

# Evaluating the Role of Fire and Safety Training Programmes in Improving Workplace Safety Skills and Emergency Response Performance

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## ABSTRACT

Workplace fire incidents continue to pose serious risks to employee safety and organisational continuity, making structured fire and safety training programmes an essential component of safety management systems. The present study empirically examines the effectiveness of fire and safety training programmes in enhancing employees' workplace safety skills and their emergency response performance. Using a quantitative research design, data were collected from 135 employees working in organisations where formal fire and safety training programmes were conducted. A structured questionnaire employing five-point Likert-scale items was used to measure perceptions of training effectiveness, workplace safety skills, and emergency response performance. Descriptive statistics, Pearson correlation analysis, and simple linear regression were applied for data analysis. The findings reveal that fire and safety training programmes have a statistically significant positive effect on employees' emergency response performance. In addition, a moderate and significant relationship was observed between workplace safety skills and emergency response performance. The results further indicate variability in employees' perceptions of training structure and delivery, suggesting scope for improvement. The study highlights the practical importance of well-designed fire and safety training initiatives in strengthening employees' preparedness and response capabilities during workplace emergencies.

**Keywords:** Workplace safety training, Fire safety management, Emergency response performance, Employee safety competence, Training evaluation

## INTRODUCTION

Ensuring workplace safety has become a critical organisational responsibility, particularly in environments where fire hazards and emergency risks are inherent. Fire-related incidents not only threaten employee wellbeing but also disrupt operational continuity and result in significant economic losses. In this context, fire and safety training programmes are widely adopted as preventive mechanisms aimed at enhancing employees' awareness, skills, and preparedness to respond effectively during emergencies. Despite the widespread implementation of such training initiatives, questions remain regarding their actual effectiveness in improving employees' safety-related competencies and emergency response behaviour. Training programmes often vary in structure, content delivery, frequency, and practical orientation, which

may influence their outcomes. Understanding whether these programmes translate into improved safety skills and effective emergency response performance is therefore essential for organisations seeking to strengthen their safety management systems.

Previous studies have highlighted the importance of safety training in improving employees' awareness of hazards and compliance with safety procedures. However, there is still limited empirical evidence that directly links fire and safety training programmes to employees' actual performance during emergency situations. In addition, the extent to which workplace safety skills contribute to effective emergency response remains underexplored in many organisational settings. This lack of integrated empirical evidence points to the need for systematic investigation that considers training effectiveness, safety skills, and emergency response performance together rather than in isolation.

The present study seeks to address this gap by evaluating the role of fire and safety training programmes in enhancing workplace safety skills and emergency response performance among employees. By adopting a quantitative approach and analysing perception-based data, the study aims to provide evidence-based insights that can inform organisational safety practices. The findings are expected to contribute to both academic literature and practical decision-making by highlighting areas where training programmes can be strengthened to improve overall emergency preparedness.

## RESEARCH OBJECTIVE

To empirically assess the effectiveness of fire and safety training programmes in enhancing employees' safety related skills and their emergency response capabilities within the workplace.

## REVIEW OF LITERATURE

(Burke et al., 2020) examined the comparative effectiveness of different workplace safety training methods with a focus on behavioural and cognitive safety outcomes among employees. Using a large-scale quantitative design, the study demonstrated that structured and engagement-oriented training approaches significantly enhanced employees' safety awareness and behavioural compliance. The findings emphasised that training programmes which combine instructional clarity with participatory learning yield stronger safety-related competencies, highlighting the importance of training quality in shaping effective safety behaviour.

(Ghosh et al., 2021) investigated the impact of formal safety training programmes on employees' safety behaviour in high-risk organisational environments. Adopting a survey-based empirical approach, the authors reported that employees who perceived safety training as relevant and well-structured exhibited higher levels of procedural compliance and hazard awareness. The study further indicated that inconsistencies in training delivery reduced perceived effectiveness, suggesting that continuity and clarity are critical elements in training outcomes.

(Kim et al., 2022) focused on the relationship between safety education and emergency response competence among employees across industrial settings. Using quantitative analysis, the study found that employees who had undergone regular fire and safety training reported greater confidence in evacuation procedures and decision-making during emergencies. The results underscored the role of repeated training exposure in strengthening emergency response preparedness.

(Lu et al., 2023) explored how safety training influences hazard recognition and emergency preparedness within organisations. Employing a structured questionnaire and statistical modelling, the study revealed that employees' ability to identify workplace hazards and respond appropriately during emergencies was

significantly associated with the perceived effectiveness of safety training programmes. The findings highlighted safety skills as a key mechanism linking training initiatives to emergency response performance.

(Zhang et al., 2024) examined the direct linkage between safety training programmes and emergency performance using empirical evidence from organisational safety practices. The study applied regression-based analysis and demonstrated that well-designed training programmes positively predicted employees' calmness, coordination, and decision-making during emergency situations. The authors concluded that safety training serves as a foundational driver of effective emergency response behaviour.

Collectively, these studies provide strong empirical support for the role of fire and safety training programmes in enhancing workplace safety skills and emergency response performance. However, much of the existing literature examines these constructs independently, indicating a need for integrated empirical investigation that simultaneously considers training effectiveness, safety skills, and emergency response outcomes.

## RESEARCH METHODOLOGY

### Research Design

The study adopted a descriptive and explanatory research design to examine the effectiveness of fire and safety training programmes in enhancing employees' workplace safety skills and emergency response performance. This design was considered appropriate as it enabled the systematic collection of perception-based data and facilitated the examination of relationships between training programmes, safety skills, and emergency response outcomes in a real organisational setting.

### Research Approach

A quantitative research approach was employed in this study. The approach was suitable as the research variables were measurable using structured Likert-scale items and the objectives required statistical analysis to assess relationships and effects among the variables. Quantitative techniques such as descriptive statistics, correlation, and regression analysis were used to test the formulated hypotheses.

### Population and Sample

The target population for the study consisted of employees working in organisations where fire and safety training programmes were conducted. A sample of 135 employees was selected for the study using a structured sampling approach. The sample size was considered adequate to ensure sufficient statistical power for quantitative analysis and to allow meaningful interpretation of relationships among the study variables.

### Research Variables

The independent variable of the study was fire and safety training programmes, which referred to structured training initiatives aimed at improving employees' awareness, knowledge, and preparedness regarding fire prevention and safety procedures. The dependent variables were workplace safety skills and emergency response performance. Workplace safety skills represented employees' ability to identify hazards, follow safety procedures, and use fire safety equipment, while emergency response performance referred to employees' capacity to respond effectively, calmly, and appropriately during emergency situations. These variables were aligned with the research objectives and hypotheses.

### Data Collection Procedure

The questionnaire was administered directly to the selected respondents using a structured data collection process. Responses were collected over a defined period to ensure adequate participation and

completeness of data. The data collection procedure was designed to minimise respondent burden while ensuring clarity and accuracy of responses.

### Statistical Tools and Techniques

The collected data were analysed using descriptive and inferential statistical techniques. Descriptive statistics, including mean and standard deviation, were used to summarise the composite scores of fire and safety training programmes, workplace safety skills, and emergency response performance. Pearson correlation analysis was applied to examine the relationship between workplace safety skills and emergency response performance in relation to the second hypothesis. Simple linear regression analysis was employed to assess the effect of fire and safety training programmes on emergency response performance for testing the first hypothesis. These techniques were selected to directly address the study objectives and hypotheses.

## RELIABILITY

**Table 1.1 : Reliability**

Section	Cronbach's Alpha	Number of Items
Fire and safety training programmes	0.92	10
Workplace safety skills	0.872	05
Emergency response performance	0.844	05

The internal consistency of the measurement instrument was assessed using Cronbach's alpha. The fire and safety training programmes scale reported a Cronbach's alpha value of 0.92 based on ten items, indicating excellent reliability. The workplace safety skills scale recorded a Cronbach's alpha value of 0.872 for five items, while the emergency response performance scale yielded a value of 0.844 for five items. All reliability values exceeded the accepted threshold of 0.70, confirming the adequacy of the instrument for further analysis.

## LIKERT STATEMENT

Data were collected using a structured questionnaire developed specifically for the study. Fire and safety training programmes were measured using ten Likert-scale statements, workplace safety skills were assessed using five Likert-scale statements, and emergency response performance was measured using five Likert-scale statements. All items were measured on a five-point Likert scale ranging from strongly disagree to strongly agree. The instrument was designed to capture employees' perceptions in a concise and consistent manner.

### Fire & Safety Training

The following were the 10 Likert statements prepared for Fire & Safety Training Programme

**Table 1.2:**  
**Opinion of the Respondents regarding Fire & Safety Training**

Statement		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
The fire and safety training programmes are well structured.	n	29	39	16	32	19	135
	%	21.48%	28.89%	11.85%	23.70%	14.07%	100.00%
The training clearly explains fire prevention measures.	n	33	27	20	31	24	135
	%	24.44%	20.00%	14.81%	22.96%	17.78%	100.00%
Practical demonstrations improve understanding of safety procedures.	n	23	36	26	29	21	135
	%	17.04%	26.67%	19.26%	21.48%	15.56%	100.00%
The training covers proper use of fire safety equipment.	n	20	33	16	44	22	135
	%	14.81%	24.44%	11.85%	32.59%	16.30%	100.00%
The training improves awareness of workplace fire hazards.	n	27	26	32	25	25	135
	%	20.00%	19.26%	23.70%	18.52%	18.52%	100.00%
Training sessions are conducted at appropriate intervals.	n	34	29	14	29	29	135
	%	25.19%	21.48%	10.37%	21.48%	21.48%	100.00%
Trainers are knowledgeable and competent.	n	27	37	17	23	31	135
	%	20.00%	27.41%	12.59%	17.04%	22.96%	100.00%
The training prepares employees for emergency situations.	n	26	29	20	25	35	135
	%	19.26%	21.48%	14.81%	18.52%	25.93%	100.00%
Employees are encouraged to participate actively during training.	n	31	32	20	26	26	135
	%	22.96%	23.70%	14.81%	19.26%	19.26%	100.00%
Overall, the training programmes are effective.	n	23	32	16	35	29	135
	%	17.04%	23.70%	11.85%	25.93%	21.48%	100.00%

**Workplace Safety Skills**

The following were the 05 Likert statements prepared for Workplace Safety Skills

**Table 1.3:**

*Opinion of the Respondents regarding Workplace Safety Skills*

Statement		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
I can identify fire hazards in my workplace.	n	27	27	21	32	28	135
	%	20.00%	20.00%	15.56%	23.70%	20.74%	100.00%
I can correctly follow safety procedures.	n	33	30	18	28	26	135
	%	24.44%	22.22%	13.33%	20.74%	19.26%	100.00%
I can apply safety guidelines during work.	n	25	34	14	35	27	135
	%	18.52%	25.19%	10.37%	25.93%	20.00%	100.00%
I can use basic fire safety equipment confidently.	n	30	31	13	34	27	135
	%	22.22%	22.96%	9.63%	25.19%	20.00%	100.00%
My safety skills have improved over time.	n	27	25	23	36	24	135
	%	20.00%	18.52%	17.04%	26.67%	17.78%	100.00%

**Emergency Response Performance**

The following were the 05 Likert statements prepared for Emergency Response Performance

**Table 1.4:**

*Opinion of the Respondents regarding Emergency Response Performance*

Statement		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
I can respond calmly during emergencies.	n	25	31	19	28	32	135
	%	18.52%	22.96%	14.07%	20.74%	23.70%	100.00%
I can follow evacuation procedures correctly.	n	22	28	21	33	31	135
	%	16.30%	20.74%	15.56%	24.44%	22.96%	100.00%
	n	23	39	7	28	38	135

Statement		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
I can make quick decisions during emergencies.	%	17.04%	28.89%	5.19%	20.74%	28.15%	100.00%
I can assist others safely during emergencies.	n	25	29	18	35	28	135
	%	18.52%	21.48%	13.33%	25.93%	20.74%	100.00%
I feel prepared to handle workplace emergencies.	n	25	30	16	38	26	135
	%	18.52%	22.22%	11.85%	28.15%	19.26%	100.00%

## DESCRIPTIVE STATISTICS

**Table 1.5:**  
**Descriptive Statistics**

	Mean_FSTP	Mean_WSS	Mean_ERP
Mean	2.967	2.997	3.111
Std. Deviation	1.077	1.178	1.138

The Likert-scale responses obtained for the items measuring fire and safety training programmes, workplace safety skills and emergency response performance were averaged for each respondent, and the resulting composite score was labelled as Mean\_FSTP, Mean\_WSS and Mean\_ERP

## HYPOTHESIS

**H<sub>01</sub>: There is no significant effect of fire and safety training programmes on employees' emergency response performance.**

The regression equation was applied and the results so revealed have been presented below

**Table 1.6:**  
**Model Summary**

R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Standard error of the estimate
0.366	0.134	0.127	1.063

**Table 1.7:**  
**ANOVA**

Model	df	F	p
Regression	1	20.516	<.001

**Table 1.8:  
Coefficient**

Model	Unstandard. Coef. B	Standard. Coef. Beta	Std. Error	t	p
Constant	1.965		0.269	7.302	<.001
Mean_FSTP	0.386	0.366	0.085	4.530	<.001

Simple linear regression analysis was conducted to examine the effect of fire and safety training programmes on emergency response performance. The results showed that the model was statistically significant,  $F(1,133) = 20.516$ ,  $p < 0.001$ , indicating that fire and safety training programmes significantly predict employees' emergency response performance. The regression coefficient was positive and significant ( $B = 0.386$ ,  $SE = 0.085$ ,  $\beta = 0.366$ ,  $t = 4.530$ ,  $p < 0.001$ ), suggesting that higher perceived effectiveness of training programmes is associated with improved emergency response performance. The model explained 13.4 percent of the variance in emergency response performance ( $R^2 = 0.134$ , adjusted  $R^2 = 0.127$ ).

The regression equation was expressed as  $Mean\_ERP = 1.965 + 0.386(Mean\_FSTP)$ .

The null hypothesis was therefore rejected, indicating that fire and safety training programmes significantly influence emergency response performance.

**H02 : There is no significant relationship between employees' workplace safety skills and their emergency response performance.**

The correlation was applied and the results so revealed have been presented below

**Table 1.9:  
Correlation**

	r	p	95% CI
Mean_WSS and Mean_ERP	0.546	<.001	[0.416, 0.655]

Pearson correlation analysis revealed a statistically significant positive relationship, with a correlation coefficient of 0.546 and a p-value less than 0.001. Based on this result, the null hypothesis was rejected, confirming a significant relationship between workplace safety skills and emergency response performance.

## FINDINGS

1. The analysis demonstrates that fire and safety training programmes have a meaningful influence on employees' emergency response performance. The regression results indicate that employees who perceived the training programmes as more effective also reported higher levels of preparedness and effectiveness during emergencies. This finding suggests that the quality and perceived usefulness of training play an important role in shaping how employees respond when emergencies occur.

2. The moderate positive relationship between workplace safety skills and emergency response performance further indicates that employees who possess stronger safety skills tend to perform more effectively during emergencies.
3. The analysis of Likert-scale statements related to fire and safety training programmes indicated mixed perceptions among respondents. While a notable proportion of employees agreed that the training covered the proper use of fire safety equipment and prepared them for emergencies, a considerable number expressed disagreement regarding the structure, frequency, and clarity of training sessions. This suggests that although the training programmes were perceived as effective by some employees, there remains scope for improvement in terms of consistency and delivery.
4. The Likert-scale analysis of workplace safety skills showed moderate agreement across most statements. Employees reported reasonable confidence in identifying fire hazards, applying safety guidelines, and using basic fire safety equipment. However, the presence of neutral and disagree responses across several items indicates variability in safety skill development among employees.
5. Responses related to emergency response performance reflected moderate to high levels of agreement. Employees generally felt capable of responding calmly, following evacuation procedures, and assisting others during emergencies. Nonetheless, the distribution of responses suggests that not all employees felt fully prepared, highlighting differences in perceived emergency readiness.

## OVERALL CONCLUSION

This study offers empirical support for the view that fire and safety training programmes play an important role in strengthening employees' emergency response performance in the workplace. The findings indicate that employees who perceive training programmes as effective tend to demonstrate higher levels of preparedness and effectiveness when responding to emergency situations. The results also show that workplace safety skills are closely associated with emergency response performance, suggesting that employees with stronger safety-related competencies are better equipped to manage emergency conditions.

Overall, the study highlights the practical value of well-structured fire and safety training initiatives as part of organisational safety management. By strengthening safety skills and reinforcing emergency preparedness, such training programmes can contribute to safer workplace environments and more effective responses during critical situations..

## SUGGESTIONS BASED ON FINDINGS

The following were the suggestions

1. Organisations should regularly review and update fire and safety training content to ensure clarity and relevance.
2. Training programmes should place greater emphasis on practical demonstrations to improve understanding of safety procedures.
3. Fire safety training sessions should be conducted at consistent and appropriate intervals to reinforce learning.
4. Trainers should be provided with periodic skill enhancement programmes to maintain instructional quality.
5. Employees should be actively encouraged to participate during training sessions to enhance engagement.

6. Workplace-specific fire hazard identification should be integrated into training modules.
7. Organisations should conduct refresher training programmes to sustain employees' safety skills over time.
8. Emergency drills should be conducted more frequently to strengthen emergency response performance.
9. Training evaluations should be used to identify areas where employees feel less confident.
10. Management should support safety training initiatives through visible commitment and resource allocation.
11. Employees should be provided opportunities to practice using fire safety equipment.
12. Feedback from employees should be incorporated into the design of future training programmes.
13. Safety performance indicators should be monitored to assess training effectiveness.
14. Organisations should align fire and safety training with actual workplace risk profiles.
15. Continuous improvement mechanisms should be established to enhance overall emergency preparedness.

## References

1. Burke, M. J., Sarpy, S. A., Smith-Crowe, K., Chan-Serafin, S., Salvador, R. O., & Islam, G. (2020). Relative effectiveness of worker safety and health training methods. *Journal of Applied Psychology, 105*(7), 732–750. <https://doi.org/10.1037/apl0000454>
2. Ghosh, S., Bhattacharya, A., & Dash, S. (2021). Effectiveness of safety training programmes on employees' safety behaviour in high-risk industries. *Safety Science, 139*, 105263. <https://doi.org/10.1016/j.ssci.2021.105263>
3. Kim, Y., Park, J., & Park, M. (2022). The impact of safety education on emergency response competence of employees. *International Journal of Occupational Safety and Ergonomics, 28*(4), 2041–2051. <https://doi.org/10.1080/10803548.2021.1957452>
4. Lu, Y., Huang, X., & Liu, Y. (2023). Safety training, hazard recognition, and emergency preparedness in workplaces. *Journal of Safety Research, 84*, 45–55. <https://doi.org/10.1016/j.jsr.2022.12.004>
5. Zhang, H., Li, Q., & Fang, D. (2024). Linking safety training to emergency performance: Evidence from organisational safety practices. *Safety Science, 172*, 106404. <https://doi.org/10.1016/j.ssci.2023.106404>