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The importance of life basic support training and first aid in the school setting: knowledge building in the scope of university community outreach

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Abstract: The aim of this study was to develop an educational process on First Aid (FA) and Basic Life Support (BLS) in the initial care of emergency and emergency victims in the school setting, in order to compare the previous knowledge acquired by educational actions in health carried out by students of the undergraduate program of nursing (UFMT/Sinop). A longitudinal, prospective, quantitative approach involved the training of 27 teachers from a municipal school, who answered a questionnaire before and after each training. It was demonstrated that the training promoted a significant increase in the hit rates after the training, in relation to the previous knowledge, on BLS and FA. The educational actions have achieved an excellent use, which gives the University and the academics, in the scope of extension, a very important role in the transformation of lay citizens into potential rescuers capable of providing immediate and quality assistance to the victim in urgent situations and emergency situations, both in school settings and in other out-of-hospital environments.

Keywords: Cardiopulmonary Resuscitation, First aid, School Health, Community Health Nursing.

Introduction

The school setting is often affected by accidents that can occur at any time. The moments of leisure, where students run and play, represent the main moments where recreational activities can cause accidents. This can sometimes lead to irreversible consequences if proper care is not taken. Teachers and other school officials often do not know how to proceed in emergencies. In this sense, it is necessary to instruct them about first aid (FA) in order to provide students with adequate care and even save lives (Sena, Ricas and Viana, 2008; Leite et al., 2013).

According to the World Health Organization (WHO, 2007), in developed and developing countries, accidents are among the first causes of death. These

Brazil (2003) defines the term first aid as immediate care provided to the person who is the victim of an accident or sudden illness, whose altered physical state endangers her or his life. Its objective is to maintain the vital functions of the injured and avoid worsening their conditions by means of preventive procedures until the arrival of qualified assistance. Leite et al. (2013) emphasize the agency that the population in general can have in performing initial care. Preliminary care involves evaluating the victim

data represent the number one morbidity and mortality rates among children and adolescents between 5 and 19 years old. In Brazil, from 6 to 13% of the school-age children accidents occur in educational institutions (Oliveira, 2000; Donoso and Chianca, 2002).

In view of the above, it is extremely important that schoolteachers and caregivers of children know how to act in situations of emergency. To this end, educators should know how to perform first aid, thus seeking to avoid complications arising from inadequate caregiving and ensuring better lesions prognosis (Leite et al., 2013, Pergola and Araújo, 2008).

and taking care of her or him correctly so as to reduce damage and increase survival chances. Thus, when rescuers verify an individual's sudden loss of consciousness, their first attitude should be activating medical emergency service. To this end, parents, employees, and schoolteachers must take a basic life support course in order to know how to act in the face of medical emergencies (Carvalho, 2008).

Basic Life Support (BLS) provides preliminary care to cardiovascular emergencies above all in

prehospital setting. BLS specializes in the recognition and early performance of cardiopulmonary resuscitation (CPR) maneuvers and has a focus on good quality chest compressions and quick defibrillation (Gonzales et al., 2013). The importance of BSL validates instructing lay citizens, such as schoolteachers and caregivers of children, so that they can act as potential rescuers in non-hospital

Fontana, Lima and Dutra (2009) suggest health education actions as an alternative to solve this problem. Such actions may represent a strategy to promote social responsibility of the trainers as well as an opportunity for the population to experience learning through problematization, along with social actors, in relation to the conditions that alter their health and the health of others.

The significant need to promote educational first aid training with lay citizens therefore justifies this study. With proper training, the population in general is able to perform initial care on the sick or injured person. The population's lack of knowledge often times causes complications, such as the state of panic when faced with an emergency situation. Such circumstance can consequently lead to incorrect handling of the victim besides excessive, and, sometimes, unnecessary, call for aid.

In this sense, health education can contribute to promoting the quality training of elementary schoolteachers insofar as it enables them to provide accurate immediate care in academic and out-of-hospital settings to victims of emergency situations, such as accidents, sudden illnesses, or injuries. Additionally, such education can hone the skills of the undergraduate nursing students, such as the ones involved in this project, as well as strengthen the connections between university and community.

Based on this reflection, the present study encompassed elementary schoolteachers in the municipality of Sinop, Mato Grosso, Brazil. The main objective of this study was to develop an investigative process with an educational nature about first aid and BLS in the initial care of victims in emergency situation in the school environment. The two fold purpose of the study revolves around the community and the students of the undergraduate program of nursing at UFMT. First, the study compares the previous knowledge the community held to their newly-acquired knowledge through the educational actions the students promoted. Second, the study guides the appropriate behavior and stimulates the autonomy of these professionals towards first care in emergency situations.

Methods

The present study has a longitudinal, prospective, quantitative approach, developed with teachers of the elementary school Jurandir Liberino de Mesquita of the Municipality of Sinop, Mato

environments. Pergola and Araújo (2008) suggest that a significant portion of the population, who lack specific preparation to perform first aid, rescues victims in emergency situations due to a solidarity impulse. However, the authors call attention to the fact that without the proper training such act may compromise victims' rehabilitation.

Grosso, Brazil. We carried out the field research in the second half of 2016. The main instrument for data collection was the application of a self-applicable questionnaire.

The application of the questionnaire took place during the educational actions that the students of the undergraduate program of nursing gram of the Federal University of Mato Grosso (UFMT) (University Campus of Sinop) carried out. These students participated in the project "First Aid in Schools"¹. For each educational action, the extension students designed a questionnaire with questions related to the topic addressed, under the guidance and supervision of the professors participating in the project.

First, the schoolteachers answered the questionnaire. The second stage entailed a theoretical-practical training. These educational actions began with a theoretical module on BLS, encompassing Survival Chain and CPR, with emphasis on chest compressions, use of AED, and correct position of the victim after recovery. The module is in accordance with the First Aid Manual of the Ministry of Health (Manual de Primeiros Socorros do Ministério da Saúde) (Brazil, 2003), with the 2015 American Heart Association (AHA) guidelines for cardiopulmonary resuscitation (CPR), and with the Emergency Cardiovascular Care (ECC) (AHA, 2015). The module addresses FA care regarding bleeding and injuries, burn, fractures, spinal trauma, traumatic brain injury, intoxication and stinging by venomous animal.

Second, after each theoretical module, a practical module provided the opportunity for the participants to put into practice the concepts on BLS and FA discussed previously. The practical module utilized automatic external defibrillators (AED) and dummies from the Laboratory of Hospital Practice of the Federal University of Mato Grosso. Finally, on the same day, after the theoretical and practical modules, the nursing students reassessed the schoolteachers by means of the same questionnaire. The purpose was to compare the previous knowledge to the knowledge acquired through the educational action.

¹This is a university extension project for the community which was approved and funded by the Public Notice No. 001 PBEXT ACTIONS 2016 UFMT, under protocol no. 010420162151341283.

The schoolteachers participating in the Project did so voluntarily and signed the informed consent form (TCLE). The project adopted the following inclusion criteria to select the participants: being a teacher of the Jurandir Liberino de Mesquita elementary school, being over 18 years old, female or male, accepting to voluntarily participate in the study and to sign the Informed Consent Term. On the other hand, the exclusion criteria were: teachers who had already been trained in FA and BLS or who did not voluntarily participate in the study or did not sign the Informed Consent Term. Following these criteria, 27 professionals joined the study.

We utilized the program Graphpad Prism 5.0 for the construction of the graphs and statistical analysis. All variables were tested for normality by the Shapiro-Wilk Test. Thus, when the distribution was considered normal or Gaussian, we used the parametric test Paired T-Test - One Tailed. Alternatively, in distributions considered non-Gaussian, we used the Wilcoxon non-parametric test. The observed differences were considered significant when $p < 0.05$ (5%).

Ethical principles

This research was submitted to the Ethics Committee (Research Ethics Committee of the Júlio Muller University Hospital at the Federal University of Mato Grosso) and was approved within ethical principles and current legislation, under number 58062016.2.0000.5541.

Results and Discussion

University extension as an integrative tool of teaching-research dynamics between the academic setting and the community

The mean age of the participants in the study was 39.75 (minimum of 22 years old and maximum of 64) and 88.8% were female.

The extension activities developed by the undergraduate nursing students with the teachers of the elementary school Jurandir Liberino de Mesquita of the Municipality of Sinop revealed the noteworthy need for caretakers to develop their knowledge of FA. The participants' reports indicated that accidents and risk situations involving schoolchildren are common in the school environment. The reports cited as the main risk situations falls from height, collision among children, nosebleeds, fractures and syncopes. In this scenario, the schoolteachers demonstrated great interest and participation during the activities, as they reported concern about not knowing how to act in such situations involving children in the school setting.

Both the accident situations listed by the schoolteachers as well as their interest in the educational initiative for school environments are in consonance with the School Health Program of the Ministry of Health (Brazil, 2009). Likewise, both facts

are part of the National Policy for Reducing Morbidity and Mortality by Accidents and Violence (Brasil, 2001), since students seek to promote health training at the same time that schoolteachers are enhancing their qualifications. Such actions collaborate with the policy due to their encouragement to multiply information regarding the correct behaviors to be adopted in cases of emergency in the school setting (Brasil, 2001, Brasil, 2009).

The educational actions provided an opportunity to exchange a significant amount of knowledge and experience between the academics and the schoolteachers, as the questionnaires demonstrated. Such exchange is of paramount importance to develop skills and aptitudes of the students involved in the health education process. Moreover, such actions help strengthen the bonds between university and community. In addition, the theoretical-practical methodology promoted a dynamic activity which allowed the teachers to learn the correct way and sequence of first aid care. Subsequently, it improved their knowledge as they practiced under the supervision of the students and professors involved in the extension project.

In this sense, this project had an impact on the academic formation of the nursing students and on the professional life of the schoolteachers targeted for this work. Thus, the project allowed the participants immediate application of FA knowledge in their professional lives and promoted social issues relevant to the development of Sinop by training lay people with regard to first aid.

Nardino et al. (2012) developed educational actions regarding emergency situations in the school and corporate settings in northern Rio Grande do Sul (southernmost state of Brazil). They argue that the exchange of knowledge provided by means of dialogue and dramatization was significant for the learning of both the participants and the trainers, as it allowed them to promote new ways to approach the theme by stimulating creativity and expanding their technique.

The benefits of utilizing the university extension to the community, as a tool of integration between the academia and society, through teaching and research is evident. A number of authors validate that extension actions have been favorable to students and target population, as it provides the opportunity to update knowledge, motivate them to be multipliers of that knowledge, strengthens the social commitment of the academy with society, and constructs an educational process with new horizons (Pereira et al., 2015).

This study underscores that nursing research must be understood as means of generating knowledge, since it is an instrument of growth and appreciation of nursing in society (Servo and Oliveira, 2005). The inextricability of teaching, research, and

extension activities is a fundamental process in the academic construction. This tripod makes students and educators become subjects of the act of learning. Hence, by surpassing training centered on the knowledge passed on by the educator and using active methodologies that makes students become protagonists, such practices allow the amplification of horizons and make learning more meaningful (Cezar et al., 2010). It seems crucial therefore to stimulate undergraduate students to undertake an education practice in problematizing health, focused not only on disease prevention, but also health promotion as well as healing and rehabilitation processes in all spheres of care (Fontana, Lima and Dutra, 2009).

The importance of FA and BLS educational actions in the training of lay rescuers in the school setting

The assessment of the participants' previous knowledge and their learning after the educational actions about BLS showed that they presented a low rate of accuracy in testing their BLS knowledge before the training. On the other hand, the second time answering the questionnaire demonstrated that the participants' training promoted a significant increase in their knowledge of cardiorespiratory arrest (CRA), CPR, and the sequence of care during a CRA. Regarding the correct positioning of the CRA victim during CPR, the participants had high accuracy rates both before and after the educational action (see Figure 1).

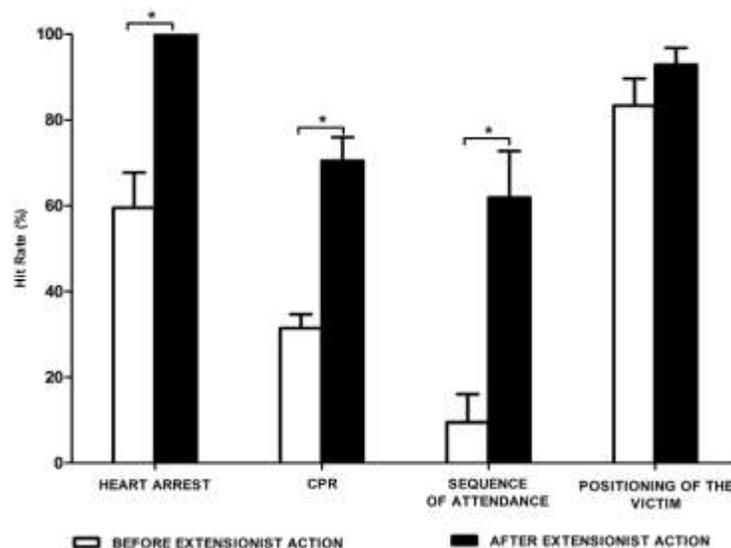


Figure 1: Average of the accuracy rates on BLS before and after the educational actions.

Confirming our results, Fernandes et al. (2014), when comparing previous knowledge and the degree of immediate learning after training in BSL, observed that before the training the target audience had insufficient knowledge about the subject. They noted however that such knowledge improved significantly after the training. These findings emphasize how educational actions on BSL can influence the knowledge of the lay population and, consequently, the adequate way of providing initial care to the CRA victim.

Pergola and Araújo (2008) aimed specifically to identify the level of information laypeople have about how to handle and position victims in emergency situations. They identified that 26% of laypeople answered this question correctly, 1% was partially accurate, 49% responded incorrectly, and 22.9% simply did not know how handle and position victims. Their results demonstrate that knowledge about the victim's positioning during CPR varies according to the population studied. Thus, this

information reinforces how much victim positioning familiarity needs to be diffused, considering that inadequate care causes negative repercussion for the victim.

Corroborating with the data seen on Figure 1, Pereira et al. (2015) evaluated the effectiveness of health education actions on the prevention of accidents and FA, by means of pre and post educational tests. They also identified an increase in the knowledge participants developed after educational actions. Moreover, their study highlights critical reflection in the construction of knowledge and points out that health education is a valid and indispensable instrument for health professionals, since it enables autonomy increase in relation to current health problems.

A study carried out by Cabral and Oliveira (2017), which aimed to investigate teachers' knowledge about first aid in schools, observed that out of 31 participants, 22 reported having experienced situations that required FA knowledge. More

specifically, such participants demonstrated limited knowledge regarding the identification and adequate conduct of CRA. Most of the participants would hypothetically choose not to move the victim and simply call the rescue service.

Other studies carried out with 385 subjects with the objective of identifying the level of information regarding how to approach victims in emergency situations at school reinforced the importance of information and adequate training of lay schoolteachers for initial assistance in emergency situations. Thus, Pergola and Araújo (2008) and Pereira et al. (2015) show that when identifying an unconscious victim, a mere 31% of the 385 subjects would call the medical service immediately, 17% did not know to recognize vital signs, and 31% did not even know telephone numbers of emergency services.

When trained laypeople are able to contribute to the rapid and correct care of basic life support in CPR situations occurring in out-of-hospital settings survival rates for the victims are maximized. Thus, training about BLS and FA and the consequent evidence of increased knowledge after these actions corroborate the attempt to associate knowledge and the best care for these victims (Pergola and Araújo, 2008, Lyra et al., 2012, Pereira et al., 2015).

In addition, our results demonstrated that the first-aid educational actions carried out by nursing undergraduate students were able to significantly increase teachers' knowledge regarding wound and bleeding issues (Figure 2A), burns (Figure 2B), fractures, traumatic brain injury (TBI) and spindle trauma (Figure 2C), intoxication, and accidents with venomous animals (Figure 2D) after training.

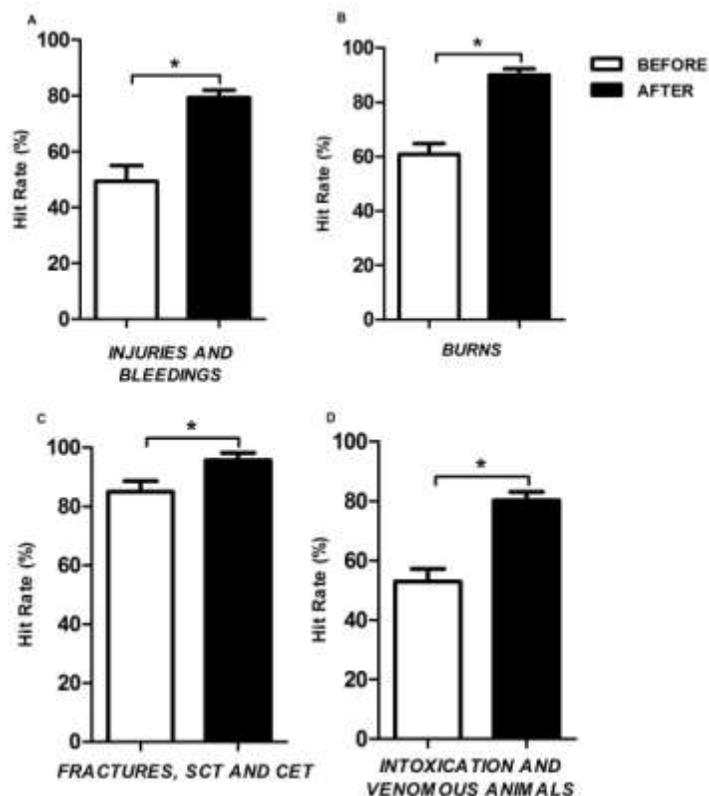


Figure 2: Average accuracy rates on First Aid care response before and after educational actions. (SCT: spinal cord trauma; CET: cranioccephalic trauma).

The literature shows that situations such as trauma, cuts, bites, bruises and choking are the most frequent events pre-schoolteachers report. Because schoolteachers are responsible for the care of the children, in the event of accidents, they must help. Nonetheless, to do so, they sometimes employ popular knowledge inappropriately, such as Pergola and Araújo (2008) indicate. An example of such situation is applying egg white in burns or ointments

without medical prescription in wounds. In this sense, our study concludes that training avoids inappropriate care with children who are victims of accidents as well as allows professors of nursery schools a positive reflection of educational actions (Galindo Neto et al., 2017).

Studies show that the main causes of death in out-of-hospital settings are the lack of immediate care and inadequate help. Due to the particularities of each

accident, victims should receive different care according to their particular situation. Omitting or inappropriately performed care however causes many to arrive at the hospital with almost no chance of recovery. Such situation could be easily avoided if trained citizens were able to perform early and adequate rescue to victims (Filho et al., 2015).

Although FA training does not replace appropriate health care by health professionals, a trained citizen can contribute considerably to maintaining the vital functions of the victim and to gain time until she or he arrives at a hospital unit and achieves satisfactory results capable of promoting recovery. It seems thus relevant for the population in general to seek FA training so as to reduce a victim's suffering, severity of injuries and sequelae, which is extremely relevant to the life of the injured (Rosa, Belgamo and Dorini, 2001; Draganov, 2007, Filho et al., 2015).

Nardino et al. (2012) suggest that laypeople and the general population should have FA training insofar as such knowledge will help them provide safer care should there be a need for it. FA Training thus contributes to minimize worsening victims' health.

Conclusion

This study reinforces the importance of carrying out educational actions on BLS and FA, insofar as training schoolteachers has promoted an increase in their knowledge of FA, as demonstrated by their increased accuracy rates in practically all the subjects covered in the questionnaire. These results ascribe to the university and academics, in the scope of community work, an essential role in transforming lay citizens into potential rescuers capable of providing immediate and quality assistance to victims in emergency situation.

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