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RESEARCH ARTICLE

SAFETY MANAGEMENT IN CONSTRUCTION SITES: IMPROPER SAFETY PRACTICES AND EMPLOYEE TURNOVER INTENTION

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ABSTRACT – There has been a significant increase in the number of recorded casualties within the construction business between 2020 and 2022, with a monthly rise in the frequency of such incidents. This study examines the correlation between safety practices and turnover intentions in the construction industry, focusing on registered construction companies in Kuala Lumpur. The target participants were Grade G5 to G7 construction companies registered with the Construction Industry Development Board (CIDB) in Wilayah Persekutuan Kuala Lumpur. The data was gathered through an online survey with 136 respondents and analysed using Structural Equation Modelling. A strong correlation was found between improper safety practices and turnover intention among construction workers. The findings hope to provide valuable insights for the construction industry to comprehend the impact of several variables on turnover intention. It also serves as an indicator for the most effective interpretation of employee turnover measurements to improve successful safety policies.

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1. INTRODUCTION

Construction projects are costly, complex, and difficult activities that frequently place personnel in a harsh work environment riddled with safety concerns. The construction industry in Malaysia has seen a significant increase in accidents and employee turnover, which is attributed to inadequate safety practices. Construction workers endure a significant level of stress that might exhaust their psychological resources because they have to meet tight deadlines in addition to these inflexible requirements. As a result, personnel in the construction industry often form intentions to leave the business, which are generally referred to as turnover intentions. Safety science has evolved to the point where safety management is regarded as a non-linear, multi-level control problem. Saeed (2017) asserts that to protect workers, it is imperative to take into account all conceivable risks and incidents. The latest data from the Department of Occupational Safety and Health (DOSH) Malaysia reveals that the construction sector, known for its high level of danger, recorded a significant number of deaths (59 deaths) in 2022. The frequent occurrence of accidents, which are caused by insufficient safety measures, not only leads to more injuries but also affects workers' desire to leave their jobs.

Employee turnover intention refers to the tendency of employees to quit from their current employment or organisation. The employee turnover rate in multinational firms has consistently been a significant concern throughout Malaysia (Hassan et al., 2023). According to Al-Suraihi et al. (2021), the costs associated with employee turnover may have a substantial influence on an organisation's productivity, sustainability, competitiveness, and profitability. Furthermore, Uğural et al. (2020) assert that employees leave their jobs because they are dissatisfied with the safety management provided and decide to leave voluntarily. The study also confirmed that project-based manufacturing, namely in the construction sector, is more susceptible to voluntary turnover compared to other industries. Therefore, it is essential to make the department's management more complacent to provide a safe working environment that can reduce and prevent potential hazards and risks around employees.

Occupational safety and health (OSH) are a crucial factor in the construction industry for ensuring the quality and success of building projects (Fan et al., 2020; Konno, 2018). In Malaysia, many construction projects put workers at risk of injury or death (Albarkani & Shafii, 2021). The causes of accidents in the construction business are frequently associated with the industry's distinctive design, human behaviour, unsuitable site circumstances, hazardous work practices, machinery, and procedures, all of which are influenced by insufficient safety management (Kim et al., 2019). Previous studies reported a significant increase in OSH-related injuries over the past five years (Peñaloza et al., 2019) where the building industry contributed the largest number of deaths, with 59 out of 186 cases as of November 2022 (DOSH, 2022).

Conversely, every contractor must possess the necessary training and strong safety systems that can continually improve safety efficiency and minimise potential hazards in building projects. Cheung and Zhang (2020) postulate that

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some construction firms fail to implement construction safety management systematically. This aligns with the findings of previous studies whereby occupational accidents and poor safety management have been connected to employees' turnover intention (Ahmed & Waqas, 2017; Hassan et al., 2023). Therefore, this study shall address such gap by defining the relationship between inappropriate safety practices and employee turnover intention in construction sites. The investigation is guided by the following research questions: What is the relationship between safety management practices and employee turnover intention? The findings hope to gain insights into how the nexus between safety equipment, safety management, employee attitude, and safety training influences turnover intention in the construction sector.

2. LITERATURE REVIEW

The literature review covers four main areas: safety attitudes, safety equipment, safety management, and safety training.

2.1 Turnover Intention

Turnover of workers is one of the significant problems for any company that has long-lasting consequences. Turnover is when employees leave their current job position while turnover intention is the measurement of the employee's probability of quitting their current job or whether the company plans to withdraw workers from the position. Both turnover and turnover intention can be classified as voluntary or involuntary (Belete, 2018). A study by Liu et al. (2019) indicated that workers are more likely to resign if the company's protection system is not fulfilled. According to Rababeh et al. (2010), 65% of construction companies record their turnover rates as incredibly high and contractors can mitigate such issue by enhancing the delivery of safety management. Organisations that consistently handle workplace protection in a high-risk job atmosphere will improve employees' loyalty and participation and secure workers' lives. Meanwhile, a weak defence will raise the turnover rate of employees, which is attributed to both employee satisfaction and employee participation. Hence, it is important to ensure that employees in high-risk construction sites are satisfied with the safe environment. Voluntary skilled workers are one of the main problems and priority concerns that will impact companies in several ways. Moreover, the construction sector comprises several distinctive features that are relative to other industries. This situation is attributed to the high degree of precariousness and employee turnover (Uğural et al., 2020). Hence, it is crucial to determine the factors influencing turnover rate.

2.2 Safety Attitude of Workers

According to Basahel (2021), the main causes of occupational accidents involving touch and exposure to electrical machinery and power tools in electrical construction projects are insufficient safety legislation, inadequate safety supervision, ineffective training, and unfavourable safety attitudes. Yang et al. (2021) added that companies often fail to provide clear definitions for safety words, which can contribute to workplace accidents caused by several factors. The issue of safety in the workplace incorporates both human variables and organisational or group issues, such as safety culture, rules, leadership, and safety attitudes. The concept of safety attitude involves the identification of negative behaviours and the enhancement of safety practices that may lead to the occurrence of injuries or hazardous conditions (Kao et al., 2019). According to Saeed (2017), employee attitude is a contributing element that increases the likelihood of injuries in building projects. The primary factors include hazardous actions and circumstances, which are commonly associated with human errors due to employees' attitudes. Hanapi et al. (2013) also mentioned that employees' attitudes impose significant challenges in implementing the norms and regulations for construction sites.

H_1: There is a significant relationship between the safety attitude of workers and employee turnover intention.

2.3 Safety Equipment

DOSH (2005) defined Personal Protective Equipment (PPE) as any gear worn by individuals during work to safeguard them from potential safety and health hazards, including any supplementary accessories intended to protect them while conducting tasks. A study by Izudi et al. (2017) highlighted that protection facilities, such as PPE, are indeed essential. Giri (2020) suggested that construction firms can enforce PPE usage to mitigate or prevent casualty cases in the construction sector. Irumba (2014) also noticed that 89% of construction sites have scaffolding and ladders; however, the standard is low with poor quality of structure and materials used, thus creating invisible safety risks. Therefore, turnover rates at construction sites can be minimised by implementing proper safety management (Rababeh et al., 2010).

H_2: There is a significant relationship between safety equipment and employee turnover intention.

2.4 Safety Management

Safety management is the process of identifying potential hazards to health and safety, preventing the occurrence of these hazards, and minimising or mitigating the potential negative impacts on a project's safety. Yiu et al. (2018) argue that implementing an effective safety management system (SMS) is crucial to address dangerous situations, minimise the risk of injuries, and lower the number of casualties. Companies can also implement and enhance the Occupational Health and Safety Management System (OHSMS) to reduce the frequency of injuries, as evidenced by the 67% reduction in accidents and 10.3% decrease in fatal injuries among construction firms in South Korea that adopted the OHSMS safety management framework between 2006 and 2011 compared to non-certified OHSMS construction companies (Yoon et

al., 2013). As the main priority of management is to protect staff from injuries, their engagement and exceptional diving abilities are crucial and can have a substantial impact on other factors (Rajaprasad & Chalapathi, 2015).

H_3: There is a significant relationship between safety management and employee turnover intention.

2.5 Safety Training

Construction companies adopt and invest in a wide range of safety initiatives to avoid and reduce workplace mishaps. One such approach is the widespread adoption of safety training measures. Efficient safety training offers numerous advantages as it can enhance workers' proficiency in the proper handling of tools and equipment, improve productivity, and reduce risks that may occur in these dangerous workplace environments (Naiman et al., 2016; Alsharef et al., 2020). Implementing efficient safety training programs can also enhance individuals' ability to identify potential dangers and prevent their engagement in risky activities. According to Wilkins (2011), successful preparation training for health and safety would increase workers' productivity and address health and safety needs. The preparation of safety training for workers also aims to enforce diverse corporate practices, minimise the likelihood of injuries, and improve productivity (Uddin et al., 2023). Furthermore, Mohamed Taufek et al. (2016) observed that accidents are frequently compounded due to the shortage of trained workers who may lose their lives during the operation of their work.

H_4: There is a significant relationship between safety training and employee turnover intention.

2.6 Theoretical Framework

Central to the concept of "safety management and employee turnover", this study aims to assess the impact of improper safety practices, such as safety attitudes, safety equipment, safety management, and safety training, on employee turnover at construction sites. The study is based on Maslow's Need Hierarchy Theory, in which protection is an essential factor of the philosophy. First, it is necessary to satisfy the lowest level of needs to meet others' high levels of expectations. According to Maslow's Need Hierarchy Theory, when the needs of the lower or bottom stages are fulfilled, the other stages can proceed. The fulfilment of essential or physiological requirements, such as air, food, and water, will prompt individuals to move to the Safety Needs, which are critical in the construction industry (Cherry, 2015). Safety needs are the most significant because it is challenging to meet the construction worker's requirements. Employees can only be fulfilled with this safety level if they are operating assigned tasks with appropriate safety devices, proper safety monitoring, and sufficient safety preparation in a safe workplace environment. On the other hand, employees might have turnover intentions if the organisation is unwilling to fulfil the second stage of safety requirements. Figure 1 shows the theoretical framework of this study.

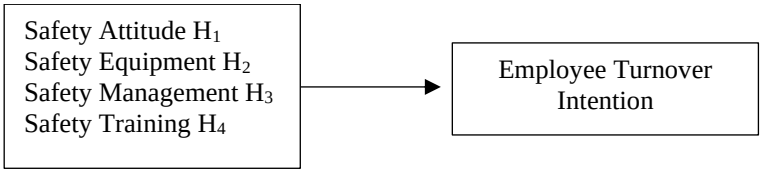

Figure 1. Theoretical framework

3. DATA AND METHODOLOGY

3.1 Data collection

This study employed a quantitative methodology using a cross-functional survey. It aligns with previous literature that supports the appropriateness of using quantitative methodology in scholarly research when the objective is to ascertain the significant correlation between the selected variables. An adapted questionnaire was used as the data collection instrument (Vinodkumar & Bhasi, 2010). It was administered through online surveys targeting Grade 5 to Grade 7 construction workers in Kuala Lumpur. The research population encompassed those under the Construction Industry Development Board (CIDB) and *Pusat Khidmat Kontraktor (PKK)* in Wilayah Persekutuan Kuala Lumpur. A sample size of 136 was determined based on G-power analysis and simple random sampling was used to select the sample. The final analysis involved 136 questionnaires, which are deemed suitable for research that analyses organisations at the unit level (Gold et al., 2001; Yusr et al., 2020).

Table 1 shows that the respondents encompassed varied job positions, namely general workers (30.88%), construction workers (25%), engineers (8.09%), general/project managers (29.41%), and quantity surveyors (6.62%). The majority of respondents (n=105, 77.12%) were from residential buildings, institutional and commercial buildings, infrastructure, and heavy construction. Their experience was sufficient to answer the survey questions and provide pertinent information. Furthermore, 89.70% of the respondents had industry experience ranging from 1 to 10 years.

Table 1: Demographic Data

Demographic Data		Frequency	(%)
Current job position	Construction workers	34	25.00
	Engineer	11	8.09
	General workers	42	30.88
	General/Project manager	40	29.41
	Quantity surveyor	9	6.62
Types of construction	Infrastructure and heavy construction	3	2.21
	Institutional and commercial building	1	0.74
	Residential building	27	19.85
	Residential building, institutional and commercial building, infrastructure, and heavy construction	105	77.21
Number of years working for the company	< 1	6	4.41
	11-15	8	5.88
	1-5	91	66.91
	6-10	31	22.79
Highest qualification before enrolling in the current program	Bachelor	119	87.50
	Diploma	2	1.47
	Masters	4	2.94
	Other	11	8.09
Grand total		136	100.00

3.2 Measurement and Scale

All items in the questionnaire were adapted from relevant literature and measured using a 5-point Likert scale, ranging from (1) = strongly disagree, (2) = disagree, (3) = neutral, (4) = agree, and (5) = strongly agree. Safety equipment and safety management were measured through 8 items that were adopted from Vinodkumar and Bhasi (2010) and Ahmed and Waqas (2017). Safety attitude and safety training were assessed by 8 items adopted from Ahmed and Waqas (2017). Finally, employee turnover intention was measured using items adopted from Ahmed and Waqas (2017). Structural Equation Modelling (SEM) via Smart PLS version 3.2 was utilised for data analysis purposes through descriptive analysis, convergent validity, discriminant validity, hypothesis testing, and coefficient of determination.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics and Normality Assessment Criteria

Table 2 shows the descriptive statistics and normality assessment results. All items for safety equipment recorded the mean values of 4.463 for SE1, 4.654 for SE2, 4.493 for SE3, and 4.662 for SE4. The mean values for safety management items were 4.485 for SM1, 4.471 for SM2, 4.500 for SM3, and 4.419 for SM4. Meanwhile, items for safety attitude had the mean values of 4.368 for SA1, 4.404 for SA2, 4.412 for SA3, and 4.441 for SA4. Finally, the mean values for safety training items were 4.456 for ST1, 4.441 for ST2, 4.507 for ST3, and 4.471 for ST4. These results indicate that all four variables had an accurate outcome.

The standard deviation for all four independent variables is considered relatively small considering that the data was less spread. The skewness result revealed that the data was negatively distributed across all four variables, indicating that the results were distorted negatively.

Table 2. Descriptive statistics and normality assessment criteria

Construct	Item Code	Min	Max	Mean	Standard Deviation	Excess Kurtosis	Skewness
SE	SE1	3	5	4.463	0.605	-0.498	-0.662
	SE2	3	5	4.654	0.506	-0.244	-0.999
	SE3	3	5	4.493	0.618	-0.316	-0.821
	SE4	3	5	4.662	0.518	0.308	-1.166
SM	SM1	3	5	4.485	0.556	-0.839	-0.462
	SM2	3	5	4.471	0.568	-0.734	-0.492
	SM3	3	5	4.500	0.582	-0.500	-0.680
	SM4	3	5	4.419	0.576	-0.739	-0.379

Table 2. (cont.)

Construct	Item Code	Min	Max	Mean	Standard Deviation	Excess Kurtosis	Skewness
SA	SA1	3	5	4.368	0.616	-0.643	-0.435
	SA2	2	5	4.404	0.623	0.503	-0.739
	SA3	2	5	4.412	0.624	0.519	-0.762
	SA4	3	5	4.441	0.603	-0.570	-0.583
ST	ST1	3	5	4.456	0.580	-0.666	-0.512
	ST2	1	5	4.441	0.662	4.079	-1.398
	ST3	3	5	4.507	0.606	-0.289	-0.829
	ST4	3	5	4.471	0.581	-0.621	-0.567
ETI	ETI1	3	5	4.015	0.642	-0.547	-0.013
	ETI2	3	5	4.279	0.615	-0.604	-0.257
	ETI3	3	5	4.338	0.621	-0.651	-0.387
	ETI4	3	5	4.419	0.601	-0.622	-0.506

Note: SE = Safety equipment; SM = Safety management; SA = Safety attitude; ST = Safety training; ETI = Employee turnover intention

4.2 PLS Path Model

Figure 2 illustrates the PLS path model's description, a statistical method for analysing dynamic multivariate interactions between independent and dependent variables. The PLS route model's loading value must be greater than 0.4 and the researcher can delete the loading indicator below 0.4 from the model (Hulland, 1999). Results from the PLS algorithm indicated that all loading values were more significant than the acceptable value of 0.4. No items were beyond the cut-off point and must be removed from the model. Hence, there is no updated PLS-Path model.

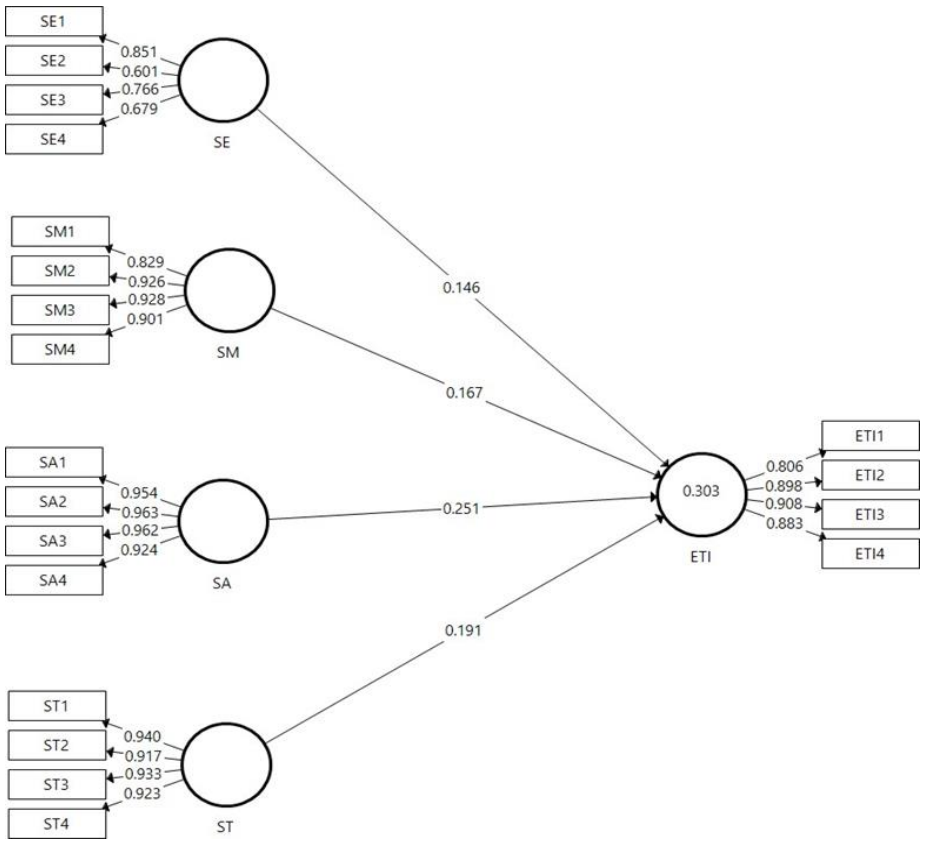

Figure 2. Hypothesised PLS path model

4.3 Measurement Model

4.3.1 Convergence Validity

As shown in Table 3, the outer loading value for each predictor reached the minimum acceptable value of 0.4 and the lowest value obtained was 0.601. The acceptable cut-off for the average variance extracted (AVE) is more than 0.5. The results show that the AVE ranged from 0.534 to 0.904, subsequently implying half of the variance within their respective indicators. According to Hair et al. (2019), the cut-off value for composite reliability (CR) should be 0.7 or higher than

the amount of reliability specified. As indicated in Table 3, the CR values for the five constructs ranged from 0.818 to 0.974, which is higher than the appropriate value and indicates adequate internal consistency. Convergent validity measures the degree to which the construct converges to count the variance of its indicators and can be assessed via AVE. Hair et al. (2019) suggest that the acceptable AVE is 0.50, meaning that the construct can account for at least 50% of the variation in its elements. The results in Table 3 suggest that all values are acceptable and meet all recommended thresholds. The convergent validity assessment also indicates that the model meets the convergent validity requirements criteria.

According to Tavakol and Dennick (2011), the Cronbach's Alpha value should be greater than 0.7. A high Alpha value indicates that the test is highly reliable while a low value of Alpha denotes that the question is insufficient. In this study, employee turnover intention obtained an Alpha value of 0.897, indicating good reliability. Safety attitude recorded an excellent Alpha value of 0.964 while safety equipment had a significant Alpha value of 0.718. Finally, both safety management and safety training obtained Alpha values that exceeded the threshold, each with 0.918 and 0.947, respectively.

Table 3. Convergent validity

Construct	Item Code	Outer Loading	AVE	CR	Cronbach's Alpha
ETI	ETI1	0.806	0.765	0.929	0.897
	ETI2	0.898			
	ETI3	0.908			
	ETI4	0.883			
SA	SA1	0.954	0.904	0.974	0.964
	SA2	0.963			
	SA3	0.962			
	SA4	0.924			
SE	SE1	0.851	0.534	0.818	0.718
	SE2	0.601			
	SE3	0.766			
	SE4	0.679			
SM	SM1	0.829	0.804	0.943	0.918
	SM2	0.926			
	SM3	0.928			
	SM4	0.901			
ST	ST1	0.940	0.862	0.961	0.947
	ST2	0.917			
	ST3	0.933			
	ST4	0.923			

Note: SE = Safety equipment; SM = Safety management; SA = Safety attitude;
ST = Safety training; ETI Employee turnover intention

4.3.2 Discriminant Validity

Finally, testing the reflected measurement's discriminant is necessary to determine its validity and reliability. In this regard, the metric of discriminant validity indicates the degree to which the constructs in the structural model are distinct (Hair et al., 2019). It specifies whether the model's structures are strongly associated with other constructs. Kline (2016) suggests that the Heterotrait-Monorait (HTMT) ratio of more than 0.85 indicates a lack of discriminant validity. HTMT refers to the mean of average correlations for items measuring the same construct (Hair et al., 2019). HTMT value below 90% is considered discriminant validity while must be below 85% to verify discriminant validity (Henseler et al., 2015). Table 4 shows that the largest HTMT statistic is 0.535 (ST→SM). Moreover, the HTMT trust period should not provide zero based on clear PLS bootstrapping. Such results indicate that the discriminant validity is satisfactory, suggesting that there is sufficient construct validity in the measurement model.

Table 4. Discriminant validity: Heterotrait-Monotrait Ratio (HTMT)

	ETI	SA	SE	SM	ST
ETI					
SA	0.455				
SE	0.367	0.279			
SM	0.461	0.418	0.498		
ST	0.443	0.410	0.334	0.535	

Note: SE = Safety equipment; SM = Safety management; SA = Safety attitude; ST = Safety training; ETI = Employee turnover intention.

4.4 Structural Measurement

4.4.1 Coefficient of Determination (R^2)

It is important to satisfy the reflective measurement model prior to proceeding to the second stage of analysis, namely hypothesis testing. These requirements include the statistical significance of path coefficients, coefficient determination (R^2), and blindfolding-based cross-validated redundancy measure (Q^2) (Hair et al., 2019). According to Henseler et al. (2016) and Hair et al. (2019), the primary criterion for assessing the explanatory power of the model is the coefficient of determination (R^2) of a specific intrinsic latent variable. PLS-SEM is a prediction-oriented method that aims to explain the amount of variance that occurs on the endogenous latent variable. The R^2 value of 0.75 is considered significant while 0.50 and 0.25 indicate a general indication (Hair et al., 2019). The R^2 results from the PLS-SEM algorithm indicate the dependent variable for the proportion of variance, which can be predicted from the independent variables. The value of 0.303 means that 30.30% of employee turnover intention can be expected from the independent variables in this study.

Table 5. R Square

	R Square	R Square Adjusted
ETI	0.303	0.282

Notes: ETI = Employee Turnover Intention

4.4.2 Cross-Validity Redundancy (Q^2)

Blindfolding procedures are generally utilised to evaluate cross-validity redundancy (Henseler et al., 2009). The predictive importance of a specific endogenous construct is indicated by a number larger than zero (Hair et al., 2019). The cross-validity redundancy results in Table 6 show that the exogenous variable obtained a Q^2 value of 0.218, thus indicating its statistical significance for the endogenous construct under consideration. The Q^2 values of 0.02, 0.15, and 0.35 suggest that the latent variables have minor, medium, and high predictive significance, thereby describing the endogenous latent variable under examination. Conversely, the output validated the assertion that the model had adequate predictive relevance.

Table 6. Results of Q^2

	SSO	SSE	Q^2 (=1-SSE/SSO)
ETI	77.241	60.420	0.218
SA	82.959	82.959	
SE	77.948	77.948	
SM	84.435	84.435	
ST	81.756	81.756	

Notes: ETI = employee turnover intention; SA = safety attitude; SE = safety equipment; SM safety management; ST = safety training

4.4.3 Effect Size (F^2)

Cohen (1988) categorises effect size into three small ranges of medium (0.15), large (0.35), and no effect (less than 0.02). As shown in Table 7, SA (F^2 = 0.071), SE (F^2 = 0.025), SM (F^2 = 0.025), and ST (F^2 = 0.037) had a small effect on ETI. This implies that all variables (SA, SE, SM, and ST) have a small influence on turnover intention.

Table 7. Result of F^2

ETI	SA	SE	SM	ST
ETI				
SA	0.071			
SE	0.025			
SM	0.025			
ST	0.037			

Notes: ETI = employee turnover intention; SA = safety attitude;
SE = safety equipment; SM safety management; ST = safety training

4.5 Hypothesis Testing

Hypothesis testing is the final stage in examining the structural measurement. It was achieved by finding the route coefficient using PLS and the significance level of the obtained coefficients was determined via bootstrapping. This study employed one-tailed t-values to assess the pathways' degree of significance. The main focus of this study is the interaction between the key structures and the p-value indicates that all four hypotheses were accepted.

Table 8. Summary of hypotheses testing

Hypotheses	Paths	Std. Beta	Standard Deviation	t- statistics	p-value	Bias	Confidence Interval Bias Corrected		Decision
							5%	95%	
H_1	SA → ETI	0.251	0.084	2.986***	0.001	-0.002	0.110	0.379	Supported
H_2	SE → ETI	0.146	0.078	1.864***	0.031	0.024	0.014	0.254	Supported
H_3	SM → ETI	0.167	0.094	1.782***	0.038	-0.009	0.030	0.327	Supported
H_4	ST → ETI	0.191	0.083	2.308***	0.011	0.001	0.048	0.322	Supported

Note: ***$p < 0.05$

The results indicate that SA had a significant relationship with ETI ($\beta = 0.251$, $t = 2.986$). It highlights the positive direction between safety attitudes and turnover intention, indicating the crucial role played by safety attitudes in influencing employee intention. An employee's perspective must comply with every safety instruction or measure from the company's safety management committee to prevent the occurrence of injury to other employees. Furthermore, an employee's actions at construction sites can have an impact on themselves or other employees' safety. Such finding agrees with Saeed (2017) who observed that workers' attitudes can cause higher construction rates. The p-value for safety attitude was 0.001, which is less than the α value of 0.05. Therefore, it can be concluded that safety attitude has a significant relationship with employee turnover intention in the construction industry. Thus, H_1 is supported.

SE was also found to be a significant determinant of ETI ($\beta = 0.146$, $t = 1.864$). The result is supported by Irumba (2014) who found that there is still a visible safety risk. While PPE was prepared by 89% of construction sites, the standard remains low. Hence, it is necessary to routinely maintain and inspect PPE to ensure that it is in good condition at all times (Hino et al., 2014). As protection facilities like PPE are perceived as crucial (Izudi et al., 2017), construction companies can mandate its usage to reduce or eliminate casualty incidents in the industry (Giri, 2020). Thus, H_2 is supported. A positive relationship was also found between SM and ETI ($\beta = 0.167$, t = 1.782). It is crucial for a company's safety management to be more specific in controlling and monitoring construction employees, contractors, engineers, or anyone with access to construction sites alongside the mandatory use of personal protection devices at all times to mitigate injury (Rajaprasad & Chalapathi, 2015). This suggests that the management committee is the most critical component that has a significant effect on other elements. Thus, H_3 is supported.

Finally, ST also had a significant impact on ETI ($\beta = 0.191$, $t = 2.308$). The result is consistent with Wilkins (2011) who claimed that safety training could increase employee retention. In the high-risk construction sector, it is essential to provide safety training to ensure that employees know how to operate the equipment and conduct their duties safely and efficiently. Programmes like induction preparation, job-specific training, supervisory and management preparation, and specialist training are part of the formal safety training framework that can increase employees' confidence in safety management and prevent them from leaving their jobs.

5. CONCLUSION

Employees are the most valuable resource of an organisation. Hence, it is imperative for organisations to give them due consideration, which may include comprehending their decision to resign and the reasons behind it. This can be accomplished through a thorough study and meticulous review. This paper critically examines four fundamental safety variables (safety attitude, safety equipment, safety management, and safety training) that are prevalent in influencing employees' intention to leave their jobs in the construction industry. A notable correlation was discovered across all four variables with construction workers' intention to leave their jobs. Safety attitude is a crucial factor linked to staff intention turnover and while it is important for employees to use the necessary safety equipment and follow all rules and regulations

in high-risk construction sites, their attitude should be of more concern. Hence, it can be deduced that the objective of this study has been achieved.

The findings from this study have significant implications for both academic research and organisational practices, particularly within the construction industry. Firstly, it underscores the critical role of employee safety attitude as a primary determinant of turnover intention. This highlights the need for organisations to not only provide the necessary safety equipment and enforce safety regulations but also to foster a positive safety culture that addresses employees' attitudes towards safety. The study also contributes to the existing body of knowledge by offering empirical evidence on the relationship between safety practices and employee turnover. The identification of safety attitude, safety equipment, safety management, and safety training as key factors influencing turnover intention provides a foundation for future research to explore these variables in different contexts and industries. This can lead to the development of more targeted interventions aimed at reducing turnover rates. Moreover, the findings serve as a statistical benchmark for subsequent research focusing on employee turnover in the construction industry. Future studies can build upon this work by examining additional variables or employing longitudinal data to assess the long-term impact of safety practices on employee retention. The findings also offer a clear implication for organisations, especially those in high-risk industries like construction—investing in safety-related practices is not only a requirement but also a strategic priority for retaining talent. By understanding the factors that drive employees to leave, organisations can implement more effective safety programs that enhance employee satisfaction and reduce turnover rates, ultimately leading to better organisational performance.

Future studies should examine a more accurate and comprehensive theoretical perspective on turnover intention in the construction industry to solve the limitations of this study. Additionally, this study aims to identify the optimal analysis of staff turnover goals to enhance the implementation of efficient safety measures at construction sites. In Malaysia, the building industry is a mandatory sector. To steadily decrease job turnover rate in the construction sector, it is imperative to identify the specific factor that influences staff turnover and establish an effective solution to address it. Furthermore, this study would offer construction organisations valuable insights into how various factors can influence turnover intention. Having a greater understanding of the various improper safety practices that contribute to employees' intention to leave can effectively reduce the turnover rate in the construction sector. Future research should also explore the impact of specific safety training programs on employee retention in the construction sector.

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AVAILABILITY OF DATA AND MATERIALS

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AUTHORS CONTRIBUTION

Each author was involved and contributed evenly to this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST

The authors, as noted, certify that they have NO affiliations with or involvement in any organisation or agency with any financial interest (e.g., honoraria; participation in speakers' bureaus; membership, jobs, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (e.g., personal or professional relationships, affiliations, expertise, or beliefs) in the subject matter or materials addressed in this manuscript.

ETHICS STATEMENT

All subjects gave their informed consent for inclusion before they participated in the study.

REFERENCES

Ahmed, S., & Waqas, H. (2017). Occupational injuries and employee's turnover intention: A moderating effect of safety culture. Monash Business Review.

Albarkani, M.S.S., Shafii, H. (2021), Construction safety and performance in malaysian construction industry: A review. Journal of Technology Management and Business. 8(2), 79-93.

Alsharef, A., Albert, A., Jaselskis, E.J., & Bhandari, S. (2020). Construction safety training: barriers, challenges, and opportunities. Construction Research Congress 2020.

Al-Suraihi, W., Samikon, S., Al-Surahihi, A., & Ibrahim, I. (2021). Employee turnover: Causes, importance, and retention strategies. European Journal of Business and Management Research, 6(3), 1–10.

Basahel, A. M. (2021). Safety leadership, safety attitudes, safety knowledge, and motivation toward safety-related behaviors in electrical substation construction projects. International Journal of Environmental Research and Public Health, 18(8), 4196.

Belete, A. (2018). Turnover intention influencing factors of employees: An empirical work review. International Journal of Research in Business Studies and Management, 5(7), 23–31.

Cherry, K. (2015). The five levels of Maslow's hierarchy of needs. Verywell Mind. https://www.verywellmind.com/what-is-maslows-hierarchy-of-needs-4136760.

Cheung, C. M., & Zhang, R. P. (2020). How organizational support can cultivate a multilevel safety climate in the construction industry? Journal of Management in Engineering, 36(3), 04020014.

Cohen, J. (1988). Statistical Power Analysis for the Behavioral Sciences (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Construction Industry Development Board (CIDB) Malaysia. (2020). Construction industry review and prospect 2016/2017. http://www.cidb.gov.my/images/content/pdf/bisnes/const-review-20162017-update/CIDB-Construction-Industries-Review.pdf

Department of Occupational Safety and Health Malaysia. (2005, October). Guidelines on the use of personal protective equipment against chemicals hazards, 2005. https://www.dosh.gov.my/index.php/legislation/guidelines/-chemical/618-04-guidelines-on-the-use-of-personal-protective-equipment-against-chemicals-hazards-2005?path=chemical

Department of Occupational Safety and Health Malaysia. (n.d.). Statistik kemalangan pekerjaan 2022. https://www.dosh.gov.my/index.php/ms/statistik/occupational-accident-statistics/statistik-kemalangan-pekerjaan-2022

Fan, D., Zhu, C.J., Timmong, A.R., Su, Y., Huang, X., & Lu, Y. (2020). Suing the past map out of the future of occupational health and safety research: Where do we go from here? International Journal of Human Resource Management, 31(1), 90-127.

Giri, O.P., (2020). Factor causing health and safety hazards at construction sites. Technical Journal, 2(1), 68–74.

Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. Journal of Management Information Systems, 18(1), 185- 214.

Hanapi, N. M., Kamal, M. M. M., Ismail, M. I., & Abdullah, A. I. (2013). Identifying root causes and mitigation measures of construction fall accidents. Gading Business and Management Journal. 17(1), 65–79.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2–24.

Hassan, N., Halif, M. M., Ariffin, N., Aminudin, A. S. & Sumardi, N. A. (2023). Burnout as predictor towards employee turnover intention: The moderating roles of emotional intelligence. Journal of Survey in Fisheries Sciences, 10(1), 2168–2177.

Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: Updated guidelines. Industrial Management and Data Systems, 116(1), 2–20.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academic Science, 43, 115–135.

Henseler, J., Ringle, C., & Sinkovics, R. (2009). The use of partial least squares path modeling in international marketing. Advance in International Marketing, 20, 277-319.

Hino, Y., Ohdo, K., & Takahashi, H. (2014). Fall protection characteristics of safety belts and human impact tolerance. Industrial health, 52(5), 424-431.

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. Strategic Management Journal, 20(2), 195–204.

Irumba, R. (2014). Spatial analysis of construction accidents in Kampala, Uganda. Safety Science, 64, 109–120.

Izudi, J., Ninsiima, V., & Alege, J. B. (2017). Use of personal protective equipment among building construction workers in Kampala, Uganda. Journal of Environmental and Public Health, 2017, 7930589.

Kao, K. Y., Spitzmueller, C., Cigularov, K., & Thomas, C. L. (2019). Linking safety knowledge to safety behaviours: a moderated mediation of supervisor and worker safety attitudes. European Journal of Work and Organizational Psychology, 28(2), 206-220.

Kim, T., & Chi, S. (2019). Accident case retrieval and analyses: Using natural language processing in the construction industry. Journal of Construction Engineering and Management, 145(3), 04019004.

Kline, R. B. (2016). Principles and practice of structural equation modeling (4th ed.). Guilford Press.

Konno, Y. (2018). relationship between construction performance evaluation and contractor performance evaluation and contractor characteristics in Japan. Cogent Business and Management, 5(1), 1-10.

Liu, S., Gyabeng, E., Atteh Sewu, G. J., Nkrumah, N. K., & Dartey, B. (2019). Occupational health and safety and turnover intention in the Ghanaian power industry: The mediating effect of organizational commitment. BioMed Research International, 2019(1), 3273045.

Mohamed Taufek, F. H. B., Zulkifle, Z. B., & Abdul Kadir, S. Z. B. (2016). Safety and health practices and injury management in the manufacturing industry. Procedia Economics and Finance, 35, 705–712.

Namian, M., Albert, A., Zuluaga, C. M., & Jaselskis, E. J. (2016). Improving hazard-recognition performance and safety training outcomes: Integrating strategies for training transfer. Journal of Construction Engineering and Management, 142(10), 04016040.

Peñaloza, G. A., Wasilkiewicz, K., Saurin, T. A., Herrera, I. A., & Formoso, C. T. (2019). Safety-I and safety-II: Opportunities for an integrated approach in the construction industry. In 8th REA Symposium Embracing Resilience: Scaling up and speeding up. Kalmar, Sweden.

Portal Rasmi CIDB. (2020). CIDB Malaysia. Retrieved from http://www.cidb.gov.my/index.php/my

Rababeh, S., El-Mashaleh, M., Al Smadi, B., & Hyari, K. (2010). Safety management in the Jordanian construction industry. Jordan Journal of Civil Engineering, 4(1), 1-12.

Rajaprasad, S. V. S., & Chalapathi, P. V. (2015). Factors influencing implementation of OHSAS 18001 in Indian construction organizations: Interpretive structural modeling approach. Safety and Health at Work, 6(3), 200–

Saeed, Y. (2017). Safety management in construction projects. The Journal of University of Duhok, 20(1), 546–560.

Tavakol, M., & Dennick, R. (2011). Making Sense of Cronbach's Alpha. International Journal of Medical Education, 2, 53-55.

Uddin, S. M. J., Albert, A., Ovid, A., & Alsharef, A. (2023). Leveraging ChatGPT to aid construction hazard recognition and support safety education and training. Sustainability, 15(9), 7121.

Uğural, M. N., Giritli, H., & Urbański, M. (2020). Determinants of the turnover intention of construction professionals: A mediation analysis. Sustainability, 12(3), 954-963.

Vinodkumar, M. N., & Bhasi, M. (2010). Safety management practices and safety behaviour: Assessing the mediating role of safety knowledge and motivation. Accident Analysis & Prevention, 42(6), 2082-2093.

Wilkins, J. R. (2011). Construction workers' perceptions of health and safety training programmes. Construction Management and Economics, 29(10), 1017–1026.

Yang, J., Ye, G., Xiang, Q., Kim, M., Liu, Q., & Yue, H. (2021). Insights into the mechanism of construction workers' unsafe behaviors from an individual perspective. Safety Science, 133, 105004.

Yiu, N. S. N., Sze, N. N., & Chan, D. W. M. (2018). Implementation of safety management systems in the Hong Kong construction industry: A safety practitioner's perspective. Journal of Safety Research, 64, 1–9.

Yoon, S. J., Lin, H. K., Chen, G., Yi, S., Choi, J., & Rui, Z. (2013). Effect of occupational health and safety management system on work-related accident rate and differences of occupational health and safety management system awareness between managers in South Korea's construction industry. Safety and health at work, 4(4), 201-209.

Yusr, M. M., Salimon, M. G., Mokhtar, S. S. M., Abaid, W. M. A. W., Shaari, H., Perumal, S., & Saoula, O. (2020). Green innovation performance! How it be achieved? A study applied to the Malaysian manufacturing sector. Sustainable Futures, 2, 100040.