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General Knowledge and Attitudes about Safety and Emergency Evacuation: The Case of a Higher Education Institution

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Abstract: The implementation of a safety culture and awareness of emergency issues in buildings has been growing in more developed societies. It is essential that all occupants know how to act in an emergency situation, particularly during an emergency evacuation. In higher education institutions (HEIs), which annually host not only their many employees, but also national and international students, it is essential to know and understand the knowledge, attitudes, and behaviors that the academic community demonstrates in this matter. This study aimed to characterize the perception of occupants regarding safety, specifically in the emergency evacuation phase, within the academic community of an HEI. In this observational cross-sectional study, data on general knowledge and attitudes regarding safety and actions during emergency situations were collected through an anonymous questionnaire targeting students, faculty, and non-teaching staff, which was sent via institutional email. Valid responses were received from 392 participants and then scored and assessed on different domains. The results obtained showed that, despite a reasonable average regarding the general level of knowledge, attitudes, and behaviors of the occupants on the subject, the community falls somewhat short in terms of training. It is noteworthy that approximately 64% of the sample has never received awareness or training related to emergency evacuation, and around 68% are unaware of the location of their institution's meeting/gathering point. Finally, by identifying the most common gaps, namely the training dimension, some simple measures could be improved, such as the dissemination of safety instructions accessible through QR codes placed in strategic locations or even conducting small drills during class sessions, as well as learning with simulation concerning different scenarios of emergency.

Keywords: school buildings; evacuation; emergency; safety; human behavior

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1. Introduction

Annually, emergency situations result in the loss of human lives and significant material damages. According to Bahmani et al., the total number of natural disasters in 2021 exceeded the average of natural disasters that occurred between the years 2001 and 2020. Besides natural disasters, the population is exposed to other emergency situations caused by humans themselves, such as terrorist attacks, industrial accidents, but above all, urban fires, the most common cause of emergency worldwide [1,2]. The evacuation process plays a crucial role in preserving human life, so new models were developed to facilitate the evacuation planning process, especially when considering moving vulnerable people [3–5].

When discussing fire safety in buildings, the primary concern will always be to ensure conditions considered of minimal acceptable risk for the occupants of these buildings and, from a different perspective, for insurers, the safety conditions of the building itself, and the assets it contains [6].

The existence of an internal emergency plan (IEP) allows the occupants of a particular building to know the risks they are exposed to and, above all, how to act in an emergency case so as to minimize physical or material damage. During the execution of the plan and after the phase of detection, recognition, and evaluation, the alert phase follows, with various teams that are part of the emergency organization coming into action, including the evacuation team. In an emergency case, evacuation is one of the main measures, and when well-prepared, it can save lives [7,8].

Assertive behavior during emergency evacuation may not have a significant effect on material losses, but it is crucial for preserving human life. Therefore, the goal of evacuation of occupants is to reach a stable location [9], commonly referred to as a meeting point or gathering point, safely and swiftly.

In educational facilities, issues related to emergency evacuation can become more problematic, first because they are highly populated buildings, and secondly due to the lower capacity for risk analysis, perception, and response by their occupants, mainly students [1], especially during the early years of study. It is unrealistic to expect logical and correct actions from students, no matter how many simulations they had participated in [10]. For this reason, in primary and secondary educational establishments, the preparation of school staff and the emergency plan outlined for the building are of great importance. However, this does not exempt the need for awareness-raising actions for students and their participation in drills. "Education for safety and risk prevention is a fundamental element in building a safety culture, by developing skills in the field of prevention and self-protection" [11] (p. 34). Whenever possible, new technologies can be used to motivate younger individuals, especially in evacuation scenarios based on games, as combining gaming with emotion, in the context of educational data exploration applicable to crisis management, provides reliable results in a less invasive manner [12]. Similarly, in HEIs, the issue of evacuation is equally critical, firstly due to their dense population, then due to the size and complexity of some buildings. The presence of students from other countries, not familiar with local safety culture, can also lead to evacuation failures, especially in essential facilities within these buildings, such as cafeterias and auditoriums, where the concentration of occupants is higher, or laboratories, places that can lead to emergency evacuation due to chemical, biological, or physical risk factors [13]. Evidence shows that university laboratories have a higher degree of hazardousness compared to industrial laboratories, primarily due to the lack of promotion and investment in an appropriate safety culture [14]. Therefore, it is essential that all occupants are provided with proper training, and there should be serious commitment by the safety services to ensure the participation of individuals in each building in emergency drills. This ensures they can respond quickly and effectively to an emergency [15].

During and after emergency events, schools must ensure the safety of their students. According to a study conducted in New Zealand on student safety in emergencies, Tipler et al. [16] concluded that the results indicated differences related to the preparedness and planning of each educational institution for emergency events. This was linked to a lack of clarity regarding the activities that should be carried out by the responsible parties in each institution. Kano et al. [17], in a study on emergency preparedness conducted in three school districts in Los Angeles, also found that school emergency plans needed improvement. This included training and drills to make the emergency response more efficient. In addition, Bandecchi et al. [18] assessed the emergency preparedness and risk perception related to seismic risk in 27 schools in Italy and concluded that the knowledge of younger children is appropriate for their age, but it does not increase proportionally with age. They also found that the competence of the personnel responsible for student safety is insufficient, likely due to a low perception of risk, underestimating the importance

of preventive actions. A study, conducted by Ding and Sun [19], in an older sample (university students), aimed to understand leader and follower behaviors and concluded that the external environmental factors, individual psychological factors, and personal senses characterized students' route selection. Also, students tended to follow the paths of those in the front of the group, a behavior also known as the "herd phenomenon". Regarding re-entry into the correct evacuation route, half of the participants followed the behavior of other participants. They also found that half of the participants chose the same path twice, indicating that they may have done so due to familiarity with a route during an experimental test.

The success of evacuation in an emergency is intrinsically linked to the fire safety strategy and emergency decision making [20], as well as the knowledge and attitudes of the occupants of a particular building. Therefore, it is important, first, to understand the knowledge and attitudes that HEI students demonstrate in an emergency, and second, to create methods for raising awareness on this matter. This study aims to evaluate the general knowledge and attitudes of occupants in HEI buildings regarding safety and emergency evacuation, with a particular focus on fire emergencies related to urban areas, allowing an understanding of the occupants' perceptions, the main defects, and future needs for implementing new safety awareness methods.

2. Materials and Methods

2.1. Study Type and Sample

We conducted an observational cross-sectional study involving a sample of the academic community (composed of students, faculty, and non-teaching staff, totaling 22,422 persons) of an HEI located in the Porto district, Portugal. The institution comprises 8 academic units of teaching and research (schools) and 2 administrative central services, hereafter referred to as organic units (OUs). The target population of the study was around 22,000 people.

The data collection instrument was a questionnaire survey, used to assess the level of knowledge within the academic community regarding safety and evacuation in the event of an emergency in a school-like building.

2.2. Data Collection Instruments

Each participant completed and submitted an individual, voluntary, and anonymous questionnaire to provide information about their general knowledge and attitudes regarding safety and actions during emergency situations in HEI buildings. This questionnaire was adapted from the original survey conducted by Zmud [21] and adapted and translated into Portuguese by Salgado [22]. Additionally, some questions used by Marrafa [23] were included due to their relevance to the objectives of this study. The final version of the questionnaire, after a pilot test, consists of thirty-two questions (30 closed-ended and 2 open-ended) organized into four domains, namely: (A) characterization of the target population; (B) general knowledge about building safety and evacuation (assessing respondents' knowledge of building safety and evacuation); (C) attitudes and behaviors in emergency situations (understanding the types of attitudes and behaviors exhibited by respondents during an emergency); and (D) training and experience (identifying whether respondents are aware of the topic and assessing the quality and importance of training and drills).

2.3. Ethics and Study Disclosure

This study was approved by the institution's Ethics Committee on 12 July 2023, and received a favorable opinion from the Data Protection Officer (DPO) of the HEI on 6 July 2023. To publicize the study and recruit participants, an email was sent containing information about the study's theme and a link to access the electronic questionnaire created on the Microsoft Forms platform. This questionnaire was available from July to September, 2023.

The procedures for data collection adhered to the guidelines outlined in the General Data Protection Regulation (GDPR). To store the collected data, a database was created using IBM SPSS Statistics 28 software. All data in the database are anonymized and stored on a restricted-access desktop computer.

2.4. Data Processing and Analysis

For data processing and analysis, data from the Microsoft Forms platform were first extracted into an Excel spreadsheet, with separate tabs for questionnaire elements. Four separate tabs were created: one for personal data, one for general knowledge, another for attitudes and behaviors, and a final one for training and experience. For the latter three tabs, scores were calculated according to Table 1. The questions are presented in Appendix A.

Table 1. Aggregation of responses by domain.

Domain	Question No	Value			Min.	Max.
		0	1	2		
General Knowledge	10	Insufficient	Sufficient	Good	0	2
	11	0 to 2	3 or 4	5 or more	0	2
	12	0 to 2	3	4 or more	0	2
	13	0	1	2 or 3	0	2
	14	0 to 2	2 or 3	4 or more	0	2
	15	More than 10 min	5 to 10 min	Up to 5 min	0	2
	16	No opinion—A complete waste of time and resources	-	Beneficial	0	2
Attitudes and Behaviors	17	0	1 or 2	3 to 5	0	2
	18	Example: I don't know—Stay in the same place	Example: Leave the building	Example: Meeting point	0	2
	19	No	-	Yes	0	2
	20	Safe to use—As safe as evacuation via the stairwell	-	Never safe to use	0	2
	21	Not confident at all	Not very confident	Quite confident	0	2
	22	Fire in 3rd place or lower as most likely	Fire in 2nd place most likely	Fire as most likely	0	2
	23	More than 10 min	5 to 10 min	Would not go—Up to 5 min	0	2
	24	Example: Anything	-	Example: Nothing	0	2
	25	0 or 1 most correct	2 to 3 most correct	More than 4 correct answers	0	2
	26	Don't know what I would do—No opinion	Stop and let everyone pass ahead—Depends on my awareness level of the emergency situation	Continue to exit so they can enter the stairwell after passing	0	2
Training and Experience	27	No	-	Yes	0	2
	28	None	At least 1	At least 3	0	2
	29	Not important	Important	Very important	0	2
	30	Every 2 years	Once a year	Every 6 months	0	2
	31	-	No	Yes	0	2
	32	Every 2 years	Once a year	Every 6 months	0	2

Subsequently, the data were migrated to the IBM SPSS Statistics 28 for descriptive and inferential statistical analyses.

Descriptive analysis of the data was performed, followed by an assessment of the normality of the variables, specifically the Knowledge Score, Attitude Score, and Training

Score, using the Kolmogorov–Smirnov test with Lilliefors correction. Variables were considered to follow a normal distribution when $p > 0.05$.

To analyze the relationship between different participant groups and the scores obtained in the three domains, we initially intended to perform one-way analysis of variance (ANOVA) to compare scores among the three groups or independent samples' *t*-tests. However, since the assumptions for these tests were not met, non-parametric tests were used, such as the Kruskal–Wallis test. A significance level of 0.05 was considered.

3. Results

3.1. Sample Characterization

The number of participants in the study was 401 members of the academic community. After validating the collected data, only the responses of 392 individuals were considered, as the remaining participants chose not to respond to the questionnaire, selecting the option "I do not authorize", thereby terminating their participation.

Table 2 shows the distribution of the sample in relation to the position or role of the respondents in the institution, as well as the percentage of the sample obtained in each OU.

Table 2. Distribution of the sample of the academic community of the HEI.

Organic Unit	Students	Non-Teaching Staff	Faculty	Total Sample (n)	%
OU1	-	30	2	32	8.16
OU2	-	2	1	3	0.77
OU3	43	15	22	80	20.41
OU4	20	12	21	53	13.52
OU5	29	4	13	46	11.73
OU6	9	4	12	25	6.38
OU7	20	1	9	30	7.65
OU8	51	5	38	94	23.98
OU9	4	3	5	12	3.06
OU10	7	4	6	17	4.34
TOTAL	183	80	129	392	100

As observed in the previous table, OU8 was the most representative OU, with a total of 94 respondents and a sample percentage of approximately 24%, followed by OU3 with 80 respondents, representing 20.41% of the sample. Students accounted for 46.68% of the sample, faculty and/or HEI administrators accounted for 32.91%, and the remaining staff represented 20.41%. The sample characterization is presented in Table 3 and included the following variables: age; gender; participation in security or emergency teams at the institution; number of years at the institution; hearing impairment; and motor impairment.

It is noted that 49.74% of the respondents are above 40 years old, corresponding to 195 individuals. In the age group between 22 and 40 years, there were 122 respondents, representing 31.12%, and 75 individuals are below 22 years old, accounting for 19.13% of the sample. Predominantly, the sample consists of individuals of the female gender, representing 59.95% of the sample, which corresponds to 235 participants. Regarding the number of years, there is a slight difference in the responses, with 53.57% having been at the institution for up to 5 years, and the remaining 46.43% for more than 5 years. Most of the respondents are not part of any emergency team at the institution where they are located (94.13%). As for difficulties related to hearing conditions and physical conditions in the event of an emergency evacuation, the majority of respondents reported that they do not have any condition that makes it difficult for them leave the building (98.72% and 97.70%, respectively).

Table 3. Sample characterization.

Variable		N	%
Age	Up to 22 years	75	19.13
	Between 22 and 40 years	122	31.12
	More than 40 years	195	49.74
Gender	Female	235	59.95
	Male	156	39.80
	Other	1	0.26
Do you belong to an emergency team at your institution?	Yes	23	5.87
	No	369	94.13
How many years have you worked/studied at the institution?	Up to 5 years	210	53.57
	More than 5 years	182	46.43
Do you have any conditions that would make it difficult for you to clearly hear alarms or spoken instructions in an emergency?	Yes	3	0.77
	No	387	98.72
Do you have any physical condition that makes it difficult for you to leave your building in the event of an emergency evacuation?	Yes	9	2.30
	No	383	97.70

3.2. Data Analysis

The safety and emergency evacuation of the academic community of the institution under study were indirectly assessed through 23 questions divided into three dimensions (parts B, C, and D of the questionnaire): general knowledge, attitudes and behaviors, and training/experience. See Tables A1–A3 in Appendix A for an overview of the questions and responses given by the participants, also discussed in Section 4.

To simplify the interpretation of the results, respondents' answers were scored on a scale of 0 to 20, classified into three levels: scores from 0 to 7 indicate a low level (0), scores from 8 to 14 indicate an intermediate level (1), and scores from 15 to 20 indicate a high level (2). This classification will also allow the prioritization of intervention needs in the three defined dimensions/domains.

The classification and mean obtained in each of the dimensions as well as the mean values obtained globally for the different groups involved in the study are presented in Table 4.

According to the classification in Table 4, 48.21% of the respondents were classified as having a high level of general knowledge about safety and emergency evacuation. It is worth to note that 9.44% have a low level of general knowledge. Regarding the other two dimensions, 30.10% of the participants have a high level in the attitudes and behaviors score, and only 7.40% have a high level related to training/experience. In terms of the dimensions of knowledge and attitudes, the average score of the non-teaching staff group is slightly higher than the other groups, with statistically significant differences in the knowledge score among the different groups studied ($p < 0.001$). For the Attitude Score, there are no statistically significant differences between the groups under analysis ($p = 0.734$). In the dimension of training, despite the fact that the student group achieved a higher average when compared to the other two groups, there are no statistically significant differences between groups for the Training Score ($p < 0.001$).

Table 4. Scores *per* dimension.

Dimension	Classification Level	% (n)	Classification *per* Group 0–20 Scale (Mean ± SD)			*p* *
			Students	Non-Teaching Staff	Faculty	
General Knowledge	0	9.44 (37)	14.00 ± 4.00	15.94 ± 3.58	14.52 ± 4.09	<0.001
	1	42.35 (166)				
	2	48.21 (189)				
Attitudes and Behaviors	0	1.79 (7)	12.00 ± 2.85	12.99 ± 2.93	12.97 ± 2.89	0.734
	1	68.11 (267)				
	2	30.10 (118)				
Training and Experience	0	52.55 (206)	9.00 ± 4.28	7.00 ± 4.64	7.12 ± 4.92	<0.001
	1	40.05 (157)				
	2	7.40 (29)				

* Kruskal–Wallis test (Kolmogorov–Smirnov normality test $p < 0.001$).

4. Discussion

The results show that the general knowledge regarding safety and emergency evacuation in the academic community of the institution under study are at an intermediate/high levels. However, when it comes to the topic of training and experience, the average score falls into the low/intermediate range. Regarding the attitudes and behaviors, the academic community is at an intermediate level.

Regarding knowledge and attitudes, Marrafa [23], in a study conducted at an institution of higher education, observed a limited understanding among the respondents concerning the facilities and safety equipment for fire prevention. In contrast, Salgado [22] concluded that the majority of occupants in an HEI set of buildings, had a good overall knowledge and perception of the subject. Meanwhile, Cordeiro et al. [24] determined that knowledge in this area has not been sufficiently consolidated, suggesting the need for national-level information to overcome existing knowledge barriers and to develop a behavioral model relevant to the country's reality. Ferreira [25], in a study of an educational institution in Brazil, identified a lack of knowledge among students and staff on the subject, and found that the building's facilities did not comply with safety regulations, in contrast to the values obtained in this study's questionnaire, where approximately 75% of respondents believed the facilities were prepared for a potential fire incident. Concerning the identification of emergency alarms, it was noted that over 60% of the sample was unfamiliar with, or had never heard of, the emergency alarm, a problem that Marrafa [23] similarly noted to be of greater magnitude.

In general, when it comes to knowledge about the building and the ability to locate safety equipment, there are results that are incongruent when compared to data from similar studies. The study conducted by Al-Zyoud et al. [26] shows that there were weaknesses regarding how staff deal with specific emergency incidents, such as the proper use of fire extinguishers, which can also explain students' poor attitudes and knowledge of safety. To significantly improve knowledge and attitudes regarding fire safety, innovative methods, such as game-based programs, should be introduced to facilitate occupant engagement with learning [27].

Regarding the perception that respondents have of the evacuation time during an emergency, more than 58% believed it would take less than 5 min. However, as Freitas [28] pointed out, when there is an imbalanced distribution of occupants, queues and population clusters can form, and factors such as stress can significantly increase emergency evacuation times, as noted by Cao et al. [29]. Additionally, in a study related to emergency evacuation, Balboa et al. [30] indicated that participants do not always react promptly to sirens, leading to evacuation delays. Some research even suggests that for real pre-evacuation events,

evacuation times can reach an average of 10 min [31]. Regarding the use of elevators for building evacuation, the percentage of respondents indicating that "using elevators is never safe" aligns with the results of Salgado [22]. A total of 77.30% of respondents claimed that they would know how to respond in case of a fire, and 68.88% in the event of an earthquake. However, 74.74% of individuals reported having no prior experience in the safety/emergency field, and 27.81% of respondents had never received any training in this field, despite legal requirements. The deficient safety awareness policies of institutions play a critical role in occupant knowledge and attitudes, as they fail to provide the required training and communication strategies to sensitize occupants to safety issues proactively. According to Tipler et al. [16], the communication during the preparation and prevention phases is often inadequate in many institutions, which is why Cristo [11] emphasizes the need for educational establishments to better prepare their occupants in terms of both training and emergency drills, which may incorporate new technologies to optimize evacuation plans [12]. Concerning drills, more than 57% of respondents indicated they had never participated in one. Regarding the emerging technology in this field, Kuo et al. [32] proposed using a smartphone voice-guided evacuation system to provide alternative evacuation routes for civilians trapped at a fire scene. This could be a possible solution to be adopted in HEI buildings since, in a real scenario, smoke reduces the visibility of emergency direction signs, making them ineffective in providing appropriate guidance along evacuation routes in a fire situation.

This study had some limitations, including a relatively small sample. The period of data collection included the summer holidays, potentially affecting the sample size. Additionally, sending the questionnaire to institutional emails may have allowed responses from former members of academic community (alumni), despite the detailed explanation of questionnaire fulfillment. Also, the main constraint was that the students do not frequently access institutional emails.

5. Conclusions

Based on the obtained results, it is evident that, in comparison with similar studies conducted in higher education institutions (HEIs), the conclusions vary among different studies. The identified gaps in the three dimensions assessed in this study—knowledge, attitudes, and training—suggest the need for improvements in the safety policy of the analyzed higher education institution.

The knowledge of the occupants achieved a higher average score, while the training dimension scored the lowest. Therefore, to continuously improve knowledge and attitudes of the academic community, there is the need to implement awareness-raising actions for all. Training actions in fire safety are crucial to increase the awareness of occupants and empower them to use existing equipment and means, as well as to apply effective and rapid evacuation techniques. It is recommended that training be provided to all occupants during the first semester of each academic year, covering topics such as self-protection measures, fire phenomena, installed safety equipment, firefighting practices, and evacuation techniques. Awareness-raising actions can be carried out more frequently and include community questionnaires, seminars, workshops, and informative videos. Disseminating information through QR codes in places frequented by members of the academic community can also be effective. Simulations play a fundamental role in creating emergency and evacuation routines. It is recommended to conduct simulation exercises at times involving the highest number of occupants and to collaborate with external entities such as firefighters, police, and civil protection to make scenarios more realistic. Furthermore, it is important to consider that simulations should include different scenarios such as bomb threats or terrorist attacks, as occupants demonstrated less knowledge about how to react to these situations. For future research, a more targeted approach to the training and awareness dimensions of fire safety in buildings is suggested. This would allow for a more in-depth analysis of training and awareness needs, aiming to improve awareness and preparedness of occupants for fire safety, responding efficiently to a building

emergency and evacuation. The design of a longitudinal study will allow us to examine the evolution of safety knowledge and preparedness over an extended period.

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Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

(Tables A1–A3)—Questionnaire questions and detailed participant responses by domain.

Table A1. Results of assessment questions on general knowledge.

Question	Options	N	%
10—Indicate your level of knowledge about your institution's building/facilities:	Good	156	39.80
	Sufficient	197	50.26
	Insufficient	39	9.95

11—For each of the following items, indicate your level of knowledge, using the category that best fits your perception for each of them:	Items	Know it exists		Not sure if it exists	
		n	%	n	%
	Measures of self-protection	189	48.21	203	51.79
	Safety structure (safety and emergency teams)	188	47.96	204	52.04
	Internal emergency plan	220	56.12	172	43.88
	First intervention firefighting means	255	65.05	137	34.95
	Emergency exits	343	87.50	49	12.50
	Alarm buttons	255	65.05	137	34.95
	Emergency plans	306	78.06	86	21.94
	Meeting points	226	57.65	166	42.35
	Conducting drills	124	31.63	268	68.37
	Conducting inspections	153	39.03	239	60.97

12—In your institution, can you locate:	Items	Yes		No	
		n	%	n	%
	Emergency plans	278	70.92	114	29.08
	Emergency lighting	302	77.04	90	22.96
	Emergency signage	307	78.32	85	21.68
	Emergency exits	324	82.65	68	17.35
	Meeting points	190	48.47	202	51.53
	Fire extinguishers	344	87.76	48	12.24
	Fire hydrants	197	50.26	95	49.74

Table A1. *Cont.*

Question	Options	N			%	
13—About your institution's alarm signal:	Questions	Yes		No		
		n	%	n	%	
	Do you know the alarm signal?	156	39.80	236	60.20	
	Have you ever heard the alarm signal?	142	36.22	250	63.78	
	Do you think you know how to react if the alarm signal is activated?	293	74.74	99	25.26	
14—Indicate your level of agreement with each of the following statements:	Statements	Disagree		Neither agree nor disagree		Agree	
		n	%	n	%	n	%
	I am concerned about fires in my institution	44	11.22	67	17.09	281	71.68
	I think the building is not prepared for a fire	156	39.80	168	42.86	68	17.35
	I am well informed about safety procedures	162	41.33	135	34.44	95	24.23
	I am prepared to take necessary actions in case of a fire in the building	111	28.32	136	34.69	145	36.99
	I take fire drills in the building very seriously	37	9.44	168	42.86	187	47.70
	I have ignored a fire alarm because I was sure it was false	235	59.95	70	17.86	87	22.19
	I waited until I was ordered to evacuate in the last drill	81	20.66	243	61.99	68	17.35
15—Approximately how long would it take to completely evacuate the building through evacuation routes (knowing that other people are evacuating simultaneously)?	Options	N			%	
	Up to 5 min	228			58.16	
	5 to 10 min	135			34.44	
	More than 10 min	29			7.40	
16—Which of the following options best describes your opinion on conducting drill exercises in your institution, in relation to the preparedness of occupants and security and emergency teams in a real situation?	Options	N			%	
	A complete waste of time and resources	5			1.28	
	Beneficial	353			90.05	
	Without opinion	34			8.67	

Table A2. Results of assessment questions on attitudes.

Question	Options	N			%	
17—Do you believe you know how to react in the following emergency situations?	Cases	Yes		No		
		n	%	n	%	
	In case of an earthquake	270	68.88	122	31.12	
	In case of a flood	170	43.37	222	56.63	
	In case of a bomb threat	91	23.21	301	76.79	
	In case of a terrorist attack	64	16.33	328	83.67	
	In case of a fire	303	77.30	89	22.70	
18—According to your knowledge, where would you go in case of a fire in your building?		Acceptable		Unacceptable		
		n	%	n	%	
	Open response	343	87.50	49	12.50	

Table A2. *Cont.*

Question	Options	N	%
19—In an emergency fire situation, would you know how to use first intervention equipment, such as fire extinguishers or hoses?	Options	N	%
	Yes	181	46.17
	No	211	53.83
20—To what extent do you consider using elevators during a building evacuation to be safe?	Options	N	%
	Usage is never safe	385	98.21
	Usage is safe	5	1.28
	Usage is as safe as evacuation through stairwells	2	0.51
21—In the event of an emergency and with the evacuation process underway, how confident would you feel if a member of the security and emergency team (security guard, safety delegate, floor manager, rescuer) told you it was safe to return to your floor?	Options	N	%
	Quite confident	160	40.82
	Not very confident	168	42.86
	Not confident at all	64	16.33
22—Order the following events in terms of the order you believe they could cause a building evacuation, with the first being the most likely and the last being the least likely:	Options	N	%
	Fire as the most likely event in 3rd place	77	19.64
	Fire as the most likely event in 2nd place	104	26.53
	Fire as the most likely event in 1st place	211	53.83
23—If you had time to retrieve personal belongings during a drill or a real evacuation, specify how much time you would spend:	Options	N	%
	Up to 5 min	162	41.33
	5 to 10 min	26	6.63
	More than 10 min	4	1.02
	Would not go	200	51.02

24—In an evacuation situation, during a drill or a real situation, what would you take with you?		Acceptable		Not Acceptable	
		n	%	n	%
	Open response	88	22.45	304	77.55

25—Next, there are possible actions that can be taken in case of a real fire in the building. Consider each one and indicate the correct response:	Actions	Yes		No		Not Applicable	
		n	%	n	%	n	%
	If you noticed smoke outside the building, would you open the door to exit?	131	33.42	232	59.18	29	7.40
	If the fire alarm on your floor goes off, would you wait for the floor manager to give the order to evacuate?	139	35.46	232	59.18	21	5.36
	If an elevator is working during a fire emergency, would you use it to exit?	5	1.28	379	96.68	8	2.04
	If you knew the fire was not on your floor, would you use the elevator?	5	1.28	379	96.68	8	2.04
	Going to the roof is a possible alternative instead of going down the stairs.	93	23.72	244	62.24	55	14.03
	If isolated on your floor during a fire, would you stay in the space and seal the areas to prevent smoke from entering?	262	66.84	103	26.28	27	6.89
	If there is a fire with smoke on the floor, would you open a window to let in fresh air?	159	40.56	211	53.83	22	5.61
	If a neighboring building is on fire, would you immediately evacuate your building?	293	74.74	65	16.58	34	8.67

26—Suppose you were evacuating the building through the emergency stairwell and saw other people from lower floors waiting to enter the same stairwell. Which statement best describes what you would do?	Options	N	%
	Stop and let everyone go ahead	44	11.22
	Continue to exit so they could enter the stairwell after you	115	29.34
	I don't know what I would do	46	11.73
	It would depend on my level of awareness about the emergency situation	176	44.90
	Without opinion	11	2.81

Table A3. Results of assessment questions on training and experience.

Question	Options	N	%
27—Do you have any experience in the area of safety/emergency?	Yes	99	25.26
	No	293	74.74

28—For each of the following items, indicate if you have received awareness/training sessions:	Items	Yes		No	
		n	%	n	%
	Self-Protection Measures (general concepts)	165	42.09	227	57.91
	Fire Phenomena	133	33.93	259	66.07
	Installed Safety Means	115	29.34	277	70.66
	Firefighting Practice	108	27.55	284	72.45
	Evacuation Techniques	142	36.22	250	63.78
	General Principles of First Aid	168	42.86	224	57.14
	Basic Life Support (BLS and/or BLS-AED)	173	44.13	219	55.87

29—If you answered yes to any of the previous items, indicate the level of importance it had for your daily life:	Items	Not important	Important	Very important
		n	n	n
	Self-Protection Measures (general concepts)	20	95	109
	Fire Phenomena	24	89	86
	Installed Safety Means	23	76	97
	Firefighting Practice	28	75	88
	Evacuation Techniques	31	59	121
	General Principles of First Aid	19	77	128
	Basic Life Support (BLS and/or BLS-AED)	25	74	131

30—In your opinion, what is the most suitable frequency for awareness/training sessions for building occupants?	Options	N	%
	Every 2 years	89	22.70
	Once a year	250	63.78
	Every 6 months	53	13.52

31—Have you ever participated in a fire drill?	Options	N	%
	Yes	226	57.65
	No	166	42.35

32—In your opinion, what is the most suitable frequency for fire drills in the building?	Options	N	%
	Every 2 years	77	19.64
	Once a year	250	63.78
	Every 6 months	65	16.58

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