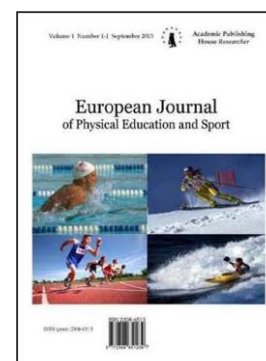


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## The Effect of a 10-Week Health Education Program on the Prevention of Injuries in Students With Special Needs

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### Abstract

The purpose of the present study was to examine the effects of the participation of students with special needs in a health education program for injuries prevention. Ten students of secondary education with mental retardation, aged  $17.63 \pm 2.018$  years, were separated randomly to an intervention group who participated in a 10-week health education program for injuries prevention and a control group who, at the same period, did not attend any extra lesson except the defined ones from the Ministry of Education. Before and after the 10-week period all the students, from both the intervention and the control group, filled in the same questionnaires in order to collect information about their injuries, their experience concerning them, as well their knowledge, attitude and behavior towards injuries. For data analysis, descriptive analysis and the chi square test ( $\chi^2$ ) of the SPSS ver. 17.0 for windows was used. By processing the data, it was shown that the majority of the students (70 %) have an injury experience, either at home (57.1 %) or at school (28.6 %). From the injuries at school, a very significant proportion (38.6 %) occurred during the break, while 32.8 % of the students' injuries occurred in the corridor. In addition, after participating in the 10-week health education program, the students of the intervention group, acquired knowledge regarding possible dangers, understood that they should not run in the school property, that they should not step or run on wet floor, as well as that they should not push others. They also learned how to use electrical appliances and cleaning agents of household equipment properly, and that they should be careful for themselves and for their peers in order to prevent injuries. Likewise, no difference in the control group was observed. Furthermore, the  $\chi^2$  test proved a very significant effect of the students' participation in the health education program regarding injuries' prevention, the knowledge and the right attitude and behavior towards it (Pearson  $\chi^2 = 4.286-6.667$ ,  $p < 0.05$ , Cramer's  $V = 0.655-0.816$ ). Consequently, the implementation of health education programs for the prevention of injuries at students of secondary education with special needs is very important because through them students perceive possible risks and how they should act and behave in certain situations in order not to expose themselves and others to dangers and also prevent injuries.

**Keywords:** mental retardation, disabilities, intervention, attitude, accident, school, home environment, secondary education.

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## 1. Introduction

Injuries are a combination of many factors and often have their causes in social differences, social conditions, social behaviours and quality of life in the living space (Papadopoulos, 2005). Injuries are constantly the leading cause of mortality in people aged 1-24 years of both sexes (Kendrick et al., 2013; UNICEF, 2013; WHO, 2008). More specifically, it is the leading cause of infant mortality and the second cause of childhood morbidity and visits to the doctor after the acute infections (Towner, 1994).

As for people with disabilities, they have higher rates of injuries than those without disabilities (Leland et al., 1994). A research conducted in Australia showed that the rate of injuries was higher in individuals with mental retardation in relation to the normal population (Sherrard et al., 2002), as mental retardation affects the expected behavioural, social and functional ability of children (Burkett, 1989). Compared with peers without disabilities, children with disabilities are at a significantly higher risk of injury (Shi et al., 2015).

Of all the groups of people with disabilities, the people with multiple disabilities seem to be the most disadvantaged and have the greatest risk of injury (Valletutti, 1984). Also, blind people seem to have increased risks of accidents on the road, while those with sensorimotor disabilities have increased risks of burns. Similarly, students with orthopaedic disabilities have difficulty controlling their limbs concerning balance and falls. Furthermore, there is a high risk of injury among people with behavioural problems (Sherrard et al., 2002). Conversely, students with developmental disabilities have limited mobility and little contact with their peers, and therefore are less involved in school activities, resulting in a reduced risk of injury (Ramirez et al., 2004).

The legislation of all the developed countries provide for the education of people with disabilities (Ramirez et al., 2004). Since about six million students with disabilities participate in school (Snyder, Hoffman, 2001), the creation of a safe and accessible school environment with appropriate school facilities is essential (Ramirez et al., 2004). It is worth to be mentioned that language-communication, as well as the limitation of cognitive and motor skills may be potential risk factors which can cause injuries at school (Gaebler-Spira, Thornton, 2002).

Regarding the school injuries of students with disabilities, there are not sufficient researches to study them further. However, according to the National Pediatric Trauma Registry, young people with disabilities in school population in the United States account for 17 % of the injuries related to the school but are presented in less than 2 % in the general school population (Snyder, Hoffman, 2001). It has also been recorded high injury rate in special classes with students with developmental disabilities in Switzerland (Woringer, 1995). Accordingly, students with special educational needs in African schools have higher injury rates of teeth than the normal population of students (Ohito et al., 1992).

It is worth to be mentioned that injury prevention rather than overprotection in this special population is important (Kendrick et al., 2013; UNICEF, 2013). However, the successful strategies for preventing children's injuries require a better understanding of the epidemiology of injuries (Zamani et al., 2007). Such knowledge can be acquired through specific educational programs. According to Simpson and Nicholls (2012), future research on injuries in children with disabilities should focus on passive interventions to prevent both intentional and unintentional injuries. In addition, according to Shi et al. (2015) teens with disabilities may be an important subgroup for future injury prevention efforts.

For these reasons, the purpose of the present study is to examine the effects of the participation of students of secondary education with special needs in a 10-week health education program for the prevention of injuries.

## 2. Methods

### Sample

The subjects of the sample were pupils of secondary education attending Laboratories for Special Vocational Education and Training, a structure of education for pupils with special needs in Greece. Of all the pupils of the school, the more functional children were selected in order to participate in the program. More specifically, the sample consisted of 10 students, eight boys and two girls, aged  $17.63 \pm 2.018$  years. The subjects were divided, randomly, into two groups, an intervention group (three boys and two girls) and a control group (5 boys). It is worth to be mentioned that the sample was homogeneous as for the students' level of functionality.

### Experimental Design

The design of this interventional-educational program intended to prevent injuries by changing the attitude and behavior of the subjects of the sample regarding injuries. The implementation of the experimental design was firstly made by the questionnaire method which allowed the collection of information regarding the knowledge, attitude and behavior of the pupils, of both intervention and control group, concerning injuries and their experience of them.

Then followed a 10-week educational program that is 10-hour classes for the students of the intervention group, during which they were able to learn some very important data about injuries, play games, dramatize tales, discuss and draw some symbols concerning the injuries and the right way to attitudes and behavior that will help them to avoid the risk for injuries' occurrence. More specifically, the theoretical framework underlying the teaching proposal includes approaches of behaviorism (Komis, 2004), the structural constructivism and sociocultural learning theory (Solomonidou, 2006). In some activities the pupils are asked to think and solve problems through cognitive conflict. Several of the activities guide the students in the construction of new knowledge, while other activities emphasize on social interaction and the role played by the social and cultural environment, as expressed through symbolic systems, to the establishment of knowledge. Moreover, the teaching methodology which was chosen for this program consists of brainstorming, role playing, dialogue and action in the field. As for the students of the control group, at the same period, they did not attend any extra lessons except the defined ones from the Ministry of Education.

Finally, after the 10-week period, all the students, from both the intervention and the control group, filled in the same questionnaires in order to examine the knowledge, attitude and behavior towards injuries' occurrence.

#### Health education program

##### 1<sup>st</sup> and 2<sup>nd</sup> Session (2-hour classes)

*Aim:* To show pupils the content of the teaching scenario, stimulate their interest and ensure their active participation.

*1<sup>st</sup> activity:* Presentation of pictures of children running and dropping on a wet floor and the dangers they face, with sound effects on the topic. Instructions: Observe and express your opinions concerning these dangers, as well as the correct behavior.

*2<sup>nd</sup> activity:* Presentation of the above activity as a story. Purpose: the better understanding of important data concerning accidents – the pupils know the heroes and more specifically “Mr. Look after” and “Mr. Stumble”.

*3<sup>rd</sup> activity:* The students draw cards with symbols regarding slippery floors and the risks of it, which were posted in various parts of the school, to remind the risks. Discussion about the safety rules to be obeyed when walking at school and when playing with schoolmates. Purpose: to conclude that it is absolutely necessary and useful primarily to recognize the dangers.

##### 3<sup>rd</sup> and 4<sup>th</sup> Session (2-hour classes)

*Aim:* The learning of the two main "stop" signs referring to the "wrong" behaviors in school environment which are particularly dangerous.

*1<sup>st</sup> activity:* Connection with previous intervention. Presentation of pictures of children running down the school stairs and the dangers they face, with sound effects on the topic. Instructions: Observe and express your opinions concerning these dangers, as well as the correct behavior.

*2<sup>nd</sup> activity:* Representation from pupils, of what can happen at the school stairs when someone runs and is not careful both for themselves and for others. In addition, presentation by the teacher of the right attitude and behavior concerning the area of the school stairs. Pupils were photographed during the representation of wrong and correct behavior.

*3<sup>rd</sup> activity:* Pupils try to depict in paintings the risk of wrong behavior concerning the stairs.

##### 5<sup>th</sup> and 6<sup>th</sup> Session (2-hour classes)

*Aim:* To teach pupils to use properly electrical devices in order to avoid the risk of electric shock. Place: Laboratory of the lesson of “Autonomous Living”, a simulation of a house.

*1<sup>st</sup> activity:* Presentation of pictures of people who do not use properly electrical devices and the dangers they face, with sound effects on the topic. Instructions: Observe and express your opinions concerning these dangers, as well as the correct behavior.

*2<sup>nd</sup> activity:* Presentation of the risks resulting from the improper use of household appliances by using the equipment of the laboratory. It was emphasized that pupils: must be very careful when placing the electrical device cord because there is a risk of electric shock, must not touch plugs with wet hands, and must place the cord by holding it by the plastic edge. The teacher of the “Autonomous Living” lesson photographed the pupils during the correct and wrong use of electrical devices in order to put them onto the appliances by the end of the program.

*3<sup>rd</sup> activity:* With the help of the teacher, pupils dramatize a play in the Autonomous Living workshop, representing life in the house with "parents" to advise the "children" as for the correct behavior concerning the use of appliances.

#### 7<sup>th</sup> and 8<sup>th</sup> Session (2-hour classes)

*Aim:* To teach pupils to use properly electrical devices such as electric cooker, electric iron, kettle, through which heat strokes and severe burns may be caused. Place: Laboratory of the lesson of “Autonomous Living”, a simulation of a house.

*1<sup>st</sup> activity:* Presentation of pictures of people who do not use properly electrical devices such as stove, iron, etc., and the dangers they face, with sound effects on the topic. Instructions: Observe and express your opinions concerning these dangers, as well as the correct behavior.

*2<sup>nd</sup> activity:* Learning and practicing ironing and using electric cooker, very carefully and with safety, with the help of the teacher. The risks and the correct way to use were specifically emphasized. Aim: At the end of the activity, the students must know that they should not touch the eyes of the kitchen, the oven and iron soleplate when on operation, because of the risk of suffering serious burns.

*3<sup>rd</sup> activity:* The teacher of the “Autonomous Living” lesson photographed the pupils during correct and wrong use of electrical devices in order to put them onto the Autonomous Living Laboratory, reminding them for the correct and safe use of electrical appliances and protecting from the risk of burn.

#### 9<sup>th</sup> and 10<sup>th</sup> Session (2-hour classes)

*Aim:* To teach pupils to use correctly cleaning agents of household equipment, and their risks. Also, to recognize the special signs which mean "prohibited", "toxic" etc, printed in various cleaners and detergents. Place: Laboratory of the lesson of “Autonomous Living”, a simulation of a house.

*1<sup>st</sup> activity:* Presentation of pictures of people who do not use properly cleaning agents of household equipment such as chlorine (bleach), alcohol, detergents, etc., and the dangers they face, with sound effects on the topic. Instructions: Observe and express your opinions concerning these dangers, as well as the correct behavior.

*2<sup>nd</sup> activity:* Presentation-interpretation of various specific signs of cleaning agents and detergents. Aim: Understanding of the multitude of the specific signs of the cleaning agents.

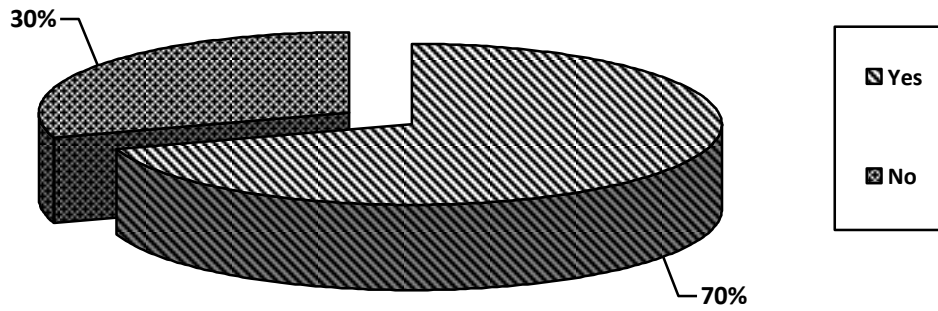
*3<sup>rd</sup> activity:* Pupils try to depict in paintings the various specific signs. The meaning of the signs was emphasized, starting from those with the serious consequences to the body.

#### Data Analysis

For the data processing *descriptive analysis* was used. Moreover, it was applied the *chi square test* ( $\chi^2$ ) in order to explore possible correlations between qualitative variables. The level of significance was set at  $p < 0.05$ .

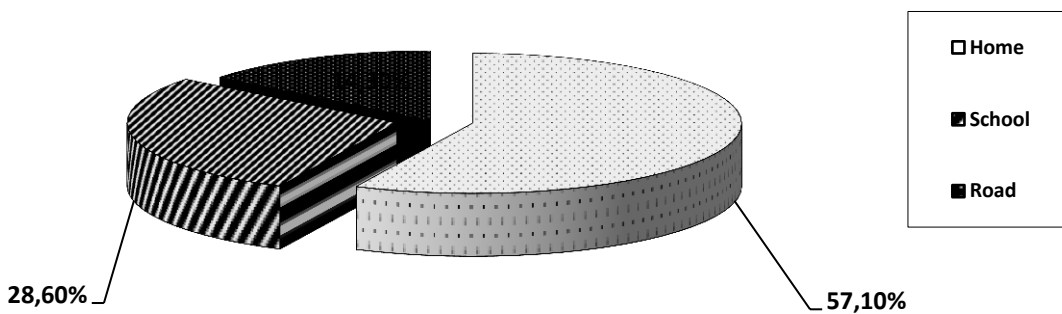
### 3. Results

From the results it was found that most students (70 %) have suffered from an injury in their life, while 30 % of the students haven't (Figure 1).



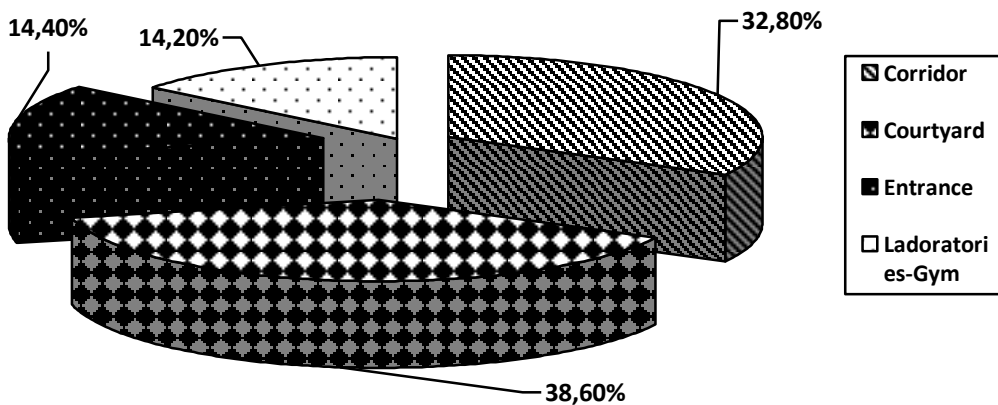
**Fig. 1.** Injury occurrence

In addition, in [Figure 2](#), the place where the latest injury of the students happened is presented.



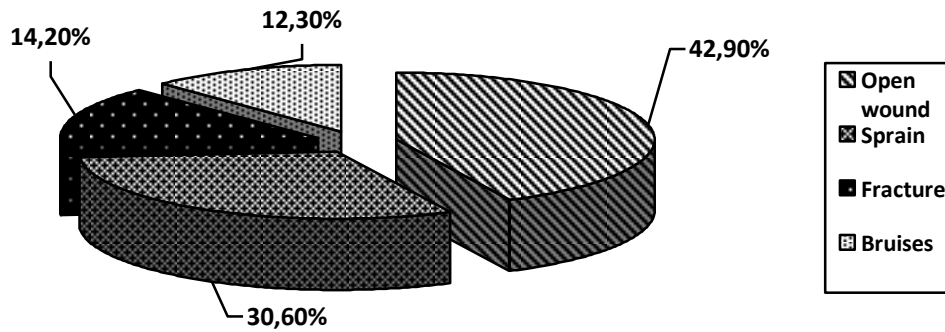
**Fig. 2.** The place where students' latest injury happened

According to the majority of the sample (57.1 %), their latest injury happened at home, while for a significant proportion (28.6 %) the latest injury happened at school. Furthermore, a percentage of 14.3 % state that the latest injury happened on the street ([Figure 2](#)). In [Figure 3](#), are presented the places of the school where the injuries of the students occurred.



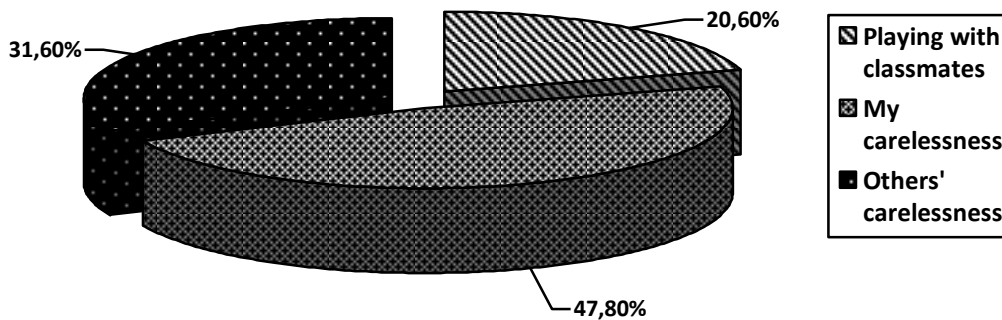
**Fig. 3.** The place at school where the injury happened

As for the places at school where the injuries happened, according to students' statements they happened, in order, in the school courtyard during break time (38.6 %), in the corridor area (32.8 %), in the school entrance (14.4 %), as well as in laboratories and gym during physical education lessons (14.2 %) ([Figure 3](#)). In addition, in [Figure 4](#) is presented the kind of students' injuries that happened in the school environment.



**Fig. 4.** The kind of injuries in the school environment

As it is shown in [Figure 4](#), the largest percentage of students (42.9 %) state that their injuries have caused an open wound in various parts of the body. 1/3 of the students (30.6 %) declare they have suffered a sprain. Moreover, the students report in smaller percentages (14.2 % and 12.3 %) as injuries during their accidents fractures and bruises, respectively. In [Figure 5](#), injuries' causes are presented.

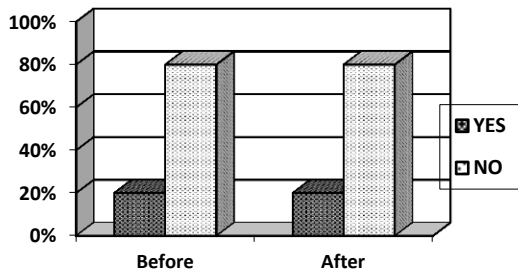


**Fig. 5.** The cause of the injuries in the school

As it is shown in [Figure 5](#), almost half of the students (47.8 %) consider as the key factor leading to injuries in the school their own carelessness, while 31.6 % consider as a determinant others' carelessness. Finally, a significant proportion (20.6 %) of the sample reported that playing with other children in school is a factor that causes injuries ([Figure 5](#)).

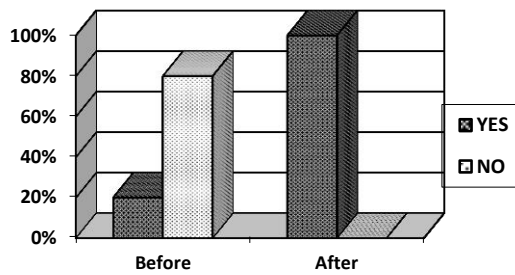
From [Figures 6a-12b](#) below, it is shown the significant effect of student's participation in the health education program for injuries' prevention. Regarding the control group, the results showed that after the 10-week period, the students had not changed their knowledge, attitudes and behavior towards injuries. On the contrary, the students of the intervention group, after participating in the 10-week health education program, acquired knowledge regarding possible dangers when they are not careful, and this becomes apparent in [Figure 6b](#). In addition, the students of the intervention group understood that they should not run in the school property or at home ([Figure 7b](#)), as well as that they should not push others ([Figure 8b](#)). Moreover, students understood that they should not step or run on wet floor ([Figure 9b](#)). They also understood that they should be careful for themselves and for their peers in order to prevent injuries ([Figure 10b](#)). In addition, they learned how to use electrical appliances and cleaning agents of household equipment properly and with safety ([Figure 11b](#) and [Figure 12b](#), respectively).

**DO YOU KNOW THE RISKS WHEN YOU ARE NOT CAREFUL?**



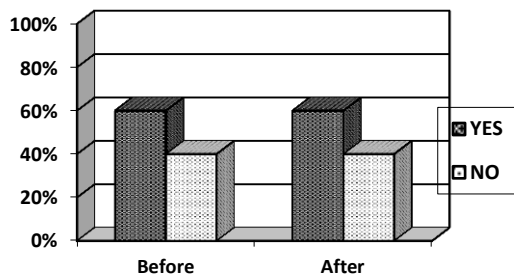
**Fig. 6a.** Control Group

**DO YOU KNOW THE RISKS WHEN YOU ARE NOT CAREFUL?**



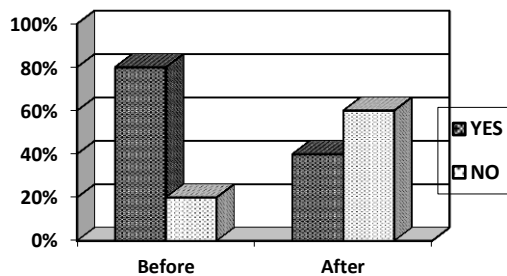
**Fig. 6b.** Intervention Group

**SHALL WE RUN AT SCHOOL OR AT HOME?**



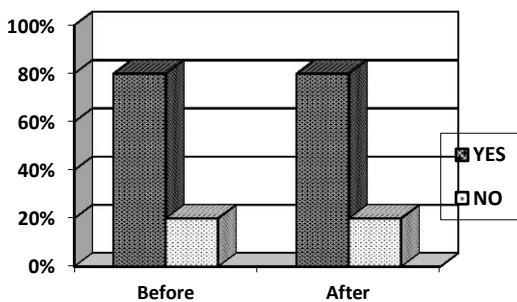
**Fig. 7a.** Control Group

**SHALL WE RUN AT SCHOOL OR AT HOME?**



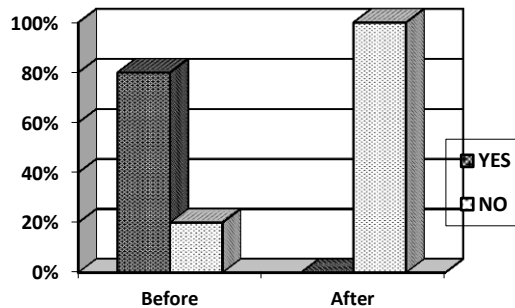
**Fig. 7b.** Intervention Group

**SHALL WE PUSH THE OTHERS?**



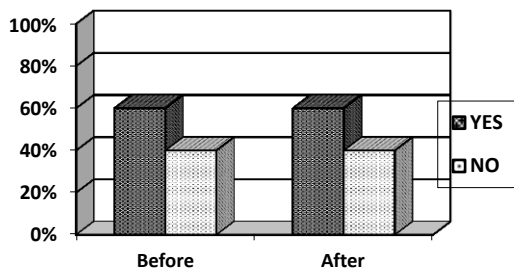
**Fig. 8a.** Control Group

**SHALL WE PUSH THE OTHERS?**



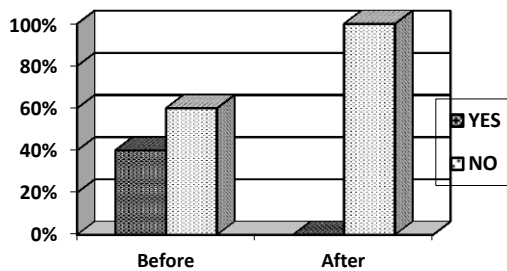
**Fig. 8b.** Intervention Group

**SHALL I STEP OR RUN ON WET FLOOR?**



**Fig. 9a.** Control Group

**SHALL I STEP OR RUN ON WET FLOOR?**



**Fig. 9b.** Intervention Group

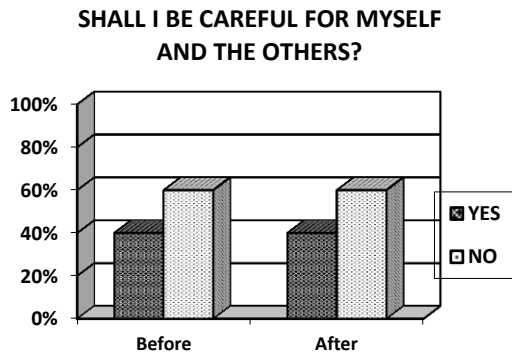


Fig. 10a. Control Group

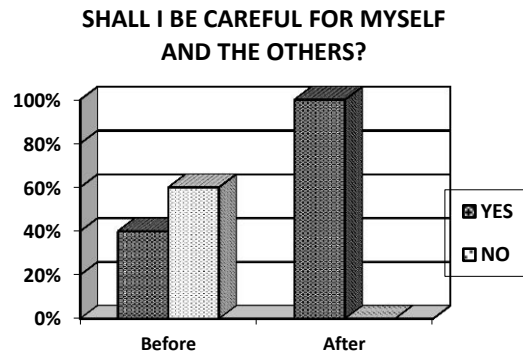


Fig. 10b. Intervention Group

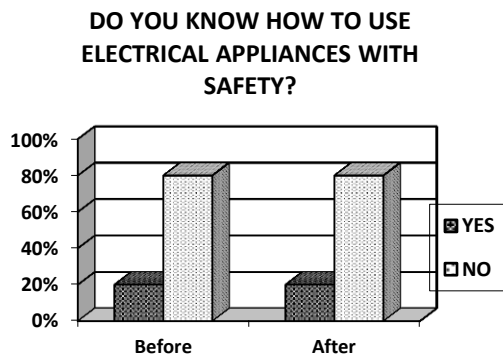


Fig. 11a. Control Group

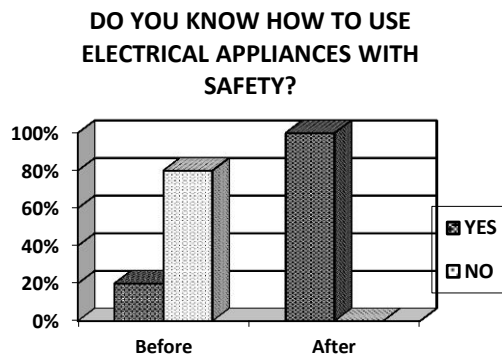


Fig. 11b. Intervention Group

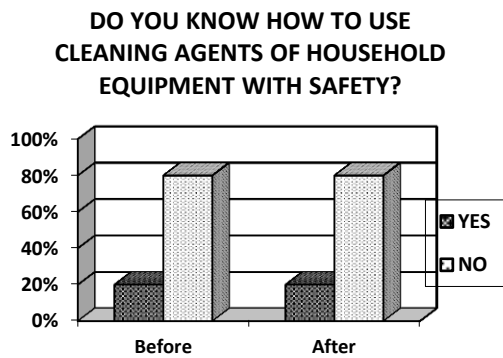


Figure 12a. Control Group.

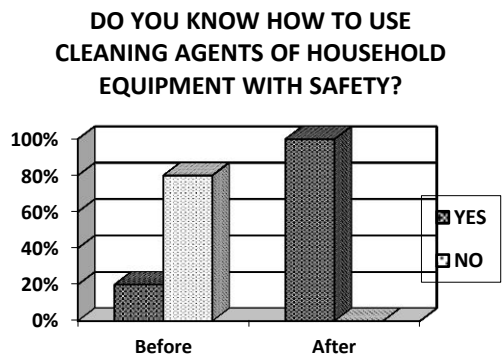


Figure 12b. Intervention Group.

In addition,  $\chi^2$  *cross-tabulations* were carried out in order to examine the effect of the group on some of the qualitative variables. The results showed a very significant effect of the group in variables for injury prevention (Table 1).

Table 1. The effect of the group in variables for injury prevention

Variables	Pearson $\chi^2$	p	Cramer's V
"Do you know the risks when you are not careful?"	6.667	<0.05	0.816
"Shall we push the others?"	6.667	<0.05	0.816
"Shall we step or run on wet floor?"	4.286	<0.05	0.655
"Shall I be careful for myself and the others?"	4.286	<0.05	0.655
"Do you know how to use electrical appliances with safety?"	6.667	<0.05	0.816
"Do you know how to use cleaning agents of household equipment with safety?"	6.667	<0.05	0.816



Thus, the  $\chi^2$  test proved a very significant effect of the participation in the health education program regarding injury prevention, the knowledge and the right attitude and behavior of the students towards it.

Therefore, the effect of the participation in the intervention program was very important since the intervention group understood the existence of risks and how to behave in specific situations in order not to be exposed to risks. On the contrary, the control group, with respect to knowledge of the existence of risks and its behavior, did not change at all.

#### 4. Discussion

From the literature review it became clear that injuries of individuals aged 1-24 years are a very important issue, since they are the leading cause of morbidity and mortality in these ages, and a major cause of ill health (Kendrick et al., 2013; Orton et al., 2016; UNICEF, 2013; WHO, 2008). Disabled children, indeed, have higher injury rates than non-disabled children out of school, as well as in the school environment (Ohito et al., 1992; Ramirez et al., 2004; Snyder, Hoffman, 2001; Woring, 1995).

In agreement, from the results of the present research it was found out that the highest percentage of the students with special needs, who participated in the present research either in the control group or in the intervention group, had previously been exposed to injuries from accidents (70 %). According to the students, their latest injury occurred at home (57.1 %), at school (28.60 %) or/and on the road (14.30 %), percentages that are in accordance with the statistics of Hellenic Ministry of Health and Welfare (2002). Thus, it could be said that child accidents can happen anytime and anywhere, including at home, at school, on the street, as well as the playground (Vrynas, 2010).

Moreover, from the injuries in the school, the highest percentage (38.60 %) occurred in the school play yard, in the corridor (32.80 %), at the entrance (14.40 %), and during laboratory courses, as well as physical education lessons (14.20 %). Indeed, in Greece, school play yard considered the most dangerous injuries area (45.52 %), in conjunction with accidents occurring in the corridor and stairs (8.95 %), while the most serious accidents occur during the breaks (60.17 %) and physical education lessons (10.57 %) (Georgiakodis, Vozikis, 2004). In agreement, surveys in schools of Sweden and Poland, showed that the largest number of school injuries happen during breaks and physical education lessons (Hammarström, Janlert, 1994; Schelp et al., 1991; Sosnowska, Kostka, 2003). In addition, Petridou et al. (2003) in their research found that 21.9 % of the disabled group referred that their accident was caused during the courses.

For the sample of the present research, the most common injury in school is the open wound (42.90 %), sprain (30.60 %), fracture (14.20 %) and bruises (12.30 %). Similar percentages with respect to the kind of injury reported, also, in their research Petridou et al. (2003) in students with disabilities. Moreover, a survey in schools in Alexandria of Egypt showed that fractures account for 23 % of school injuries (Kamel et al., 1998). In addition, according to the students of the present research the cause of the injury was mainly their own carelessness (47.80 %), the carelessness of the other students, (31.60 %) and playing with other children at school (20.60 %). In agreement, Petridou et al. (2003) recorded that most students with disabilities are injured while playing with their peers (66.9 %). Thus, aggressiveness, impulsivity and hyperactivity that children often exhibit have been found to be important factors in child injuries (Bijur et al., 1986).

Therefore, facing the important issue of child injuries, it is understood that strategies to prevent and cope with accidents and injuries are required (Zamani et al., 2007). In addition, a meta-analysis of Shi et al. (2015) on unintentional injuries in children with disabilities concluded that injury prevention among children with disabilities, both unintentional and intentional injury, merits attention in the injury prevention field. In agreement, in a research in the province of Rockland, New York, where an injury prevention program was implemented in children for three years, a large decrease in injuries was observed during the second half of the educational/training phase (Schlesinger et al., 1966).

Successful strategies, of course, require the study of incidents or knowledge of what injuries occur, to whom, where, how, when and why (Zamani et al., 2007). That is exactly what has been implemented with the health education program for the prevention of injuries in the present study. Thus, with the intervention of the health education program for the prevention of injuries safety

skills, behavior/practices and knowledge about the injuries of the students with special needs, of the present research who were involved in the project, have been achieved.

So, as a result of their participation in the health education program for the prevention of injuries, the students acquired knowledge regarding possible dangers when they are not careful, understood that they should not run at the school grounds, push others, walk and/or run on wet floor. In addition, they learned how to use the household electrical appliances and cleaning agents properly and with safety, and that they must be careful for themselves but also for their classmates in order to prevent injuries. On the contrary, the students of the control group did not change at all their knowledge, nor their attitude and behaviour toward injuries.

In agreement with the present results, statistically significant changes in children's behavior and attitudes towards safety was reported after oral presentation programs at school, covering a wide range of injury prevention areas on the road, at home and outdoors (Azeredo, Stephens-Stidham, 2003; Pearson et al., 2012). Moreover, statistically significant changes in children's playground safety attitudes were also reported following programs that used an oral presentation and activities to focus on particular aspects of risky playground behavior and by using a video about risky playground behavior that was designed to evoke fear (Morrongiello, Matheis, 2007; Morrongiello, Mark, 2008; Pearson et al., 2012).

Thus, it could be said that school-based educational programs for the prevention of injuries could improve safety skills, behavior/practices and knowledge in children and young people without (Orton et al., 2016) or with special needs and disabilities. It should therefore be noted that most schools could benefit from the application of school programs that include preventing injuries and accidents, according to a research in adolescent students in Louisiana (Louisiana Public Health Institute, 2011). In agreement, from the results of the present study it was concluded that the effect of the participation in the health education program for injury prevention was very important, as students with special needs who participated in the program understood the existence of risks and how to act and behave in certain situations, in order not to expose themselves and their peers to risks and to prevent injuries. Consequently, the present study reveals the worth of school-based health educational programs for the prevention of injuries in students with special needs.

## 5. Conclusion

From the present research derived the following conclusions:

- The application and implementation of health education programs for the prevention of injuries may help as for the very important issue of injuries in students with special needs.
- The participation of the students with special needs in health education programs regarding the prevention of injuries leads to the improvement of the knowledge in relation to injuries, as well as the modification of the observed attitudes and behaviour, and thus to injuries' decrease and avoidance.
- Education in health and safety should be a permanent module taught at school-based programs, especially for students with special needs.
- Future research should focus on the implementation of educational programs regarding the prevention of accidents, in parents and people working with pupils with special needs outside the school.

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