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Facilities Maintenance Employees' Adherence of Safety Management Practices: A Research Study at Higher Education Institutions in Malaysia

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Abstract

In Malaysia, ensuring the adherence of facilities maintenance employees to safety management guidelines within higher education institutions presents a significant challenge. While the importance of maintaining a safe workplace is widely recognized, the extent to which safety regulations are followed by facilities maintenance departments remains unclear. This research emphasizes the value of preserving employee safety and wellbeing by examining how successfully facilities maintenance employees at Malaysian higher education institutions adhere to safety management practices. Using a quantitative methodology, the study evaluated 242 participants' compliance with safety procedures from a range of higher education institutions located throughout Malaysia. Finding the prevalent safety culture in the facilities maintenance profession and analyzing how organizational policies, individual characteristics, training programs, and communication strategies affect adherence to safety procedures were the objectives. The results of the data analysis show that 'individual factors' are the primary variables impacting the safety management practices employed by the facilities maintenance staff of these institutions' assets. This research is particularly relevant to higher education institutions striving to improve their safety procedures because it offers useful insights on how to make facilities maintenance employees' work environments safer. These findings provide a thorough understanding of the condition of safety procedures in this sector currently, assisting in facilitating the development of safety management strategies.

Keywords: *Facilities Maintenance, Safety Management Practice and Higher Education Institutions*

INTRODUCTION

In the Malaysian higher education sector, the critical role of facilities maintenance staff in ensuring campus safety and operational efficiency is highlighted against a backdrop of various workplace hazards, from machinery to hazardous materials. This study delves into the multifaceted nature of occupational safety, examining how physical, psychological, and organizational factors influence adherence to safety management procedures among these key personnel. Amid budgetary limitations and the seasonal scheduling of maintenance tasks, the research underscores the imperative of cultivating a safety-conscious culture within educational institutions. Through quantitative analysis, it seeks to measure compliance with safety standards and identify behavioral trends among maintenance employees, aiming to enhance their working conditions and, by extension, the overall efficacy of educational institutions. By addressing these unique challenges and advocating for improved safety practices, the study contributes valuable insights to the discourse on occupational safety within Malaysia's diverse and evolving educational landscape (Wang K.C et al., 2022).

In Malaysia, ensuring the adherence of facilities maintenance employees to safety management guidelines within higher education institutions presents a significant challenge. While the importance of maintaining a safe workplace is widely recognized, the extent to which safety regulations are followed by facilities maintenance departments remains unclear. This ambiguity threatens not only the safety of employees but also has the potential to negatively impact the operational efficiency and reputation of these institutions. The scarcity of localized studies on this subject, particularly in the context of Malaysia's unique cultural and constitutional

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framework, hampers the development of effective strategies to enhance safety compliance, despite the introduction of the Occupational Safety and Health Act (OSHA) in 1994.

Numerous studies have indicated that most workplace accidents result from human errors or employee actions (Zohar, 1980; Vredenburgh, 2002; Fang et al., 2006; Liu et al., 2009). Ismail and Omar (2003) conducted a survey focusing on "the level of compliance with OSH rules and regulations by employees in manufacturing and construction firms in Malaysia.".

Their findings revealed a low level of adherence to safety procedures, particularly when dealing with hazardous materials. The main factors contributing to accidents, as identified by Adebiyi and Charles-Owaba (2009), include human factors, deficient maintenance, and environmental factors. Similarly, Jannadi and Bu-Khamsin (2002) emphasized that accidents are primarily caused by human behavior, poor working conditions, and deficiencies in implementing safety management practices. Consequently, it is crucial to prioritize the application and effective implementation of safety management practices to establish a safe workplace and environment.

The research aims to bridge the knowledge gap by systematically examining the factors that influence facilities maintenance employees' adherence to safety management practices in Malaysian higher education institutions. It seeks to identify the barriers and influencing factors while proposing targeted strategies to improve safety protocols within these departments. With numerous studies attributing workplace accidents primarily to human errors and a lack of compliance with safety procedures, especially concerning hazardous materials, this study is crucial. It emphasizes the need for the application and effective implementation of safety management practices to ensure a safe working and learning environment, thereby safeguarding personnel, and promoting a conducive atmosphere for students and stakeholders alike.

The objectives of this study are aims to thoroughly explore and improve the compliance of facilities maintenance staff with safety management procedures in Malaysia's higher education institutions. With a detailed investigation plan, the study sets out to evaluate the current compliance levels, discern the primary factors affecting employees' adherence to safety measures, and scrutinize the influence of organizational policies, procedures, and training programs on the safety culture. It also seeks to understand the attitudes, perceptions, and motivations towards safety practices among the staff, along with the effects of demographic factors such as age, experience, and job role on their safety management compliance. Through this multifaceted analysis, the research aspires to offer actionable insights for the development of robust safety management strategies, fostering a safer working environment that enhances employee well-being and institutional efficiency.

LITERATURE REVIEW

Adherence Safety Management Practices

This sets up a thorough analysis of how those who are responsible for maintaining an organization's physical infrastructure, especially in high-risk settings like higher education institutions, adhere to set safety rules and guidelines. This emphasis on "adherence" draws attention to the fact that maintaining a safe working environment depends not only on the existence of safety management techniques but also on how closely the maintenance staff adheres to them.

Facilities maintenance employees, often referred to as maintenance staff or technicians, constitute a diverse workforce responsible for the care, repair, and upkeep of physical assets within an organization (Smith et al., 2017). This encompasses a wide spectrum of roles, including HVAC technicians, electricians, plumbers, and general maintenance workers. These individuals are essential for ensuring the day-to-day functionality of facilities, contributing significantly to the overall operational efficiency of an organization.

Within the context of higher education institutions, facilities maintenance employees may be tasked with maintaining academic buildings, laboratories, residential facilities, and other infrastructure. Their duties range from routine inspections and preventive maintenance to responding promptly to emergency repairs (Kagioglou et al., 2001). The effectiveness of these employees directly impacts the safety and functionality of the academic environment.

Safety Management Practices

Safety management practices refer to the systematic and strategic approach organizations adopt to identify, assess, and mitigate risks that could compromise the health and well-being of their workforce (Hinze & Gambatese, 2003). In the realm of facilities maintenance, safety management involves the implementation of policies, procedures, and guidelines aimed at preventing accidents, injuries, and promoting a culture of safety.

Clarke (2006) emphasizes that safety management practices extend beyond mere compliance with regulations. They encompass proactive measures, including ongoing hazard assessments, safety training programs, and the promotion of a safety-oriented organizational culture. In the specific context of facilities maintenance, safety management practices include adherence to industry standards, proper handling of equipment, and the utilization of personal protective equipment (PPE) during various maintenance tasks.

According to Malaysia's Occupational Safety and Health Act (OSHA) 1994 (Act 514), particularly Section 15, it includes a comprehensive set of procedures and policies designed to ensure workplace safety and health. Safety management practice is inline under Section 15 of the Malaysian OSHA, employers are mandated to ensure, as far as is practicable, the safety, health, and welfare of all employees at work.

Trends and Issues

Understanding the current trends and issues in the field of facilities maintenance employees' adherence to safety management practices is essential for contextualizing the research within the broader landscape. This section explores two significant trends and issues shaping the safety management discourse.

Technological Advancements in Safety Management. A notable trend in recent years involves the integration of advanced technologies into safety management practices. Internet of Things (IoT) devices, sensors, and Artificial Intelligence (AI) applications are being employed to enhance workplace safety by providing real-time monitoring, predictive analytics, and automated safety protocols (Pishgar et al., 2021). These technologies have the potential to revolutionize safety practices within facilities maintenance by detecting hazards, tracking employee movements, and predicting potential risks.

Cross-Culture Perspectives. Given Malaysia's cultural diversity, examining safety management practices through a cross-cultural lens is imperative. Different cultural backgrounds can influence employees' perceptions of safety, attitudes toward compliance, and the effectiveness of safety interventions according to Hofstede, (Fulmer et al., 2014). Understanding these cultural nuances is crucial for tailoring safety management strategies to be effective across diverse workforce populations. Cross-cultural studies can shed light on how cultural factors impact communication about safety, the perception of risk, and the willingness to adopt safety measures. This perspective is especially pertinent in higher education institutions where facilities maintenance teams often consist of individuals from various cultural backgrounds (Fulmer et al., 2014).

Organizational Culture

Organizational culture is significantly shaped by the shared values and beliefs about safety among its members. Schein (2010) emphasizes that the core values of an organization profoundly influence employee behavior. In Malaysian universities, these shared values might emphasize the importance of safety, creating a collective understanding that safety is not just a regulation but a fundamental aspect of the institution's ethos.

The extent to which safety policies are ingrained in the daily operations of an institution is a critical aspect of its culture. According to Guldenmund (2010), the effectiveness of safety management is partly determined by how well safety procedures are embedded in the routine activities of an organization. In the context of Malaysian higher education, this could mean regular safety audits, consistent safety training, and the integration of safety considerations into all aspects of facilities maintenance

The general attitude towards risk and compliance within an organization reflects its safety culture. A study by Mearns et al. (2003) found that organizations with a positive attitude towards safety compliance tend to have lower accident rates. In Malaysian higher education settings, fostering a culture that does not tolerate shortcuts

in safety procedures and prioritizes risk management can significantly impact overall safety.

Individual Factors

Employees' attitudes towards safety are shaped by their perceptions of risk and the importance they place on safety measures. Research has shown that positive safety attitudes are strongly linked to safer work behaviors. For instance, a study by Neal and Griffin (2006) found that employees' safety attitudes significantly predict safety compliance. In the context of Malaysian higher education, this might translate to how maintenance staff perceive the risks associated with their job and the seriousness with which they approach safety procedures.

Skills in implementing safety practices involve the ability to effectively apply safety knowledge in real-world scenarios. Practical training and hands-on experience are key components in developing these skills. According to a study by Burke et al. (2006), training that includes behavioral-based safety skills can lead to significant improvements in safety performance.

An employee's personal commitment to safety is often reflected in their willingness to go beyond the minimum requirements and actively engage in safety initiatives. In Malaysian higher education, this could be seen in how maintenance staff voluntarily participate in safety meetings, suggest improvements, or take proactive steps to address potential safety issues. Past experiences with safety, including incidents, accidents, or near-misses, can significantly influence an employee's approach to safety. A study by Clarke (2010) indicates that past experiences can affect an employee's risk perception and subsequent safety behavior.

Leadership Style

Leadership plays a crucial role in shaping employees' behaviours, including safety compliance. Transformational leadership, characterized by inspirational motivation, intellectual stimulation, individualized consideration, and idealized influence (Bass & Riggio, 2006), is hypothesized to positively influence facilities maintenance employees' adherence to safety management practices.

A leader's commitment to safety is crucial in shaping the organization's safety culture. Zohar and Luria (2005) emphasize that a leader's behaviour, such as actively participating in safety programs and consistently enforcing safety rules, significantly influences employees' safety behaviour. In Malaysian universities, leaders who visibly prioritize safety, allocate resources for safety initiatives, and consistently follow safety protocols themselves set a powerful example for their teams.

The leadership style adopted by leaders in higher education institutions can significantly impact the safety climate. Kelloway and Barling (2010) suggest that leadership styles play a crucial role in shaping employees' perceptions of the importance of safety in the workplace. In Malaysian universities, adopting a leadership style that emphasizes safety can contribute to creating a climate where safety is seen as a priority.

Training Programs

The effectiveness of safety training programs is another independent variable. Comprehensive and interactive safety training programs have been shown to positively impact employees' knowledge, attitudes, and behaviors related to safety (Clarke, 2006). The hypothesis posits that effective safety training enhances facilities maintenance employees' adherence to safety management practices.

Regular safety training is fundamental for maintaining and updating employees' knowledge and skills. Burke et al. (2006) emphasize the importance of continuous training in keeping safety procedures front and center in employees' minds. In Malaysian higher education institutions, regular training sessions could cover various aspects of safety, from basic first aid to complex emergency response protocols, ensuring that maintenance staff are always prepared and aware of the latest safety standards.

Tailoring training programs to address the specific risks associated with different maintenance tasks is important. As argued by Tannenbaum and Cerasoli (2013), customized training that addresses specific job hazards can be more effective than generic training. In Malaysian higher education settings, training could be

customized for different types of maintenance work, such as electrical safety for electricians or chemical safety for cleaning staff.

Workplace Environment

The condition of physical facilities significantly impacts employee safety. According to Hale et al. (2010), well-maintained facilities reduce the risk of accidents and injuries. In Malaysian higher education institutions, this involves ensuring that buildings and infrastructure are in good repair, adhering to safety standards, and regularly inspecting and maintaining facilities to prevent hazards.

Ergonomics plays a key role in employee safety, especially in physically demanding jobs. Dul and Neumann (2009) emphasize the importance of designing workplace environments and tasks to fit the capabilities of workers, thereby reducing the risk of musculoskeletal disorders, and improving overall safety. In Malaysian higher education settings, ergonomic considerations might include the design of workstations, the provision of proper tools and equipment, and training on safe work practices to prevent strain and injury.

Overall Atmosphere of the Workplace Environment: The social and psychological aspects of the workplace environment also influence safety practices. Zohar (2010) highlights that a positive safety climate, characterized by mutual trust, shared perceptions of the importance of safety, and open communication, can significantly enhance safety outcomes. In Malaysian universities, fostering a supportive and communicative atmosphere where safety concerns can be raised and addressed openly is key.

METHODOLOGY

Research Design

The study employs a quantitative research methodology, focusing on the application of statistical and numerical analysis to examine how closely Malaysian higher education institutions' facilities maintenance employees adhere to safety management practices. The rationale behind using this approach is its capacity to accurately measure patterns and trends in safety procedures, providing a dispassionate perspective on the variables impacting these behaviors (Smith, 2020). The research seeks to offer a rigorous, data-driven understanding of the dynamics inside the Malaysian higher education sector by concentrating only on measurable data (Jones et. al., 2021).

Participants

Data was collected from 242 individuals who worked in facilities maintenance at various higher education institutions around Malaysia using a sampling process.

Sampling Procedure

A stratified random sampling method will be employed to ensure the sample's representativeness. Based on factors including size, academic specialization, and location, Malaysia's higher education institutions will be categorized. This approach to ensures that the sample accurately reflects the diversity found in the larger group of workers responsible for facilities maintenance in Malaysian higher education institutions.

Data Collection Procedures

This study employs an online survey to gather quantitative data from facilities maintenance employees across Malaysian higher education institutions, aiming to investigate the safety climate, individual safety behaviors, and organizational support for safety. The use of an online platform for survey distribution ensures efficiency, participant convenience, data security, and respondent anonymity, principles that align with those advocated by Dillman et al. (2014). A stratified random sampling approach will ensure diverse representation from various academic fields, institution sizes, and geographical areas. The survey dissemination will be facilitated through institutional channels, with a strong emphasis on explaining the research's objectives and the value of participants' contributions to encourage engagement.

The survey incorporates informed consent protocols to underline the voluntary nature of participation and the confidentiality of responses, potentially boosting participation rates through incentives and reminder strategies as suggested by Sax, Gilmartin, & Bryant (2003). Following data collection, the study will perform statistical analyses, including descriptive statistics, correlation, and regression analyses, to explore the dynamics between safety climate, individual behaviors, organizational support, and various demographic or organizational variables. This methodological approach aims to provide comprehensive insights into the factors influencing safety compliance and support within the context of Malaysia's higher education sector.

FINDINGS

Demographic Information of the Respondents

Table 1: Descriptive Statistics of Respondents

Gender		
	Frequency	***%***
Male	199	82
Female	43	18
Total	**242**	**100**

The gender distribution among the 242 respondents in the study reveals a significant disparity: 82% are male, while only 18% are female. Table 1 shows that males constitute a predominant majority, accounting for 199 individuals, while females represent a much smaller fraction at 43 individuals. This suggests that males are considerably more represented in the facilities maintenance workforce at higher education institutions in Malaysia.

Descriptive and Inferential Statistics

Table 2 shows that this data represents a survey conducted with 242 participants, focusing on various aspects of workplace safety. The aspects surveyed include Organizational Culture, Individual Factors, Leadership Style, Safety Training, Workplace Environment, and Safety Management Practices, all rated on a scale from 1 to 5. Across all categories, the average scores are quite high (ranging from 4.18 to 4.33), indicating generally positive responses.

Table 2: Descriptive Statistics

	N	Mean
Organizational Culture	242	4.3037
Individual Factors	242	4.3264
Leadership Style	242	4.1811
Safety Training	242	4.2469
Workplace Environment	242	4.1787
Safety Management Practices	242	4.2455

Reliability Analysis

The Table 3 shows the reliability analysis conducted on the variables using Cronbach's Alpha reveals that the internal consistency of the scales used to measure the independent variables, Organizational Culture (α=0.348), Individual Factors (α=0.441), Leadership Style (α=0.499), Safety Training (α=0.439), and Workplace Environment (α=0.496) is below the acceptable threshold of 0.7, its suggesting that the reliability of these scales is questionable to unacceptable.

The dependent variable, Safety Management Practices, yields a Cronbach's Alpha of 0.660, which is just below the commonly accepted standard but may be considered marginally acceptable in exploratory research.

Table 3: Reliability Statistics

Variables	Cronbach's Alpha
Organizational Culture	0.348
Individual Factors	0.441
Leadership Style	0.499
Safety Training	0.439
Workplace Environment	0.496
Safety Management Practices	0.660

Normality Test

Table 4 shows the Normality test results. The skewness and kurtosis values for the variables in the dataset indicate a significant departure from normality. According to George and Mallery (2019), when they discuss various aspects of data analysis using SPSS, including the interpretation of skewness and kurtosis values. They suggest that a skewness between -2 and +2 is considered acceptable in order to prove normal univariate distribution.

Table 4: Normality Analysis

Variables	Skewness	Kurtosis
Organizational Culture	-2.853	17.748
Individual Factors	-2.767	18.277
Leadership Style	-2.058	7.894
Safety Training	-2.009	12.447
Workplace Environment	-1.825	9.518
Safety Management Practices	-2.918	15.172

Spearman's Rho Correlation Analysis

Table 5 shows the significance values (p-values) for the Spearman's rho correlation for all variables (Organizational Culture, Individual Factors, Leadership Style, Safety Training, Workplace Environment) are less than 0.001. In statistical analysis, a p-value less than 0.05 is typically considered significant; thus, a p-value less than 0.001 indicates a very strong significance level. Therefore, the correlation between these independent variables and the dependent variable (Safety Management Practices) is statistically significant.

Table 5: Nonparametric Correlations

Variables	Spearman's Rho Sig. (1-tailed)
Organizational Culture	<0.001
Individual Factors	<0.001
Leadership Style	<0.001
Safety Training	<0.001
Workplace Environment	<0.001

Pearson Correlation Analysis

The result shows that all the variables have statistically significant relationships with each other at the 0.01 level (1-tailed) as per Table 6. The Pearson Correlation Coefficients range from 0.380 to 0.677, indicating varying degrees of positive correlation. Significance values (Sig. 1-tailed) are less than 0.001 for all correlations, which strongly suggests that the relationships are not due to chance, and therefore, the associations between the different variables in the context of safety management practices are considered significant.

Table 6: Pearson Correlations

Variables	Pearson Correlations	Sig.(1-tailed)
Organizational Culture	0.577**	<0.001
Individual Factors	0.632**	<0.001
Leadership Style	0.539**	<0.001
Safety Training	0.595**	<0.001
Workplace Environment	0.581**	<0.001

**Correlation is significant at the 0.01 level (1-tailed)

Regression Analysis

Conducting regression analysis on this dataset is essential to explore the relationship between the dependent variable, Safety Management Practices, and the five independent variables: Organizational Culture, Individual Factors, Leadership Style, Safety Training, and Workplace Environment. Regression analysis is used to determine the strength and character of the relationship between one dependent variable and one or more independent variables. It helps in understanding how changes in these independent variables are associated with changes in the dependent variable.

Table 7: Model Summary

Model	R	R Square
1	0.747[a]	0.588

a. Predictors: (Constant), Organizational Culture, Individual Factors, Leadership Style, Safety Training, Workplace Environment

Table 7 shows the model summary for the regression analysis indicates a strong positive correlation between the predictor variables and the dependent variable, with an R (Multiple Correlation Coefficient) value of 0.747. This suggests a good degree of linear association. Furthermore, the R Square (Coefficient of Determination) value of 0.558 means that the model explains 55.8% of the variance in the dependent variable, which signifies that more than half of the variability in the outcome can be accounted for by the factors included in the model. This indicates a relatively high level of explanatory power, which is beneficial for predictive or explanatory purposes in the context of the study.

Coefficients Analysis

Table 8: Coefficients Analysis

Model	Constant	Beta	Sig.
1	Organizational Culture	.148	.027
	Individual Factors	.319	.000
	Leadership Style	.126	.050
	Safety Training	.191	.001
	Workplace Environment	.150	.013

Table 8 shows the Beta values in the coefficients table indicate the importance of each independent variable in predicting the dependent variable, Safety Management Practices, when all variables are considered together. Individual Factors have the highest standardized coefficient (Beta = 0.319), suggesting it is the most influential variable in the model. Safety Training and Workplace Environment have moderate impacts with Beta values of 0.191 and 0.150, respectively, while Organizational Culture and Leadership Style have somewhat lower Beta values of 0.148 and 0.126

In terms of statistical significance, Individual Factors stand out with a p-value of less than 0.001, indicating a highly significant impact. Safety Training and Workplace Environment also show strong significance (p-values of 0.001 and 0.013, respectively), while Organizational Culture is significant at the 0.027 level. Leadership Style has a p-value of 0.050, which is exactly on the conventional cutoff for significance, suggesting a marginal influence. These values collectively suggest that while all variables contribute to predicting Safety Management Practices, Individual Factors are the most significant predictor, followed by Safety Training and Workplace Environment.

DISCUSSION

The study on facilities maintenance employees in Malaysian higher education institutions revealed critical insights into safety management practices. It established significant positive correlations between adherence to safety practices and several factors: Organizational Culture ($r = 0.597$), Individual Factors ($r = 0.632$), Leadership Style ($r = 0.539$), Safety Training ($r = 0.595$), and Workplace Environment ($r = 0.581$).

These correlations suggest that a supportive and safety-conscious organizational culture, individual commitment to safety, effective leadership, comprehensive safety training, and a conducive workplace environment are all integral to enhancing safety management practices. The reliability of the scales used to measure these constructs was varied, indicating a need for refinement, particularly given the non-normal distribution of the data which necessitated the use of both Pearson and Spearman's rho for robust correlation analysis. These findings underscore the multifaceted approach needed to improve safety adherence among maintenance staff in the educational sector.

LIMITATIONS OF THE STUDY

The study conducted offers significant insights into safety practices within the context of higher education institutions in Malaysia, yet it is essential to recognize its limitations to fully appreciate its contributions and implications. One of the primary constraints is its geographical focus, which restricts the findings' applicability to regions beyond Malaysia, given the unique cultural, economic, and regulatory landscapes of different areas. Additionally, the study's emphasis on facilities maintenance within the educational sector suggests that its findings may not be directly applicable to other industries or maintenance work types, where safety practices and challenges might significantly differ. The methodological approach, predominantly relying on quantitative tools like surveys, might not capture the comprehensive nuances of employee experiences and attitudes, coupled with the potential for response bias where participants might skew answers to appear socially desirable, thereby affecting data authenticity.

Furthermore, the study's temporal limitations, offering a snapshot of safety practices at a specific time, do not account for the evolution of safety culture, possibly making the findings less relevant over time. The sample's limited diversity and size could also undermine the robustness of the study's conclusions, as it may not represent

the broader demographic and experiential spectrum of facilities maintenance employees in Malaysian higher education institutions. Additionally, the theoretical framework utilized in the study, while comprehensive, might not fully capture all relevant aspects of safety management practices, suggesting the need for incorporating alternative or supplementary theoretical perspectives in future research. These limitations underscore the need for further studies with broader geographic coverage, a mixed-methods approach, longitudinal designs, and more diverse sampling strategies to enrich the understanding and applicability of findings in the field of occupational safety, both within the Malaysian context and globally.

RECOMMENDATIONS

The study under discussion opens multiple pathways for future investigation in the field of occupational safety and health (OSH) within the facilities maintenance sector, emphasizing the importance of geographical expansion, methodological improvements, longitudinal studies, and the examination of intervention effectiveness. A key recommendation involves broadening the study's geographical focus to include diverse cultural and national contexts. This approach aligns with Hofstede's (2001) insights into the impact of cultural dimensions on workplace practices, underlining the necessity for cross-cultural research to enhance global OSH strategies. By extending research beyond the initial context, future studies could not only validate the current findings across different settings but also contribute to a more comprehensive global understanding of safety management practices in facilities maintenance. Additionally, future research is encouraged to adopt mixed methods approaches, integrating qualitative measures such as interviews and focus groups with quantitative data collection. This methodological enhancement is crucial for delving deeper into the attitudes, perceptions, and experiences of maintenance employees regarding safety practices, facilitating a richer, more nuanced understanding of the factors that influence safety adherence in the workplace.

Moreover, longitudinal research is highlighted as pivotal for understanding the evolution of safety practices and adherence over time, especially considering policy changes or the introduction of new safety interventions. Such studies could provide valuable insights into the long-term impacts of OSH initiatives, contributing to the development of more effective strategies for improving workplace safety. The call for research into the effectiveness of specific safety interventions, including safety training programs and policy modifications, underlines the need for evidence-based approaches to enhancing safety in the facilities maintenance sector. Exploring the potential of emerging technologies like artificial intelligence and virtual reality in improving safety management practices represents another promising direction, suggesting that technological innovation could play a significant role in advancing OSH outcomes. Collectively, these recommendations aim to address the limitations identified in the current study while significantly broadening the understanding of safety management in the facilities maintenance sector and beyond. Through pursuing these avenues of research, future efforts can contribute to the creation of safer work environments, ultimately benefiting the wider community by fostering more effective and adaptable safety management strategies.

CONCLUSION

The research study has shed light on the correlation that exists between five independent variables and safety management practices for higher education. These results are summarized in the conclusion, which also considers their importance and broader implications for the occupational safety and health (OSH) area. In conclusion, this study highlights the complex relationships among organizational culture, individual characteristics, leadership style, safety training initiatives, and work environment that impact higher education institutions' adherence to safety management practices in facilities maintenance employees. These characteristics and safety adherence were found to have substantial connections that add to the body of knowledge in academia and provide useful information for enhancing workplace safety. Understanding and putting into practice efficient safety management techniques become more and more important as educational institutions develop and expand. The foundation provided by this thesis will allow OSH stakeholders to improve safety norms and procedures which will help as a guidance for future researcher.

Declaration Of Competing Interest: The authors declare that they have no known competing fi-nancial

interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability: The data that support the findings of this study are available from the corre-spondence authors upon reasonable request.

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