

WORKERS' PERCEPTIONS AND RESPONSES TO EMERGENCY SITUATIONS

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ABSTRACT

Background: Regardless of the level of safety present in each workplace, emergency situations is always possible. To keep calm and mitigate the effects of these occurrences, it is important to ensure that workers are informed and prepared to provide an adequate response to deal with them. **Objectives:** This study examined workers' perceptions of and responses to emergency situations by evaluating their levels of knowledge, preparedness, and safety awareness, as well as by analysing the extent to which training in emergency-related areas influences these dimensions. **Methodology:** To collect the data, a questionnaire was applied to a sample of thirty-seven workers from three companies/institutions in the municipality. **Results:** They although the majority of workers are trained, there are clear gaps in their practical knowledge and in the procedures to be adopted in the event of a situation of this type, and there was also a positive influence on the perception of preparedness, but not on the feeling of safety **Conclusions:** Training is essential to achieving satisfactory outcomes; however, it must be appropriately designed and sufficiently comprehensive to be effectively perceived and internalised. It is therefore recommended that training initiatives be strengthened and that a greater emphasis be placed on practical methodologies, thereby facilitating the assimilation and application of acquired theoretical knowledge.

Keywords: Emergency at Work, Perception for Emergency, Emergency Response, Emergency Training.

1. INTRODUCTION

Every year, there are approximately 9,000 fires (AGIF, 2025), 1,000 earthquakes (Rodrigues, 2017) and 63 areas in Portugal that have been identified by the Portuguese Environment Agency (APA) as Areas of Significant Potential Flood Risk (ARPSI) (Portuguese Environment Agency, n.d.). Our country naturally presents risks which, from an occupational health perspective, are impossible to eliminate, but it is possible to prepare workers to ensure that they are informed and able to deal with them.

The aforementioned preparation takes the form of training and drills in emergency situations, something that the employer is legally obliged to provide in accordance with paragraph 3, article 20, Law no. 102/2009 of 10 September - Legal framework for the promotion of safety and health at work: "Without prejudice to the provisions of paragraph 1, the employer must train, in sufficient numbers, taking into account the size of the company, the existing risks and worker evacuation measures. Without prejudice to paragraph 1, the employer must train the workers responsible for implementing first aid, firefighting and worker evacuation measures in sufficient numbers, taking into account the size of the company and the existing risks, and provide them with suitable

equipment." It is the employer's responsibility to ensure that all their workers are prepared for the event of an emergency and that there are designated workers responsible for this type of situation (Assembly of the Republic, 2009).

An informed and prepared worker will be calmer and safer, will be less likely to become stressed, will feel more capable and will have more initiative to act when faced with an emergency situation, which contributes to the safeguarding and well-being not only of the worker themselves, but also of everyone present at the time, preventing the situation from progressing (Carvalho, 2021).

Organisations that invest in regular training are able to keep their workers trained and confident in dealing with emergencies, whether through evacuations, first aid training, basic life support training, fire prevention and fighting training, training in building evacuation techniques, drills, safety exercises and other types of training (Higiworks, 2022).

To ensure that training can provide the necessary knowledge and guarantee that the worker keeps the knowledge gained, it must hold clear and concise communication, include realistic scenarios, and be focused on practical skills. The way in which training is given directly influences the perception that workers will have of the seriousness of the situations presented and the actions that should be taken. In times of crisis, communication must be quick, clear, and direct, otherwise the information transmitted can be confusing and misinterpreted, leading to errors and inadequate responses, increasing the risk of accidents and injuries and the progression of the emergency situation.

Another particularly crucial element in guaranteeing a good and effective response by workers to emergency situations is the organisation of the organisation. An organisation that has safety as a clear and promoted priority, as a result, has workers who are more active and motivated in relation to the safety procedures implemented, which in turn allows for a better response to emergency situations and greater comfort and confidence on the part of workers to suggest improvements or report non-conformities.

Another essential element is psychological support before and after the emergency: emotional reactions to emergencies are natural and expected. The stress, panic and fear felt in these situations can lead to reactions of flight, blockage, indecision or, on the contrary, rash decisions. The presence of psychological support can both help workers prepare emotionally to deal with the pressure of an emergency and help them deal with the repercussions of experiencing an emergency situation.

How workers perceive and respond to an emergency is achieved through a combination of factors, all of which are important and interconnected. It is essential for an organisation to be able to implement all these factors in order to promote an atmosphere of safety and ensure that its workers are able to grasp the concept of an emergency situation, the level of risk and severity, who to contact for support and how to act accordingly.

Considering that the occurrence of emergency situations is a danger that is impossible to eliminate, not only the employer but also the worker must take steps to reduce the risk associated with emergency situations as much as possible, and this reduction begins precisely with information and training.

2. MATERIALS AND METHODS

Study design

The study in question is classified as "explanatory/predictive" and correlational in nature. This information falls within knowledge level III. The quantitative and qualitative approach, with a retrospective and cross-sectional timeline, is one of the fundamental characteristics of this study. The sites under study are companies and institutions in the municipality of Góis.

Population and sample

The study population is made up of workers from companies in the municipalities of Góis and Miranda do Corvo. The inclusion criterion is active workers, and the exclusion criterion is workers on long-term sick leave or retired. The sampling method selected was non-probabilistic for convenience. The sample was selected by applying the data collection method (questionnaire) to the workers to match the target population. This was done with the support of a contact person from each company/institution who sent the questionnaire in the form of a fill-in link to all the workers, who were free to respond or not after a period of 28 days (9 April to 6 May), resulting in a total of 37 responses that make up the sample under study.

Instruments and data collection

The methodology and data collection instrument used was a questionnaire structured into several sections, the questionnaire was made by the study authors, and validated for 5 workers of different companies: The first section is designed to collect socio-demographic data. The second section is designed to collect data on the type and amount of training in emergency situations undertaken by the worker. The third section is designed to collect data on the employee's knowledge of emergency situations, following training in emergency situations. The fourth section collects data on the employee's knowledge of emergency situations without emergency training. The fifth and concluding section is designed to collect data on the level of preparedness and safety felt by the worker. The questionnaire is made up of qualitative and quantitative questions (evaluation of certain parameters using scales from 0 to 10). The assessment tool was approved by the ethics committee of the Polytechnic Institute of Coimbra (process no. 58/2025) and then applied to workers from the municipalities of Góis and Miranda do Corvo, selected on non-probabilistic basis for convenience. Participants were previously informed of the study's goals and were guaranteed anonymity and informed consent throughout the process.

Statistical analysis

To analyse the data obtained from completing the questionnaire, IBM SPSS Statistics data analysis software was used to create tables of association and grouping of variables and parametric and non-parametric statistical analysis techniques, including Pearson's chi-square and Student's t-tests for independent samples. A 95% confidence level was adopted, with a consequent 5% probability of error.

3. RESULTS

This study involved workers from three companies/institutions in the areas of window frames, decorative lighting manufacture and government in the municipality of Góis and Miranda do Corvo, in the district of Coimbra. Of the 37 participants, at the time of the study: 13.5 % were aged between 18 years and 25 years, 29.7 % between 26 and 35 years, 18.9 % between 36 and 45

years and 37.7 %, the majority, over 46 years; 43.2 % of the participating workers had 15 or more years' experience in the company where they worked at the time of completing their participation in the project, while 29.7 % had less than 5 years' experience and 27.0 % between 5 and 10 years. Regarding the type of position held by each participant: the majority (56.8%) were employees, 32.4% senior technicians and 10.8% managers (table 1).

Table 1: Characterisation of the sample

		Frequency	%
Age	18 – 25 years old	5	13,5
	26 – 35 years old	11	29,7
	36 – 45 years old	7	18,9
	> 46 years old	14	37,7
Total		37	100
Working time	< 5 years	11	29,7
	5 – 10 years	10	27,0
	> 15 years	16	43,2
Total		37	100
Position	Employee	21	56,8
	Technician	12	32,4
	Manager	4	10,8
Total		37	100

Considering the subject to be studied, it was deemed relevant to determine at the outset of the study which of the 37 workers had undergone some kind of training related to emergency situations in the workplace: it was determined that the majority (62.2%) had been trained (table 2).

Table 2: Whether or not they had received training.

	Frequency	%
With training	23	62,2
Without training	14	37,8
Total	37	100

Of the workers who had received training (23 workers), the majority (31.5%) had received training in first aid, 24.1% had received training in basic life support, 18.5% had received training in fire prevention and firefighting, 14.8% had carried out drills and 11.1% had received training in building evacuation techniques (Attachment 1). Following on from this, 69.6 % of the workers with training consider it to have been sufficient, while 30.4 % say it was not (Attachment 2).

The following results were obtained regarding the workers' knowledge of emergency situations: Regarding the steps to take in case of a fire only two workers (trained) out of thirty-seven answered correctly while thirty-five workers (14 untrained and twenty-one trained) got it wrong (table 5). About the steps to take to correctly activate a fire extinguisher, regardless of whether they were trained, none of the workers answered correctly (Attachment 3).

Regarding the steps to take in the event of an earthquake, eleven workers (trained) answered correctly, while twenty-six were wrong (14 untrained and twelve trained) (Attachment 4). Regarding the places to avoid during an earthquake, nine workers (trained) answered correctly, while twenty-eight workers got it wrong (14 trained and fourteen untrained) (Attachment 5).

As for identifying whether their workplace is in a flood-prone area, 62.2 % are aware of this, while 37.8 % are not (Attachment 6). Regarding the correct practices to follow when a flood occurs, twenty-nine workers (11 untrained and eighteen trained) answered correctly, while eight were wrong (3 untrained and five trained) (Attachment 7).

Considering the objectives defined in this study, we sought to obtain some more specific information by statistically analysing the results obtained through the questionnaire distributed. In view of the results shown in Table 3, we can see that most workers know how to identify emergency situations and that, regardless of whether the p-value is less than 0.05 in each of the situations presented, i.e., regardless of whether the relationship between the presence or absence of training and the type of emergency situation identified is statistically non-significant, there is a slight prevalence of knowledge among trained workers.

Table 3: Types of emergency situations known to the workers surveyed.

		Training Yes/No		Total n (%)	p-value
		Yes n (%)	No n (%)		
Fire	Yes	23 (63,9)	13 (36,1)	36 (97,3)	0,194
	No	0 (0,0)	1 (7,1)	1(2,7)	
	Total	23 (62,2)	14 (37,8)	37 (100,0)	
Earthquake	Yes	19 (59,4)	13 (40,6)	32 (86,5)	0,377
	No	4 (80,0)	1 (20,0)	5 (13,5)	
	Total	23 (62,2)	14 (37,8)	37 (100,0)	
Flood	Yes	14 (56,0)	11 (44,0)	25 (67,6)	0,265
	No	9 (75,0)	3 (25,0)	12 (32,4)	
	Total	23 (62,2)	14 (37,8)	37 (100,0)	
Mass movements	Yes	1 (100,0)	0 (0,0)	1 (2,7)	0,429
	No	22 (61,1)	14 (38,9)	36 (97,3)	
	Total	23 (62,2)	14 (37,8)	37 (100,0)	
Pearson's chi-square test					

Analysing the results shown in table 4, it can be seen that there was a statistically significant association between the presence or absence of training and the identification of the correct steps to take during an earthquake (p value = $0.002 < 0.05$), where although most of the answers were wrong, all the correct answers came from trained workers. In relation to the other situations shown, none had statistically significant results, however we can see that in relation to the correct steps to take during a fire, the majority got it wrong (94.6%) and in relation to the correct steps to take in the face of a flood, the majority got it right (78.4%) and that in both situations the majority of correct answers came from trained workers.

Table 4: Influence of training on knowledge of the steps to take in the event of an emergency situation.

		Training Yes/No		Total n (%)	p-value
		Yes n (%)	No n (%)		
Correct steps to take during an earthquake	Correct	11 (100,0)	0 (0,0)	11 (29,7)	0,002
	Incorrect	12 (46,2)	14 (53,8)	26 (70,3)	
	Total	23 (62,2)	14 (37,8)	37 (100,0)	
Correct steps to take in a fire	Correct	2 (100,0)	0 (0,0)	2 (5,4)	0,257
	Incorrect	21 (60,0)	14 (40,0)	35 (94,6)	
	Total	23 (62,2)	14 (37,8)	37 (100,0)	
Correct steps to take in a flood	Correct	18 (62,1)	11 (37,9)	29 (78,4)	0,982
	Incorrect	5 (62,5)	3 (37,5)	8 (21,6)	
	Total	23 (62,2)	14 (37,8)	37 (100,0)	
Pearson's chi-square test					

Considering the results shown in table 5, we can see that there is statistically significant reaction between the groups, however untrained workers on average (5.07) feel safer in emergency situations when compared to untrained workers in the same situations (4.65), but this difference is not enough to determine whether it is due to the absence or presence of training.

Table 5: Influence of training on workers' sense of safety in emergency situations

		Training Yes/No	
		Yes	No
In view of the training obtained, worker feels safe	N	23	14
	Average	4,65	5,07
	Standard Deviation	1,774	2,868
	p-value	0,558	

Student's t-test for independent samples

Considering the results shown in table 6, we can see that there is no statistically significant reaction between the groups. However, trained workers feel more prepared on average (4.04) than untrained workers (3.00), compared to untrained workers (3.00), but this difference is not sufficient to determine whether it is due to the absence or presence of training.

Table 6: Influence of training on workers' sense of preparedness for emergency situations

		Training Yes/No	
		Yes	No
In view of the training obtained, workers feels prepared	N	23	14
	Average	4,04	3,00
	Standard Deviation	1,718	2,000
	p-value	0,101	0,101

Student's t-test for independent samples

4. DISCUSSION

Workers' perception of emergency situations is determined by the type of response they can provide. The results obtained during this study show that the majority of workers (62.2 %) claim to have been trained in emergency situations, a figure which, although positive, is nonetheless worrying given that, according to Portuguese legislation, it is the employer's responsibility to guarantee the provision of training in emergency situations, in particular training in first aid, firefighting and evacuation for all its workers. Despite the high rate of trained workers, several gaps were observed in their level of knowledge, and training proved to be a factor with some influence, although not enough to be a determining factor, which may be due to the fact that existing training is not the most appropriate or effective (Assembleia da República, 2009).

In general, most of the participants knew how to identify emergency situations, particularly the most common ones: fires, earthquakes, and floods. However, the fact that they know how to identify emergency situations has not been demonstrated in their knowledge of what to do in one of these situations. This discrepancy may be due to the fact that having theoretical knowledge is not always synonymous with having practical knowledge; practicality and routine are essential for retaining knowledge and applying it correctly, so these results also show that the training received by the workers was neither effective nor regular enough to produce satisfactory results. Of all the areas assessed here, this was the one with the worst results. The data obtained shows that workers lack knowledge in procedural and technical areas of how to deal with an emergency situation. This fact in particular can be seen clearly when you consider that 5.4 % of all workers were able to correctly answer the questions about the correct steps to take in the event of a fire, but none were able to correctly describe the steps necessary for the correct use of a fire extinguisher. Of all the emergency situations assessed, only one had a majority of correct answers: only 29.7 % were able to correctly describe the correct steps to take in the event of an earthquake, 5.4 % in the event of a fire and 78.4 % in the event of a flood. Although most correct answers came from trained workers, the p-values obtained show no statistically significant relationship.

Contrary to expectations, untrained workers rated their perceived level of safety slightly higher (average= 5.07) than trained workers (average= 4.65). This small difference may be due to several factors: the fact that they have more training, and therefore presumably more knowledge about the type of situations studied, means that trained workers, who are more aware of the risk, have a lower sense of safety; unlike untrained workers who, because they are not as aware of the risks that exist in an emergency situation, may be overestimating their knowledge and thus have a false sense of security. This difference, although notable, was not statistically significant (p -value = 0.558) (Kruger & Dunning, 1999).

In contrast to the above, the workers' perception of preparedness proved to be as expected: trained workers rated themselves as more prepared (4.04) than untrained workers (3.00). Although once again there was no statistically significant relationship (p -value = 0.101), the results show that the training factor, even if it is limited, has some influence on the results obtained. This result is consistent with studies that state that training contributes to greater preparation and self-confidence on the part of workers, showing the positive influence of training on their perception and response. Although these results are satisfactory, they do not translate into the knowledge demonstrated by workers, which reinforces the need to reformulate and increase the regularity of training (Kılıç & Şimşek, 2019).

The data obtained shows that training in emergency situations, although necessary for an adequate and legally obligatory response, is not being applied to all workers. The study also reveals that the training that is actually being applied is not sufficient to guarantee an effective perception and response on the part of workers, solidifying the urgent need to reformulate training programmes into something more practical, realistic and continuous (Kalidindi *et al.*, 2018).

It should be noted that due to the small sample size, most of the tests applied during the statistical analysis of the results were not statistically significant. To solve this problem, it is recommended that a similar study be carried out with a larger sample so that the statistical results are also more significant.

5. CONCLUSIONS

The presence of training has been shown to be a positive influence on the knowledge and level of preparedness of workers, which will consequently influence their response to emergency situations. On the other hand, the presence of training has been shown to be a negative influence on workers' feelings of safety, so we can infer that workers' perceptions are influenced not only by their knowledge of a given situation, but also by more subjective and emotional aspects. Although the influence of training is clearly seen, throughout the study it proved to be insufficient to combat the existing gaps in the workers' technical knowledge, which implies that the training currently provided may not be sufficient or the most significant.

With this study, we can emphasise the importance of investing in training, which, although it is mandatory by law in Portugal, is not always the case here. Training must be effective, concise, and regular, to keep the knowledge fresh in workers' minds and thus ensure that, in case of an emergency, they are able to respond appropriately and remain calm.

To obtain more significant and in-depth results in further research, it is recommended that the sample used be larger and thus more representative.

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