

# Effect of first aid training on teams from special education schools

*Efeito de capacitação sobre primeiros socorros em acidentes para equipes de escolas de ensino especializado*

*Efecto de la capacitación sobre primeros auxilios en accidentes para los equipos de escuelas de enseñanza especializada*

**Jackeline Gonçalves Brito<sup>1</sup>**

ORCID: 0000-0003-0943-2910

**Inês Pereira de Oliveira<sup>1</sup>**

ORCID: 0000-0003-3777-7991

**Christine Baccarat de Godoy<sup>1</sup>**

ORCID: 0000-0002-9397-9400

**Ana Paula dos Santos Jesus Marques França<sup>2</sup>**

ORCID: 0000-0002-9252-5917

<sup>1</sup> Universidade Federal de Mato Grosso. Cuiabá,  
Mato Grosso, Brazil.

<sup>2</sup> Escola Superior de Enfermagem do Porto. Porto, Portugal.

## How to cite this article:

Brito JG, Oliveira IP, Godoy CB, França APSJM. Effect of first aid training on teams from special education schools. Rev Bras Enferm. 2020;73(2):e20180288. doi: <http://dx.doi.org/10.1590/0034-7167-2018-0288>

## Corresponding Author:

Jackeline Gonçalves Brito

E-mail: [jackeline\\_brito@hotmail.com](mailto:jackeline_brito@hotmail.com)



EDITOR IN CHIEF: Dulce Aparecida Barbosa

ASSOCIATE EDITOR: Margarida Vieira

**Submission:** 04-09-2018

**Approval:** 09-12-2018

## ABSTRACT

**Objectives:** Analyze the effect of first aid training on the knowledge of multidisciplinary teams from special education schools, in school accidents. **Methods:** A quasi-experimental, before-and-after study with a single comparison group. Descriptive statistics and McNemar's test were used to evaluate the effect of the intervention. **Results:** This study had the participation of 162 higher education professionals, predominantly teachers (82.1%), female (97.5%), aged over 40 (69.2%). An increase in correct answers was observed, with statistical significance ( $\leq 0.05$ ), especially in proper handling in case of fall with traumatic brain injury, electric shock, and burn due to hot liquid (98.1%, 98.1% and 96.9% of proper response, respectively). **Conclusions:** First aid training for child accidents, through content exhibition, in a dialogical and practical way, proved to be efficient for multidisciplinary teams from special education schools for people with disabilities.

**Descriptors:** First Aid; Accidents; Training; People with Disabilities; Special Education

## RESUMO

**Objetivos:** Analisar o efeito de uma capacitação no conhecimento da equipe multidisciplinar de escolas de ensino especializado sobre primeiros socorros diante de acidentes escolares. **Métodos:** Estudo quase experimental do tipo antes e depois com grupo único de comparação. Realizou-se estatística descritiva e teste de McNemar para avaliar o efeito da intervenção. **Resultados:** Participaram 162 profissionais de nível superior, predominantemente professores (82,1%). Sexo e faixa etária preponderante foram, respectivamente, feminino (97,5%) e idade acima de 40 anos (69,2%). Houve aumento de acerto em todas as questões abordadas com significância estatística ( $\leq 0,05$ ). Destacam-se o correto manejo diante de queda com traumatismo craniano encefálico, choque elétrico e queimadura por líquido quente (respectivamente: 98,1%, 98,1% e 96,9% de acertos). **Conclusões:** A capacitação sobre primeiros socorros diante de acidentes, por meio de exposição de conteúdo de forma dialogada e prática, se mostrou eficiente para a equipe multidisciplinar de escolas de ensino especializado para pessoas com deficiência.

**Descritores:** Primeiros Socorros; Acidentes; Capacitação; Pessoas com Deficiência; Educação Especial.

## RESUMEN

**Objetivos:** Evaluar el efecto de la capacitación sobre los primeros auxilios ante accidentes escolares en el conocimiento del equipo multidisciplinario de escuelas de enseñanza especializada. **Métodos:** Estudio cuasiexperimental con análisis antes y después de un único grupo de comparación. Se realizaron la estadística descriptiva y la prueba de McNemar para evaluar el efecto de la intervención. **Resultados:** Participaron 162 profesionales de nivel superior, principalmente profesores (82,1%). El sexo y el grupo de edad predominantes fueron el femenino (97,5%) y la edad superior a 40 años (69,2%). Se observó un incremento de aciertos con significancia estadística en todas las cuestiones abordadas ( $\leq 0,05$ ). Se destacan el manejo correcto ante la caída con traumatismo craneal encefálico, el choque eléctrico y la quemadura por líquido caliente (con un 98,1%, un 98,1% y un 96,9% de aciertos, respectivamente). **Conclusiones:** La capacitación sobre primeros auxilios ante accidentes, por medio de exposición de contenido de forma dialogada y práctica, fue eficaz para el equipo multidisciplinario de escuelas de enseñanza especializada para personas con discapacidad.

**Descriptores:** Primeros Auxilios; Accidentes; Capacitación; Personas con Discapacidad; Educación Especial.

## INTRODUCTION

First aid procedures can be performed by any person, not necessarily a health professional, to help people in life-threatening conditions and maintain vital functions, avoiding aggravation of their health condition<sup>(1-2)</sup>. Circumstances requiring first aid procedures are common in schools, especially in early childhood education, and the lack of first aid knowledge can lead to many problems, such as failure to provide help and improper handling of victims, resulting in aggravation of the situation or unnecessary request of emergency services<sup>(1-2)</sup>.

Special education school for people with disabilities aims to "complement or supplement training to students by offering services, accessibility resources and strategies that eliminate obstacles to their active participation in society and learning development."<sup>(3)</sup>

It should be noted that a many children, adolescents and young people with disabilities spend most of the day in these institutions and, therefore, the professionals who work in them, including teachers, are often the first to witness situations that require first aid procedures<sup>(4-5)</sup>. Therefore, not only the teachers, but also the whole multidisciplinary team of the school, must be able to properly perform first aid procedures until health professionals arrive at the school.

Among the situations that require first aid, accidents are the most common among children and adolescents, and the most frequent accidents are fall, traumatic brain injury (TBI), trauma with dental avulsion, burn, electric shock, and obstruction of airways by a foreign body, among others<sup>(6-7)</sup>. These events are defined as "unintentional and avoidable" injuries and, therefore, can be predicted and prevented with the implementation of safety measures<sup>(8)</sup>.

Studies comparing accidents among children and adolescents with and without disabilities have demonstrated similar causes of accidents: falls and mechanical forces represent the most prevalent accidents in both groups<sup>(9-10)</sup>. However, the risk for these events varies according to one's disability. Children with physical, cognitive, auditory, visual and multiple disabilities present greater risks of accidental injuries than their peers, and children with multiple and cognitive disabilities present the most serious injuries<sup>(11-12)</sup>.

Regarding the accident environment, school is one of the main scenarios of accidents involving children; some authors report children, adolescents and young people with disabilities present greater risk than their peers due to their greater vulnerability, changes in neuropsychomotor development, and inability to predict and avoid situations of risk<sup>(9,13-16)</sup>.

Considering the above, schools must have people that can properly provide immediate care to students, which justifies the need to implement measures to promote and prevent health in schools, aiming to reduce the number of accidents and promote training so that first aid procedures can be properly performed<sup>(17)</sup>.

These activities are aligned with the Health in School Program (PSE) of the Ministry of Health in partnership with the Ministry of Education, whose purpose is to promote health in schools – one of its goals is: "reduce morbidity and mortality due to accidents and violence" through health promotion and prevention activities in schools –, and the National Policy for the Reduction of Morbidity and Mortality due to Accidents and Violence<sup>(8,18)</sup>.

## OBJECTIVES

Analyze the effect of first aid training on the knowledge of multidisciplinary teams from special education schools, in school accidents.

## METHODS

### Ethical aspects

In compliance with Resolution nº 466 of December 12, 2012 of the National Health Council, this study was approved by the Research Ethics Committee of Hospital Universitário Júlio Muller; all schools provided a written authorization and the participants signed an informed consent form (ICF).

### Study design, site and period

This is a quasi-experimental before-and-after study with a single comparison group, conducted in seven special education schools for children, adolescents and young people with disabilities, located in the cities of Cuiabá and Várzea Grande, both in Mato Grosso. These institutions have children aged six months (for early stimulation) and older, including children and adolescents at school age, and young adults (basic education for youth and adults – EJA). Data collection was performed from February to August 2017.

### Study population; inclusion and exclusion criteria

Cuiabá, the capital of Mato Grosso, has eight special education institutions: five public and three philanthropic institutions. Várzea Grande has two public institutions, one for children under 12 years and one for adolescents and adults. All these institutions were invited to participate in this study; seven of them accepted (six in Cuiabá and one in Várzea Grande) and scheduled a day to receive the training. A total of 162 higher education professionals participated in this study, who were part of the multidisciplinary team of the schools: teachers, principals, coordinators (pedagogues who performed these functions), speech therapists, social workers, psychologists and physical therapists participated in the study.

Inclusion criteria: be a higher education professional and be part of the multidisciplinary team of the special education schools.

Exclusion criteria: fail to conclude the training and be unable to participate in the educational activity due to leave, vacation or other reasons.

### Study protocol

The questionnaire used in this study to evaluate the knowledge of school professionals was developed by the Projeto Creche Segura (PCS) team. PCS is a company with many years of experience in first aid training, health promotion and accident prevention, focused on the health of children and adolescents and the school environment<sup>(19)</sup>. Accident-related topics covered in the questionnaire are reviewed on an annual basis and selected from studies about the most frequent accidents in schools involving children and adolescents.

Some adaptations were made to the questionnaire, with the approval of the PCS coordination team. Then, this study used a semi-structured questionnaire with eight closed-ended questions

and one open-ended question, in an understandable language, containing the following variables: 1) child fall in a school environment with head trauma; 2) child having a seizure; 3) trauma with tooth loss; 4) baby in a choking situation; 5) older child or adolescent in choking situation; 6) steps to perform when a child/adolescent is not reacting, has no pulse and is not breathing (cardiorespiratory arrest situation); 7) electric shock in school environment; 8) burn due to hot liquid (scald caused by hot tea served in class break) in school environment; and an open-ended question about the emergency service number.

As previously scheduled and authorized by the institutions, seven training sessions were held, one in each institution participating in the study. Each training session lasted between 3:30 hours to 4 hours. Before starting, the ICF was read in a loud voice to the participants, their doubts were answered, and two counterparts of the ICF were handed to the participants (15-20 minutes). Participants were informed that even if they did not want to participate in the study, they would be allowed to participate in the training, and in this case, they would not have to answer and submit the knowledge assessment questionnaire. However, they all agreed to participate in the study.

The participants had 25 minutes to answer the pre-training questionnaire, under the supervision of the researchers. Then, the training started with a presentation about the content (average duration of 90 minutes); the content was about prevention of different types of accidents in school environment, emergency service telephone, child to help a child after a fall, TBI, seizure, electric shock, trauma with dental avulsion, burn, airway obstruction, and cardiorespiratory arrest.

After the initial presentation with doubts answered, the second part of the training was a practical activity. Pediatric and adult simulation manikins were used for each participant to perform airway clearance and cardiopulmonary resuscitation (CPR) procedures under the supervision of the researchers. This second part of the training had an average duration of 30-50 minutes and varied according to the number of participants. Finally, the post-test assessment questionnaire was handed to the participants, who had 25 minutes to answer it, under the same conditions as the pre-training evaluation.

### Analysis of results and statistics

Data were analyzed using the IBM Statistical Package for Social Sciences (SPSS), version 24. Descriptive and inferential statistics were used to describe the characteristics of the study population, and the effect of the educational activity was analyzed through McNemar's non-parametric test (paired sample and nominal data); significant results were  $\leq 0.05$ .

Samples obtained before and after the intervention were paired; the answers were dichotomized as 'right' or 'wrong'. All variables were tested using McNemar's test to check for any difference between the groups before and after the intervention and evaluate the probability of changes in the answers.

### RESULTS

This study had the participation of 162 higher education professionals from the multidisciplinary teams of seven schools.

The participants aged 22 to 66 years, mean age was 44.87 years (standard deviation 10.23).

The schools with the largest number of participants were: School G (22.2%) followed by School D (21.6%). Predominant sex of participants was female (97.5%) and predominant age groups were 40-49 years (34.6%) and over 50 (34.6%). The multidisciplinary team is mostly comprised of teachers (82.1%) (Table 1).

Table 2 shows that more than half of the participants had no prior training on accident prevention and first aid for children (56.8%). Most of those with a prior educational activity in this aspect had received it more than two years before (68.5%).

Figures 1 and 2 show the number of correct and wrong answers, before and after the educational activity. An increase of answers with statistical significance was observed after the training (McNemar test = 0.000 in all questions).

**Table 1** – Profile of multidisciplinary teams from special education institutions: school identification, sex, age and occupation, Cuiabá, Mato Grosso, Brazil, 2017

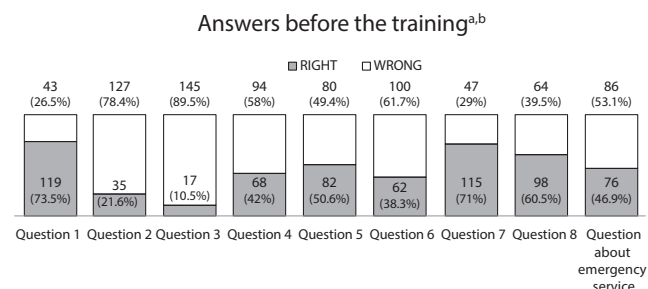
	n	%
Special education school		
School A	18	11.1
School B	22	13.6
School C	16	9.9
School D	35	21.6
School E	10	6.2
School F	25	15.4
School G	36	22.2
Total	162	100
Sex of participants		
Female	158	97.5
Male	4	2.5
Total	162	100
Age of participants		
Under 30	11	6.8
30 to 39	39	24
40 to 49	56	34.6
Over 50	56	34.6
Total	162	100
Occupation		
Teacher	133	82.1
Principal/coordinator	14	8.6
Social worker	5	3.1
Physical therapist	4	2.4
Psychologist	3	1.9
Speech therapist	3	1.9
Total	162	100

**Table 2** – Prior accident prevention and first aid training for children of multidisciplinary teams from special education institutions, Cuiabá, Mato Grosso, Brazil, 2017

	n	%
Have you ever participated in a first aid and accident prevention training for children?		
Yes	92	56.8
No	70	43.2
Total	162	100
If yes, when was it?		
Less than 6 months ago	2	2.2
6 months to 1 year ago	6	6.5
1 to 2 years ago	21	22.8
2 to 5 years ago	28	30.4
More than 5 years ago	35	38.1
Total	92	100

Before the training, Question 3 had the highest number of wrong answers, which was related to first aid procedures for trauma with dental avulsion (89.5% wrong answers) (Figure 1).

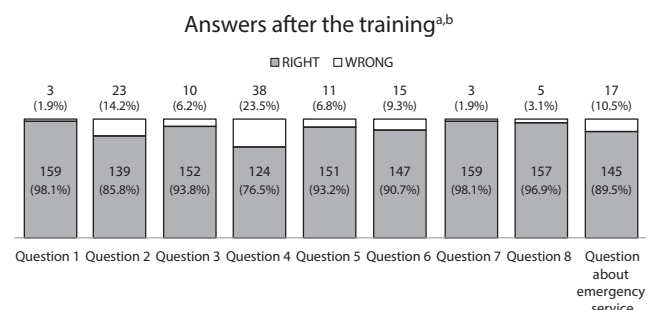
After the training, all questions presented more correct answers with statistical significance, particularly Question 1, which was about proper handling in case of child fall with traumatic brain injury (98.1% correct answers); Question 7, about electric shock in school environment (98.1% correct answers); and Question 8, which addressed burn due to hot liquid (scald) (96.9% correct answers) (Figure 2).



<sup>a</sup>Themes of the questions: 1) child fall in school environment with head trauma; 2) child having a seizure; 3) trauma with tooth loss; 4) baby in a choking situation; 5) older child or adolescent in a choking situation; 6) steps to perform when a child/adolescent is not reacting, has no pulse and is not breathing (cardiorespiratory arrest situation); 7) electric shock in school environment; 8) burn due to hot liquid; and an open-ended question about the emergency service number.

<sup>b</sup>Results of McNemar's test: Question 1 = 0.000; Question 2 = 0.000; Question 3 = 0.000; Question 4 = 0.000; Question 5 = 0.000; Question 6 = 0.000; Question 7 = 0.000; Question 8 = 0.000; Question about emergency service = 0.000.

**Figure 1** - Knowledge about first aid procedures in accidents of multidisciplinary teams from special education schools before the training. Cuiabá, Mato Grosso, Brazil, 2017



<sup>a</sup>Themes of the questions: 1) child fall in school environment with head trauma; 2) child having a seizure; 3) trauma with tooth loss; 4) baby in a choking situation; 5) older child or adolescent in a choking situation; 6) steps to perform when a child/adolescent is not reacting, has no pulse and is not breathing (cardiorespiratory arrest situation); 7) electric shock in school environment; 8) burn due to hot liquid; and an open-ended question about the emergency service number.

<sup>b</sup>Results of McNemar's test: Question 1 = 0.000; Question 2 = 0.000; Question 3 = 0.000; Question 4 = 0.000; Question 5 = 0.000; Question 6 = 0.000; Question 7 = 0.000; Question 8 = 0.000; Question about emergency service = 0.000.

**Figure 2** - Knowledge about first aid procedures in accidents of multidisciplinary teams from special education schools after the training, Cuiabá, Mato Grosso, Brazil, 2017

## DISCUSSION

The multidisciplinary team of the schools that participated in the study was comprised of teachers, physical therapists, speech therapists, social workers, psychologists, principals and teaching coordinators. The age group of participants was similar to that of a study conducted in Palestine, which reported 40% of teachers over 40 years old<sup>(20)</sup> and a study conducted in Mangalore (south

region of India), which had 69% of participants over 40 years and mean age of 39.3 years<sup>(21)</sup>.

Female participants prevailed, in agreement with other studies<sup>(4,5,21-22)</sup>. This finding can be associated with the role played by the participants, who are mostly early childhood teachers, an activity that is mostly performed by women<sup>(23)</sup>.

The most prevalent occupation of participants was teacher, which is aligned with another study<sup>(4)</sup>, showing this occupation has the highest number of professionals in the school environment. Not all schools had a complete multidisciplinary team, and they had no nurse, because this role is not mandatory in special education. Professionals of the technical team (medium and technical level) were included in a different training and the results were analyzed separately.

One suggestion is to include a nurse in the school environment, since this role is critical for health promotion and disease prevention. By observing the school routine, actions can be developed to solve any issue reported and train teachers and staff on different topics, including accident prevention and first aid, and strengthen the social relationship between education and health professionals, as proposed in the PSE<sup>(18,24)</sup>.

Other studies<sup>(4,20-21)</sup> also reported a significant number of professionals without prior training on accident prevention and first aid, which shows the need to develop these activities for the population. This study also suggests mandatory inclusion of this content from early childhood education, as already seen in many countries<sup>(25-27)</sup>, to basic education, high school and higher education, particularly in teacher training.

Other studies have also demonstrated that educational activities on first aid for teachers present a statistically significant result, with immediate expansion of knowledge about the theme<sup>(4,17,28)</sup>. A study conducted in China evaluated an immediate expansion of knowledge, and even six months, nine months and four years after the training, although the number of correct answers declined, teachers still presented correct answers with statistical significance in the tests, confirming the training is effective in the short and long terms, promoting significant knowledge about safety of children, adolescents and young people in the school environment<sup>(17)</sup>.

Children, adolescents and young people with disabilities present greater risks for accidents in school environments than their peers<sup>(10,29-30)</sup>. In case of fall with TBI, this risk is even higher among children with multiple and physical disabilities when compared to children with cognitive disabilities<sup>(31)</sup>.

Falls with TBI may result in paraplegia, and inadequate first aid procedures can cause spinal cord injury and change an incomplete cut into a complete cut, resulting in permanent neurological damage. In this situation, the victim should be moved accordingly, maintaining correct immobilization<sup>(5)</sup>. Then, it was very important to discuss how to perform the first aid procedure in this situation.

A study conducted in Nigeria also reported a lack of prior knowledge of teachers about how to help students with seizure, with statistical significance in expanded knowledge after the educational activity<sup>(28)</sup>. Seizures are very common in childhood and among children with cerebral palsy or multiple disabilities. Because a child spends many hours of the day at school, the teacher is very likely to witness a seizure and needs to know how to act in this situation<sup>(32)</sup>.



Before the training – and aligned with other studies – most teachers believed they should place a spoon or another object in the child's mouth to prevent tongue biting or rolling and that they should mobilize the child to prevent body movements<sup>(32-33)</sup>. After the training, an increase was observed in the number of correct answers with statistical significance, which demonstrates assimilation of knowledge regarding the correct procedure: remain with the child or adolescent all the time, prevent the victim from falling and head trauma by padding it, place dangerous objects away, do not interfere during the seizure, place the victim on his/her side, and time the seizure<sup>(1,34)</sup>.

In this study, the question with the greatest number of wrong answer addressed the correct handling in case of trauma with dental avulsion, showing lack of knowledge regarding this subject, in alignment with studies conducted in Matura, India<sup>(35)</sup>, and Khartoum, Sudan<sup>(36)</sup>. After the training, expanded knowledge was observed, with statistical significance, in agreement with other studies that performed an educational intervention and demonstrated the importance of a training on this theme<sup>(37-38)</sup>.

The prognosis of dental trauma depends on the correct handling immediately after the injury, which is usually performed by the teachers nearby at the time of the accident<sup>(36)</sup>. When a tooth avulsion occurs, the tooth should be stored in cold milk, because it has excellent osmolarity and ideal pH for tooth conservation for up to three hours, which is enough for the child to receive dental care. Dental trauma most often affects the central incisors and can lead to a loss of function, as well as a negative impact on quality of life, discomfort when smiling, psychological suffering and low self-esteem, so immediate implantation of broken or lost tooth is very important<sup>(36-37)</sup>.

Before the training, poor knowledge was found regarding airway clearance procedures in infants and older children/adolescents, in agreement with studies conducted with teachers in Turkey<sup>(5)</sup> and India<sup>(21)</sup>. Teachers and other team members must know how to perform the Heimlich maneuver properly, because in case of a foreign body or choking in the school environment, they are the only witness and source of help for the student.

Other studies<sup>(4,17)</sup> also reported statistical significance in CPR procedure knowledge. In this study, the practical activity was essential for content learning and assimilation, so training should be regularly provided for updated knowledge.

Proper handling in situations of electric shock also received a high number of correct answers after the training, so the following information should be highlighted: first the power source should be disconnected before touching the victim; when the power is off, the victim should be evaluated, who may need CPR; and all victims of electrical shock require medical evaluation because the extent of the injury may not be apparent<sup>(1)</sup>.

One study conducted in Egypt<sup>(39)</sup> and one in China<sup>(17)</sup> also showed poor knowledge before an educational intervention on first aid in case of scald, and then correct answers with statistical significance after the intervention. In Isparta, only 32.7% of teachers knew how to properly perform this procedure<sup>(5)</sup>.

In this study, a significant number of participants would use an ointment, toothpaste or other products on burned skin, or simply would not do anything until medical care. The correct procedure would be to cool the affected area for about 15 minutes with cold running water, as cooling reduces pain, edema and depth of injury<sup>(1)</sup>.

Other studies also showed a considerable number of teachers and other employees who did not know the emergency number<sup>(5,21,40)</sup>, so it is important to disseminate this information and explain when this service should be contacted.

### Study limitations

One limitation of this study refers to the limited availability of educational institutions in finding one day in their school calendar so that teachers and employees could participate in the training. It would be extremely important to continue this action and perform this evaluation constantly. These activities should be encouraged and included in the academic planning of educational institutions to promote an interface between healthcare and education.

### Contributions to nursing, healthcare or public policy

This study is aligned with the objectives of public health policies for the prevention of accidents among children, adolescents and young people, contributing to the reduction of injuries by promoting accident prevention and first aid knowledge in case of accidents.

It also encourages nursing practices in the school environment, promoting education and health in the community, providing care by means of a training to teachers and staff from special schools for children, adolescents and young people with disabilities, promoting safety as it ensures prevention and proper first aid procedures, and avoiding actions that could aggravate the health status of this population.

### CONCLUSIONS

This study observed poor knowledge of multidisciplinary teams from special education schools for children, adolescents and young people with disabilities about first aid procedures in case of school accidents. A training session was provided including content presentation and a practical activity, which efficiently promoted knowledge about the subject, with increase in the number of correct answers immediately after the intervention, with statistical significance.

This study suggests that some days of the academic calendar should be reserved for staff trainings, with the school management working with the health team of the Family Health Strategy so these actions can be continuous, aligned with the PSE and the National Policy for the Reduction of Morbidity and Mortality due to Accidents and Violence.

### ACKNOWLEDGEMENT

We would like to thank the Coordination for the Improvement of Higher Education Personnel (CAPES) for the doctoral scholarship to one of the investigators, and the National Council for Scientific and Technological Development (CNPq) for the scientific initiation scholarship to the nursing graduate from Universidade Federal do Mato Grosso (UFMT). In addition, we would like to thank Programa Creche Segura team for providing the first aid knowledge assessment questionnaire.

## REFERENCES

1. Markenson D, Ferguson JD, Chameides L, Cassan P, Chung KL, Epstein J, et al. Part 17: first aid: 2010 American Heart Association and American Red Cross Guidelines for First Aid. *Circulation*. 2010;122(18 Suppl 3):S934-46. doi: 10.1161/circulationaha.110.971168
2. Fundação Oswaldo Cruz (Fiocruz). Manual de Primeiros Socorros [Internet]. Rio de Janeiro: Fiocruz; 2003 [cited 2019 Apr 03]. Available from: <http://www.fiocruz.br/biosseguranca/Bis/manuais/biosseguranca/manualdeprimeirosocorros.pdf>
3. Ministério da Educação (BR). Resolução nº 4, de 2 de outubro de 2009. Institui Diretrizes Operacionais para o Atendimento Educacional Especializado na Educação Básica, modalidade Educação Especial [Internet]. Diário Oficial da União, 2009 Oct 05. Brasília: Ministério da Educação; 2009 [cited 2019 Apr 03]. Available from: [http://portal.mec.gov.br/dmdocuments/rceb004\\_09.pdf](http://portal.mec.gov.br/dmdocuments/rceb004_09.pdf)
4. Calandrim LF, Santos AB, Oliveira LR, Massaro LG, Vedovato CA, Boaventura AP. First aid at school: teacher and staff training. *Rev Rene*. 2017;18(3):292-9. doi: 10.15253/2175-6783.2017000300002
5. Sönmez Y, Uskun E, Pehlivan A. Knowledge levels of pre-school teachers related with basic first-aid practices, Isparta sample. *Turk Pediatr Ars*. 2014;49(3):238-46. doi: 10.5152/tpa.2014.1581
6. Sethi D, Towner E, Vincenten J, Segui-Gomez M, Racioppi F. European report on child injury prevention [Internet]. Copenhagen: World Health Organization; 2008 [cited 2019 Apr 03]. Available from: <https://apps.who.int/iris/bitstream/handle/10665/326500/9789289042956-eng.pdf>
7. World Health Organization (WHO). World report on child injury prevention [Internet]. Geneva: WHO; 2008 [cited 2019 Apr 03]. Available from: [https://apps.who.int/iris/bitstream/handle/10665/43851/9789241563574\\_eng.pdf?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/43851/9789241563574_eng.pdf?sequence=1)
8. Ministério da Saúde (BR). Portaria MS/GM nº 737, de 16 de maio de 2001 [Internet]. Diário Oficial da União. 2001 May 18. Brasília: Ministério da Saúde; 2001 [cited 2019 Apr 03]. Available from: [http://bvsms.saude.gov.br/bvs/saudelegis/gm/2001/prt0737\\_16\\_05\\_2001.html](http://bvsms.saude.gov.br/bvs/saudelegis/gm/2001/prt0737_16_05_2001.html)
9. Brenner RA, Taneja GS, Schroeder TJ, Trumble AC, Moyer PM, Louis GMB. Unintentional injuries among youth with developmental disabilities in the United States, 2006-2007. *Int J Inj Contr Saf Promot*. 2013;20(3):259-65. doi: 10.1080/17457300.2012.696662
10. Petridou E, Kedikoglou S, Andrie E, Farmakakis T, Tsigas A, Angelopoulos M, et al. Injuries among disabled children: a study from Greece. *Inj Prev*. 2003;9(3):226-30. doi: 10.1136/ip.9.3.226
11. Sinclair SA, Xiang H. Injuries among US children with different types of disabilities. *Am J Public Health*. 2008;98(8):1510-6. doi: 10.2105/AJPH.2006.097097
12. Xiang H, Wheeler KK, Stallones L. Disability status: a risk factor in injury epidemiologic research. *Ann Epidemiol*. 2014;24(1):8-16. doi: 10.1016/j.annepidem.2013.10.014
13. Shi X, Shi J, Wheeler KK, Stallones L, Ameratunga S, Shakespeare T, et al. Unintentional injuries in children with disabilities: a systematic review and meta-analysis. *Inj Epidemiol*. 2015;2(1):21. doi: 10.1186/s40621-015-0053-4
14. Ramirez M, Fillmore E, Chen A, Peek-Asa C. A comparison of school injuries between children with and without disabilities. *Acad Pediatr*. 2010;10(5):317-22. doi: 10.1016/j.acap.2010.06.003
15. Bonander C, Beckman L, Janson S, Jernbro C. Injury risks in schoolchildren with attention-deficit/hyperactivity or autism spectrum disorder: Results from two school-based health surveys of 6- to 17-year-old children in Sweden. *J Safety Res*. 2016;58:49-56. doi: 10.1016/j.jsr.2016.06.004
16. Ramirez M, Peek-Asa C, Kraus J. Disability and risk of school related injury. *Inj Prev*. 2004;10(1):21-6. doi: 10.1136/ip.2003.002865
17. Li F, Sheng X, Zhang J, Jiang F, Shen X. Effects of pediatric first aid training on preschool teachers: a longitudinal cohort study in China. *BMC Pediatr*. 2014;14(1):1-8. doi: 10.1186/1471-2431-14-209
18. Ministério da Saúde (BR). Saúde na escola [Internet]. Brasília: Ministério da Saúde; 2009 [cited 2019 Apr 03] (Caderno de Atenção Básica nº 24). Available from: [http://189.28.128.100/dab/docs/publicacoes/cadernos\\_ab/abcad24.pdf](http://189.28.128.100/dab/docs/publicacoes/cadernos_ab/abcad24.pdf)
19. Projeto Creche Segura [Internet]. São Paulo; 2018 [cited 2018 Mar 17]. Available from: <http://www.crechesegura.com.br/>
20. Amro N, Qtaib M. General knowledge & attitude of first aid among schoolteacher's in Palestine. *Int J Innov Res Med Sci*. 2017;2(4):660-5. doi: 10.23958/ijirms/vol02-i4/05
21. Joseph N, Narayanan T, Bin Zakaria S, Nair AV, Belayutham L, Subramanian AM, et al. Awareness, attitudes and practices of first aid among school teachers in Mangalore, south India. *J Prim Heal Care*. 2015;7(4):274-81. Available from: <https://www.publish.csiro.au/hc/pdf/hc15274>
22. Sharma R, Kumar A, Masih S. Knowledge and practice of primary school teachers about first aid management of selected minor injuries among children. *Int J Med Public Heal*. 2014;4(4):458-62. doi: 10.4103/2230-8598.144114
23. Costa SNG, Silva JMM, Freitas BIBM, Reis AFC. Child accidents: knowledge and perception of daycare educators. *J Nurs UFPE On Line*. 2017;11(10):3845-52. doi: 10.5205/reuol.12834-30982-1-SM.1110201719
24. Rasche AS, Santos MSS. Enfermagem escolar e sua especialização: uma nova ou antiga atividade. *Rev Bras Enferm*. 2013;66(4):607-10. doi: 10.1590/S0034-71672013000400022
25. De Buck E, Van Remoortel H, Dieltjens T, Verstraeten H, Clarysse M, Moens O, et al. Evidence-based educational pathway for the integration of first aid training in school curricula. *Resuscitation*. 2015;94:8-22. doi: 10.1016/j.resuscitation.2015.06.008

26. Lukas RP, Van Aken H, Mölhoff T, Weber T, Rammert M, Wild E, et al. Kids save lives: a six-year longitudinal study of schoolchildren learning cardiopulmonary resuscitation: who should do the teaching and will the effects last? *Resuscitation*. 2016;101:35-40. doi: 10.1016/j.resuscitation.2016.01.028
27. Bollig G, Myklebust AG, Østringen K. Effects of first aid training in the kindergarten: a pilot study. *Scand J Trauma Resusc Emerg Med*. 2011;19(1):13. doi: 10.1186/1757-7241-19-13
28. Eze CN, Ebuehi OM, Brigo F, Otte WM, Igwe SC. Effect of health education on trainee teachers' knowledge, attitudes, and first aid management of epilepsy: an interventional study. *Seizure*. 2015;33:46-53. doi: 10.1016/j.seizure.2015.10.014
29. Zhu H, Xiang H, Xia X, Yang X, Li D, Stallones L, et al. Unintentional injuries among chinese children with different types and severity of disability. *Ann Epidemiol*. 2014;24(1):23-8. doi: 10.1016/j.annepidem.2013.10.015
30. Peiris-John R, Ameratunga S, Lee A, Al-Ani H, Fleming T, Clark T. Adolescents with disability report higher rates of injury but lower rates of receiving care: findings from a national school-based survey in New Zealand. *Inj Prev*. 2016;22(1):40-5. doi: 10.1136/injuryprev-2015-041636
31. Limbos MAP, Ramirez M, Park LS, Peek-Asa C, Kraus JF. Injuries to the head among children enrolled in special education. *Arch Pediatr Adolesc Med*. 2004;158(11):1057-61. doi: 10.1001/archpedi.158.11.1057
32. Elhassan MA, Alemairi AA, Amara ZM, Hamadelneel AA, Mohamed AH, Elaimeri AA. Epilepsy: knowledge, attitude, and practice among secondary school teachers in Khartoum State. *Neurol Ther*. 2017;6(2):225-35. doi: 10.1007/s40120-017-0083-7
33. Akhtar SW, Mogal Z, Ali S, Sonija AL, Iqbal Z, Ali SM, et al. Knowledge, attitude and practice of epilepsy among schoolteachers in Pakistan. *Pakistan J Neurol Sci*. 2016;11(3):220-4. doi: 10.12669/pjms.301.4307
34. Camboin FF, Fernandes LM, organizadores. *Primeiros Socorros para o ambiente escolar*. Porto Alegre: Evangraf; 2016.
35. Singh M, Ingle N, Kaur N, Yadav P. Evaluation of knowledge and attitude of school teachers about emergency management of traumatic dental injury. *J Int Soc Prev Community Dent*. 2015;5(2):108-13. doi: 10.4103/2231-0762.155735
36. Mergany NN, Ibrahim Y, Abuaffan AH. Knowledge and attitude of sudanese school health teachers regarding first aid management of dental trauma. *Dent Oral Craniofac Res*. 2016;2(2):242-6. doi: 10.15761/DOCR.1000155
37. Thabet AM, El Kerim HIA. Primarily School teachers' knowledge before and after teaching first aid measures about avulsed or broken permanent incisor among children. *IOSR J Nurs Health Care*. 2016;5(1):1-10. doi: 10.9790/1959-05170110
38. Leão BLC, Lima C, Neto JS, Perin CP, Mattos NHR. Level of knowledge on first aid care of dentoalveolar trauma and knowledge acquisition through the reading of an educational brochure. *Rev Fac Odontol Univ São Paulo*. 2017;22(2):172-6. doi: 10.5335/rfo.v22i2.7189
39. El Magrabi NM, Elwardany Aly S, Khalaf SA-R. Impact of training program regarding first aid knowledge and practices among preparatory schools' teachers at Assiut City. *J Nurs Educ Pract*. 2017;7(12):89-97. doi: 10.5430/jnep.v7n12p89
40. Slabe D, Fink R, Dolenc E, Kvas A. Knowledge of health principles among professionals in Slovenian kindergartens. *Zdr Varst*. 2016;55(3):185-94. doi: 10.1515/sjph-2016-0024