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HEALTH CARDIOPULMONARY REACTION TEACHING FOR THE LAY: REPORT OF EXTRACURRICULAR ACTIVITIES IN TRAINING IN SCHOOLS

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ABSTRACT

Objective: Teach high school adolescents to identify a Cardiorespiratory Stop and how to take basic life support. **Method:** Report of an extension activity called "Realistic Simulation in Emergency and Emergency", in the period from April 5 to June 29, 2018, with high school students from public and private schools in the metropolitan region of Belem, Para. **Results:** In total, five educational interventions were performed through a realistic simulation of the basic life support maneuvers for 500 students from the 1st to 3rd year of high school. Students were taught to perform resuscitation maneuvers according to the assumptions of the science of resuscitation proposed for basic life support by the American Heart Association, Guideline 2015. Participants expressed satisfaction with the methodology used by demonstrating the technique through simulator mannequin made with recycled PET bottles. **Conclusion:** We conclude that there was interest on the part of the students, and such an interest is attributed to the active methodology used, and that more activities like this should be encouraged in the various contexts of society, since it is believed that it is an educational action with potential to save lives and reduce mortality and preventable sequelae in cardiac arrest.

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INTRODUCTION

Despite significant advances in care for victims of cardio respiratory arrest (CA), there is still considerable variability in survival rates that can not be attributed exclusively to the momentary clinical frame. In order to increase the chances of survival of CA victims, by allowing these individuals to receive high quality care, training in Cardiopulmonary

Resuscitation (CPR) must use appropriate techniques supported by evidence-based scientific knowledge and reach the greatest number of people (American Heart Association, 2015). CA is characterized by the stop of the mechanical function of the myocardium, leading to other vital dysfunction organs due to lack of oxygenation, yet the chance of survival depends fundamentally on the identification of the signs and early onset of care, which can also be initiated by lay people (Ferreira et al., 2013). The signs of cardiac arrest are loss of consciousness, apnea or agonal respiration and no central pulse (Dallacosta et al., 2017). Sudden cardiac arrest is the leading cause of death in Europe, the United States of America, and

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Canada. An incidence of Sudden Cardiac Death (SCD) in the United States is estimated at between 180.00 and 400.00 cases / year. However, an accurate estimate is still not possible due to different definitions of SCDs used, studies based on retrospective analysis of death certificates or even the absence of a structured system to report cases in some regions (BRAGGION *et al.*, 2015). In Brazil, according to Ministry of Health data, diseases of the circulatory system are the main causes of death, and more than 30% of these deaths (MARQUES *et al.*, 2015). They are responsible for about 20% of all deaths in individuals over 30 years old, reaching the adult population in full productive phase (MANSUR *et al.*, 2012). Although the beneficial effect of CPR is already well established in the scientific community, only one of three patients receives correct care performed by lay people outside the hospital setting. Approximately 200,000 new cases of CA occur annually in Brazil, with half of the cases occurring outside the hospital, such as residences, shopping centers, airports, stadiums etc. (FERNANDES *et al.*, 2014, NOGUEIRA *et al.*, 2017). In this scenario, the teaching of Basic Life Support (BLS) for the community, especially for adolescents, is essential to perform CPR maneuvers effectively as well as adults, and schools are an ideal laboratory to disseminate knowledge on this type of scientific praxis (TAVARES *et al.*, 2015).

BLS consists of a set of sequentially executed steps and maneuvers, which include evaluation and immediate intervention in each phase of CPR, identified by the acronym, C - circulation (evaluation of circulation signals and performing chest compressions), A - (assessment and correct positioning of the airways), B - breathing (evaluation of respiratory movements and ventilation) and D - early defibrillation. These recommendations are based on the guidelines of the International Liaison Committee on Resuscitation (ILCOR) and on the international scientific consensus of the AHA (SILVA *et al.*, 2015, NOGUEIRA *et al.*, 2017). The care in a CA is complex, however, the basic CPR maneuver can be performed by anyone, and, if well executed, result in the maintenance of the circulation of the vital organs until the arrival of a specialized care. Considering the significant number of CAs that occur daily, and the lack of an Automatic External Defibrillator (AED) available in public places, the training of lay people is a dynamic strategy with potential for saving lives (DALLACOSTA *et al.*, 2017, NOGUEIRA *et al.* 2017). Cardiorespiratory resuscitation is characterized by chest compression and its purpose is to maintain contraction of the myocardium, ensuring artificial circulation with a small but crucial contribution of oxygen to vital organs. In order to ensure that this pre-hospital care is carried out in an effective and early manner, it is necessary to train inexperienced individuals with an interest in learning the CPR maneuvers (FERREIRA *et al.*, 2013; DALLACOSTA *et al.*, 2017; NOGUEIRA *et al.* al. 2017). Higher education institutions are currently including, in their extracurricular activities, learning methods that can add advantages both to the academic environment and to society, an approach that is inserted within extension activities that permeate playful actions that facilitate learning and also corroborate to disseminate knowledge to a public not included in the academic environment, allowing direct contact between the student and society, in which they will exercise their functions and abilities acquired within the university in the future (DALLACOSTA *et al.*, 2017).

Realistic simulation represents an active methodology aimed to a previous training, which can be used at BLS teaching, in order to provide an adequate academic scenario either to general society, either to the graduation student, favoring the development of one's skill and abilities with scientific knowledge acquired in the academic period (BRANDÃO *et al.*, 2014). Resuscitation maneuvers should be performed by laypersons only with chest compressions as they are easy to perform and can be simply guided by an emergency professional. In the event that the unsupervised rescuer is instructed and able to perform rescue ventilation, the recommendation is to apply 30 compressions for every 2 rescue breaths, using the barrier mask to protect both the victim and the rescuer (AMERICAN HEART ASSOCIATION, 2015). For CPR to be effective, it is necessary that the interruption of chest compressions be minimal and performed with quality, being these with adequate frequency and depth to maintain cardiac circulation. In adult patients it is recommended to maintain the frequency of 100 to 120 compressions per minute (GONZALEZ *et al.* 2013). In this conception, the study proposes to add the relevance of the training to the realization BLS directed to lay people, through the extension activity linked to the undergraduate nursing course, using realistic simulation as an educational tool. The objective of this study was to teach high school adolescents to identify a cardiorespiratory arrest and how to perform basic life support. This action was carried out by the Nursing Course of the University of the Amazon (UNAMA), linked to the extension activity of "Realistic Simulation in Urgency and Emergency".

MATERIALS AND METHODS

This is a qualitative and participatory method, based on actions carried out in the extension activities of "Realistic Simulation in Urgency and Emergency", carried out by Nursing students of the 7th and 8th years of the University of Amazon (UNAMA). In total, five interactive educational interventions were carried out through the simulation of BLS maneuvers for 500 students from the 1st to 3rd year of high school in different public and private schools in the metropolitan area of Belem, Para. The students were instructed to perform the resuscitation maneuvers according to the assumptions of the science of resuscitation proposed for BLS by the American Heart Association, 2015. The extension activity was performed by the use of realistic simulation, which is a technique to enact real situations, reproducing a scenario that allows the training of the desired practice (ABREU *et al.*, 2014). High school students from public and private schools in the metropolitan region of Belem, Para, aged between 16 and 19 years old, from April to June of 2018, participated in the study in a structured environment for training at the quoted university.

The support material used was a banner, simulant mannequin (Resusci Anne - LAERDAL®), for training in cardio respiratory arrest and two-liter recycled PET bottles to simulate the thorax of an adult individual. The execution and management of the entire simulation process was carried out by Nursing course students with the supervision and guidance of instructor teachers. The event was divided in two moments. Initially, there was a brief explanation about the survival current focusing on BLS, highlighting each step, through demonstration and simulation in the CPR manikin, followed by the practical execution of what was explained. Each student was directed to stand in front of a PET bottle, kneeling on the

floor, and instructed to follow the behaviors listed according to the protocol of the American Heart Association 2015 "1- assessing the scenario, 2- evaluating the victim's responsiveness, 3- connect to the SAMU, 4 - initiate chest compression, placing the hand in the middle of the bottle, simulating the victim's chest, without flexing the arms at a 90° angle, at a minimum frequency of 100, not exceeding 120 compressions per minute, in the depth of 5 to 6 cm, always allowing the return of the chest after each compression", among other important orientations in this context.

RESULTS AND DISCUSSION

Most of the participants were not aware of the subject, presenting difficulties in performing CPR. After the simulation, it was observed that these students were able to perform the technique correctly, but some still showed difficulties and doubts, which were clarified, commented and exemplified by the instructors. Participants demonstrated interest and curiosity from the beginning regarding the methodology used, due to the ease of applicability in the current context, making the learning didactical and pleasurable. The practiced action demonstrated that the lack of knowledge about BLS among lay people is a relevant problem that deserves attention and is easy to solve, because people tend to show interest in learning everything that becomes didactic and interesting, but there is a lack in the scientific and academic milieu concerning to carrying out training aimed at the society, hindering access to knowledge, which can have a significant impact on the mortality rates by pre-hospital CPR. The results found in the present study suggest that the realistic simulation methodology is an effective and relevant resource for the teaching of BLS for adolescents in a school environment, when carried out through an accessible language, providing an essential practice for breaking " myths " on CPR (TERASSI *et al.*, 2015).

The lack of knowledge about BLS by lay people is a serious public health problem. A survey carried out in schools in the public and private network of Manaus-AM showed that 8.7% of 665 students did not know the number of the Mobile Emergency Care Service (SAMU), a fact of concern, since without the activation of the emergency service and request for help there is a break in the survival chain and consequently an unfavorable outcome in the survival of the individual in CA (ALVES *et al.*, 2016). A study conducted with 28 nursing students recommended that BLS training should be applied regularly, quarterly or semi-annually, with the justification that there is a significant decline in knowledge and skills after this period (NOGUEIRA *et al.*, 2017). In order to address the benefits of technological tools for teaching, SALVADOR *et al.* (2015), developed a study based on the principles of andragogy and conceptualized different innovative technologies in the teaching-learning process, highlighting the realistic simulation as a resource that offers the dissemination of knowledge through practice, allowing the student to learn without the result of misconduct in patients. On this subject, BARRETO *et al.* (2014) in an integrative literature review, showed that 76.9% of 26 articles analyzed did not present evidence of disadvantages in the use of realistic simulation. Therefore, the actions carried out by the extension of "Realistic Simulation in Urgency and Emergency" were successful, since the scholars were able to pass on the knowledge acquired during the graduation to the participants, and they were willing and enthusiastic to pass on to their

friends and family the received knowledge about CPR maneuvers.

Conclusion

Considering that half of the CAs occur in out-of-hospital environments and are usually witnessed by lay people, most of whom are unprepared to perform BLS, where simple attitudes such as calling for help requesting emergency services in a timely manner, initiating resuscitation maneuvers with quality chest compressions early and correctly, substantially increase the chances of a better prognosis. We believe that the role of the nurse as an educator in this context is essential, acting in an active way in the dissemination of knowledge about CA. It is thus envisaged to foster discussions about educational actions that value the practice aimed at lay people, strengthening the chain of response in CA situations, through effective training on BLS in a continuous way. In the meantime, we strongly recommend that these strategies be carried out in the various social contexts, using dynamic resources such as realistic simulation as methodology. We found in this study that the participants showed an interest in the subject matter, given that, we could observe the correct and satisfactory performance of conducts. As a team, the experience made it possible to relate theory and practice based on current scientific knowledge through play strategies, which provided the improvement of these skills in situations of cardiological emergencies. We aim to contribute to the development of new studies, which may stimulate reflections about the teaching of BLS to students of basic education and society in general. In addition, to cooperate with the assurance that the realistic simulation favors the educational process, being a relevant strategy of prevention of deaths by CA in extrahospital environment. In this perspective, we conclude that educational events about BLS turned to high school students arise as possibilities of meaningful learning tools, so that individuals may become able to intervene on their health-disease determinants effectively.

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