

ASSESSMENT OF THE KNOWLEDGE OF PHYSICAL EDUCATORS IN BASIC LIFE SUPPORT

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Abstract: An observational, descriptive study was carried out with the aim of analyzing the knowledge of physical educators and employees of the various physical activity academies in Araras about the appropriate and timely management of Cardiorespiratory Arrest, according to the international recommendations of Basic Support of Life (SBV). Data were collected from an objective questionnaire containing 20 multiple-choice questions based on the American Heart Association to assess the level of knowledge in BLS. Despite the general average of correct answers having remained at 60.5%, the results showed that the participants have insufficient knowledge in BLS. The minimum number of hits remained at 7/20 and the maximum at 17/20. The results demonstrate important gaps in teaching that need to be evaluated and addressed. They also reinforced the need to include a permanent subject on BLS in higher education institutions for all courses in the health area and, mainly, with an adequate perspective for the needs within the field of action of each health professional, as well as courses of recycling and maintenance of knowledge for already trained professionals, since, even with training courses, the lack of continuous applicability of the knowledge learned can reduce over time the ability to use the clinical procedures necessary in specific cases of BLS.

Keywords: Out-of-hospital cardiac arrest, Cardiopulmonary arrest, Cardiopulmonary Resuscitation, Sports Academies, Physical Educator.

INTRODUCTION

Basic Life Support (BLS) consists of the immediate recognition of patients in Cardiopulmonary Arrest (CPA), scene security, contact with the emergency system until the beginning of high quality Cardiopulmonary Resuscitation (CPR) and

use of the Device External Automatic (AED), as well as the airway clearance maneuvers due to foreign body (OVACE) in conscious and unconscious patients, with the respective guidelines regarding the procedures. (1)

In Brazil, the data are imprecise, but it is estimated that in the United States of America (USA) there are approximately 300,000 deaths due to CRA (2). In addition, it is known that for each minute passed from the cause of the process that generated the CRA, the probability of survival decreases by 7 to 10% (2-4), which makes a prompt response essential for a favorable outcome. In the search for a favorable and timely outcome, BLS training programs carried out by laypeople have provided very optimistic survival rates, reaching up to 85% of cases (2-4). One of the successful projects in reducing these deaths occurs in São Paulo, at subway stations, where it was possible to successfully reverse cardiorespiratory arrest through training laypeople in the practice of CPR. (5)

In recent years, there has been an increase in the population that practices some type of physical activity, either with the purpose of achieving better quality of life or concerned with aesthetics, but these people increasingly sought places such as gyms and weight training to achieve these goals. (6) Therefore, it can be said that physical educators are susceptible to experiencing, during their classes, situations in which students need emergency care. As, probably, in some situations, the teacher will not immediately have the assistance provided by rescuers, it must be assumed that, as he is the person closest to the victim, at that moment, the teacher ends up being responsible for providing First Aid. (7)

This way, it is worth highlighting the importance of knowledge in first aid by physical educators, with professionals having the task of looking for ways to expand

their skills, improving and perfecting their techniques. According to the Physical Education Professional's Code of Ethics, in item XI, it is stated that it is the obligation of the physical education professional, in his place of work, to take care of the well-being of all who attend the environment, and he must be aware that becomes responsible for all his actions, whether resulting from his imprudence or not. (8) The more citizens present this training, the greater the possibility of procedures being performed efficiently, with increased survival in the pre-hospital context (9).

In view of this, it is hypothesized that the knowledge of physical educators in relation to basic life support is still insufficient, highlighting the need to permanently implement BLS training for physical educators in the various academies, the in order to carry out adequate and timely management of CRA, which meet international recommendations, allowing to reduce death and the sequelae resulting from unassisted CRAs.

MATERIALS AND METHODS

This is a quantitative, observational, descriptive study, whose sample was built by intention in the city of Araras/São Paulo (physical educators and other employees of the physical activity academies in the city in question). An assessment of the knowledge of the subjects under study was carried out through a collection instrument made specifically for the development of the project and participation took place after signing the Informed Consent Term (FICT). The questionnaire consists of 20 multiple-choice questions about general knowledge of BLS, distributed as follows: five questions related to the recognition of a PCR; five questions regarding the correct sequence of CPR maneuvers; four questions regarding the compression/ventilation ratio; three questions related to the management of AED

and three questions related to knowledge about sudden death. Each correct answer was worth 1 (one) point, making it possible to reach 20 (twenty) points as the maximum score (100%). The questionnaire was applied electronically, through Google Forms. The collection was carried out from February 2021 to April 2021. After collection, the data were stored and tabulated in the form of a spreadsheet in Microsoft Excel 2019 programs. Subsequently, the analysis was performed using the *Good Calculator*, JMP[®] 16 programs and Microsoft Excel 2019. The research only started after approval by the Research Ethics Committee, under opinion 4,510,483.

FINAL RESULTS

Twenty-seven physical educators participated in the study. The average age of participants is 32.6 years. Regarding the results, despite the general average of correct answers having remained at 60.5%, the results showed that the participants have insufficient knowledge in Basic Life Support. The minimum number of correct answers remained at 7/20 and the maximum number at 17/20. The knowledge test scores showed that all professionals had some basic theoretical knowledge of CPR, scoring an average of 12.1/20 and a median of 12. The standard deviation, in turn, remained at 2.81.

Data analysis was performed using descriptive and inferential statistics of the collected observations. For the discrete quantitative variable, the presence of a normal distribution ($p > 0.05$) of the responses given by the participants was verified, which was performed using the Shapiro-Wilk test, which serves to analyze adherence to normality of the distribution of a variable. The test presupposes the rejection of the normality of the data distribution if the significance level is less than 5% ($p < 0.05$). As a normal distribution

was found, we chose to use parametric tests for inferential statistics.(10)

Therefore, Analysis of Variance (ANOVA) was used, comparing the performance (correct rate, in raw points and percentage) in each of the questions by the different participating subjects.

DISCUSSION

Basic Life Support (BLS) is defined as the initial approach to the victim through a set of strategies that aim to maintain life, providing support until the arrival of the emergency team, through actions aimed at improving the victim patient's prognosis. of PCR in a pre-hospital setting(3, 11), covering airway clearance, artificial ventilation and circulation (12). It is important to emphasize that about 80% of CRAs occur in a pre-hospital environment and several factors can influence the results of patient care such as ambulance response time, initial CPA rhythm, among others (13,14). This way, the BLS is essential, since in most cases there is no time for locomotion to the hospital environment, without the patient having already died or acquired sequelae, if the initial care has not been provided (10). Although the regular practice of physical activity promotes health and well-being, intense exercise increases the risk of sudden death in people with cardiovascular diseases. The increasing rate of cardiac arrest related to physical activity makes it a public health problem, making education necessary for the recognition of cardiorespiratory arrest, immediate cardiopulmonary resuscitation and early access to an automatic external defibrillator (15).

Albert et al (16) reported a relative risk of 17 for sudden cardiac death during and up to 30 minutes after exertion compared with the risk at rest. These findings emphasize the importance of adequate staff preparedness

for emergencies in exercise environments. For example, there was a case in which a 21-year-old college student suffered a fatal cardiac arrest while exercising, and this case was brought to justice. In this case, the verdict was returned in favor of the student's family, as basic cardiac life support was allegedly not administered by the fitness team, although "911" was promptly called during the emergency (17). This case demonstrates the importance of not only having a written emergency plan as part of an academy's policies and procedures manual, but having a team properly prepared to carry out these procedures through recurring practical training (18). All health/fitness facility staff supervising activities must be trained in SBV. When an incident occurs, each team member must perform the necessary emergency support steps in accordance with established procedures. Emergency drills must be practiced once every 3 months or more often with staff changes. Recycling is especially important (19). It is essential to recognize that emergency equipment alone does not save lives, and can provide a false sense of security if not supported by adequate personnel. Training and preparing a professional team that can promptly deal with emergencies is critical. (19) This way, the participation of physical educators in the attendance at the stop is essential, providing a reduction in the time between the stop and the beginning of the interventions (12).

The main aspects to be observed in the compressions are frequency, depth, return of the chest with each compression and minimum interruption (19,21). The frequency per minute indicated for performing compressions is 100 times per minute (22-28) and the compression-to-ventilation ratio is given by 30:2 in adults (19,21). In this research, 86.8% knew how to establish the appropriate frequency. However, only 28.6% were able to

establish the adequate relationship between compression and ventilation. When asked about the depth of compression, less than 5% of the participants were able to highlight that it must be in the range between 5-6 cm in depth. This was one of the questions that most raised doubts among the participants. The 2010 American Heart Association (AHA) recommendation is to compress the chest by at least 51 mm (2 inches) in an effort to optimize cardiopulmonary resuscitation provided to victims of cardiac arrest (29). Regarding the maximum time available for checking the pulse, 71.4% were able to point out that it cannot exceed 10 seconds. As for the region of the body on which the compression is performed, more than 40% of the interviewees answered that the location would be the upper region of the sternum (23,25,26). Asked why full chest recoil is important when performing high-quality CPR, 89.5% of the participants were able to state that this allows the heart enough time to properly inflate (22). Regarding the change of position of rescuers during a CPR, in order to perform a quality CPR, 71.4% of the participants were able to affirm that the change must be performed every 2 minutes. The most recent guidelines state that when there is more than one rescuer, it is necessary to alternate the compression and ventilation functions every 2 minutes in order to maintain the quality of CPR (20-22). As for the conduct in the face of the PCR situation, the hit rate was very satisfactory. When asked about the situation in which the victim does not respond and there is no pulse, despite making "gaspings sounds", 100% of the interviewees were able to report that, in this case, it is necessary to start CPR, as Gasping is not a breath. normal. It is defined that the victim who does not breathe or breathes ineffectively (*gasping*), but has a palpable pulse, is in respiratory arrest, therefore, CPR must be initiated (22).

Defibrillation and Electrical Cardioversion (EVC) consist of the application of high-energy electrical current to reverse cardiac arrhythmias generated by the reentry mechanism. The AED is a type of semi-automatic defibrillator/cardioverter, since the rhythm recognition is performed by the device that informs if there is a recommendation for electric shock, and the decision of application depends on an operator (20-22). Asked about the purpose of defibrillation, 88.7% of the participants stated that it has the ability to restore a regular heart rhythm. When asked about the correct time to use the equipment, only 58.6% of the participants were able to report that it must be used as soon as it is available(22). It was found that many assumed that it must only be used after a sequence of basic resuscitation with ventilations and compressions. Regarding the positioning of the AED, 86.9% of the interviewees were able to answer that the AED must be positioned in the right infraclavicular and left inframammary regions. (22) When asked about the correct steps for using the AED, 89.1% of respondents knew the proper sequence: turn on the AED, place the electrodes, analyze the rhythm and deliver the shock if necessary. It was noticed that almost 20% of respondents believed that rhythm analysis must only be performed after shock, to verify its effectiveness in returning to normal heart rhythm. When the question was raised about what to do after shocking a person with AED, only 14.3% of the participants were able to say that it is necessary to immediately resume CPR, and the vast majority (71.4%) believed it was necessary to evaluate the pulse again.

Regarding the pediatric population, it is worth noting that the epidemiology of CRP in children is different from that in adults, in which, in most cases, it is a sudden event of primary cardiac origin with a predominance

of VF rhythm. In children, CPA is typically the result of the progressive deterioration of respiratory and/or circulatory functions, causing hypoxemia and progressive acidosis, culminating in secondary CRA, with asystole and PEA being the most frequently observed rhythms (22,31). In the study population, 71.5% were able to highlight this difference, in which asystole becomes the most common rhythm of arrest in the pediatric population. For this reason, the care for children's CRA is also differentiated. The main differences are the reaffirmation of the CAB sequence, with C referring to chest compressions, A to opening the airways and B to ventilation, as preferred in the pediatric age group; establishment of a maximum limit of 6 cm compression depth in adolescents; recommendation of 100 to 120 compressions per minute, similar to adults; reaffirmation of the need for compressions and ventilations in pediatric CPR. All other recommendations are similar across resuscitation councils (22, 30, 31).

The second thematic axis addressed in the evaluation questionnaire was the approach and performance of BLS in victims of Airway Obstruction by a Foreign Body (OVACE), in which most of the participants' difficulties were concentrated. One of the questions with the lowest rate of correct answers asked about the procedure for a victim with airway obstruction by a foreign body, when this becomes unresponsive, in 13.8% of the interviewees they were able to answer that it is necessary to start CPR, starting with the chest compressions. Most of them (71.4%) believed that it was necessary to start the Heimlich maneuver. However, this must only be performed in cases of severe airway obstruction in a conscious victim. (20-22). In turn, when asked about the best conduct to identify total airway obstruction in conscious victims according to the AHA protocol, a total of 85.7% of those interviewed

were able to answer that it is necessary to start the Heimlich maneuver. Only a total of 57.3% of the participants were able to answer that, in cases of partial obstruction, it is necessary to stimulate coughing. Almost 30% of respondents believed that at that moment, it was already necessary to start the Heimlich maneuver. However, it is known that, in mild (partial) obstruction, there is air passage, and the victim is able to cough (20,22). In general, in the present study, there was a greater number of correct answers in questions related to approaching the OVACE and performing CPR in adults. The higher rate of correct answers in these subjects may be linked to the fact that they are more general and addressed in a more widespread way. On the other hand, there was a higher rate of errors in questions related to the chain of survival in children, as well as some points related to maneuvers in OVACE. Issues related to infants and children within the BLS were rarely addressed in the literature, giving preference to procedures in adults, and, therefore, the difficulty of comparing the findings in the present study.

The findings of the present research corroborate the importance of training physical educators in continuing education, which positively favors the incorporation and retention of information (11). We believe, however, that this scenario can be modified through adequate training and continuing education of physical educators, in order to promote an improvement in the professional's knowledge, skill and attitude in the face of these incidents.

CONCLUSION

Despite an average of correct answers above 60%, it is important to emphasize that there are important gaps in teaching that need to be evaluated and addressed (11). Considering the importance of the

BLS, it is intended that the findings of the present study can stimulate greater debate on the subject, contributing to the training of future professionals and, thus, enhancing more effective actions in supporting victims of CPA (11), the in order to enable the correct performance of pre-hospital care for victims of cardiac arrest, given its importance in urgent and emergency scenarios. The results also reinforce the need to include a permanent discipline on

BLS in higher education institutions, for all courses in the health area and, mainly, with an adequate perspective for the common needs within the field of action of each health professional, as well as refresher courses and knowledge maintenance for already trained professionals, since, even with training courses, the lack of continuous applicability of the knowledge learned can reduce over time the ability to use the clinical procedures necessary in specific cases of BLS (31).

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