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A STUDY OF FACTORS CONTRIBUTING TO ACCIDENTS AT CONSTRUCTION SITES

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ABSTRACT

Malaysia's construction industry is a key driver of the country's growth and prosperity. Regardless of its importance, the construction business is seen as exceedingly dangerous, with construction workers at risk of injury and disease. The construction industry is responsible for a substantial number of occupational injuries and fatalities each year. Previous research has found that the unique nature of the business, human attitudes, harsh working circumstances, and poor health and safety management are the primary causes of accidents. This paper aims to investigate the factors causing the occurrence of accidents at the construction site and suggest ways to reduce the frequency of accidents at construction sites. The sample or questionnaires were distributed via a survey technique using Google Forms, an internet survey service, and will be sent to 80 people from three different case studies, and 40 of them will respond. The data from the questionnaire will be examined using the SPSS version 26 in this study. Aside from that, the survey found that an accident involving a crane or hoist was the most common type of incident. At the end of the study, various proposals can help to increase understanding and safety factors in construction site accidents, such as longitudinal studies, qualitative research, and comparative analysis of Safety Regulations. By pursuing these recommendations, future studies can further enhance the knowledge and practices surrounding safety factors in construction site accidents.

Keywords: *factors, safety, accidents, construction site*

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INTRODUCTION

In many nations, the construction industry plays a significant role in the economy and is frequently cited as an engine of economic expansion, especially in developing nations. Additionally, it significantly affects the safety and health of employees. Both economically and socially, the building sector is crucial. There are many different activities that construction workers take part in, and each one carries some danger. Building design, materials, proportions, and site conditions are frequently particular to each location, necessitating adaptation and a learning curve. At any point during the process, injuries might happen in several different ways. Additionally, a safe and healthy work environment is crucial to a person's overall quality of life. Because there are numerous significant risks that can endanger a worker's life in the construction business, occupational safety is a crucial element of production efficiency.

To improve all aspects of safety performance, it is important to identify the primary causes of construction accidents. This information could be applied to improve the settings and working conditions on construction sites. The safety and welfare record of the sector was not stellar. For the construction business, the government has adopted and taken several measures to protect workplace safety and health. Meanwhile, Arsiah et al. (2013) reveal that research findings on major projects are consistent in terms of safety level when compared to small initiatives. The study's general conclusions are made, the employee perceptions of safety and health are mostly influenced by management systems like as safety training, safety meetings, and having adequate safety resources accessible.

LITERATURE REVIEW

Definition of Construction Hazard

According to the International Labour Organization (ILO), 2001, occupational health and safety are defined as "the prevention and maintenance of the highest level of physical, mental, and social well-being, the prevention of ill-health among workers caused by their working conditions, the protection of workers from factors detrimental to their health in their employment, and the placement and maintenance of workers in occupational environments adapted to their needs."

Construction is one of the world's most risky and hazardous industries. According to a report by DOSH, Tan Sri Lee Lam Thye, who is the senior consultant of the Department of Occupational Safety and Health said in 2018 has recorded 169 deaths and 3911 accidents in the construction industry. Based on these statistics, the mortality ratio per 1000 workers was 30.44 percent compared to 14.57 percent in 2017. Moreover, the construction sector in 2018 recorded the highest number of deaths when compared to other sectors. The amount of death is counted by every

state in Malaysia and the highest cases at Johor. It is because that state has many types of construction to finish it. Also because of the pandemic Covid-19 that faced in Malaysia, they had to drag their project and must finish it based on the requirement and agreements (DOSH, 2021).

In various parts of the world, according to work-related mortality, workers' compensation, injury, and fatality rates, the construction sector has been rated as one of the riskiest. The construction site is an extremely important area because it employs a big number of people. Workplace safety is a complex subject that must be addressed on a case-by-case basis. From Hinze (1997) article, this is owing to significant advancements in industrial safety during the last decade. An accident is an unplanned, unwanted, unexpected, and uncontrollable event. An accident does not always result in injury. Damage to equipment and materials, particularly those that result in injuries, receives the most attention. All accidents, regardless of the type of damage or loss, should be handled seriously. Errors that do not cause material or equipment damage or harm to personnel may anticipate future incidents with less desirable consequences.

Example of Accidents at the Construction Site

Accidents on construction sites are either the consequence of carelessness on the part of construction businesses or employees, and they have a negative impact on the construction process. In 2016, a construction worker died after falling from a height due to his employer's failure to provide safe working conditions and adequate personal protective equipment (PPE) to the employees (Wahab, 2017). Accidents may have been avoided if construction companies had been more cautious in managing and monitoring their employees and had followed OSHA 1994 requirements throughout the Building 8 process (Borneo Post, 2017). It goes without saying that full adherence to OSHA 1994 is required for site safety precautions (Wahab, 2017).

According to their findings (Asanka and Ranasnghe, 2015), on-site accidents not only delay project completion and result in cost overruns, but they also frequently taint the reputation of the construction company involved. Accidents may also result in uncompetitive bids for the business concerned, dissatisfaction among stakeholders, economic losses for businesses due to property damage, and authorities being freed of the cost, compensation, and fines. (Hamid et al, 2014). Moreover, the high frequency of accidents on site may contribute to an economic slowdown (Chong and Low, 2014).

Factors of Accidents Happening in Construction Site

In various parts of the world, according to work-related mortality, workers' compensation, injury, and fatality rates, the construction sector has been rated as one of the riskiest. The construction site is an extremely important area because it employs a big number of people.

- Example of accidents at the construction site

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- Failure to use personal protective equipment (PPE) and use of defective equipment

The use of inadequate equipment and the failure to wear Personal Protective Equipment are the major causes of construction site accidents (PPE). The increased injuries come from inefficient management of the purchase and maintenance of safety equipment. Without personal protective equipment (PPE), the risk of an unintended injury increases considerably (Toole, 2002). According to Holt, 2001, by using poor equipment and tools is also a risky practice because it can result in direct injury to personnel. Many personnel refuse to wear PPE for a variety of reasons, including discomfort with the equipment while performing their job on-site and the perception that it will impair their work performance (Dorji and Hadikusumo, 2006). Some employees experience discomfort while wearing any sort of PPE during work at construction sites.

- Poor site management

Other than that, when laborers are performing construction-related jobs, the construction site is one of the most dangerous places they may be. Housekeeping comprises the proper storage, use, cleaning, and disposal of various construction components. Poor housekeeping results in a waste of time, energy, and resources, as well as an increased danger of fire and injury.

Ineffective execution arises from insufficient planning. The more time and effort you put into project preparation, the better equipped you will be once work begins. This process starts with a thorough review and understanding of the plans, specifications, scope of work, and client expectations. Establishing construction timeframes and project requirements in coordination with the customer, architect, subcontractors, and suppliers is part of effective planning. Planning requires more than just creating a construction timeline. Moreover, develop a risk assessment and management approach, create site-specific safety plans, create contingency plans, and organize site logistics and material and equipment delivery. Keep in mind that the plan and schedule are dynamic documents that must be updated and changed as the project progresses.

- Human factor

Human error causes building site mishaps. Alcohol or drug use may affect employees' attentiveness and lead to serious mishaps. According to Michaud, 1995 show that using any type of drug or alcohol while working would affect their decision-making ability. They are unable of acting responsibly, which leads to poor decision-making and unsafe employment. Every year, drugs and alcohol are either the direct cause or a contributing factor in a huge number of workplace accidents. (Minter, 2002). Hence, the stubbornness of workers is also the cause of accidents happening in the construction site. The workers who have zero knowledge about construction do not want to gain knowledge and can make a problem at the site.

METHODOLOGY

The distribution of surveys will help the study's objective be met. The researcher approaches the respondents through a physical meeting but because time is running out and the respondents were too busy, the questionnaire will be given by link through email or social media. To accurately answer the unique research questions for the study, data must be carefully obtained and analyzed. Additionally covered in this study is a questionnaire designed for quantitative data collection techniques.

Microsoft Excel 2020 and the Statistical Package for Social Science (SPSS) version 26 will be used in this study's examination of the questionnaire's data.

The sample or questionnaires were sent utilizing a survey technique with an internet survey tool called Google Forms. The expert that might be involved with building sites from the three separate case studies around Seri Iskandar, Perak is 100 respondents, with only 80 sample size required for this analysis. The respondents involved were developers, contractors, project managers, site The researcher received 37 returned surveys, representing 46.25% of the 80 questionnaires issued to the respondents while 43 (53.75%) of the questionnaires were not received by the researcher. The target population may consist of people starting at the age of 21. The research study's sample population consisted of workers who had knowledge or experience of the elements that lead to accidents that occur at construction sites and the significance of safety practices.

FINDINGS

Table 1: Demographic Information

Description	Frequencies	Percentage (%)
Gender		
Male	21	56.8
Female	16	43.2
Age		
18 - 20 years	0	0
21 - 25 years	2	5.4
26 - 35 years	16	43.2
36 – 45 years	9	24.3
46 years old and above	10	27.0
Position in consultant firm		
Contractor	13	35.1
Developer	0	0
Project Manager	3	8.1
Site Supervisor	15	40.5
Site Worker	6	16.2
Working experience		
Less than 1 year	0	0
2 – 5 years	11	29.7
6 – 10 years	6	16.2

11 – 15 years	10	27.0
16 – 20 years	2	5.4
20 years and above	8	21.6
Total numbered of projects involved or handle		
0-5 projects	13	35.1
6-10 projects	6	16.2
11-15 projects	1	2.7
16-20 projects	1	2.7
21-25 projects	2	5.4
26-30 projects	0	0
More than 30 projects	14	37.8

Table 1 summarises each respondent's profile statistics; the gender distribution of respondents shows that the number of male respondents (56.8% of the total) exceeds the number of female respondents (43.2% of the total). Male and female respondents provide a wide range of questionnaire responses. Further analysis reveals that the bulk of responders are 26-35 years old (43.2%), followed by 21-25 years old (5.4%), 36-45 years old (24.3%), and 46 years old and above (27.0%).

Besides that, most of the respondents work as Site Supervisor for the positions in consultant firms which is (40.5%) while Contractor is (35.1%) and Project Manager is (8.1%). Other than that, most of the respondents have 2-5 years of working experience which is (29.7%). Meanwhile, 6-10 years is (16.2%), 11-15 years is (27.0%), and 20 years and above is (21.6%). Next, the total number of projects involved or handle for more than 30 projects is the highest which is (37.8%) while the second highest is 0-5 projects with (35.1%). This finding is consistent with the findings of previous researchers.

Factors Causing the Occurrence of Accidents at Construction Site

From Table 2, it shows that several factors causing to the occurrence of accidents at construction site. Majority of the respondents agree that 'Do you agree that unsafe working methods or unsafe equipment are the cause of construction site accidents?' (Mean = 4.81) are the highest with Rank 1 while the second highest (Mean = 4.73) is 'Do you agree that a lack of safety precautions when working with any machinery can lead to danger?' which is Rank 2. There is only a little difference in which decided each ranking by using the mean. This finding is consistent with the findings of previous researchers.

Table 2: Factors Causing to the Occurrence of Accidents at Construction Site

Description	Mean	Rank
Do you believe that the accident may have been caused by faulty equipment?	4.68	3
Do you acknowledge that accidents frequently occur because of your own negligence?	4.43	5
Do you agree that a lack of safety precautions when working with any machinery can lead to danger?	4.73	2
Do you agree that unsafe working methods or unsafe equipment are the cause of construction site accidents?	4.81	1
Do you agree that the most common types of accidents that occur on construction sites include falls, electrocutions, and being struck by objects?	4.62	4

CONCLUSION

In a nutshell, the aim of the study has been achieved. By achieving this objective, a deeper understanding of the root causes and contributing factors behind construction site accidents can be gained, leading to targeted interventions and preventive measures. The analysis focused on identifying the factors that were consistently associated with the occurrence of accidents. Through data analysis, the study uncovered significant correlations between these factors and the occurrence of accidents at construction sites. For example, it was found that a lack of proper training and worker non-compliance with safety procedures were key factors contributing to accident occurrence. Similarly, equipment malfunction and inadequate maintenance were identified as factors that increased the likelihood of accidents.

After successfully achieving the objectives of this thesis, there are several recommendations for future studies that can further contribute to the understanding and improvement of safety factors in construction site accidents such as longitudinal studies, qualitative research, and comparative analysis of Safety Regulations. By pursuing these recommendations, future studies can further enhance the knowledge and practices surrounding safety factors in construction site accidents. The continuous exploration and improvement of safety management strategies will contribute to the ongoing efforts to create safer working environments and protect the well-being of construction workers.

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