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Article

Experiences in Organizing and Implementing Evacuation Drills for People at Risk From Educational Facilities

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Abstract

Regular evacuation drills for individuals at risk in public facilities are of great importance for employees and visitors, as they improve efficiency and reduce the risk of consequences in real-life fire situations and other emergency events. They are particularly important in facilities used by educational institutions, as these environments, in addition to staff, accommodate a large number of children and young people. Well-prepared, organized, and implemented drills in such institutions enable the verification of alarm systems, evacuation plans and routes, as well as procedures and actions of both staff and students, while also helping to reduce fear and panic. When planning these drills, it is essential to ensure detailed preparation for all key participants involved in their implementation: the director, civil protection officers, teachers, professors, and administrative and technical staff. After the drill is conducted, it is also necessary to analyze all activities carried out during the exercise, identify areas for improvement, and derive lessons, conclusions, and measures for the future. The group of authors analyzed the implemented activities, with particular emphasis on the

organizational aspects of the drills and on identifying critical points in the evacuation process. A total of 16 evacuation drills were organized and conducted in all primary and secondary schools within a local self-government unit over a previous period. This paper presents experiences related to the preparation of employees and teaching staff for conducting evacuation drills, potential shortcomings, difficulties, and threats encountered during their implementation, as well as lessons learned following the post-drill analysis involving all key stakeholders. The obtained results confirm that a systematic approach to planning, implementing, and analyzing evacuation drills is a key factor in reducing risks and increasing safety in educational institutions.

Keywords

Education, fire, emergency event, alerting, evacuation, panic, evacuation routes, safe place, analysis

1. Introduction

Evacuation from endangered environments is a key topic in disaster risk reduction and emergency management. The effectiveness of evacuation procedures significantly influences the outcome of any emergency event, whether it involves fire, earthquake, technological accidents, terrorist attacks, or similar hazards. Fires with catastrophic consequences and a high number of casualties continually emphasize the importance of evacuation, both from a preventive and operational perspective (Alexander, 2002).

Human behavior during evacuation is generally rational; however, instances of irrational individual or group behavior may occur, with serious consequences. Rational and composed behavior is more commonly observed among individuals who have prior experience, as well as those who have participated in training or evacuation drills. In situations where individuals are unfamiliar with the environment and evacuation routes, disorientation and confusion are more likely to arise, potentially hindering safe evacuation (Proulx, 2001; Gwynne et al., 1999).

Evacuation is particularly important in facilities where large numbers of people gather, especially children, such as educational institutions. In such environments, it is essential that responsible persons and all employees are adequately informed, trained, and prepared to ensure that endangered individuals can be safely evacuated at any time, without panic and within the shortest possible timeframe (NFPA, 2022).

Despite the recognized importance of evacuation planning and training, prior studies and practical experience indicate that challenges remain in the organization, preparedness, and consistent implementation of evacuation procedures, particularly in educational settings. This highlights the need for a systematic approach that integrates planning, training, and continuous evaluation of evacuation drills.

The objective of this study is to analyze experiences in organizing and conducting evacuation drills in educational institutions, focusing on identifying organizational aspects, potential shortcomings, and critical points in the evacuation process, and deriving lessons learned to improve future practice.

2. Methods

2.1. Study design and rationale

This study is designed as a qualitative case study with descriptive elements, combined with document analysis and field observations. The case study approach was selected because the research focuses on the real-life implementation of evacuation drills in schools within a specific municipality, enabling an in-depth understanding of procedures, challenges, and outcomes. The study aims to analyze the legal framework, current practices, and the implementation of evacuation exercises in schools, and to identify deficiencies and propose improvements.

2.2. Setting and data sources

The study was conducted in 16 schools in the territory of the City of Sremska Mitrovica, including:

- Primary schools
- Secondary schools
- A music school
- A special education school

Data were collected during the implementation of evacuation drills organized as part of a joint project involving SITE d.o.o. and a partner institution, with support from the City Administration for Education.

2.3. *The data sources included*

- Legal and regulatory documents
- School internal documentation (plans and procedures)
- Interviews with school directors and municipal education authorities
- Direct observation during evacuation exercises
- Reports and analyses prepared after drills

2.4. *Data collection procedures*

Data collection involved multiple methods:

- Document analysis: Review of fire protection rules, evacuation plans, risk assessments, and protection and rescue plans.
- Interviews: Conducted with school directors and municipal education representatives to assess preparedness and organizational aspects.
- Direct observation: Monitoring of evacuation drills in real-time, including response to simulated fire scenarios.
- Training sessions: Two online training sessions were conducted via the Moodle platform for civil protection officers and school staff.

Evacuation drills were conducted using standardized scenarios simulating fire incidents, including the use of a smoke simulation device and the activation of alarm systems.

To ensure consistency, detailed evacuation plans were prepared in advance for each school and shared with all relevant stakeholders.

2.5. *Sampling and study units*

The study used purposive sampling, selecting all schools included in the project within the municipality. The study units were:

- Schools as organizational entities
- School staff involved in evacuation procedures
- Students participating in evacuation drills

No exclusion criteria were applied, as all institutions involved in the project were included in the study.

2.6. Ethics and compliance

The study was conducted in accordance with applicable national regulations governing school safety and emergency preparedness. Participation in interviews and drills was coordinated with school administrations and municipal authorities.

Informed consent was obtained at the institutional level. Data were used in aggregated, anonymized form to ensure the confidentiality of participants and institutions. No personal sensitive data was collected.

2.7. Data processing and analysis

The analysis followed a qualitative descriptive approach:

- Data from documents, interviews, and observations were systematically reviewed.
- Key themes were identified, including legal compliance, organizational preparedness, execution of drills, and identified deficiencies.
- Comparative analysis was conducted across schools to identify common patterns and differences.
- Findings were synthesized into categories such as strengths, weaknesses, and recommendations.

No statistical testing was performed, as the study is qualitative in nature. Analysis was supported by structured note-taking and thematic categorization.

3. Results

3.1. Legal and regulatory framework

The analysis of legal documents shows that evacuation-related obligations in schools in Serbia are regulated through multiple laws and regulations. According to the Law on Fire Protection, schools as legal entities have clear obligations to ensure the safe evacuation of students and staff. Article 28 requires the adoption of Fire Protection Rules, which include instructions for action in the event of a fire and evacuation plans. These plans must be publicly displayed in visible locations. Article 53 defines the obligation to adopt a training program for employees in fire protection, including both theoretical and practical training. The Law on Disaster Risk Reduction and

Emergency Management requires schools to develop risk assessments and protection and rescue plans that include evacuation measures and assigned tasks for key actors.

The Rulebook on the Protocol for Action in Institutions in Response to Violence, Abuse, and Neglect (Ministry of Education, 2024) provides guidelines for strengthening school resilience to crisis events by upholding the principles of continuity, cooperation, accessibility, and efficiency. This rulebook obliges schools to form crisis teams, develop crisis response programs, and conduct evacuation drills and procedures at least once per year.

Only the aforementioned ministerial rulebook explicitly prescribes the obligation to conduct evacuation drills at least once per year, while other laws provide more indirect obligations.

Table 1. Legal basis for evacuation and evacuation drills

Topic	Law on Fire Protection	Law on Disaster Risk Reduction and Emergency Management	Rulebook on Protocol for Action in Institutions in Response to Violence, Abuse, and Neglect
Evacuation	YES	YES	YES
Training of employees in fire protection and practical training	YES	NO	NO
Disaster protection and rescue plan with evacuation measures and assigned tasks	NO	YES	NO
Evacuation plans and procedures	YES	YES	YES
Evacuation drills	NO	NO	YES (at least once per year)

Notes: Law on Fire Protection. (2009, 2015, 2018). Official Gazette of the Republic of Serbia, No. 111/2009, 20/2015, 87/2018; Law on Disaster Risk Reduction and Emergency Management. (2018). Official Gazette of the Republic of Serbia, No. 87/2018; Rulebook on the Protocol for Action in Institutions in Response to Violence, Abuse and Neglect. (2024). Official Gazette of the Republic of Serbia, No. 11/2024.

3.2. Current state of evacuation practices

The findings indicate that evacuation drills are not implemented consistently across schools. There is a lack of standardized methodology for planning and executing drills, and the existing rulebook does not define detailed procedures for their organization. As a result, drills are performed irregularly and without a systematic approach. Post-drill analyses are rarely conducted systematically with all key actors, and lessons learned are not consistently documented or applied. This limits the continuous improvement of evacuation procedures. A thorough post-drill analysis with responsible persons must be integral to every evacuation exercise to identify deficiencies and enable progress.

3.3. Implementation of evacuation drills

All evacuation drills followed a structured scenario:

- Simulation of a fire using a smoke device
- Attempted initial suppression by school staff
- Activation of alarm systems
- Evacuation of students and staff
- Assembly at designated safe locations
- Verification of attendance
- Notification of fire and rescue services

All participants were required to follow predefined evacuation routes and procedures.

3.4. Identified deficiencies

The main deficiencies observed during drills included:

- Inadequate audibility of alarm systems in some parts of school buildings
- Limited visibility of students for teachers during evacuation
- Improperly located assembly points in certain schools
- Partial non-participation of some staff members due to operational duties

4. Discussion

The results indicate that although a legal framework exists, its implementation in practice is inconsistent. The lack of detailed procedural guidelines contributes to variability in how evacuation drills are conducted across schools. The absence of standardized post-drill evaluation limits the ability to identify weaknesses and improve procedures over time. This is consistent with findings in emergency management literature, which emphasize the importance of feedback loops and continuous training.

The study highlights the purpose of systematic evacuation drills: they educate all participants on individual and group procedures, improve coordination, raise safety awareness, and reduce fear and panic. Drills also allow verification of key parameters, such as evacuation plans and routes, alternative evacuation paths depending on the hazard, evacuation time (from alarm to assembly), and staff and student procedures.

Furthermore, post-drill analysis should follow the experiential learning cycle: concrete experience during the drill, reflective observation of actions taken, abstract conceptualization (interpretation of actions), and active experimentation (planning improved activities for the future). Without quality analysis, the experience is not effectively translated into learning at the individual or team level.

The identified deficiencies suggest that both technical infrastructure (e.g., alarm systems) and organizational readiness are critical factors influencing evacuation effectiveness.

Limitations of the study include: a focus on a single municipality, the lack of quantitative performance metrics (e.g., evacuation times), and reliance on observational and interview-based data. Future research could include comparative studies across regions and the integration of quantitative performance indicators.

5. Conclusions

The study demonstrates that evacuation preparedness in schools depends on both regulatory compliance and practical implementation.

Key conclusions:

- Legal regulations exist but are not uniformly operationalized in practice.

- Evacuation drills are essential but lack standardization and systematic evaluation.
- Post-drill analysis is a critical component that is often neglected and should become mandatory.
- Identified deficiencies point to both technical and organizational challenges.

Regular evacuation drills, combined with structured analysis and continuous improvement, significantly enhance the safety culture in schools.

Recommendations

- The school director is the responsible person for evacuation implementation.
- All students should be informed or reminded of evacuation procedures at the beginning of the school year.
- Carefully select and appoint civil protection officers, deputies, and members of the evacuation team.
- Periodically test the fire alarm system and verify siren audibility in all areas of the school.
- Prepare a backup alarm signal in case the siren fails.
- The assembly point must be adequately chosen, clearly defined, with an established layout for each class, and at a safe distance from the building.
- At the assembly point, every teacher must have full visibility and control over the presence of their students.
- Plan evacuation drills at least once per year using scenarios based on identified risks (fire, earthquake, terrorist attack, etc.).

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6. References

1. Alexander, D. (2002). Principles of emergency planning and management. Oxford, UK: Oxford University Press.
2. Babić, B. (2012). Evakuacija i spasavanje. Novi Sad: Visoka tehnička škola strukovnih studija.
3. Gwynne, S., Galea, E. R., Owen, M., Lawrence, P. J., & Filippidis, L. (1999). A review of the methodologies used in the computer simulation of evacuation from the built environment. *Building and Environment*, 34(6), 741–749. [https://doi.org/10.1016/S0360-1323\(98\)00057-2](https://doi.org/10.1016/S0360-1323(98)00057-2)
4. Law on Disaster Risk Reduction and Emergency Management. (2018). Official Gazette of the Republic of Serbia, No. 87/2018.
5. Law on Fire Protection. (2009, 2015, 2018). Official Gazette of the Republic of Serbia, No. 111/2009, 20/2015, 87/2018.
6. Lazarević, A. (2016). Evacuation of endangered persons in complex firefighting interventions. In Proceedings of the 12th Professional Conference of Firefighters (pp. 109–119). Rijeka: Firefighters Association of Primorje-Gorski Kotar County.
7. NFPA. (2022). NFPA 101: Life Safety Code. Quincy, MA: National Fire Protection Association.
8. Proulx, G. (2001). Occupant behavior and evacuation. *Fire Safety Science*, 6, 219–232.
9. Rulebook on the Protocol for Action in Institutions in Response to Violence, Abuse and Neglect (Official Gazette of the Republic of Serbia, No. 11/2024).