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School as a place for learning first aid

A escola como espaço para aprendizado sobre primeiros socorros

La escuela como espacio de aprendizaje sobre primeros auxilios

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Abstract: Objectives: to implement an educational strategy on first aid for students from public and private schools and to verify their knowledge before and after the educational intervention. **Method:** quantitative, descriptive, exploratory research, carried out with 48 ninth-year students. In order to verify students' knowledge, ten objective and multiple choice questions were used in a pre- and post-test. Data collection was carried out from September to December 2016, totaling six meetings. Data analysis was performed using PASW Statistics for Windows software, version 20.0. McNemar's and Chi-square tests were used. **Results:** there was a statistically significant difference between the correct answers in the post-test questions about choking ($p^2=0.008$), electric shock ($p^2=0.018$), hemorrhage ($p^2=0.004$), and cardiopulmonary arrest ($p^2=0.041$). The average of correct answers in state and private schools were, respectively, 70.0% and 85.5%. **Conclusion:** students achieved significant learning through the educational intervention, emphasizing the relevance of including first aid in the school syllabus.

Descriptors: Health promotion; Nursing; Adolescent; Health education

Resumo: Objetivos: implementar estratégia educativa sobre noções básicas de primeiros socorros com estudantes de escola pública e particular e verificar o conhecimento destes antes e após a intervenção educativa. **Método:** pesquisa quantitativa, descritiva, exploratória, realizada com 48 estudantes do nono ano. Para verificar o conhecimento, utilizaram-se dez questões objetivas e de múltipla escolha como pré e pós-teste. A coleta foi realizada de setembro a dezembro de 2016, totalizando seis encontros. Para análise utilizou-se *Software PASW Statistics for Windows*, versão 20.0, teste McNemar e Qui-quadrado.

Resultados: nas escolas, houve diferença estatisticamente significativa entre os acertos no pós-teste sobre engasgo ($p^2=0,008$), choque elétrico ($p^2=0,018$), hemorragia ($p^2=0,004$), parada cardiorrespiratória ($p^2=0,041$). Logo, a média de acertos na escola pública e privada foi, respectivamente, 70,0% e 85,5%. **Conclusão:** os estudantes obtiveram aprendizado significativo mediante intervenção educativa, ressaltando a relevância na inclusão da disciplina de primeiros socorros nas escolas.

Descritores: Promoção da saúde; Enfermagem; Adolescente; Educação em saúde

Resumen: Objetivos: implementar una estrategia educativa sobre los conceptos básicos de primeros auxilios con estudiantes de escuelas públicas y privadas y verificar sus conocimientos antes y después de la intervención educativa. **Método:** investigación exploratoria, cuantitativa, descriptiva, realizada con 48 alumnos del noveno año. Para verificar el conocimiento, se utilizaron diez preguntas objetivas y de opción múltiple como pre-test y post-test. La colección se llevó a cabo de septiembre a diciembre de

2016, totalizando seis reuniones. Para el análisis, se utilizó el software PASW Statistics para Windows, versión 20.0 y las pruebas de McNemar y Chi-cuadrado. **Resultados:** hubo una diferencia estadísticamente significativa entre las respuestas correctas en el post-test acerca de asfixia ($p^2=0.008$), descarga eléctrica ($p^2=0.018$), hemorragia ($p^2=0.004$) y paro cardiorrespiratorio ($p^2=0.041$). El número promedio de respuestas correctas en las escuelas públicas y privadas fue, respectivamente, 70.0% y 85.5%. **Conclusión:** los estudiantes obtuvieron un aprendizaje significativo a través de la intervención educativa, enfatizando la relevancia de incluir la disciplina de primeros auxilios en las escuelas. **Descriptor:** Promoción de la salud; Enfermería; Adolescente Educación en salud

Introduction

Accidents are currently responsible for a high number of emergency room visits. Accident is defined as a random event, independent of human will, caused by an external force that acts quickly, manifesting itself by bodily or mental damage; being an unexpected and unplanned event, which shows a dysfunction of the environment where it occurs.¹

Traffic accidents involving vehicles and pedestrians, drowning, fires and accidents in the work or home environment such as burns, electric shock, falls, intoxication, injuries from sharp objects, among others, are very common and can happen at any time, place and occasion. However, they most frequently occur in the home environment, such that family members and even victims themselves are the first to provide first aid or take immediate actions at the time of the accident.² Furthermore, first aid can also be necessary for patients with acute chronic illness in which the patient requires immediate intervention to avoid complications.

First aid refers to the initial emergency procedures, of lesser complexity, aiming to preserve life and prevent further harm until the person receives specialized assistance. It is based on immediate assistance to the person with health problems, including procedures that may or may not require minimal use of materials or equipment. The objectives of this service are: to preserve life; prevent sequelae or deterioration of the victim's health status; and promote recovery, until health professionals take over the care. First aid practices are always based on the fundamental principle of not causing harm to the victim.³

The procedures performed are appropriate actions, which include knowledge, being expressed in the responses given by the individuals involved in situations that require immediate action.² Certain basic first aid procedures can be performed by anyone present at the scene of an accident, while other more complex procedures should be undertaken exclusively by a medical team with the assistance of the nursing team and other qualified personnel.⁴

The role of the health professional, including nurses and first responders, in preventing a worsening of the condition is the maintenance of life until the arrival of basic or advanced life support and appropriate transportation to a health service properly hierarchized and integrated into the Unified Health System.⁵ The first attendance avoids possible complications, such as: aggravation of the clinical picture, further injuries and even death.

In various emergency situations, a layperson can also quickly recognize the fact and begin the emergency care procedure. Ensuring prompt activation of specialized emergency services, makes this person of fundamental importance for the survival of the victim. Increased survival, especially outside the hospital environment, is related to the performance of lay rescuers. A lay rescuer is defined as a person without professional training in the health field, but who can intervene in an emergency situation, thereby contributing to increased survival and reduced sequelae for the victim.³

The guidance and training of the population in relation to emergency situations is extremely necessary and should be more widespread in collective environments such as schools, companies, gyms and parks. This is verified in the cardiopulmonary arrest protocol for laypersons, which has achieved an increase in patient survival.⁶

Accidents involving children and adolescents are common within the school environment, therefore it is important for both students and staff to have adequate knowledge about the interventions that must be performed in emergency situations. This is essential because poorly performed emergency care can cause complications and further endanger the victim's health.

Consequently the importance is highlighted of training teachers and employees of public and private educational and recreational establishments regarding first aid practices. In fact, Law 13,722 of 2018 makes training in basic first aid mandatory for all educators and employees in the educational sector.⁷

In schools, students are also important multipliers, by passing on their acquired knowledge to other colleagues, employees and family members. In this context, schools have an important and growing role in disease and accident prevention as well as health promotion among children and adolescents.⁸ Nurses, in their role of professional educators, can train students to act correctly in emergency situations.

The above reinforces the importance of implementing educational strategies focussed on first aid in the school context, since there is clearly insufficient knowledge related to these practices. This motivated the present researchers to investigate the area, especially considering that according to the literature, there have been few studies carried out with an emphasis on first aid training and schoolchildren.⁷

Based on this problem, the need to investigate the following questions was identified: What is the students' knowledge about the basics of first aid? Does the realization of educational actions on this theme in schools contribute to their learning?

Thus the objective of this research is to implement an educational strategy on the basics of first aid with students from public and private schools and to verify their knowledge before and after the educational intervention.

Method

Exploratory, descriptive, quantitative study, carried out in two schools, one in the city of Acarape and the other in Fortaleza, both in the State of Ceará, from September to December 2016. Of the two schools, one was selected from the state municipal network and one from the private sector.

Students participating in the study were regularly enrolled in the day period of the ninth year of elementary school. The choice of the ninth year was intentional, as it contemplated students of approximately 15 years of age, who it was assumed would be able to understand the method to be used. All 70 students (38 in Fortaleza and 32 in Acarape) from the day period were invited to participate; of these 48 students participated in the study, 24 from public schools and 24 from private schools. Students were excluded because 13 (8 from the private school and 5 from the public school) did not deliver their parents' authorization and 9 missed some of the meetings (6 from the private school and 3 from the public school). Those students who missed any of the educational strategy meetings were excluded, 14 from Fortaleza and 8 from Acarape.

It is emphasized that before starting the intervention, the researchers confirmed with the school coordinator and ninth year teachers that these students had not received any previous training on first aid, such that there was no bias in the results.

Data collection took place in six previously scheduled meetings at the schools. In the first meeting, the students received a verbal explanation about the objectives and importance of the research and free and informed consent was obtained from both the students and their legal guardians.

In the second meeting, to assess the students' prior knowledge, a pre-test instrument was developed, based on reading and previous analysis of bibliographies on basic life support. The data collection instrument comprised ten objective multiple-choice questions, addressing first aid measures that must be taken in the

main emergency situations. The questions covered the following topics: Q1 – choking; Q2 – seizure; Q3 – fainting; Q4 – burns; Q5 - electric shock; Q6 and Q7 – hemorrhage; Q8 – intoxication; and Q9 and Q10 - cardiopulmonary arrest.

Next in meetings 3 to 6, workshops lasting one hour each were organized, focusing on the basics of first aid in the main emergency situations. Educational activities were developed by monitors graduating in nursing and auxiliary nurses who had undergone training at SAMU [Emergency Medical Assistance Service].

For the realization of the workshops, as educational strategies, demonstration classes, practical experience and videos were used, which approached subjects about first aid procedures in situations of burns, electrical shock, choking, fainting, seizures, hemorrhages, intoxication/poisoning and cardiopulmonary arrest. It is underscored that the notions of biosafety were explained and their importance for the safety of those who provide first aid, in order to avoid contamination or that they too become victims.

After approaching the theoretical content, the students participated in an immediate practical demonstration of all maneuvers on simulation mannequins. At the end of the four workshops, the post-test instrument was applied with the same questions as the pre-test instrument, in order to determine the percentage of errors and correct answers for the questions before and after the intervention and thereby evaluate the assimilation of information among the students on the theme.

The data were processed using the PASW Statistics for Windows (SPSS) software version 20.0, license number 10101131007. The comparison of the correct answers of the questions before and after the educational strategy for each school was verified using McNemar's Test. The comparison of the correct answers of the questions after the educational strategy between the two schools was also analyzed using the Chi-Square Test, to assess which school obtained more correct answers. Analyses with $p < 0.05$ were considered statistically significant.

The study was approved by the Research Ethics Committee under CAAE nº 56673216.5.0000.5576 and all ethical principles were respected according to Resolution 466/12. Students and their parents or legal guardians signed the Free and Informed Consent Form.

Results

A total of 48 students participated in the study. Their age ranged from 13 to 17 years, while the majority were 13 and 14 years old (66.6% and 75.0%, respectively). In relation to gender, there was a predominance of girls in the private (70.8%) and public schools (53.3%).

Table 1 shows that for both schools in general, the students obtained a high percentage of correct answers to the questions after the intervention, thereby demonstrating satisfactory levels of learning.

Table 1 - Ratio of the percentage of correct answers to questions before and after (pre- and post-test) the educational intervention in public and private schools. Acarape-CE, 2018.

Questions	Public					p ¹	Private					p ¹	p ²
	Before		After		Before		After						
	N	%	N	%	N		%	N	%				
Q1 Choking	14	58.3	14	58.3	1.000	20	83.3	22	91.7	0.500	0.008		
Q2 Seizure	3	12.5	24	100.0	0.000	14	58.3	22	91.7	0.039	0.149*		
Q3 Fainting	13	54.2	21	87.5	0.021	13	54.2	20	83.3	0.039	0.683		
Q4 Burns	17	70.8	22	91.7	0.125	19	79.2	22	91.7	0.250	1.000		
Q5 Electric shock	21	87.5	19	79.2	0.687	20	83.3	24	100.0	0.125	0.018		
Q6 Hemorrhage	17	70.8	6	25.0	0.013	15	62.5	16	66.7	1.000	0.004		
Q7 Hemorrhage	8	33.3	10	41.7	0.727	4	16.7	16	62.5	0.001	0.149		
Q8 Intoxication	8	33.3	18	75.0	0.006	5	20.8	20	83.3	0.000	0.477		
Q9 CPA	14	58.3	18	75.0	0.180	11	45.8	22	91.7	0.000	0.081		
Q10 CPA	9	37.5	16	66.7	0.012	4	16.7	22	91.7	0.000	0.041		

CPA cardiopulmonary arrest. p^1 : McNemar's test to compare correct answers before and after the educational intervention in each school. p^2 : Chi-square test to compare the correct answers after the intervention between the two schools. * Likelihood ratio test

As shown in Table 1, in the pre-test the questions with the lowest percentage (less than 50%) of correct answers in public schools were questions Q2 (12.5%), Q7 (33.3%), Q8 (33.3%), and Q10 (37.5%). Similarly, in the private school, the questions were Q7 (16.7%), Q8 (20.8%), Q9 (45.8%), and Q10 (16.7%). Therefore, the subjects about which the students demonstrated least knowledge were first aid procedures in situations of seizure, hemorrhage, intoxication and cardiopulmonary arrest.

In the post-test, the questions with more than 80% correct answers among public school students, were on the topics of seizure, burn and fainting, respectively: Q2 (100.0%), Q4 (91.7%), and Q3 (87.5%). In the private school, all questions in the post-test had a correct response rate above 80%, except for questions related to hemorrhage: Q6 (66.7%) and Q7 (62.5%).

Furthermore, there was a statistically significant difference between the pre- and post-test for questions Q2 ($p^1 = 0.000$), Q3 ($p^1 = 0.021$), Q6 ($p^1 = 0.013$), Q8 ($p^1 = 0.006$) and Q10 ($p^1 = 0.012$), in the public school. Among private school students, this association was observed for questions Q2 ($p^1 = 0.039$), Q3 ($p^1 = 0.039$), Q7 ($p^1 = 0.001$), Q8 ($p^1 = 0.000$), Q9 ($p^1 = 0.000$) and Q10 ($p^1 = 0.000$). This demonstrates that the educational workshops contributed to an increase in knowledge regarding first aid procedures, especially for situations involving convulsion, fainting, hemorrhage, intoxication and cardiopulmonary arrest.

Also in Table 1, the p^2 values show a comparison of the correct answers after the educational intervention between the two schools. There was a statistically significant difference between the public and private schools regarding the correct answers in the post-test for questions about first aid in situations of choking, electric shock, hemorrhage, cardiopulmonary arrest, respectively: Q1 ($p^2 = 0.008$), Q5 ($p^2 = 0.018$), Q6 ($p^2 = 0.004$) and Q10 ($p^2 = 0.041$).

In the post-test, the mean percentage of correct answers in public schools was 70.0% and in private schools it was 85.5%. It is observed that although the percentage of correct answers was higher in the private school compared to students in the public school, there was nevertheless an increase in the number of correct answers in the post-test in relation to the pre-test. This demonstrates that the public school students were able to assimilate most of the content discussed during the workshops.

Discussion

Understanding the school as a favorable environment for the formation of citizens, infers the need to work on themes related to the preservation of human safety, as related to health issues and with due regard to first aid skills. A study carried out with laypeople showed that providing them with educational activities on accident prevention and first aid, allowed participants to acquire and refresh knowledge on the subject, favoring them to become multipliers of their acquired knowledge.⁹ This reinforces the importance of having basic knowledge of proper conduct for people who could face emergency situations.

A study carried out with 46 children from 9 to 13 years old, used two different strategies to identify first aid procedures, one by means of play resources and the other only by a formal lecture. In both, pre- and post-tests were applied, verifying that the class based on ludic activity obtained a higher percentage of correct answers to the questions (87%) when compared to the group from the traditional class (37%).¹⁰ Thus the use of educational resources contributes effectively as a facilitator for teaching and learning at school.

The results of this study showed there was a significant improvement in relation to knowledge immediately after the educational workshops. It was found that in both schools there was an increase in correct answers to the questions in the post-test compared to the pre-test, thereby demonstrating the ability to acquire theoretical and practical skills, associated to its applicability in potential situations of risk that could be experienced in the school environment.

In a study that aimed to evaluate the knowledge of teachers and school staff, through theoretical and practical approaches, there was a significant increase in the percentage of correct answers after first aid training. Before the training there was a mean score of 19.43 points for skill and 2.91 points for knowledge. After training there was a statistically significant difference ($p < 0.001$) with 174.57 points for skill and 9.17 for knowledge. Consequently, there was a significant increase in the percentage of correct answers after training in first aid.⁸ Furthermore, a similar study with 110 preschool teachers, reported there was insufficient prior knowledge regarding basic first aid practices. Following the intervention the mean score for knowledge increased from 11.9 ± 2.9 to 20 points.¹¹

Circumstances that require medical attention are common in schools and teachers are often the first to be present at emergencies involving their pupils. This reinforces the importance of the role that the educational environment plays in health promotion which includes disease and accident prevention. Hence it is essential that there are people within the school environment who are trained to offer this support, such as health professionals.¹²

These training courses should be organized on a continuous basis, in which the contents are presented visually with practical demonstrations, simulation of care practices and construction of scenarios that recreate real-life situations. These methodologies favor the acquisition not only of theoretical knowledge, but also of practical skills.¹³

In the present study, it was observed from the percentage of correct answers before the educational workshops that students already had some prior knowledge constructed from common sense, acquired through interaction with the social context. Educational strategies on accident prevention and first aid in the school environment are fundamental to amplify this knowledge.

First aid education should be made widely available for the general population. It should not be restricted to health professionals or those from universities and hospitals. It provides users with greater security to resolve their health problems, while reducing their vulnerability.¹⁴

There are strategies that favor the teaching of first aid at school, such as the School Health Program and the *Samuzinho* [little emergency care services] project. The School Health Program, since 2007, stimulates the intersectoriality between health and education due to the performance of the Family Health Strategy.¹⁵ The *Samuzinho* project was conceived in 2007, by the Emergency Medical Service, of the Federal District, with the objective of raising awareness and also informing children in relation to problems caused by improper calls to the emergency number 192.¹⁶ These strategies on the theme of first aid at school contribute to health education activities, both for teachers and students.¹⁷

From this perspective, it is the responsibility of health professionals who comprise the Family Health Strategy and especially nurses, to perform the situational diagnosis of the school community regarding the subject in question. They should plan health education, implement and evaluate this activity on a holistic basis and use critical-reflective reasoning on the situations that students and/or teachers could experience.¹⁸

Conclusion

The results of this research demonstrated that educational interventions enabled students to obtain significant learning in the school environment. In addition, this study can help school management to understand the importance of including the discipline of first aid in the school curriculum starting as early as elementary school.

In future studies, it is intended to carry out such educational strategies with a greater number of students and to expand the workshops to include elementary school teachers. The school environment is conducive to the occurrence of accidents and these teachers are the first to have contact with the child, yet most do not have sufficient knowledge to perform first aid.

This study presented as a limitation the number of schools and students that participated in the research, given the realization only with ninth-year school students and the small number of meetings. Further, the elaboration of the didactic material counted on the knowledge of the teachers, using books and manuals on the theme, nevertheless it allowed the students to participate actively in the process of approaching the content and to clarify any questions in the process.

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