dependent variables and to meet the study's research objectives, the researcher's hypothesis was assessed in this section. As a result, the findings were examined to determine whether the research was effective in achieving the goal.

5.4.1 Objective 1: To measure individual factors with workplace accidents among employees

To achieve the first objective of the research, it is necessary to first know what the individual factors that have been mentioned before, the individual factors are two of the five independent variables that were selected, namely stress and fatigue and unsafe acts. The table below shows the summary of these two independent variables with workplace accidents among workers.

		DV_AVE	SF_AVE	UA_AVE
DV_AVE	Pearson Correlation	1	.663**	.631**
	Sig. (2-tailed)		.000	.000
	N	156	156	156
SF_AVE	Pearson Correlation	.663**	1	.692**
	Sig. (2-tailed)	.000		.000
	N	156	156	156
UA_AVE	Pearson Correlation	.631**	.692**	1
	Sig. (2-tailed)	.000	.000	
	N	156	156	156

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

Table 5.2: Pearson Correlations Analysis Individual Factor

[Source: Data Analysis SPSS]

Correlation Ceofficient	Correlation Strength
0.80 – 1.00	Very Strong
0.60 – 0.79	Strong
0.40 – 0.59	Moderate
0.20 – 0.39	Weak
0.00 – 0.19	Very Weak

Table 5.3: Strength of the Correlation Coefficient

Table 5.2 shows the Pearson Correlations Analysis of independents (stress and fatigue and unsafe acts) and dependent variable (workplace accidents among workers) in this research.

According to Saunders (2016) states less than 0.05 value is significant and while less than 0.05 is not significant while the pearson correlation value is according to the correlation strength in table 5.3. Based on the result, is shows correlation analysis between the dependent variable and the independent variable stress and fatigue [r (156) = .663, p = .000] means that it is significant and in a strong correlation. next for the independent variable unsafe acts [r (156) = .631, p = .000] also means it is significant and is in strong correlation.

From this calculation it was found that objective 1 which focuses on individual factors with workplace accidents among workers is very influential according to the calculation explained above. This statement is also supported by Satana (2013) who states that a job with a heavy task of up to 12 hours a day can contribute to accidents caused by fatigue. Not to mention the risky behaviours that lead to workplace accidents, where all of this is impacted by society, organisations, project management, supervision, contractors, site conditions, group work, and individual traits. (Khosravi, 2014).

5.4.2 Objective 2: To measure nature of job with workplace accidents among employees.

To achieve the second objective is to identify three more independent variables, namely machinery or tools, design of workplace and training procedures, of which these three are the nature of the job that can cause workplace accidents among employees. The table below shows the summary of these three independent variables with workplace accidents among workers.

Correlations

		DV_AVE	MT_AVE	DW_AVE	TP_AVE
DV_AVE	Pearson Correlation	1	.207**	.279**	.076
	Sig. (2-tailed)		.010	.000	.345
	N	156	156	156	156
MT_AVE	Pearson Correlation	.207**	1	.427**	.528**
	Sig. (2-tailed)	.010		.000	.000
	N	156	156	156	156
DW_AVE	Pearson Correlation	.279**	.427**	1	.532**
	Sig. (2-tailed)	.000	.000		.000
	N	156	156	156	156

TP_AVE	Pearson Correlation	.076	.528**	.532**	1
	Sig. (2-tailed)	.345	.000	.000	
	N	156	156	156	156

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

Table 5.4: Pearson Correlations Analysis Nature of Job Factor

[Source: Data Analysis SPSS]

Correlation Ceofficient	Correlation Strength
0.80 – 1.00	Very Strong
0.60 – 0.79	Strong
0.40 – 0.59	Moderate
0.20 – 0.39	Weak
0.00 – 0.19	Very Weak

Table 5.5: Strength of the Correlation Coefficient

Table 5.2 shows the Pearson Correlations Analysis of independents (stress and fatigue and unsafe acts) and dependent variable (workplace accidents among workers) in this research. According to Saunders (2016) states less than 0.05 value is significant and while less than 0.05 is not significant while the pearson correlation value is according to the correlation strength in table 5.3. Based on the result, is shows correlation analysis between the dependent variable and the independent variable machinery or tools [r (156) = .207, p = .010] meaning it is still significant but has a weak correlation. For the independent variable design of workplace [r (156) = .279, p = .000] means that it is significant but has a weak correlation. And the last one is the independent variable training procedures [r = (156) = .076, p = .345] which means it is not significant and is at very week correlation.

From the calculations that have been made found that machinery or tools is significant but weak correlation, this is proven by Pačaiová, H (2021) He claims that although there have been fewer incidents involving the use of mechanised equipment, they still happen because people adopt risky working practises, such as acting without permission, going against orders, breaking the law, or continuing to stay in a dangerous place. Design of workplace is also significant but weak correlation to workplace accidents among employees because the design of a factory including machine areas, machinery paths, and safety paths have been examined and studied in detail to

ensure workers are in a safe condition but accidents can occur if the space they work narrow and small. Last but not least is the training procedures which were found to be insignificant and have a very weak correlation to workplace accidents among employees because all employees have done classes or briefings on safety before they start. Employees also do not forget the laws that they must obey before, during and after work that they know and understand about this.

5.5 Implication of Study

The purpose of this study is to find out the real cause of accidents in the manufacturing industry which according to the accident case data that has been recorded is so high and this study will also give awareness to all parties including the superiors and subordinates of a company about safety at work. With the causes of accidents that occur in the workplace that have been selected by the researcher, it becomes a view for all parties to see all companies that have or have not started their operations. Lastly, the management can identify the advantages and disadvantages regarding occupational health and safety management and all forms of improvement can be carried out.

5.6 Limitation of Study

Limitation in conducting this study is taking into account the limitations of the researcher in conducting this study. Among the limitations faced by the researcher while doing this study is in terms of distributing the questionnaire. This constraint is due to the researcher only choosing an organization that is focused on conducting the study, namely Jinko Solar, in order to obtain the desired number of respondents, this also causes time constraints for respondents in answering the questionnaire online and requires frequent distribution. By only choosing one company to conduct a study where the study focuses on the employees there, causing the researcher to contact someone with a high rank to get the desired number of respondents. this is taken into account of their erratic time off because they all work in shifts that change every week. the researcher also had to contact them with various platforms such as whatsapp, tiktok, etc. The researcher has made observations from the beginning related to the company, but after Covid hit or after the movement control order

was made, a number of management had to be changed, causing the researcher to find it difficult to obtain respondent data.

5.7 Recommendation for Future Research

According to the findings of the data analysis, environmental variables have a negative relationship with both health and stress at work. This demonstrates that the workplace environment affects employees' health and is a contributing element to work-related stress. So that the employees can generate high-quality output and sustain the volume of output produced, the work environment must constantly be safe and not have an adverse effect on health. Accidents like sliding and kicking equipment can be prevented in a workplace that is ergonomic and well-organized. Only factory operators in the manufacturing industry are the subject of this study. This is the case because the job of a factory operator is perceived as requiring a lot of physical energy and quick thinking.

However, people in professions like nurses run the danger of contracting disorders like WMSD or those connected to workplace injuries (Yasobant & Rajkumar, 2014). When compared to other employment in the same industry, nursing jobs, which are primarily held by women, have a higher incidence of WMSD. Additionally, this research can vary the ways it collects data, such as through interviews and observations. This indicates that it is not always necessary to distribute questionnaires in order to perform this type of research. By meeting and speaking with respondents in the study region, the researcher may gain a clearer understanding of the determinants and the connections between the variables in this study.

5.8 Conclusion

The study's goal was to identify the elements that contribute to workplace accidents at Jinko Solar. This study is compatible with the grounded theories' logical justification, according to the statistical testing findings of the Jinko Solar survey that was done. This study comes to the conclusion that occupational injuries among Jinko Solar employees may result from both risky +behaviour and harmful surroundings. Workplace injuries are significantly positively correlated with unsafe behaviours as evaluated by weariness and lack of training. In other words, injuries at

work may be caused by working under exhausted conditions or by having insufficient safety awareness. Additionally, there are strong positive correlations between occupational injuries and dangerous circumstances as determined by the layout of the workspace and the equipment and instruments used. This demonstrates that there is a significant chance of injury when completing work if the workspace environment is unsafe or if equipment and instruments are in poor condition.

Researchers came to the further conclusion that Jinko Solar's dangerous working circumstances provide a bigger risk of occupational injuries than do risky activities. The major cause of industrial accidents at Jinko Solar is the state of the equipment and tools. This was followed by poorly designed working conditions. Recent incidents that occurred at Jinko Solar as a result of dangerous machinery and tools confirmed this conclusion. Even while lack of training and weariness are not the primary contributing causes to workplace accidents at Jinko Solar, it is nevertheless important to pay attention to these two issues. The management of Jinko Solar must use all of this data on the variables that contributed to workplace accidents in order to develop remedial and preventative action plans.

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APPENDIX 1

PSM 1 GANTT CHART

ACTIVITIES	WEEK															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FYP talk																
Search topic for FYP																
Modification And Confirmation of Research Topic																
Identify Research Objective and Research Question																
Identify Problem Statement and Background of Study																
Find Information for Literature Review																
Complete Chapter 1																
Complete Chapter 2																
Complete For Chapter 3																
Revised Report Before Presentation																
Viva Presentation for FYP 1																
Correction Of FYP1																

Submission Of FYP 1															

APPENDIX 2

PSM 2 GANTT CHART

ACTIVITIES	WEEK															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Designing Questionnaire																
Distribute Questionnsires																
Data Collection																
Data Analysis																
Report Writing																
Submission Draft of Report																
Amendment of Report																
Preparation of Report Presentation																
Submission and Presentation of Final Year Project (PSM II)																
Revised Report Before Presentation																
Viva Presentation for FYP II																
Correction Of FYP II																
Submission Of FYP II																

APPENDIX 3

QUESTIONNAIRE

Section / Bahagian A: Demographic / Demografik

1. Gender / Jantina

	Male / Lelaki
	Female / Perempuan

2. Age / Umur

	18 – 29
	30 – 39
	40 – 49
	50 above

3. Work experience / Pengalaman bekerja

	< 2 years / tahun
	2 – 5 years / tahun
	6 – 10 years / tahun
	> 10 years / tahun

4. Education level / Taraf pendidikan

	PMR
	SPM
	Diploma
	Degree

5. Marital status / Taraf perkahwinan

	Married / Berkahwin
	Divorced or widowed / Bercerai atau janda

☐ Not married / Tidak berkahwin

6. Smoking / Merokok

☐ Never / Tidak pernah
☐ Former / Bekas
☐ Current / Masih

7. Drink alcohol / Minum alcohol

☐ Never / Tidak pernah
☐ Former / Bekas
☐ Current / Masih

Section / Bahagian B: Workplace Accident / Kemalangan tempat kerja

1	2	3	4	5
Never / Tidak pernah	**Rarely / Jarang**	**Sometimes / Kadang-kadang**	**Often / Kerap**	**Very Often / Sangat Kerap**

Item	Causes / Sebab	Scale / Skala				
		1	2	3	4	5
1	Fall from height / Jatuh dari tempat tinggi					
2	Fall or trip on the floor / Jatuh atau tersadung di lantai					
3	Hit by falling object / Cedera dari objek yang jatuh					
4	Bump into stationary object / Terlanggar objek pegun					
5	Being cut or scratched / Terpotong atau terluka					
6	Being trampled / Tertindih					
7	Injury from extreme temperature / Kecederaan daripada suhu yang melampau					
8	Contacting hazardous material / Berhubung dengan bahan berbahaya					

9	Electric shock / Kejutan elektrik					
10	Injury from explosion / Kecederaan akibat letupan					
11	Fire / Kebakaran					
12	Improper action / Tindakan tidak wajar					
13	Traffic related accident / Kemalangan berkaitan trafik					

Section / Bahagain C: Stress and fatigue / Tekanan dan keletihan

1	**2**	**3**	**4**	**5**
Strongly disagree / Sangat tidak setuju	**Not agree / Tidak setuju**	**Not sure / Tidak pasti**	**Agree / Setuju**	**Strongly agree / Sangat setuju**

Item	**Question / Soalan**	**Scale / Skala**				
		1	**2**	**3**	**4**	**5**
1	Not proud with my job / Tidak berbangga dengan pekerjaan saya					
2	An unpleasant or unsafe workplace / Tempat kerja yang tidak menyenangkan atau tidak selamat					
3	My job negatively affects my physical or emotional well-being / Pekerjaan saya memberi kesan negatif kepada fizikal dan emosi saya					
4	Lots of work to do or unreasonable deadlines / Banyak kerja yang perlu dilakukan atau tarikh akhir yang tidak munasabah					
5	Difficult to express my opinion or feelings to superiors / Sukar untuk menyatakan pendapat dan perasaan saya kepada pihak atasan					

6	Work pressure interferes with my family or personal life / Tekanan kerja menganggu keluarga atau kehidupan peribadi saya					

Section / Bahagian D: Unsafe acts / Perbuatan tidak selamat

Item	**Question / Soalan**	**Scale / Skala**				
		1	**2**	**3**	**4**	**5**
1	Inadequacy of alertness as a result of mind overload / Ketidakcukupan kewaspadaan akibat daripada beban kerja					
2	Challenges in remembrance of information related to work / Cabaran dalam mengingati maklumat berkaitan kerja					
3	Problem-solving difficulties / Kesukaran menyelesaikan masalah					
4	Circumstantial rule disobedience / Ketidaktaatan peraturan mengikut keadaan					
5	Inadequacy of persons' resilience / Ketidakcukupan daya tahan seseorang					
6	The inability of emotion management / Ketidakupayaan pengurusan emosi					

Section / Bahagian E: Machineries or tools / Jentera atau alatan

Item	**Question / Soalan**	**Scale / Skala**				
		1	**2**	**3**	**4**	**5**
1	All equipment is checked regularly at the workplace / Semua peralatan diperiksa secara berkala di tempat kerja					
2	Manual guidelines are provided on how to use the equipment / Garis panduan manual disediakan tentang cara menggunakan peralatan					

3	Join short term courses or online courses to develop knowledge about each machinery used / Menyertai kursus jangka pendek atau kursus dalam talian untuk mengembangkan pengetahuan tentang setiap jentera yang digunakan					
4	Machinery operation is assisted by a procedure manual / Kendalian jentera dibantu oleh manual prosedur					
5	Have a safer place for products or chemicals in the workplace / Mempunyai tempat yang lebih selamat untuk produk atau bahan kimia di tempat kerja					
6	Only trained workers will operate certain machinery / Hanya pekerja terlatih akan mengendalikan jentera tertentu					

Section / Bahagian F: Design of workplace / Reka bentuk tempat kerja

Item	**Question / Soalan**	**Scale / Skala**				
		1	**2**	**3**	**4**	**5**
1	Little space available to work / Sedikit ruang tersedia untuk bekerja					
2	Working on unstable or irregular surfaces / Bekerja pada permukaan yang tidak stabil atau tidak teratur					

Section / Bahagian G: Training procedures / Prodesur latihan

Item	**Question / Soalan**	**Scale / Skala**				
		1	**2**	**3**	**4**	**5**
1	Procedures for emergencies at my workplace have supported the prevention of fatal work accidents / Prosedur untuk kecemasan di tempat kerja saya telah menyokong pencegahan kemalangan kerja yang membawa maut					

2	I will do manual handling as long as I don't feel any pain / Saya akan melakukan pengendalian secara manual selagi saya tidak berasa sakit					