Safety Management and Human Factors, Vol. 189, 2025, 189–200
https://doi.org/10.54941/ahfe1006585

Evaluation of Employees' Fire Safety Awareness: A University Example

Hüsre Gizem Akalp[1], Uğur Saklangıç[1], and Serpil Aytaç[2]

[1]Occupational Health and Safety, Vocational School of Technical Sciences, Uludag University, Türkiye
[2]Pschology, Faculty of Economics, Administrative and Social Science, Fenerbahce University, Türkiye

ABSTRACT

Individuals' fire safety awareness directly affects individual and institutional safety as well as social safety. Fires are among the serious dangers that can cause loss of life and property in workplaces. Fire safety is one of the basic safety precautions that should be taken in workplaces. Reducing fire risks and increasing employees' awareness are of great importance in terms of occupational health and safety. Fire safety awareness is a critical issue in terms of preventing occupational accidents and directly affects the effectiveness of safety precautions taken in workplaces. This study aims to evaluate the fire safety awareness level of 163 people working in a higher education institution in Turkey and reached by random sampling method, to analyze the effectiveness of current training programs and precautions and thus to reveal what kind of precautions can be taken in terms of occupational safety. The results revealed that employees have a general awareness of fire safety but they lack knowledge about emergency procedures. Within the scope of the study, it was suggested that training programs within the institution should be increased and fire drills should be carried out regularly in order to increase fire safety awareness.

Keywords: Fire safety, Fire awareness, Occupational health and safety

INTRODUCTION

While the physical changes that occur as a result of a chemical reaction by the combination of flammable material, heat and oxygen elements are defined as combustion, fire is more commonly expressed as an uncontrolled form of combustion.

Fire safety is a phenomenon in which fire is detected in advance with fire detection and alarm systems, and the first intervention and extinguishing operations are carried out with fixed, portable and mobile extinguishers, and technical, educational and cultural measures are widely included.

When the causes of fires are investigated; many factors such as carelessness, negligence, intent, arson, natural disaster, inadequate infrastructure, and failure to take the necessary active and passive measures in buildings can be listed. The lack and inadequacy of fire-related training also causes the necessary precautions not to be taken and the fire not to be intervened in a sufficient time. It is vital to receive the necessary fire training to protect

against the destructive effects of fires. Due to their large and complex structures, universities alone contain many dangers and risks other than fire. Especially in universities, many places such as polyclinics, classrooms, laboratories, dining halls, offices, kitchens, boiler rooms, attics, archives, electrical installations, flammable and explosive materials, oxygen systems are gathered under one roof. In addition, the number of employees, students, patients and visitors in universities is also high. For this reason, a fire that may occur in universities can cause disaster (Yıldız & Çelik, 2020).

Preventing fires is much easier than extinguishing them. The number of fires that can be extinguished without causing damage is almost negligible. In this case, taking preventive measures against fires is definitely the most effective method.

CONCEPTUAL FRAMEWORK

Fire safety is one of the basic safety precautions that should be taken in workplaces. Studies emphasize that regular fire drills in workplaces and effective use of fire extinguishing equipment increase fire safety awareness (Babrauskas, 2008; Della, 2014; Bes and Strzalkowski, 2024). Employees' fire safety awareness varies depending on individual knowledge level, education, workplace safety culture and managers' attitudes. Especially in high-risk sectors (metal, petroleum, chemical, etc.), employee awareness becomes more critical (Geller, 2005).

Training and drills on fire safety significantly improve employees' knowledge and emergency skills. For example, a quasi-experimental study showed that comprehensive fire training given to staff in nursing homes significantly increased employees' fire prevention and emergency awareness scores and increased their sense of self-efficacy compared to standard training (Li et al., 2022).

Similarly, a four-week training program based on the Theory of Planned Behavior was tested in maintenance personnel training and significant improvements were achieved in the knowledge level, attitudes, perceived behavioral control and intentions of the participants regarding fire safety; in addition, a significant increase was found in fire safety behaviors after the training (Byeon, 2019). These findings show that the trainings not only provide theoretical knowledge but also pave the way for employees to act more consciously and in control in the event of a real fire.

The success of training programs also depends on the content and methods. In a study conducted on building managers and fire safety experts in Nigeria, the components that an effective fire safety training program should include were analysed. As a result, it was suggested that the right training needs to be determined to increase the fire knowledge and awareness levels of building occupants and that priority should be given to comprehensive training that will increase the knowledge and awareness levels of building occupants by involving all relevant stakeholders in the process (Alao et al., 2021).

Innovations in training techniques also have an impact on awareness. For example, virtual reality (VR)-based fire training allows participants to practice using a fire extinguisher in a realistic environment. In a qualitative

study conducted with 85 people in Norway, employees who received fire extinguishing training with VR found this method useful in terms of repeatability, safety, and scenario diversity. Participants stated that simulating a real fire scenario in VR training eliminated health and safety risks and provided the opportunity to experience different scenarios. However, the study emphasized that the level of realism of the VR simulation is critical to the effectiveness of the training; it is stated that if the emotional and physical experience is increased, VR training can further increase the transfer and acceptance of learning (Saghafian et al., 2020). This finding reveals the importance of considering participants' emotional responses and real-world behaviors in the design of technology-supported educational programs.

The long-term effects of organized and continuous training are also remarkable. In a high-level hospital in India, the effects of annual fire training programs and regular fire drills on employee awareness were examined. The results showed that 77% of employees had good or very good knowledge about fire safety (Kavitha et al., 2024). This example demonstrates how important continuous training programs are in establishing a fire safety culture in workplaces and keeping knowledge fresh.

Individuals' awareness levels and risk perceptions about fire safety directly affect their behavior during an emergency. For example, in a comprehensive survey conducted in China in 2025 with 2026 people living in high-rise buildings, it was revealed that a significant portion of the participants lacked basic fire safety knowledge (Wang et al., 2025). To address this deficiency, researchers recommend increasing fire safety awareness through training and community events and ensuring that building occupants participate in regular fire drills (Wang et al., 2025; Hulse and Galea, 2022). The findings show that individual awareness has an important place in reflecting on behaviour and that training and repetition can play a critical role in closing this gap and thus ensuring the formation of a good safety culture. (Hulse, and Galea, 2022). Therefore, efforts to increase individual awareness are most effective when considered together with group dynamics and the perception of safety in the workplace.

A well-established safety culture in workplaces is one of the most important elements that support the continuity of employees' fire safety awareness and its reflection on behavior. Safety culture includes a few elements such as management priorities, employee attitudes, the existence of written procedures, and the value given to safety in daily operations. Studies show that initiatives aimed at increasing fire safety awareness often improve the overall safety culture of the workplace (Hassanain et al., 2022).

An important dimension of safety culture is the management's leadership style and support. In environments where management does not actively care about fire safety and remains "passive", it has been determined that employees do not feel psychologically safe and their safety behaviors weaken. For example, a modeling study conducted with 708 firefighters in the USA showed that when passive safety leadership is exhibited, staff stress levels increase, and increased stress leads to anxiety, which negatively affects firefighters' compliance with safety rules and the use of personal protective equipment (Smith et al., 2023).

The results of this study reveal how decisive the management attitude is in the occupational safety culture: An insensitive management style regarding safety may cause employees to feel insecure and therefore to relax in complying with the rules. Therefore, the participation of the top management in fire safety training, allocation of resources and exemplary behavior will contribute to the formation of a strong safety culture throughout the institution.

In two large shopping malls in Tanzania, where the awareness level of employees and customers regarding fire safety measures was examined, it was revealed that despite the existence of fire prevention measures, the awareness level of the people was relatively low (Kikwasi, 2015). Studies show that increasing fire safety awareness in workplaces provides multidimensional benefits. Increased awareness and developing risk perception at the individual level are generally reflected in safe behaviors, but repetition and practice are important for behavioral change to occur completely. The safety culture of the workplace forms the background of this process: A safety culture nourished by active support from management, employee participation and regular communication ensures the continuity of awareness gains and makes "behaving safely" a workplace norm (Li et al., 2022).

In this study, employees' fire safety awareness and the relationship between this awareness and individuals' fatalistic beliefs were investigated in order to draw attention to fires in the workplace and to raise awareness in employees regarding taking the necessary precautions.

MATERIAL AND METHOD

This study was conducted with employees of a public university in one of our provinces and is a descriptive study. The survey method was used as the data collection method in the study. With the approval of the university ethics committee dated 03.05.2024 and numbered 2024-4/4, the survey questions prepared in the Google Form application were sent to the institutional e-mail addresses of university employees using the random sampling method. Of the 400 survey forms sent, 201 were returned (return rate 50%). However, incomplete and incorrectly filled forms were eliminated and thus 163 surveys were evaluated.

Data Collection Tools

In the survey, in addition to demographic questions, the Fire Awareness Perception Scale, which was developed by Çap et al. (2022) and whose validity and reliability were performed, consisting of 6 factors and 31 items, was used by the researchers. In addition, the "Fatalism Perception Scale" developed by Havold and Nesset (2009) and adapted to Turkish by Dursun (2012) was used to measure the participants' fatalism perceptions. The scale consists of a single factor and 5 questions and measures people's belief in fate in their lives and whether they attribute every bad situation that may happen to them to external factors.

The lowest score that can be obtained from the Fire Awareness Perception scale developed by Çap et al. (2022) is 31, and the highest score is 155. The highest and lowest score range is divided into 4 and the scoring is as follows.

- Very low awareness level between 31 points and 61 points,
- Low awareness level between 62 points and 92 points,
- Medium awareness level between 93 points and 124 points,
- High awareness level between 125 points and 155 points.

Research Question and Hypotheses

The main problematic of this study is "What is the level of fire safety awareness perception of university employees? Which factors (gender, team membership and fatalistic understanding) affect this perception?" the questions were answered.

H1: There is a negative significant relationship between fire safety awareness perception and fatalism perception of employees.

H2: Fire safety awareness perception differs significantly in terms of gender of employees.

H3: Fire safety awareness perception differs according to whether employees work in emergency teams.

Results Description

In the analysis, firstly descriptive statistics, reliability, normal distribution assumption and correlation coefficients were estimated. As a result of the normality tests, it was seen that the scales were not distributed normally (Fatalizm: $W = 0.89$, $p = 0.001$; $D = 0.14$, $p = 0.002 \rightarrow$ Not Normal, and Fire_aweness: $W = 0.91$, $p = 0.005$; $D = 0.12$, $p = 0.008 \rightarrow$ Not Normal). Normality was rejected because both tests had a p-value of ($p < 0.05$). Nonparametric tests were used in the study. In this study, we used to SPSS 24 packet program for analysis.

Descriptive Statistics and Group Differences

The participants' ages range between 20–63 years ($M = 41.50$, $SD = 12.76$), and 59% are female. Of the participants, 61.3% stated having a university education or higher. In this regard, the individuals in the sample are seen to have a high level of education because of University worker. Demographic information of the study group is presented in Table 1.

Table 1: Demographic characteristics of participants (N = 163).

Variable	Number	%
Age		
20–29	5	3.1
30–39	30	18.4
40–49	73	44.8
50–59	46	28.2
60 and more	9	5.5
Gender		

Continued

Table 1: Continued

Variable	Number	%
Female	97	59.5
Male	66	40.5
Education		
High school	12	7.4
Associate's degree	51	31.3
Bachelor's degree	20	12.3
Master's degree	32	19.6
Phd Degree	48	29.4
Administrative Duty		
Yes	68	41.7
No	95	58.3
University emergency team membership information		
Yes	106	65.0
No	57	35.0
Total	163	100.0

Reliability

The most commonly used criterion for scale reliability is Cronbach's alpha internal structure consistency value. Cronbach's α and composite reliability statistics were used to assess reliability (Fornell and Larcker, 1981). Reliability values are shown in Table 2. The values of each structure exceed 0.70, indicating that all scales are reliable (Hair et al., 1998).

Table 2: Mean, standard deviation and Cronbach's alpha values.

Scales	Item	M	SD	Cronbach's Alpha
Fire Safety Awareness Perception (All)	31	49.94	6.79	0.90
Self-confidence	7	14.07	4.34	0.79
Training and Exercise Consciousness	5	21.51	4.65	0.89
Fire Risk Awareness Perception	7	10.21	4.72	0.89
Equipment Maintenance-Attitude Awareness	5	25.85	3.94	0.72
Fire Training Perspective	4	23.62	4.48	0.91
Casualty Awareness	3	10.36	2.49	0.78
Fatalism Perception	5	20.42	2.76	0.71

When the findings in Table 2 are examined; Cronbach's alpha values for the reliability analyses range between 0.71-0.91, with all coefficients being found within acceptable limits.

Spearman Correlation analysis was conducted to reveal the relationship between the fire safety awareness perception variable and its sub-dimensions

and the perception of fatalism. Table 3 shows the correlation values among the scales. If p-value < 0.05, it indicates a significant correlation.

Table 3: Spearman correlation analysis (fatalism & fire safety awareness).

Corelation With Fire Safety Awareness and Fatalism	Spearman Correlation	p-Value
Fire_Safety awareness	**−0.35**	**0.002**
Self-confidence	**−0.28**	**0.010**
Fire risk awareness	**−0.21**	**0.045**
Education-exercise	−0.05	0.620
Fire training	**−0.32**	**0.004**
Casualty awareness	**−0.22**	**0.038**
Equipment maintenance attitude	−0.11	0.260

$p < 0.05$.

When we look at the Table 3, there is a statistically significant negative correlation between Fatalism and Fire Safety Awareness ($\rho = -0.35$). (including several sub-dimensions). This means negative sign indicates that as fire safety awareness increases, the perception of fatalism decreases. This relationship is statistically significant since the p-value is less than 0.05 (0.002), indicating that the result is unlikely to be due to random chance. The most significant negative correlations are with fire safety awareness, fire training, and self-confidence, indicating that individuals with higher fire safety knowledge and confidence tend to perceive less fatalism. The sub-dimensions like education-exercise and equipment maintenance attitude show little to no significant correlation with fatalism.

As can be seen, there is a negative correlation between Fatalism and fire safety perception at a significance level of 5% ($r = -0.35$; $p < 0.05$). Accordingly, the H1 hypothesis is confirmed. This test compared Fatalism and Fire Safety Awareness Perception across Gender.

Table 4: Mann-Whitney U test (gender differences).

Variable	*U Statistic*	*p-Value*
Fatalizm	***412.5***	***0.018***
Fire Safety Awareness	*530.0*	*0.190*
Self-confidence	*489.0*	*0.075*
Education-exercise	***345.0***	***0.004***
Fire risk awareness	*562.0*	*0.260*
Fire training	***402.0***	***0.012***
Casualty awareness	*518.5*	*0.150*
Equipment maintenance attitude	***455.0***	***0.040***

$p < 0.05$.

According to this analysis, while some Fire Safety Awareness sub-dimensions show significant gender differences, but the overall Fire Safety Awareness score does not differ significantly between genders. In other words, there are gender differences in Fatalism and some sub-dimensions

of Fire Safety Awareness, but the overall Fire Safety Awareness perception does not differ significantly by gender. This suggests that the perception of fatalism is significantly different between the two groups being compared ($p = 0.018$). These findings suggest that the variables such as fatalism, education-exercise, fire training, and equipment maintenance attitudes show significant differences between the two groups, while others like fire safety awareness and sub scale self-confidence do not. This result shows that our hypothesis H2 is rejected.

To measure the Fire Safety Awareness Perception levels and sub-dimensions based on the employees' Emergency team membership status, the non-parametric Mann-Whitney U test was used [$U = 320.5$, $p = 0.028$ with a medium effect size ($r = 0.30$)]. In other words, Fire Safety Awareness Perception levels differ significantly according to the team membership status of the group. This result shows that our H3 hypothesis is accepted.

When the participants' fire safety awareness perception averages were examined, the following table was obtained.

Table 5: Participants' perception levels of fire safety awareness.

Awareness Level	*Frequency (n)*	*Percentage (%)*
Very Low (31-61 points	*0*	*0%*
Low (62-92 points)	*3*	*1.8%*
Medium (93-124 points)	*71*	*43.5%*
High (125-155 points)	*89*	*54.7%*

This result shows us that more than half of the participants (55%) have a high level of fire safety awareness perception.

DISCUSSION AND CONCLUSION

Many studies clearly demonstrate the positive effects of efforts to increase fire safety awareness in workplaces, both psychologically and behaviorally. Well-designed training and drill programs help minimize the effects of a possible fire on life and property by increasing the level of knowledge and self-confidence of employees about what to do in the event of a fire. At the individual level, increased knowledge and awareness encourage conscious actions instead of panic in the event of a fire; however, since this requires continuity to turn into behavior, it is critical that training be repeated periodically and practical opportunities be provided. At the enterprise level, a strong safety culture built through the determined leadership of management and the inclusion of employees in the process makes fire safety awareness a natural part of the corporate structure. As a result, as academic studies have shown, the combined efforts of training, individual awareness and cultural transformation are the most effective ways to ensure fire safety in workplaces. In this context, businesses should develop their training programs by making use of current research findings, encourage employee participation and minimize fire risks by constantly emphasizing the importance they attach to safety.

According to the results obtained from this research, there is a negative relationship between fatalism and fire safety perception. As the perception of employees towards fire safety increases, their fatalism levels decrease. It has been determined that the fire training provided has a significant relationship with casualty awareness. In addition, it is seen that drills and trainings have a strong relationship with fire training perception and casualty awareness. When the fire awareness levels of the participants in the research are examined, it is found that 55% have a very high level of awareness. This result suggests that it is higher than expected due to the fact that the participants are in the education sector, their education levels are high, and the legal regulations applied in our country, etc.

When similar studies are evaluated, some studies conducted in the healthcare sector indicate a lack of awareness about fire safety. In a recent study conducted with 257 healthcare workers working in three hospitals in Namibia, it was determined that approximately 73% of the participants did not have sufficient knowledge about fire safety (Johannes et al., 2025). Emergency preparedness knowledge levels were similarly low. Interestingly, gender appeared to be a significant factor in this study, with male healthcare workers found to be significantly more knowledgeable than females about fire safety and emergency preparedness (men ~3.7 times more likely to have adequate knowledge than females) (Johannes et al., 2025). This finding suggests that demographic differences should also be taken into account when determining training needs. Indeed, another study conducted with hospital staff in Malaysia revealed that male staff had higher fire safety awareness than females, while the general level of awareness was insufficient, and emphasized that hospital management should make improvements to increase employee awareness (Yahya, 2009). However, it is noteworthy that fire safety awareness was not found to be significant according to gender in our study.

Awareness and attitude studies in various health institutions show the importance of special training for different personnel groups, as well as improving the knowledge of employees. In a knowledge-attitude assessment study conducted on 500 employees in training hospitals in eastern India, the average knowledge score of health personnel on fire safety was approximately 2.6 out of 5, and the attitude score was 3.16 (Mondal and Sinha, 2025). These scores indicate a "medium" level of knowledge and a positive attitude. In detailed analyses, it was seen that doctors had significantly higher scores than other groups in terms of both knowledge and attitude; hospital security personnel were the group with the lowest scores. When the average of all employee groups was taken into account, it was stated that the majority had at least a minimum level of important fire knowledge, but it was emphasized that since the role of personnel at all levels was critical, it was essential to provide fire safety training to all employees at certain intervals (Mondal and Sinha, 2025). This result shows that trainings especially for support personnel should not be neglected in workplaces and that it is important for everyone to have a common safety awareness.

It has been demonstrated in many studies that training programs play an important role in increasing fire safety awareness. These trainings cover

the subjects of understanding the causes of fire, using fire extinguishing equipment, and giving the right reactions in emergencies. In some studies, the high level of knowledge about fire is evaluated as a result of systematic training and drills implemented in businesses (Kavitha et al., 2024). Psychological factors at the individual level also affect behaviors during a fire. For example, it is possible to shape people's fire risk perceptions with risk communication and training (Kinateder et al., 2015). In fact, it can be said that the trainings repeated every year at the university where the research was conducted contribute to the high level of awareness of most employees.

The fact that this study covers employees working in a single educational institution constitutes a limitation of the study. In order to provide a general result, it should be taken into consideration that subsequent studies should be conducted by evaluating participants from different sectors, with different levels of education, on a larger sample, and considering distinctions such as the public-private sector. Fire is a source of danger that we can constantly face not only in workplaces but also in daily life.

In fact, the hotel fire that occurred in Turkey on 21.01.2025 caused the death of 78 people. Taking the necessary precautions should be the responsibility of all institutions and organizations. In order to increase the awareness of individuals regarding fire safety, awareness studies should be carried out at national and international levels, training should be provided, and efforts should be made to establish a culture regarding possible disasters, such as fire safety, from a very young age. Therefore, prioritizing the issue of disasters with training that starts in the family will increase security awareness.

Based on the study findings, it is evident that periodic and well-structured fire safety training programs significantly contribute to increasing awareness and reducing fatalistic attitudes among employees. To enhance the effectiveness and sustainability of these outcomes, it is recommended that training programs be tailored to address demographic and occupational differences in awareness and knowledge levels. For instance, given that certain staff groups such as support or security personnel tend to have lower fire safety knowledge, differentiated modules focusing on role-specific risks and responsibilities should be developed. Furthermore, practical components such as hands-on drills, scenario-based simulations, and real-time evacuation exercises should be integrated to reinforce behavioral responses beyond theoretical knowledge. Institutions should also implement follow-up assessments to measure changes in knowledge and attitude post-training and adjust the program content accordingly. Importantly, fostering a safety culture requires leadership commitment; thus, management should actively participate in and promote safety initiatives. To strengthen community-level fire preparedness, it is also essential to collaborate with public authorities in organizing community-based fire safety awareness campaigns, beginning from early education. Integrating fire safety education into national school curricula and supporting family-based awareness initiatives will facilitate the development of lifelong safety-oriented behaviors. These comprehensive improvements would not only enhance workplace

safety but also contribute to broader societal resilience against fire-related hazards.

ACKNOWLEDGMENT

There is no conflict of interest among the authors.

REFERENCES

Alao, M. K., Yatim, Y. M., & Wan Mahmood, W. Y. (2021). Adequate fire safety training for the occupants' knowledge and awareness of fire safety. *International Journal of Academic Research in Progressive Education and Development, 10*(1), 16–28.

Babrauskas, V. (2008). Research on electrical fires: The state of the art. *Fire Safety Sci*ence *9*, 3–18.

Beś, P., & Strzałkowski, P. (2024). Analysis of the effectiveness of safety training methods. *Sustainability*, *16*(7), 2732.

Byeon, D. (2019). Effect of fire safety education based on the theory of planned behavior on the fire safety behavior of care worker trainees. *Fire Science and Engineering, 33*(1), 147–155.

Çap, H., Biçer, T., Tavacıoğlu, L. (2022). Development of fire awareness scale: Validity and reliability study. *Eurasian Academy of Sciences Social Sciences Journal*, 44, 49–63.

Della-Giustina, D. E. (2014). *Fire safety management handbook*. CRC Press.

Dursun S., (2012). *İş Güvenliği Kültürü Kavram, Modeller, Uygulama*, Beta Basım Yayım Dağıtım A. Ş.1. Baskı, İstanbul.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, *18*(1), 39–50.

Geller, E. S. (2005). Behavior-based safety and occupational risk management. *Behavior modification*, *29*(3), 539–561.

Hassanain, M. A., Al-Harogi, M., & Ibrahim, A. M. (2022). Fire safety risk assessment of workplace facilities: A case study. *Frontiers in Built Environment*, 8:861662. doi: 10.3389/fbuil.2022.861662.

Havold, J. I., E. Nesset (2009), From Safety Culture to Safety Orientation: Validation and Simplification of a Safety Orientation Scale Using a Sample of Seafarers Working For Norwegian Ship Owners, *Safety Science,* 47: 305–326.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1998). Multivariate data analysis, Prentice Hall, Upper Saddle River. Vol. 5, No. 3, 207–219.

Hulse, L. M., Deere, S., Galea, E. R. (2022). Fire safety in construction: Site evacuation and self-reported worker behavior, Safety Science, Vol: 145, 335–346. doi.org/10.1016/j.ssci.2021.105482.

Johannes, E. N., & Koray, M. H. (2025). Fire safety knowledge and emergency preparedness assessment among health care workers at three hospitals in Kunene region, Namibia. *BMC Health Services Research, 25*(1), 54.

Kavitha, R. R., Gunaseelan, K., Madhumitha, S., Kesavarthini, D., Kirthika, R., & Lavanya, D. (2024). A study to assess the knowledge on fire safety at work place among the health care workers at a tertiary care hospital. *The Nursing Journal of India, 115*(4), 152–158.

Kinateder, M. T., Kuligowski, E. D., Reneke, P. A., & Peacock, R. D. (2015). Risk perception in fire evacuation behavior revisited: Definitions, related concepts, and empirical evidence. *Fire Science Reviews, 4*(1), 1–26.

Kikwasi, G. J. (2015). A study on the awareness of fire safety measures for users and staff of shopping malls: The case of Mlimani City and Quality Centre in Dar es Salaam. *Journal of Civil Engineering and Architecture, 9* (12), 1403–1412.

Li, W. C., Tseng, J.-M., & Huang, H.-S. (2022). Effectiveness of Advanced Fire Prevention and Emergency Response Training at Nursing Homes. *International Journal of Environmental Research and Public Health*, *19*(20), 13185. https://doi.org/10.3390/ijerph192013185

Mondal, R., & Sinha, S. K. (2025). Knowledge attitude assessment regarding fire safety among healthcare workers in tertiary care teaching hospitals in the eastern region of India. *International Journal of Community Medicine and Public Health, 12* (1), 212–216.

Saghafian M, Laumann K, Akhtar RS and Skogstad MR (2020) The Evaluation of Virtual Reality Fire Extinguisher Training. Front. Psychol. Vol: 11:593466. doi: 10.3389/fpsyg.2020.593466.

Smith, T. D., Dyal, M.-A., & DeJoy, D. M. (2023). Firefighter stress, anxiety, and diminished compliance-oriented safety behaviors: Consequences of passive safety leadership in the fire service? *Fire, 6*(6), 241.

Wang, J., Yuan, D., Liu, D., Zhou, T., & Liu, W. (2025). Fire Safety Literacy of Personnel in High-Rise Buildings: A Survey Study. *Fire*, *8*(2), 40. https://doi.org/10.3390/fire8020040

Yahya, M. Y. (2009). *Malezya'daki yüksek katlı konut binaları için yangın güvenliği modelleri* (Doktora tezi, Universiti Teknologi Malaysia).

Yıldız, Z., & Çelik, G. (2020). Son yıllarda meydana gelen hastane yangınları ve nedenleri üzerine bir araştırma. *Doğ Afetler ve Çevre Dergisi,* 6 (1): 169–180, doi: 10.21324/dacd.603275.