

## **The Proper Use of Safety Harness Among Workers in a Maintenance Company**

**Mohd Nadzmi Aziz<sup>1</sup>, Nurrul Hafeezah Sahak<sup>1\*</sup>, Muhammad Amirul Isyam Abdullah<sup>1</sup>**

<sup>1</sup>Faculty of Engineering Technology,  
Universiti Tun Hussein Onn Malaysia, Education Hub, Pagoh, 06400, MALAYSIA

\*Corresponding Author Designation

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**Abstract:** Most of the employees of Telecommunication and Electrical service company does not use safety harnesses when working at the height as expected. However, employees are continuously exposed to hazards when working at height places, and the use of safety equipment is required by laws such as the Occupational Safety and Health (Amendment) Act 2022. Objective of this research is to the prevalence of the proper use of safety harnesses among workers in the maintenance industry, to analyzed factors of lacking in safety harness usage among employees, and to suggest control measures to encourage employees to wear full body harnesses properly while performing work at height. Structured questionnaire produced according to the objective consisting of four part was used for data collection, and the respondents were Telecommunication and Electrical service company employees. The reason for workers' lack of use of safety harnesses is identified through theoretical analysis, descriptive statistics, correlation analysis, and regression analysis. 36 employees of Telecommunication and Electrical service company have answered a questionnaire based on specific variables. that attitude is the main cause of workers not wearing safety harnesses. Therefore, the attitude has been workers do not wear a safety harness. This analysis shows that the discomfort of using safety harnesses, and lack of knowledge about how to use safety harnesses are why employees do not use safety harnesses when working at heights. control measures proposed to encourage the use of safety harnesses among workers are to provide more safety training and focus on training the use of safety harnesses correctly and make the worker aware of the hazard they will face if wearing the harnesses in the wrong way.

**Keywords:** Occupational Safety and Health (Amendment) Act 2022, Attitude, Safety Harness

## 1. Introduction

Maintenance is one part of civil engineering. Civil engineering is a professional engineering that offers design, and construction. Maintenance can take place in the public sector from municipal public work departments to federal government agencies and the private sector. HILSB is also involved in civil engineering and electrical engineering work in handling projects with government-owned companies and government bodies such as Telekom Malaysia Berhad (TM), Tenaga Nasional Berhad (TNB), and the Malaysia Public Works Department (JKR).

Safety harness is one of the important personal protective equipment for workers who work at high places. Wearing a safety harness is in accordance with standards set by authorities, where it may reduce the rate of injuries, accidents, and death. Behavior is not recognized as a significant cause of accidents among general workers. unsafe behavior is produced; internal cognitive processes will fail to make unexpected behaviors. Surry's (1996) model, which have five levels, is commonly used to analyze the causes of unsafe behavior. The five levels are detecting danger, determining the response, and executing the decided response. Dangerous employee behavior can lead to failures and accidents on site.

Among the accident that occurred at maintenance sites, falling from a height was one type of major and serious accident at construction sites in Malaysia [1]. Fall from high altitude will not only result but also substantial costs and loss of working time [2]. According to Occupational Safety and Health Act of 1994, employers must provide employees with appropriate personal protective equipment (PPE) to protect their safety.

The objectives of this research were Prevalence on the proper uses of safety harness among worker in a maintenance industry, to analyses factors of lacking in safety harness usage among employees and to suggest control measure to encourage employees wear body harness in proper manner while performing work

## 2. Literature Review

Falling means falling from one level to another level to another and working at a height where a person is working at the height of 10 feet or more precisely 3 meters or more than 3 meters [3]. Working in a high place is one of and reported high risk of accidents. The main danger is falling from a high place and therefore safety measures should be emphasized. When working at a height of 10 feet (3 meters) or more above ground or floor level, worker must wear personal protection equipment (PPE) before starting the work [4], safety harness, safety shoes, lifeline, lanyard, rope grab and safety helmet.

### 2.1 Safety harness

Fall protection such as safety harness shall be provided and use where workers are at risk of falling 3 meter or more. Safety harnesses must be full-body one-piece harness or seat harnesses used in conjunction with chest harnesses firmly attached to seat harness [3]. A full body harnesses (FBH) is a component that connects the user to a place, it consists of fittings, straps, buckles, other element supporting the user body and restraining the user during the user during and after fall detention [5].

Full-body harness consists of straps that run over the shoulders, chest, and around the legs. When using personal fall protection equipment, wearing a work harness still risks falling. When an employee wears a full-body harness, it will reduce the risk to the wearer because the danger cannot be eliminated. However, their use has become a legal requirement and is essential to protect them from exposure to fall

### 2.2 Methods

This study uses quantitative research to explain the relationship between the variables to be studied. The relationship of these variable is meant to be the influence of one variable on another variable. This

study uses quantitative methods, the variable involved is measured using document review, literature review and numerical data or data that can be converted into statistics that can be used to analyze data. This review method is more practical for analysing data and comparing previous research methods that have been conducted and facilitating data collection. The sampling for this study is focus on employees at Telecommunication and Electrical service company who work with this company base in Penang. This questionnaire is distributed in Malaysian because most of the employees have limited knowledge of the English language. Therefore, this initiative was taken to endure understanding of the questions that were distributed to employees. This survey question has four-part, part one is the respondent background. Part two is causes of underuse of safety harnesses. Part three is the cause of the lack of use of safety harnesses according to certain beliefs, and the lastly is part four which is the factors that interfere with the wearing of body harness

Quantitative research is used to measure problems by producing numerical data that can be converted into usable statistics. This quantitative research is used to measure attitudes, opinions, behaviour, and other defined variable, and it is suitable for a large sample population [6]. The Statistical Package for The Social Sciences (SPSS) application will be used to analyze the data in this study the version that will be used is version 27. This research uses both descriptive and inference analysis. Frequency, percentage, mean, and standard deviation variables can be described using this descriptive technique.

### 3. Results

A total of 36 respondents have answered this questionnaire and will contribute to this study. The respondents who have been selected are employees who work in Harta Infra Legacy sdn.bhd in Penang Island. This section aims to identify the respondents background, which consists of the respondents age, position in industry, the respondents experience, accident experience, safety equipment provided by the employer while working, and whether there is a safety harness or not for employees who work on height.

#### 3.1 Prevalence on the proper use of safety harness among workers

Based on Table 1 the attitude on the question, I don't know how to use safety harness, and workers have a very negative attitude towards how to use a safety harness while working in high places. As many as 27.8 employees agree, and 72.2 percent of employees strongly agree that they do not know how to use the safety harness; this shows that all respondents do not know how to use the safety harness in the right way.

**Table 1: I don't know how to use safety harness**

Variable	Frequency	Percent
Agree	10	27.8
Strongly agree	26	72.2
Total	36	100

#### 3.2 Factors associated with lacking in safety harness usage among employees

Correlation analysis is used to find the strength of the relationship between several variables. It uses Pearson because the data is linear. All the variables have a positive relationship.

Table 2 show the r value for the attitude is 1 and the highest in this section. The value of r for Intent is the highest, with an r = 0.63. followed by behavior, the value of r is 0.563, and the value of r for

Behavioral control is  $r = 0.471$ , while the value of  $r$  for Subjective norms is  $0.622$ . The lowest  $r$  value in this section is Perception, which is  $r = 0.468$ .

**Table 2: Strength of the relationship**

Factors	Strength of relationship (r)
Attitude	1
Subjective norms	Large (0.622*)
Perception	Medium (0.468*)
Behavioral control	Medium (0.471*)
Intent	Large (0.630*)
Behavior	Large (0.563*)

\* $p < 0.05$

### 3.4 Factor That Interferes with The Use of Safety Harness

Factor that disturbs employees from wearing safety harness are analyzed according to three variable: Belief strength, Motivation, and Behavioral control. These three variables reflect the lack of safety harness usage among employees. Descriptive statistic and frequency distribution of Belief strength, Motivation, and Behavioral control are analyzed. Refer to Table 3 Min, max, mean strongly disagree, disagree, neutral, agree, strongly agree frequency distribution of Belief strength, Motivation, and Behavioral control.

Behavioral control has the highest mean value of 3.69, Motivation has the mean value 3.61; Belief strength has the lowest mean of 3.33. however, according to each item, most employees believe safety is a priority when working on-site, it has the highest mean value 4.69, which shows that employees strongly agree. The lowest mean value for this section is 3.58 because most employees care about how colleagues view my behavior.

Beliefs strength, more than half of workers agree that the convenience and comfort of using safety harnesses are essential, that percentage is 86.1% and 72.8%. in addition, almost all workers are concerned about safety at the site, which has a high percentage value of 91.7%, which show that belief strength has a positive value.

The motivation to comply, the average mean is 3.61. employees care about the team leaders view on work behaviour with percentage value of 47.2, while 52.8% disagree with the team leader's stance on employees behaviour. In additional, 44.5% of workers agrees to care about the safety officers view of their behaviour, while 54.5% did not care about the safety officers' statement. There employees are concerned about the opinion of colleagues about the current behaviour of employees with a positive percentage value of 52.7%, while another 47.3 disagree with the view of colleagues.

For behavioral control, more than half of the employees think it is essential for employees to know the use of safety harnesses. With this, employees agree that they should not use safety harnesses unless they know, with a percentage value of 52.7% of which 46.3% of respondent disagree that it is necessary to have prior knowledge to wear a safety harness. While 61.1% of respondent agree that they would not use safety harness less that it was provided. Most workers will not use safety harnesses unless there are safety guidelines, with a percentage value of 58.4%.

**Table 3: Min, max, mean strongly disagree, disagree, neutral, agree, strongly agree frequency distribution of Belief strength, Motivation, and Behavioral control**

Cause	Min	Max	Mean	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>Beliefs strength</b>	3.00	5.00	3.3333					
Safety is a priority	3	5	4.69			8.3	13.9	77.8
The convenience of using a safety harness is important	3	5	4.19			13.9	52.8	33.3
The comfort of using a safety harness is important	3	5	4.11			27.8	33.3	38.9
<b>Motivation</b>	3.00	5.00	3.6111					
I care about the team leader's view of my behaviour.	3	5	3.64			52.8	33.3	13.9
I was concerned about the safety officers' view of my behaviour	3	5	3.61			55.6	30.6	13.9
I care about how my colleagues view my behaviour	3	5	3.58		5.6	41.7	33.3	19.4
<b>Behavioral control</b>	1.67	5.00	3.6944					
I cannot use the safety harness unless I have the knowledge	12	5	3.67		5.6	41.7	33.3	19.4
I will not use the safety harness until it is provided	2	5	3.75		8.3	30.6	38.9	22.2
I wouldn't use a safety harness unless it had a safety line.	1	5	3.67	2.8	2.8	36.1	41.7	16.7

### 3.5 Discussion

All employee they did not know how to use safety harness and contributed the highest mean value 4.72. More than half of the workers also think using safety harness is uncomfortable, contributing a mean value of 3.53, which show a strong agreement among respondents. Worker complained that wearing safety harness restricted their movement when working at height. Two factors that can explain workers needing to be more comfortable wearing safety harness is that workers want complete their work with minimal effort considering that work at height is moderate to heavy work and most place are high Jiang (2015). Employees have a limited time frame, and employees need to work quickly to achieve and complete the work before the dateline, therefore, by improving the design of the safety, the comfort of using it can be increased and encourage works to use safety harnesses. Most workers do not agree that they will not use safety harness when working at height, which contributed a mean of 3.11. the lowest mean is 2.89, which workers deny even have not use safety harness working at height,

showing that the employee has a good behavior in using the safety harness. Most workers have experience wearing safety harness from their previous workplace. Worker disagrees that workers should not use safety harness unless they know.

**Table 4: Mean and rank of Belief strength, Motivation, and Behavioral control**

Cause	Mean	Rank
Safety is a priority	4.69	1
The convenience of using a safety harness is important	4.19	3
The comfort of using a safety harness is important	4.11	2
I care about the team leader's view of my behaviour.	3.64	7
I was concerned about the safety officers' view of my behaviour	3.61	8
I care about how my colleagues view my behaviour	3.58	9
I cannot use the safety harness unless I have the knowledge	3.67	6
I will not use the safety harness until it is provided	3.75	4
I wouldn't use a safety harness unless it had a safety line.	3.67	5

#### 4. Conclusion

There are many possible reasons for workers lack of safety harness use. Some related control measures have been proposed according to specific cause to encourage workers to use a safety harness. To minimize worker's perception of the difficulty and discomfort of using a safety harness while working at height, the design of the safety harness should be considered to be improved.

In additional, the management needs to provide a safety report to worker regarding accidents cause by not using safety harness. It is important to make workers aware and will not underestimate the risk of not using safety harness. Therefore, it can also increase awareness and improve employee behavior. It is also necessary to let managers, such as safety officer and team leader, know their influence on workers if they put negative normative pressure on using safety harnesses.

In conclusion, the reason for the lack of use safety harnesses among worker is mostly due to unsafe behavior among workers. In additional, when working at height employees have bear the responsibility of providing and educating like training employees wear safety harnesses. Therefore, all three objectives have been met, and it can help reduce the number of accidents, especially falling form a height.

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