

นิพนธ์ต้นฉบับ

(Original article)

Knowledge, attitude, and safety behaviors among Myanmar workers: A case study in a small construction company in Songkhla, Thailand

ความสัมพันธ์ระหว่างความรู้ ทักษะ และพฤติกรรมความปลอดภัยในการทำงานของ
แรงงานต่างชาติชาวพม่า: กรณีศึกษาในบริษัทรับเหมาก่อสร้างขนาดเล็กใน

จังหวัดสงขลา ประเทศไทย

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ABSTRACT: This study aimed to achieve two main goals: (1) to assess the knowledge, attitudes, and safety behaviors of Myanmar workers in a small construction company in Songkhla Province; and (2) to explore the relationship between personal factors, knowledge, attitudes, and safety behaviors of these workers. The research focused on 30 foreign workers from a small construction company in Songkhla Province, representing the whole workforce. Data collection was conducted using a questionnaire, followed by statistical analysis, including frequency, percentage, mean, standard deviation, Fisher's exact test, and Spearman's rank correlation analysis. The findings showed that foreign workers had a moderate level of safety knowledge, but their attitudes and behaviors towards safety were highly positive. However, no significant link was found between personal factors, knowledge, attitudes, and safety behaviors. This lack of significant correlation suggests that other factors, such as the quality of training or work environment, may play a more critical role in influencing safety behaviors. The results highlight the need for more tailored and context-specific safety interventions, which could be beneficial to organizations by improving safety outcomes and worker welfare.

Keywords: Construction safety; Foreign workers; Knowledge; Attitude; Safety behaviors

บทคัดย่อ: การศึกษานี้มีวัตถุประสงค์หลักสองประการคือ 1) ประเมินความรู้ ทักษะ และพฤติกรรมความปลอดภัยของแรงงานต่างชาติในบริษัทรับเหมาก่อสร้างขนาดเล็กในจังหวัดสงขลา และ 2) สำรวจความสัมพันธ์ระหว่างปัจจัยส่วนบุคคล ความรู้ ทักษะ และพฤติกรรมความปลอดภัยของแรงงานเหล่านี้ การวิจัยนี้มุ่งเน้นไปที่แรงงานชาวพม่าจำนวน 30 คน จากบริษัทรับเหมาก่อสร้างขนาดเล็กในจังหวัดสงขลา ซึ่งเป็นตัวแทนของแรงงานในบริษัทนั้นทั้งหมด การเก็บข้อมูลทำโดยใช้แบบสอบถาม ตามด้วยวิธีการวิเคราะห์ทางสถิติ ซึ่งรวมถึงการคำนวณความถี่ เปอร์เซ็นต์ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน การทดสอบแบบฟิชเชอร์ และการวิเคราะห์สหสัมพันธ์ลำดับขั้นของสเปียร์แมน ผลการศึกษาแสดงให้เห็นว่าแรงงานต่างชาติมีความรู้เกี่ยวกับความปลอดภัยในระดับปานกลาง แต่ทักษะและพฤติกรรมต่อความปลอดภัยอยู่ในระดับดีมาก นอกจากนี้ การศึกษาายังพบว่าไม่มีความสัมพันธ์ที่สำคัญระหว่างปัจจัยส่วนบุคคล ความรู้ ทักษะ และพฤติกรรมความปลอดภัยของแรงงานต่างชาติในบริษัทรับเหมาก่อสร้างขนาดเล็กนี้ ซึ่งชี้ให้เห็นว่าปัจจัยอื่น ๆ เช่น คุณภาพของการฝึกอบรมหรือสภาพแวดล้อมในการทำงาน อาจมีบทบาทสำคัญในการกำหนดพฤติกรรมด้านความปลอดภัย ผลลัพธ์เหล่านี้เน้นถึงความจำเป็นในการปรับปรุงการฝึกอบรมและการแทรกแซงที่เหมาะสมกับบริบทเฉพาะ ซึ่งจะเป็ประโยชน์ต่อองค์กรในการปรับปรุงผลลัพธ์ด้านความปลอดภัยและสวัสดิภาพของพนักงาน

คำสำคัญ: ความปลอดภัยในการก่อสร้าง; แรงงานต่างชาติ; ความรู้; ทักษะ; พฤติกรรมความปลอดภัย

1. INTRODUCTION

The construction industry is crucial for economic growth, providing essential infrastructure and jobs.^{1,2} However, it's also one of the most dangerous sectors, where safety is a major concern affecting both worker well-being and productivity. In Thailand, an emerging economy in Southeast Asia, the construction sector contributed approximately 7.67% to the national GDP in 2023, with a market size of \$25.3 billion. The sector employed millions of workers, including both local and foreign laborers, driven by ongoing infrastructure and residential projects.^{3,4} The nature of construction work involves high risks due to heavy machinery, heights, and ever-changing environments, making safety a challenging but vital priority.⁵

Foreign workers in construction face additional hurdles, such as language barriers, cultural differences, and unfamiliarity with local safety laws.^{6,7} These challenges heighten their vulnerability to workplace hazards. Despite their key role in the workforce, foreign workers often encounter unique difficulties that impact their safety and well-being, including limited training access and sometimes lower safety prioritization by employers

The literature indicates that foreign workers may be at greater risk of work-related injuries and fatalities than their local counterparts.^{8,9} This increased risk highlights the need for targeted research to understand and mitigate the specific safety issues faced by this group. In Thailand, despite the significant presence of foreign workers in construction, this area is underrepresented in academic research.¹⁰ Addressing this gap is crucial to improving safety outcomes and ensuring fair treatment for all workers.

Studies on construction safety often examine the effectiveness of safety training, the impact of safety knowledge, and the role of organizational culture in safety practices.¹¹ Research has shown a correlation between workers' safety knowledge and their behavior on-site, suggesting that better-informed workers practice safer habits.^{12,13} However, attitudes towards safety, influenced by cultural and personal factors, are also crucial. Workers who value safety measures are more likely to follow protocols and advocate for safer environments.

Previous research has explored how personal factors like age, experience, and education affect safety outcomes.¹⁴ For example, younger or less experienced workers may be at higher risk due to inexperience or lack of training.^{15,16} However, studies specifically focusing on foreign workers in Thailand's construction sector are limited. This is a significant oversight, as foreign workers may differ not only in demographic profiles but also in their responses to safety training and attitudes towards safety, influenced by their cultural backgrounds.

Given these gaps, this study aims to: (1) assess the knowledge, attitudes, and safety behaviors of foreign workers in a small construction company in Songkhla Province; and (2) explore the relationship between personal factors and these safety dimensions among the workers. These objectives aim to provide insights into the specific safety challenges and needs of foreign workers, contributing to more effective safety management strategies in the construction industry. The findings of this study could be practically applied to inform policy and training programs, ultimately enhancing the safety and well-being of all construction workers, both local and foreign.

2. METHODS

This study employed a cross-sectional design to investigate the relationship between knowledge, attitudes, and safety behaviors among Myanmar workers in a small construction company in Songkhla Province.

2.1 Population

The study involved 30 Myanmar construction workers from the company, all over 18 years old and legally permitted to work (based on company HR records as of November 30, 2023). Due to the small population size at the study location, a purposive sampling method was used, and the entire population was included in the study.

2.2 Research Instruments

2.2.1 Development of the Questionnaire: The questionnaire, developed based on relevant theories, concepts, and research, is divided into four sections:

Section 1: Personal Factors – A checklist including gender, age, marital status, work experience, training, and accident experience within the past year.

Section 2: Safety Knowledge – Binary-choice (Yes/No) format with scoring for positive and negative statements, categorized into high (above 80%), moderate (60-80%), and low (below 60%) knowledge levels.

Section 3: Attitudes towards Safety – A Likert scale with five levels ranging from strongly agree to strongly disagree. The interpretation of scores followed the method of calculating interval width to categorize attitudes as high (3.67-5.00), moderate (2.34-3.66), and low (1.00-2.33).^{17,18}

Section 4: Safety Behaviors – A Likert scale measuring the frequency of safety practices, with the interpretation of scores similar to attitudes. Behaviors were categorized as high (3.67-5.00), moderate (2.34-3.66), and low (1.00-2.33), using the same interval calculation method.

The questionnaire was translated into the Burmese language by a language expert to ensure clarity and accuracy.

2.2.2 Quality and Validation of the Instruments:

The content was reviewed by four workplace safety experts for accuracy and clarity, with an IOC ≥ 0.5 as a selection criterion. A trial was conducted with 30 similar workers from another construction company to test reliability.

Safety Knowledge: KR-20 formula used, reliability coefficient 0.81.

Attitudes and Safety Behaviors: Reliability was assessed using Cronbach's Alpha, yielding coefficients of 0.81 and 0.88, respectively, indicating high reliability.

The study adhered to ethical standards, certified by The Sukhothai Thammathirat Open University Research Ethics Committee (STOUIRB 2567/004.1810, dated December 8, 2023). Participants were informed of their right to withdraw without consequences.

2.3 Data Analysis

Statistical Analysis: Data were analyzed using various statistical methods: Descriptive statistics (frequency, percentage) for personal factors. Analysis of knowledge, attitudes, and safety behaviors using percentages, mean, and standard deviation. Fisher's exact test to explore relationships between personal factors and safety behaviors, and Spearman's rank correlation coefficients to examine the relationships between knowledge, attitudes, and safety behaviors. A significance level of 0.05 was set for these analyses.

3. RESULTS

3.1 The sociodemographic characteristics of the participants

In this study, data on knowledge, attitudes, and safety behaviors of foreign workers employed in a small construction company in Songkhla Province, Thailand were collected using a questionnaire. The respondents totaled 30 individuals. The analysis of personal factors included a range of demographic and work-related variables. These factors are detailed in Table 1 of the study.

Table 1 Distribution of respondents by personal factors

Personal Factor	Number (N = 30)	Percentage (%)
Gender		
Male	15	50.00
Female	15	50.00
Age		
18-30 years	11	36.67
31-40 years	16	53.33
41-50 years	3	10.00
Over 51 years	0	0.00
Marital Status		
Single	1	3.33
Married	29	96.67
Divorced/Widowed/Separated	0	0.00
Work Experience		
Less than 1 year	0	0.00
1-5 years	13	43.33
6-10 years	6	20.00
Over 11 years	11	36.67
Work Experience in Current Position		
Less than 1 year	0	0.00
1-5 years	6	20.00
6-10 years	14	46.67
Over 11 years	10	33.33
Training Experience		
Never	2	6.67
Yes	28	93.33
Experience of Construction-related Accidents in the Past		
Year		
Never	28	93.33
Yes	2	6.67

The key findings are summarized as follows: The workforce was evenly divided between males and females, each constituting 50.00% of the respondents, offering a diverse perspective on workplace safety and behaviors. Most workers were between 31-40 years old (53.33%), followed by the 18-30 age group (36.67%), with a small fraction in the 41-50 age range (10.00%) and none

over 51 years old, indicating a relatively young workforce. An overwhelming majority (96.67%) were married, suggesting a mature workforce with potential family responsibilities, possibly influencing their attitudes towards workplace safety. The respondents had varied experience levels in construction, with 36.67% having over 11 years of experience. Interestingly, 43.33% had 1-5 years of experience in their current position, indicating a relatively stable workforce with considerable experience in specific roles. A notable 93.33% had received some form of safety training, suggesting the workforce is generally well-informed about basic safety protocols. Most workers (93.33%) reported no construction-related accidents in the past year, highlighting either effective safety measures or potential underreporting of incidents.

3.2 Safety Knowledge

The analysis of the safety knowledge questionnaire completed by foreign workers in a small construction company in Songkhla Province involved 15 questions. The results, as detailed in Table 2, are presented in terms of the number and percentage of correct and incorrect answers for each question, along with an interpretation of the knowledge level for each item.

The workers' safety knowledge at the construction company (Table 2) indicates a moderate level of understanding overall, with an average correct answer rate of 79.11%. Key insights from the table include: 1) High Knowledge Areas: There is strong awareness regarding the use of PPE in hazardous areas and the importance of safety belts at heights. Knowledge about specific equipment, such as wearing steel-toe boots and using fire extinguishers correctly, also scored highly. 2) Moderate Knowledge Areas: Workers displayed a moderate understanding of the broader aspects of safety, such as the impact of organized workspaces on reducing accidents and the role of personal protective equipment in various contexts. 3) Variable Understanding: The data shows varying degrees of comprehension regarding the causes of accidents and the implementation of safety practices. For instance, a significant portion of workers viewed construction accidents as a matter of fate, indicating a potential area where misconceptions could be addressed.

Overall, the results from Table 2 reflect a baseline level of safety knowledge among the workers, with specific areas identified for potential improvement and clarification in safety training.

Table 2 Number, percentage, and interpretation of safety knowledge questions

Item	Correct Answers (%)	Incorrect Answers (%)	Knowledge Level
1. Construction accidents are a matter of fate, not unsafe practices or conditions	20 (66.67)	10 (33.33)	Moderate
2. Workers in hazardous areas must always wear personal protective equipment	28 (93.33)	2 (6.67)	High
3. Personal protective equipment protects body parts from hazards	21 (70.00)	9 (30.00)	Moderate
4. Wearing standard cut-resistant gloves prevents injuries from sharp materials	22 (73.33)	8 (26.67)	Moderate
5. Wearing metal-toe or steel-toe boots can protect feet and toes from falling objects or impacts	29 (96.67)	1 (3.33)	High
6. Working during rain, thunderstorms, or strong winds is safe with personal protective equipment	22 (73.33)	8 (26.67)	Moderate
7. Workers can refuse to work if they feel unskilled or unsafe	21 (70.00)	9 (30.00)	Moderate
8. Maintaining a well-organized workplace can reduce accidents	27 (90.00)	3 (10.00)	High
9. It's safe to throw materials from height if it seems harmless for faster work	18 (60.00)	12 (40.00)	Moderate
10. It's necessary to wear safety belts at all times when working at height to prevent falls	27 (90.00)	3 (10.00)	High
11. Welding requires wearing face and eye protection to prevent sparks from hitting the eyes	24 (80.00)	6 (20.00)	High
12. Using incorrect tools or equipment can cause danger	18 (60.00)	12 (40.00)	Moderate
13. It's not always necessary to wear a safety helmet during construction work	20 (66.67)	10 (33.33)	Moderate
14. Construction sites must have clear warning and mandatory signs to communicate dangers and caution to outsiders	29 (96.67)	1 (3.33)	High
15. The correct method to use a fire extinguisher is as follows: Pull, Aim, Squeeze, and Sweep	30 (100.00)	0 (0.00)	High
Overall Average	23.73 (79.11)	6.27 (20.89)	Moderate

3.3 Safety Attitude

The analysis of the safety attitude questionnaire, completed by foreign workers in a small construction company in Songkhla Province, consisted of 15 items. The results, shown in Table 3, are presented as averages and standard deviations, offering an insight into the workers' attitudes towards various aspects of safety in the workplace.

Table 3 Attitudes towards workplace safety

Item	Average (\bar{X})	Standard Deviation (S.D.)	Attitude Level
1. Everyone needs safety training in the workplace	3.73	1.69	High
2. Safety training reduces accidents	4.67	0.47	High
3. Most construction accidents are caused by unsafe acts	3.77	1.17	High
4. Company safety rules do not need to be followed entirely	3.07	1.50	Moderate
5. Incorrect work methods and lack of knowledge don't lead to accidents	3.50	1.63	Moderate
6. Working while unwell or tired doesn't cause accidents	3.13	1.84	Moderate
7. Using inappropriate tools or equipment causes accidents	3.73	1.31	High
8. Report damaged or incomplete tools or equipment to the supervisor	4.63	0.66	High
9. Accident prevention is the worker's responsibility	3.93	1.18	High
10. Personal protective equipment reduces the severity of construction accidents	4.40	0.76	High
11. No need for personal protective equipment like goggles, gloves while cutting steel	3.97	1.40	High
12. No need to check tools and equipment every time as it wastes time	4.10	1.35	High
13. Working attentively reduces construction accidents	4.63	0.71	High
14. Familiarity with work reduces accidents, no need for personal protective equipment	4.30	0.78	High
15. Drinking alcohol before or during work increases the risk of accidents	4.33	1.30	High
Overall Average	3.99	1.18	High

The key takeaways from the table are: 1) Strong agreement on training and prevention: workers strongly agreed on the importance of safety training and its role in reducing accidents. They also recognized that using appropriate tools, reporting damaged equipment, and wearing personal protective equipment (PPE) is crucial for preventing accidents. 2) High responsibility awareness: There was a high level of agreement that accident prevention is the worker's responsibility, indicating a strong sense of personal accountability in maintaining workplace safety. And, 3) Moderate views on rule adherence and work methods: the attitudes towards strictly following safety rules and the impact of work methods and physical condition on safety were more moderate. This suggests variability in how workers perceive the necessity of adhering to all safety protocols and the effect of personal factors on workplace safety.

The overall average attitude score was high, reflecting a generally positive mindset towards safety measures and practices among the workers.

3.4 Safety Behaviors

Table 4 presents an analysis of the safety behaviors of foreign workers at a small construction company in Songkhla Province. The table outlines their responses to 15 different safety-related behaviors, quantified through average scores and standard deviations to determine the behavior levels.

The workers scored high in crucial areas like compliance with company safety rules, performing tasks according to safe procedures, and consistently wearing personal protective equipment during work. This indicates a strong adherence to safety protocols. There was a high level of conscientiousness in selecting and using the appropriate tools and equipment provided by the company, which is a critical aspect of workplace safety. Workers showed a high behavior level even in challenging conditions like adverse weather, highlighting their commitment to safety regardless of external factors. Smoking in construction areas was noted as a moderate behavior, indicating an area where safety practices could be improved. High scores were observed in behaviors like consulting supervisors in case of doubts and reporting potential hazards, demonstrating proactive communication regarding safety. The workers also showed high levels of maintaining a clean and organized workspace and following warning signs, essential for preventing accidents. The overall average behavior score was high (4.16), suggesting that the workers generally exhibit a high level of safe behaviors in their workplace.

Table 4 Safety Behaviors in the Workplace

Item	Average (\bar{X})	Standard Deviation (S.D.)	Behavior Level
1. Compliance with company safety rules	4.30	0.53	High
2. Performing tasks according to safe work procedures	4.13	0.72	High
3. Wearing personal protective equipment provided by the company at all times during work, e.g., safety helmets, shoes	4.07	0.73	High
4. Selecting appropriate tools and equipment as prepared by the company	4.07	0.81	High
5. Working in adverse weather conditions like rain, strong winds	3.77	1.31	High
6. Wearing flip-flops or going barefoot in construction areas	4.67	0.47	High
7. Smoking in construction areas	3.43	1.61	Moderate
8. Consulting supervisors when in doubt about work	4.70	0.53	High
9. Maintaining a well-organized and clean work area	4.27	0.81	High
10. Joking or playing with colleagues during work	3.87	1.26	High
11. Using worn or damaged tools or equipment	4.17	1.32	High
12. Properly storing tools and equipment after work completion	3.70	1.35	High
13. Passing tools to colleagues at heights by throwing	4.07	1.31	High
14. Reporting accidents or potential hazards to supervisors	4.53	1.02	High
15. Following specified warning signs	4.73	0.44	High
Overall Average	4.16	0.95	High

3.5 Relationship Between Personal Factors and Safety Behavior Levels

Table 5 examines the relationship between various personal factors and safety behavior levels among the foreign workers using Fisher's exact test.

Table 5 Relationship between personal factors and safety behavior levels

Personal Factor	High Behavior Level	Moderate Behavior Level	Total	p-value
Gender				
- Male	12 (75.00%)	4 (25.00%)	16 (100.00%)	0.65
- Female	12 (85.71%)	2 (14.29%)	14 (100.00%)	
Age				
- 18-30 years	7 (63.64%)	4 (36.36%)	11 (100.00%)	0.23
- 31-40 years	14 (87.50%)	2 (12.50%)	16 (100.00%)	
- 41-50 years	3 (100.00%)	0 (0.00%)	3 (100.00%)	
- Over 51 years	0 (0.00%)	0 (0.00%)	0 (0.00%)	
Marital Status				
- Single	1 (100.00%)	0 (0.00%)	1 (100.00%)	1
- Married	23 (79.31%)	6 (20.69%)	29 (100.00%)	
Work Experience				
- Less than 1 year	0 (0.00%)	0 (0.00%)	0 (0.00%)	0.10
- 1-5 years	8 (61.54%)	5 (38.46%)	13 (43.33%)	
- 6-10 years	6 (100.00%)	0 (0.00%)	6 (100.00%)	
- Over 11 years	10 (90.91%)	1 (9.09%)	11 (100.00%)	
Experience in Construction Work				
- Less than 1 year	0 (0.00%)	0 (0.00%)	0 (0.00%)	0.51
- 1-5 years	4 (66.67%)	2 (33.33%)	6 (100.00%)	
- 6-10 years	11 (78.57%)	3 (21.43%)	14 (100.00%)	
- Over 11 years	9 (90.00%)	1 (10.00%)	10 (100.00%)	
Training Experience				
- Never	1 (50.00%)	1 (50.00%)	2 (100.00%)	0.36
- Yes	23 (82.14%)	5 (17.86%)	28 (100.00%)	
Experience of Construction Accident in the Past Year				
- Never	23 (82.14%)	5 (17.86%)	28 (100.00%)	0.37
- Yes	1 (50.00%)	1 (50.00%)	2 (100.00%)	

The analysis revealed no significant associations between personal factors (gender, age, marital status, work experience, experience in construction work, training experience, and experience of construction accidents) and safety behavior levels among the workers. The p-values for all factors were above the significance threshold, indicating that none of the personal factors studied had a statistically significant impact on the level of safety behavior.

3.6 Relationship Between Knowledge, Attitude, and Safety Behaviors

Table 6 explores the relationship between safety knowledge, attitude, and behavior among the foreign workers at the construction company in Songkhla Province. The table utilizes Spearman's rank correlation to determine the strength and significance of these relationships.

Table 6 Relationship between knowledge, attitude, and safety behaviors

Aspect	Spearman's rank correlation (rho)	p-value	Relationship Level
Safety Knowledge	0.33	0.22	No Relationship
Safety Attitude	0.19	0.49	No Relationship

The Spearman's rank correlation coefficient (rho) for the relationship between safety knowledge and safety behavior was 0.33. However, the p-value of 0.22 indicates that this relationship is not statistically significant. This suggests that while there is a moderate positive correlation between safety knowledge and behavior, it is not strong enough to be considered statistically meaningful. Similarly, the correlation between safety attitude and behavior was found to be weaker, with a Spearman's rank correlation coefficient of 0.19. The corresponding p-value of 0.49 further indicates that there is no significant relationship between these two variables. This implies that the workers' attitudes towards safety do not necessarily predict their actual safety behaviors in a statistically significant manner.

Overall, the data reveal no significant statistical relationship between workers' safety knowledge or attitudes and their actual safety behaviors. This finding underscores the complexity of translating safety knowledge and attitudes into consistent safety practices and highlights the need for more targeted interventions to enhance safety behavior effectively.

4. DISCUSSION

This study aimed to understand the safety knowledge, attitudes, and behaviors of foreign workers in a construction company in Songkhla Province and how these factors are influenced by various personal factors. The findings reveal that while the workers demonstrated moderate safety knowledge (79.11% correct answers) and generally positive safety attitudes, translating this knowledge and these attitudes into consistent safety behaviors proved challenging. The weak correlations between safety knowledge and behaviors (Spearman's rank correlation coefficient of 0.33, $p=0.22$) and between attitudes and behaviors (Spearman's rank correlation coefficient of 0.19, $p=0.49$) suggest that other factors, such as the work environment or specific situations, may play a more significant role in shaping safety behaviors than previously thought.

Interestingly, the results did not show a significant relationship between the three variables—knowledge, attitudes, and behaviors—which contradicts some theoretical models that suggest a strong link between these factors. One possible explanation is that while theories often assume a linear progression from knowledge to attitudes to behaviors, in practice, the application of knowledge and attitudes is mediated by situational factors, cultural differences, and the quality of the work environment. These findings imply that knowledge alone is insufficient to influence behavior without supportive environmental and organizational factors.

In terms of personal factors, the analysis found no significant differences in safety behavior based on gender, age, marital status, work experience, or other demographic variables. This finding challenges some assumptions in safety research, indicating that in this context, organizational culture and the quality of training might be more critical than personal demographics.

The findings align with similar research conducted in construction settings where weak correlations between safety knowledge and behavior were also observed. For example, a study in the Australian construction industry similarly found that understanding safety protocols did not always result in safe behavior.¹⁴ Additionally, a research in petrochemical companies suggested that even with safety training, workers often struggled to apply their knowledge in practical situations.¹⁸

Implications for training and management:

Given that 93.33% of workers had received safety training but only displayed moderate safety knowledge, it is evident that current training methods may need enhancement. Based on these findings, more interactive training approaches, such as workshops, on-site demonstrations, and multilingual training materials, are recommended. Additionally, implementing a buddy system where experienced workers mentor new or foreign workers could bridge the gap between knowledge and practice.

Practical steps for management:

Management can take several steps to address these gaps, such as revising training programs to be more context-specific and culturally sensitive, ensuring that safety protocols are clearly communicated and consistently enforced, and fostering a work environment that prioritizes safety through ongoing education and support. Moreover, the introduction of regular feedback sessions where workers can discuss safety concerns and suggest improvements could be beneficial.

Limitations and future research:

The study's limitations include its small sample size and focus on a single company, which may limit the generalizability of the findings. Future research should consider larger samples across multiple sites to validate these results. Additionally, exploring the impact of leadership styles and

psychological factors, such as risk perception, could provide further insights into safety behaviors in construction settings.

5. CONCLUSION

The findings from this study highlight the complexity of ensuring safety in construction settings, particularly among foreign workers. The weak correlations between knowledge, attitudes, and behaviors suggest that factors such as the quality of training, cultural differences, and language barriers may inhibit the translation of knowledge and attitudes into consistent safety behaviors. For instance, training that is not tailored to the specific cultural and linguistic needs of workers may fail to effectively convey critical safety information. Moreover, cultural norms and differences in risk perception could affect how safety messages are received and acted upon.

To foster a positive safety culture, it is essential to implement leadership training that emphasizes the importance of safety and encourages supervisors to model safe behavior. Additionally, involving employees in safety decision-making processes and establishing recognition programs that reward safe practices can motivate workers to prioritize safety. Such initiatives can help bridge the gap between knowledge and behavior, leading to safer construction sites, improved worker welfare, and enhanced productivity.

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DECLARATION OF CONFLICTING INTERESTS

The authors declare that there is no conflict of interest.

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