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IMPROVING EMERGENCY PREPAREDNESS IN THE WORKPLACE THROUGH TRAINING AND SIMULATION

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Abstrak

Emergency preparedness in the workplace is a key factor in preventing and minimizing the impact of incidents such as fires, accidents, and other disasters. Training and simulation are key strategies that have proven effective in improving workers' knowledge, skills, and rapid response. This article aims to examine the effectiveness of various forms of training, including Tabletop Disaster Exercise (TDE), field simulations, and the use of Virtual Reality (VR) technology in improving emergency preparedness. A review of ten journals shows that routine and structured training and simulations contribute significantly to behavioral change, improved team coordination, and strengthened work safety culture. However, the success of program implementation is greatly influenced by management support, active worker participation, and sustainability in evaluation. Therefore, the integration of adaptive training methods and organizational commitment are essential factors in creating a safe, responsive, and resilient work environment in emergencies.

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INTRODUCTION

Emergency preparedness in the workplace is an important aspect of the effort prevention and mitigation of occupational accident and disaster risks. In the context of occupational safety and health (K3), this preparedness includes workers' knowledge, attitudes, and skills to respond quickly and appropriately to emergency situations such as fires, accidents, and natural disasters. In Indonesia, the number of occupational accidents is still quite high, so the implementation of training and simulation programs is very crucial to improve safety culture and reduce these risks.

Workplaces, especially in the industrial and construction sectors, are at high risk of emergencies such as fires, work accidents, and natural disasters. Preparedness in dealing with

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emergency conditions is very important to minimize losses, both material and human casualties (Fajria Lola Sagita & Narulita, 2022) . Data from the Ministry of Manpower shows that the construction sector still contributes 31.9% of the total cases of work accidents in Indonesia, with a high number of work accidents every year. (Ismail & Rahman, 2024)

To deal with these risks, every company is required to have security standards, emergency response procedures, and adequate facilities and infrastructure such as light fire extinguishers (APAR), hydrants, alarms, smoke detectors, and first aid facilities. (Rifdha et al., 2024) . However, there are still frequent stuttering in handling emergencies due to lack of understanding, team unpreparedness, and minimal regular training. (Fajria Lola Sagita & Narulita, 2022)

Emergency training and simulation are strategic steps to improve worker preparedness. Planned training can change workers' attitudes, knowledge, and behavior so that they are able to respond to emergency situations effectively. (Ismail & Rahman, 2024) . Simulations that are carried out routinely can also train the sensitivity and coordination of the emergency response team, ensuring that all procedures run smoothly when a real incident occurs. (Fajria Lola Sagita & Narulita, 2022)

Therefore, improving emergency preparedness in the workplace through training and simulation is an urgent need that must be integrated into the company's occupational safety and health management system. This program is not only intended to comply with regulations, but also as an effort to protect company assets and the safety of all workers.

RESEARCH METHODS

The method used in this study is a literature study. The study was conducted by collecting and reviewing various written sources such as scientific journals that discuss emergency preparedness training and simulation in the workplace. The author reviewed ten journals from various sectors, ranging from hospitals, construction projects, to educational environments. Each journal was read and analyzed to see how training and simulation can improve workers' knowledge, skills, and attitudes in dealing with emergencies.

RESULTS AND DISCUSSION

Table 1. Results and Discussion

Results

No	Writer	Title	Results
1	Meita Putri Kinanti, Mitoriana Porusia	Factors Related to Emergency Preparedness for Fire Response among Employees of Perumda Air Minum Tirta Jungporo, Jepara Regency	This study revealed that fire emergency response preparedness among employees is greatly influenced by several factors, including education level, length of service, and emergency response training. The results of statistical tests showed no significant relationship between gender and preparedness (p-value = 0.619). On the other hand, there was a significant relationship between education level (p = 0.000), length of service (p = 0.000), and emergency response training (p = 0.001) with employee preparedness. Employees with higher education, longer service periods, and those who have undergone training showed better preparedness. These findings emphasize the importance of regular training, the preparation of emergency response systems, and more systematic preparedness management to

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			improve emergency response in the workplace.
2	Aliyah Rifdha, Daffa Dhiba Oesraini, Muliyani, Abdurrozzaq Hasibuan	Analysis of Fire Emergency Response Preparedness and Hospital Management Commitment in Indonesia	Literature study of six hospitals in Indonesia shows that most of them have basic infrastructure, such as APAR, alarm system, assembly point, and evacuation procedure. However, the implementation and quality of fire training and simulation still varies. Management commitment factor also determines preparedness, especially related to budget allocation, routine training, formation of emergency response team, and periodic evaluation. Limited resources and lack of staff awareness are the main obstacles in ensuring the effectiveness of fire emergency response system.
3	Joyo Hariyomadi, Horacio Fabiano Meliala, Nawang Kalbuana	The Impact of Light Fire Extinguisher Training and Simulation on Security Officers at Airports	The results of the study showed that training and simulation of the use of APAR significantly improved the knowledge and skills of airport security officers. Before the training, most officers only understood the basic theory of using APAR. After the training, they were able to use APAR effectively and were ready to respond to fires. This improvement was measured through pre-test and post-test methods. The training also increased officers' confidence and preparedness in emergency situations. It is recommended to increase the frequency and quality of training and develop more realistic simulation programs.
4	Mohamad Amiril Mu'minin, Marji, Agung Kurniawan	Providing APAR Use Training to Improve APAR Use Skills and Fire Preparedness for Security at the Rectorate Building, State University of Malang	The results of the study showed that there was a significant difference between security who had received training and those who had not received training in terms of APAR usage skills and preparedness. Security who had received training had an average skill of 78.46 and preparedness of 77.38. While those who had not received training had an average skill of 64.15 and preparedness of 62.62. Training has proven to be effective in improving knowledge, skills, and attitudes of fire preparedness through simulations, materials, and direct practice.
5	Addi Mardi Harnanto	Evaluation of Increasing Disaster Preparedness Through the Indoor Disaster Preparedness Simulation Method for KSR Members of the Nursing Department of the	The study showed that there was a significant increase in preparedness among KSR members after being given disaster preparedness training and simulation. The average pretest score was 7.56 and the posttest increased to 8.87 with a difference of 1.31 points. The results of the t-test showed a calculated t value of 17.480 which was greater than the t table of 1.761 with a p-value of 0.00 (<0.05), indicating that simulation

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		Ministry of Health Polytechnic of Surakarta	training was effective in increasing preparedness. Simulation has been proven to be able to increase participants' knowledge, skills, self-confidence, and critical thinking skills in dealing with emergency or disaster situations. In addition, this method is relevant for use by special lay people such as health volunteers so that they are able to deal with real conditions appropriately and quickly.
6	The following are the names of the three men who were named the "Best Men in the World" by Ahmad Hidayawan, and the "Best Men in the World" by Ahmad Hidayawan.	Emergency Preparedness and Response Program in Project Environment	The earthquake disaster emergency response training program conducted at the Jlantah Karanganyar Dam Project showed positive results. The activities started with providing information on the emergency response system, discussions between the K3 team and workers, to direct simulations in the field. The simulation results showed an increase in worker readiness in dealing with emergency conditions such as evacuation and first aid. The simulation also involved real scenarios, such as handling workers who fainted, coordination between emergency response teams (communication, evacuation, first aid), to reporting to the health center. In addition, the toolbox meeting activity proved effective in increasing awareness of the importance of K3 and fostering a sense of security in the work environment. This program emphasizes that routine training and simulations are very important to improve emergency preparedness and reduce the risk of accidents in construction projects.
7	Habel Taime, Fransiska Datu	Evaluation of the Implementation of the PKM Method in K3 Education at PT. Kuala Pelabuhan Indonesia (KPI): Increasing Worker Awareness and Skills to Reduce the Risk of Accidents	The K3 education program at PT. KPI uses the PKM (Skills and Management Approach) method, which has successfully increased workers' awareness and skills regarding work risks. This program includes theoretical and practical training, evacuation simulations, and periodic safety inspections. The evaluation results showed an increase in employee understanding of K3, a decrease in unsafe behavior, and increased compliance with SOPs. Emergency evacuation simulations and direct PPE use exercises were able to strengthen employees' practical skills in dealing with emergency situations. Feedback from participants also showed that interactive methods and direct practice were very effective. All of these training activities formed a stronger work safety culture in the company environment.
8	Satriya	The Influence of	This study examines the impact of disaster

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	Pranata, et al.	Disaster Management Training and Simulation on Knowledge and Preparedness Levels	management training and simulation on teachers' knowledge and preparedness at SDN 1 Banyuroto. Using a pre-test and post-test design, the results showed a significant increase in the level of knowledge and preparedness after the training and simulation intervention. This study confirms the importance of training and simulation in improving disaster preparedness, which can be adapted to the work environment.
9	Fajria Lola Sagita, Sari Narulita	Analysis of Emergency Implementation at PT TJP	This study discusses the implementation of emergency preparedness and response programs and procedures in the construction company PT TJP. The results of the study indicate that PT TJP has an emergency program document, carries out risk identification, facility inspections, and routine work safety programs. However, emergency training and simulations have not been carried out optimally. The author recommends that the company complete emergency procedures and conduct regular training and simulations to improve preparedness.
10	Jane Lindsay Miller, Joan H Rambeck, Annamay Snyder	Improving Emergency Preparedness System Readiness through Simulation and Interprofessional Education	This article discusses the development of a simulation-based emergency preparedness training curriculum for students and healthcare professionals. The results showed that simulation-based training significantly improved participants' skills, confidence, and preparedness in responding to emergency situations. The effectiveness of this training was also shown to be sustained 6–12 months after the training, highlighting the importance of simulation in emergency preparedness training across sectors, including the workplace.

Discussion

The results of studies from various journals discussing improving emergency preparedness through training and simulations show that training programs play a major role in shaping the ability and readiness of individuals to face emergencies, especially fires. From various research results, it can be seen that education and length of service factors influence a person's readiness to face a crisis situation. The higher the education and the longer the length of service, the better their preparedness is generally. Training is also an important factor that can improve this ability. Therefore, routine training should be part of a company or institution's policy.

Some workplaces already have emergency facilities such as APAR, alarm systems, and evacuation routes. However, the existence of facilities alone is not enough if it is not supported by commitment and attention from management. Training that is not supported by a budget, regular schedule, or emergency response team will not run effectively. Therefore, the success of training is highly dependent on the seriousness of management in managing emergency response programs as part of the work culture.

Training accompanied by real simulations has been proven to be effective in increasing

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mental and technical readiness. In several studies, the results of tests before and after training showed a significant increase. Officers became more confident and knew what to do when a fire occurred. They not only understood the theory, but were also able to act immediately. Simulations that were made to resemble real conditions turned out to be very useful for training calmness, responsibility, and teamwork.

Training also forms safe habits in the workplace. In addition to increasing knowledge, training can instill a mindset and culture of safety. Especially if the training involves hands-on practice, open discussion, and active involvement from all participants. With this kind of approach, safety becomes part of the work routine, not just a formality. Training is also more effective when combined with a management approach that involves regular evaluation and adjustment of procedures. Interactive methods, use of technology, and interprofessional training can also strengthen long-term results.

This kind of training is not only relevant for industry or hospitals, but can also be applied in the education or office sector. The results of the study showed that teachers or administrative staff can also be trained to be prepared for fires. This shows that training and simulation are very flexible and can be adapted to the needs of any workplace.

Equally important, training must be carried out continuously. If training is only done once or just to fulfill obligations, the results will not be optimal. There must be a cycle of planning, implementation, evaluation, and program improvement. Evaluation is also important to see whether the training is effective or still needs to be improved. With training that is continuously improved and carried out routinely, emergency preparedness in the workplace will be stronger and integrated into the organizational culture.

CONCLUSION

Training and simulation are proven effective strategies in improving emergency preparedness in the workplace. Based on the results of studies from various journals, it was found that structured training equipped with real simulations can improve workers' knowledge, skills, and attitudes in dealing with emergency conditions such as fires or other disasters. Factors such as education level, length of service, and training experience have a significant influence on the level of individual preparedness.

The success of a training program is greatly influenced by the active involvement of all elements of the organization, including management commitment in providing facilities, budget support, and periodic evaluation of program implementation. In addition, the integration of various training methods such as the use of simulation technology, interactive methods, and interprofessional approaches can strengthen learning outcomes and make preparedness a part of the work culture.

Thus, companies and work institutions need to make training and simulations a part of their sustainable work safety policies, not only to comply with regulations, but also as a real effort to create a safe, responsive and highly resilient work environment against emergency risks.

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