# EDUCATING FOR SAFETY AT SCHOOL: ACCIDENT PREVENTION AND ACTION IN CASE OF BURNS

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## Abstract

According to the Portuguese General Directorate of Health, accidents are the fourth most common cause of death in Europe. Among these are burns, for which children are a particularly vulnerable group. In the EU, burns are the 4th leading cause of accidental death in children. In addition to consequences on morbidity and mortality, burns influence quality of life, with physical, emotional and mental consequences The majority of burns happen at home and 90% are preventable. The school plays an important role in improving the student's health and life quality, responding to problems in society and preparing new generations for responsible citizenship. It is up to the school to promote the adoption of safety behaviors, prevention, and adequate risk management. The SOS Fire project (2019-22) was a co-funded ERASMUS + project aiming to create awareness among school children, teachers and families about the risks caused by fire, its prevention, and the most important measures to put in place in case of emergency. In the early stages of the project, a survey (71 respondents) and a focus group (9) showed that teachers had a low level of literacy regarding fire and burn prevention, although they considered it to be a very important issue. Additionally, they felt there are few didactic materials available, and they rarely cover these topics, although they acknowledge the important role the school has in education for risk and accident prevention. Therefore, a training workshop with a workload of 50h was designed to empower teachers to act, make decisions, improve their skills on Education for safety and risk prevention. This paper addresses the pilot training in Portugal, its design, implementation, results and conclusions. The results suggest that there is a clear need to empower teacher with tools and methodologies to address the education for risk and prevention of fire and burn, teachers fully understand the importance of the issue and are highly motivated to tackle it and those are the key ingredients for promoting effective changes.

Keywords: Education for risk, accident prevention, burns.

## 1 INTRODUCTION

The school plays an important role in improving the health and quality of life of pupils, responding to problems in society and preparing the new generations for responsible citizenship. In a broad sense of education for citizenship, it is up to the school to promote the adoption of safety behaviours, prevention and adequate risk management (Santos, Esteves, & Saúde, 2015) [1]. Education for safety and risk prevention must be based on approaches that improve health and quality of life, empowering individuals, and communities to act, to make decisions, improving their skills. In education for citizenship in schools, three dimensions should be considered: personal/individual, interpersonal, social/community (Monteiro, 2017) [2].

According to the Portuguese General Directorate of Health [3], accidents, intentional or unintentional, are the fourth most common cause of death in Europe, with a great impact on society and the personal and family life of victims. Among these accidents are burns, for which children are a vulnerable group - in the word, burns are the fifth most common cause of non-fatal childhood injuries (World Health Organization) [4]. Considering the number of burns sustained by children, about 90% of are preventable (European Burns Association) [5]. The main risk factors are at home, but with the phenomenon of climate change, there is an increased number of forest fires accidents. In Portugal, between 2012 and 2016, burns were the fifth leading cause of hospitalization for accidents in children, and the cause with the longest average length of hospital stay (APSI, 2017) [6]. In addition to consequences for children's morbidity and mortality, burns influence quality of life (Barroso, Melo & Pinto, 2018) [7], with consequences, often serious, at a physical, emotional and mental level.

Aligned within these framework Erasmus+ project "SOS SOS Fire! European Training Course for school pupils on fire prevention and first aids through civic engagement" (2019-1-BE02-KA201-060345) [8] aimed to create awareness among European school children about the risks caused by fire, its

prevention and the most important measures to put in place in case of emergency and fire. The project was coordinated by Fondation des Brûlés, from Belgium, and included other organizations and institutions from Belgium, Bulgaria, Romania, and Portugal. Through the project, the partners developed and implemented an European training course for school children and for their teachers with the objectives of: Improve the skills of young children, their teachers and their families in fire prevention and how to act in case of fire; Provide opportunities for schools to open up to their local community and local organizations and work together with them; Explore didactic materials that could be used by teachers in schools; Empower young children so that they feel more confident and responsible towards the society where they live. The target public were primary school teachers and pupils and their parents and families.

## 2 METHODOLOGY

The project was developed in three main phases: Assessment of needs and diagnosis; Preparation; Implementation. In the first phase there were two data collection instruments: a questionnaire and a focus group interview. The former was developed by the project and adapted to the Portuguese context. A previous trial of the survey was made by a small group of teachers to test mainly the questions' intelligibility, used terminology and the average time response. The survey, with open and closed questions, was available online and the replies were anonymous. Data were gathered about the following dimensions: general information (school localization, function within the school, pupils' grades); knowledge about teacher training programs; fire prevention measures effectively implemented by the school; teaching practice; personal and professional competences and knowledge; teacher training needs.

The focus group aimed to deepen the understanding about teachers' perspectives on education for preventing fires and reacting in case of a fire emergency, the teaching and learning methods used in schools and the partnerships established by schools in their local community (NGOs, fire brigades, hospitals, public authorities, police forces, among others). Due to the COVID-19 pandemic the interview took place online, using the Colibri Zoom platform, and involved nine primary school teachers.

The preparation phase also included the translation, cultural adaptation and testing of the didactic materials already developed by *Fondation des Brûlés*, the project coordinator. The validation and piloting in the Portuguese context involved different entities: teachers and students from Polytechnic Institute of Setúbal; bilingual teachers; health professionals; and primary teachers, pupils, and parents. The final version of the didactic materials, available online, encompass: Handbook for teachers; Handbook for parents; Activity books for pupils; Games; Road map for teachers and parents [9]. The topics proposed are organized in five main areas: Recognition of risk situations; Transform a risk situation into a safe situation; Identify sources of danger and different kind of burns; How to act, evacuate and leave in a fast manner; Provide good advice in case of accidents.

The implementation phase comprised a training workshop with a workload of 50h designed to empower teachers to act, make decisions, improve their skills on education for safety and risk prevention. Professors from education and health backgrounds were involved in the design process. A pilot training took place alternating 25h synchronous online sessions (Google Classroom and Colibri Zoom platforms) with 25h of autonomous work, between March and July, where the work developed in schools was presented. Twelve primary (6-10ys) teachers were recruited. The enrolled teachers were trained to create and implement pedagogical sequences, using the provided SOS Fire didactic materials, in their classes. In the beginning teachers analyzed and discussed curriculum documents and contents related to education for safety and risk prevention as well as fire and burn prevention and mitigation. This allowed to clarify and deepen concepts and promote reflection on the usual pedagogical practices of teachers. In the end of the training, teachers shared the activities implemented in schools and reflected on the results and training impact. A final evaluation questionnaire about the training workshop was available online.

## 3 RESULTS

As described above an assessment of needs and background, on risks caused by fire, its prevention and the most important measures to put in place in case of emergency, was made by applying a survey, followed by a focus group.

## 3.1 The assessment of needs

Regarding training two questions were made, both concerning the perception of the availability of teacher training one on fire prevention and the other on burn prevention (Fig. 1). On both questions the answers of “No” and “Do not know” were more than 70%, being higher on burn prevention. These results clearly show there is a lack of training availability


*Figure 1. Result from the teachers’ survey, on training.*
*Questions: **A** – Is there training on fire prevention? **B** – Is there training on burn prevention?*

On the subject of teaching practice three questions were made, concerning school curriculum (Fig. 2), compulsory teaching and objectives (Fig. 3). Although there is a lack of training options on the matter, there is a slight better performance when it comes to the teaching of fire and burn prevention. Nevertheless, the answers “No” and “Do not know” were more than 60%, providing a worrying scenario of unfamiliarity with the official documents [2]. The focus group’ interviews highlighted the lack of teaching materials about these specific topics and that there is also a lack of practical activities, the learning activities that occur consists mainly in text reading and images analysing.

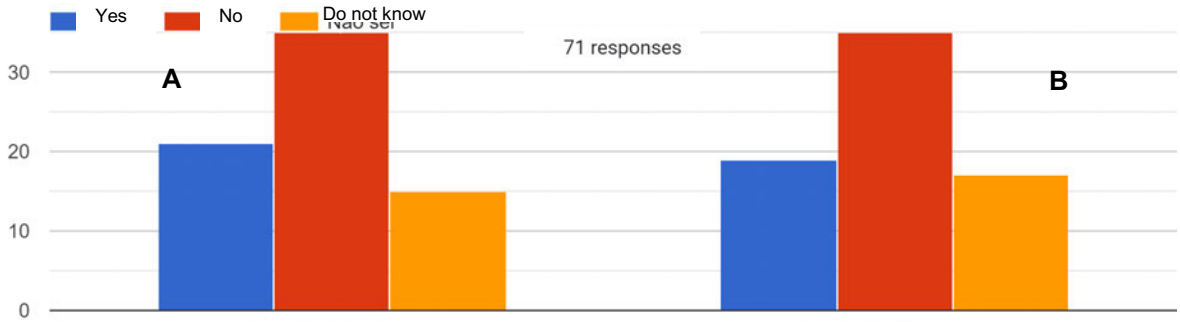


*Figure 2. Result from the teachers’ survey on School Curriculum.*
*Questions: **A** – School Curriculum includes teaching about fire prevention?*
***B** – School Curriculum includes teaching about burn prevention?*

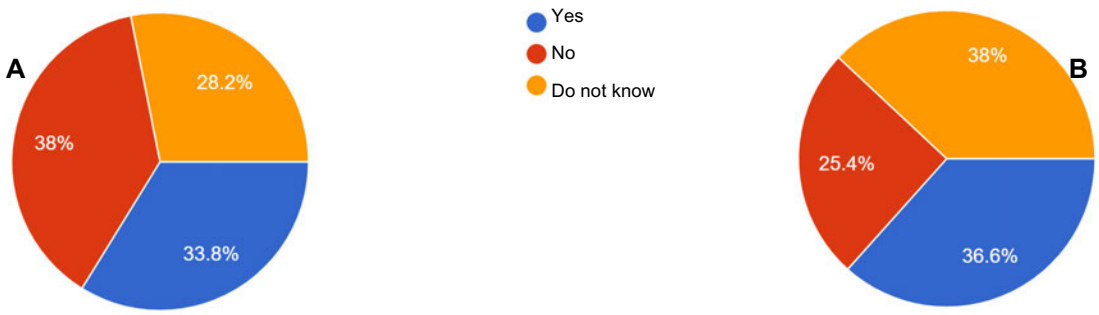


*Figure 3. Result from the teachers’ survey, on teaching fire and burn prevention.*
*Questions: **A** – Is the teaching compulsory? **B** – Are the objectives defined?*

Regarding knowledge, teachers were asked to classify it from minimum to highly consistent, on a scale from 1 to 5 (Fig. 4). Although the higher number of responses occurred on the middle of the scale, only

a few more than 10% stated to have more than average knowledge and a worrisome, above, 40% quantified their knowledge below average.

The focus group provided insight on the teachers view about the area of risk education and prevention of accidents. The main topics taught in schools are related to first aid in general and not specifically about preventing fires and reacting in case of a fire emergency. Nevertheless, teachers considered education about preventing fires and reacting in case of a fire emergency important topics, moreover, considering that children are frequent victims, but not in school. There are not many fires and burns incidents in schools, but the school pays an essential role in risk education and prevention of accidents, namely the ones that happen at home. Nonetheless, to work with parents about this topic is not frequent.

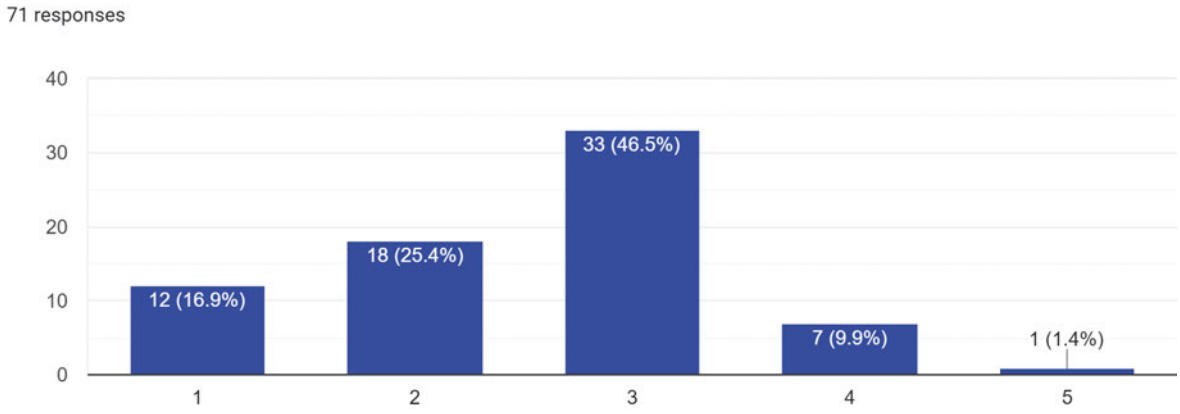


*Figure 4. Result from the teachers' survey on knowledge about fire and burn prevention, ranging from minimum (1) to highly consistent (5).*

Finally, when asked "Considering the roles you perform at the school, what are your needs in terms of preventing fires and burns?", more than 60%, of the respondents' teachers, indicated the need of training, something that is highly consistent with and substantiated by the answers detailed above.

## 3.2 Training workshop – the pilot run

The training workshop, although planned to take place in presence, due to the pandemic situation it was delivered fully online, between March and July of 2022.

### *3.2.1 Implemented Pedagogical Sequences*

Teachers were asked to empower themselves with the provided SOS FIRE materials and implement pedagogical sequences, which all did, ranging from the simpler to the more robust sequences.

One teacher applied a very straightforward sequence addressing the topic firefighters, through the analyse and discussion of a photographic story, the role and actions of firefighters were the focus of many doubts, which resulted in a visit of a firemen that answered all the questions.

A group of 6 teachers, under the topic fires in buildings and at home, created a sequence starting with the analysis and discussion of news about a fire. That originated playing an image game called "Evacuation 1" [9] and allowed pupils to work on the best actions to escape a fire site. Afterwards a practical activity on how to face a fire on yourself was executed by role-playing the rule Stop – Lay down – Roll (Fig. 5). Relating again to the news about a fire, the activity "Evacuation 2" [9], which simulates a call to the emergency service and allows to work with the pupils on type of information to provide and how to provide it. The topic was closed with a tour in the school to discover and identify equipment and supporting information to deal with a fire in the school building.

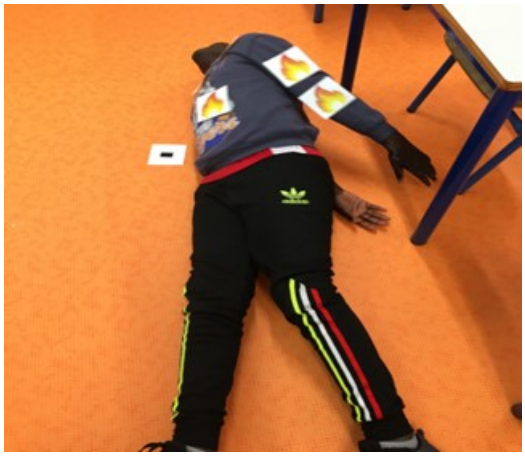

*Figure 5. Pupil on a roll motion, role-playing the rule Stop – Lay down – Roll.*

Another group of 4 teachers decided to create a sequence comprised of 8 sequential activities on the topic of burns. The first 2, to assess conceptions and background on the subject of burns, by asking the pupils to share reports of burn incidents either with them or with some next of kin; and by filling a diagnostic quiz. The next activities were the presentation and explanation of burn hazard and how to act, followed by the formative evaluation of the previous diagnostic quiz. With the new knowledge pupils were asked to construct small books with the important information (Fig. 6) to be shared and distribute them to family and school community. After these two activities another one to apply the recent know-how was implemented, little role-plays shown to several classes in the school. The last activity was the execution of a safety check-list to distribute among adults.

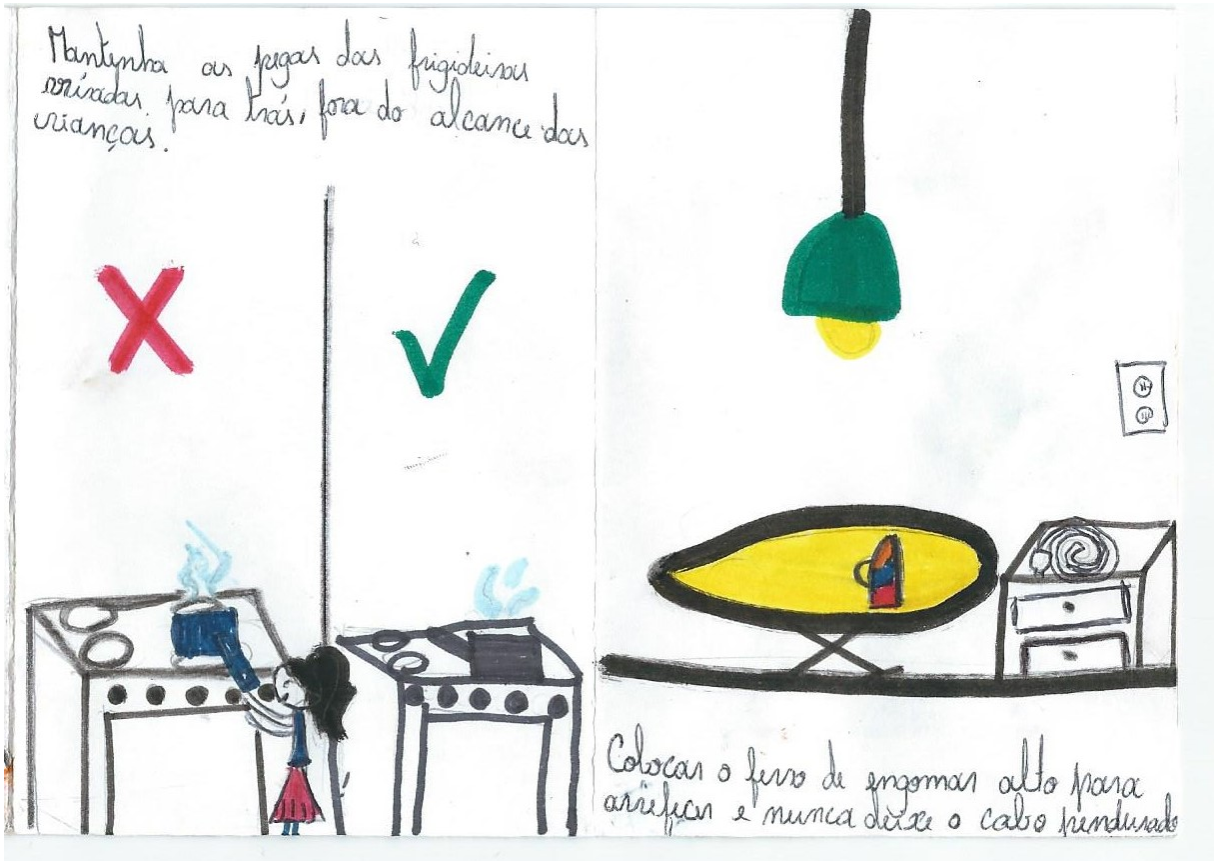


*Figure 6. Example of small books on fire and burn prevention and mitigation made by the pupils.*

Last a teacher that grounds her practice on Project Base Learning, implemented a sequence on a Project base. Where on a first phase defines with the pupils what they want to know about fires, how

they are going to find out and what conception they have on the subject. On the second phase there is a gather of information about firefighters, followed by a get-together with firemen collecting information by interview. Also, during this phase, the image game evacuation 1 detailed above was applied. The third phase starts with the construction of a poster with all the collected information, followed by a comparison between the findings and the initial conceptions. The last step was a proper tour to the fire station.

All these approaches had integrated evaluations to monitor and systematize the learning.

### *3.2.2 Training Impact*

All teachers participating on the workshop stated several impacts provided by the training, one that was universal was the finding of the Risk Education Referential [1], so unknown and so important for teaching. This impact is consistent with the survey findings of unfamiliarity with official documents.

The SOS FIRE project didactic materials were considered user friendly and together with the work around them on the workshop implementation of practical activities are considered the right tools to work the topic in a creative, active and pedagogical way. Also, the topic was understood as transversal on curriculum and as such easily integrated. On another note, some teachers expressed the highly important impact on the children on their classes, since they are the ones more exposed to danger and were now being taught how to face such danger.

On a personal level several teachers stated the various learnings associated with risk, burns and ways of acting in different help situations and in some respects, mainly burns, there was no knowledge at all about them or worse erroneous conceptions.

Another mentioned impact was the awakening to a reality of burn victims unknown.

## 4 CONCLUSIONS

At school, safety education issues must be part of the school culture itself and activities must actively involve pupils, so that they use scientific knowledge to understand and solve everyday problems and develop the know-how to act in a responsible and informed way. Societal issues like fire prevention and action in case of accidents benefits from an interdisciplinary approach, and the inclusion of health and education experts in the team. The results suggest that there is a clear need to empower teachers with tools and methodologies to address the education for risk and prevention of fire and burn, as teachers fully understand the importance of the issue and are highly motivated to tackle it and those are the key ingredients for promoting effective changes. Future work will need to focus on two dimensions: multiplication of the training workshop to include more teachers and evaluation and monitoring the consistency of the teacher's practice over time.

## ACKNOWLEDGEMENTS

Erasmus+ Programme of the European Union (2019-1-BE02-KA201-060345); SOS Fire Project coordinator Isabelle Milosevic, Fondation des Brûlés/Stichting Brandwonden, Belgian; Associação Amigos dos Queimados.

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