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SUPORTE BÁSICO DE VIDA NO 9º ANO: METODOLOGIAS DE ENSINO NA VISÃO DOS ALUNOS
BASIC LIFE SUPPORT IN 9TH GRADE: TEACHING METHODOLOGIES FROM STUDENTS' VIEW
SOPORTE VITAL BÁSICO EN 9NO GRADO: METODOLOGÍAS DE ENSEÑANZA DESDE LA VISTA DE LOS ESTUDIANTES

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RESUMO

Introdução: A reanimação cardiopulmonar (RCP) realizada por espectadores é mais eficaz do que qualquer outra intervenção terapêutica após uma paragem cardíaca extra-hospitalar. Organizações internacionais destacam a necessidade de formação de qualidade da população (leiga) em RCP, promovendo confiança e proficiência para agir em caso de emergência. Em Portugal, o ensino de suporte básico de vida (SBV) no 9º ano na disciplina de Ciências Naturais data do ano letivo de 2015-2016.
Objetivo: Conhecer a perceção dos alunos sobre as metodologias utilizadas no ensino de SBV para alunos do 9º ano.
Métodos: Trata-se de um estudo descritivo, transversal e analítico do tipo inquérito, em que uma amostra representativa de estudantes (n=1215) respondeu a um questionário entre abril e junho de 2020.
Resultados: O SBV não foi estudado por 10,4% dos estudantes. Entre aqueles que estudaram o tema, foi dedicado um valor modal de 3-4 horas ao SBV no 9º ano. Esse assunto foi abordado por bombeiros, enfermeiros ou outros profissionais que não os professores em 26,1% dos casos. Os alunos apontaram a falta de simulações práticas e a necessidade de aprender o protocolo de SBV pediátrico, além de uma abordagem diferenciada.
Conclusão: A formação prática foi percebida pelos alunos como uma componente muito frágil e, em alguns casos, ocorreu sem manequins, vídeos ou professores qualificados. Ensinar e aprender SBV nas escolas portuguesas está longe de ser ideal para um assunto tão importante.

Palavras-chave: suporte básio de vida; método de ensino; ensino básico; espectador

ABSTRACT

Introduction: Cardiopulmonary resuscitation (CPR) performed by bystanders is more effective than any other therapeutic intervention following an out-of-hospital cardiac arrest. International organizations emphasize the need for high-quality training for bystanders in CPR, promoting confidence and proficiency to act in emergencies. In Portugal, the teaching basic life support (BLS) in the 9th grade within the Natural Sciences subject began in the academic year 2015-2016.
Objective: To acknowledge students' perceptions about the methodologies used in teaching BLS to 9th-grade students.
Methods: This is a descriptive, cross-sectional, and analytical survey-type study, in which a representative sample of students (n=1215) responded to a questionnaire, between April and June 2020.
Results: BLS was not studied by 10.4% of the respondents. Among those who studied the subject, a modal value of 3-4 hours was dedicated to BLS in the 9th grade. This subject was taught by firefighters, nurses, or other professionals who were no teachers in 26.1% of the cases. Students pointed out the lack of practical simulations and the need to be learn the pediatric BLS protocol, besides with a different approach.
Conclusion: Practical training was perceived by students as a very weak component, and in some cases, it took place without mannequins, videos or qualified teachers. Teaching and learning BLS in Portuguese schools is far from ideal for such an essential subject.

Keywords: basic life support; teaching methodologies; basic education; bystander

RESUMEN

Introducción: La reanimación cardiopulmonar (RCP) realizada por transeúntes es más eficaz que cualquier otra intervención terapéutica tras una parada cardíaca extrahospitalaria. Las organizaciones internacionales destacan la necesidad de formación de calidad de la población (espectadores) en RCP, promoviendo la confianza y la competencia para actuar en caso de emergencia. En Portugal, la enseñanza de soporte vital básico (SVB) en 9º grado de la asignatura de Ciencias Naturales data del año académico 2015-2016.
Objetivo: Conocer las percepciones del alumnado sobre las metodologías de la enseñanza de SVB para alumnos de 9º grado.
Métodos: Se trata de un estudio descriptivo, transversal y analítico tipo encuesta, en el que una muestra representativa de estudiantes (n=1215) respondió un cuestionario, entre abril y junio de 2020.
Resultados: El SVB no fue estudiado por el 10,4% del alumnado. Entre aquellos que estudiaron el tema, se dedicó un valor modal de 3-4 horas al SVB en el 9º grado. Este tema fue abordado por bomberos, enfermeros u otros profesionales que no eran profesores en el 26,1% de los casos. El alumnado señaló la falta de simulaciones prácticas y la necesidad de aprender el protocolo SVB pediátrico, además de un enfoque diferente.
Conclusión: La formación práctica fue percibida como un componente muy débil y, en algunos casos, se realizó sin maniquíes, videos o profesores calificados. Enseñar y aprender en las escuelas portuguesas está lejos de ser ideal para una materia tan importante.

Palabras clave: soporte vital básico; metodologías de enseñanza; educación básica; espectador

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INTRODUCTION

Out-of-hospital cardiac arrest (OHCA) remains a public health issue with relatively low survival rates, despite advancements in resuscitation science (AHA, 2020). A fundamental educational objective in resuscitation should be the training of laypersons in cardiopulmonary resuscitation (CPR), given the importance of their intervention, which reflects in survival gains in OHCA and the number of individuals willing to perform basic life support (BLS) in real-life situations (Greif et al., 2015; Martins, 2014; Nielsen et al., 2013; Schmölzer et al., 2013; Trevisanuto et al., 2015).

This goal can be achieved by teaching school-aged children (Monsieurs et al., 2015), especially from the age of 12, for two hours per year (Bohn et al., 2012; Plan and Taylor, 2013), allowing for training and maintenance of skills, contributing to increased resuscitation rates and improved survival globally. CPR training for school-aged children demonstrates equal effectiveness whether delivered by qualified teachers or healthcare professionals, and the use of high-fidelity or low-cost equipment results in efficient skill acquisition (Böttiger et al., 2017a). Various studies support the premise that trained teachers successfully empower their students in BLS (Aaberg et al., 2014; Bohn et al., 2012; Bollig et al., 2011; Boné et al., 2020; Cuijpers et al., 2016; Isbye et al., 2007; Lorem et al., 2008; Lukas et al., 2016; Toner et al., 2007), favoring the dissemination of training in the school setting. However, for this to happen, it is necessary to equip teachers with BLS skills, as many of these professionals lack proficiency in the subject, constituting a barrier to teaching (Greif et al., 2021). Therefore, the inclusion of resuscitation training in teacher training curricula is highly recommended because, as education specialists, teachers are the most pedagogically qualified trainers to teach BLS to children (Greif et al., 2021).

A study conducted by Boné et al. (2020) presents various advantages resulting from teaching BLS to students, namely strengthening the first two links of the Chain of Survival (CoS), reducing anxiety related to making mistakes, increasing willingness to help, and confidence in their abilities, enabling them to save lives. This study also reveals that trained students gain BLS competencies, and the variety of resources used tends to positively influence gains and the maintenance of learning in this domain. Guidelines from the Ministry of Education, Universities and Research / Ministry of Health of Italy (MIUR & MS, 2015) and the Resuscitation Council United Kingdom (RCUK, 2011) support this latter conclusion. Another crucial factor in optimizing performance in CPR is providing students with real-time feedback during BLS training (Saraç and Ok, 2010).

CPR involves chest compressions and artificial ventilation; however, it is emphasized as a minimum requirement that all citizens are trained in performing chest compressions (Böttiger & Van Aken, 2015; Greif et al., 2015; Nishiyama et al., 2008; Van de Voorde et al., 2021) as they promote the maintenance of blood circulation.

Educating school-aged children in CPR constitutes a civic duty (Böttiger et al., 2017a). Currently, there is no evidence regarding the best strategy to adopt in CPR education for children. The teaching format depends on local requirements and circumstances (Greif et al., 2021). This training should occur across the board, from preschool education to higher education, and it is advisable that the CPR skills taught align with the students' ages (Greif et al., 2021). Thus, training should be tailored to different types of students, and various teaching methodologies should be employed to ensure the acquisition and maintenance of knowledge and skills (Greif et al., 2015).

According to Miró et al. (2012), schools need to allocate enough hours to implement the programme, extending beyond a single session (ideally between 5 and 10 hours). Bohn et al. (2012) also argue that annual training, lasting two hours, proves effective in knowledge acquisition and maintenance of the skills. Alvarez-Cebreiro et al. (2020) suggest that watching a brief video on the topic enhances responsiveness in cases of OHCA and the quality of CPR. Among younger individuals, the use of gamification in teaching methods is noted to promote learning (Otero-Agra et al., 2021).

In Europe, six countries have legislation mandating CPR education for children: Belgium, Denmark, France, Italy, Portugal, and the United Kingdom (Böttiger et al., 2017a).

In France, it is believed that this training increases "raising awareness about risk prevention and teaching general safety rules for education in responsibility meet the educational requirements of civil security and public health", that is, the awareness of risk prevention and the teaching of general safety rules for education in responsibility that meet civil security and public health education requirements (MENJS, 2020). In 2015, in Italy, the Ministry of Health, together with the Ministry of Education, Higher Education and Research, outlined guidelines for the comprehensive implementation of first aid training activities (MIUR & MS, 2015). These activities are intended for all students (from preschool to secondary education), teachers, and auxiliary staff. In the United Kingdom, the RCUK recommends that all students learn CPR and have knowledge of automated external defibrillator (AED) usage. It is argued that empowered students can make the difference between life and death for someone they care about, as 80% of OHCA cases occur at home (RCUK, 2021).

At the curricular level, in Portugal, with the approval of the Curricular Goals for the Natural Sciences subject - 9th grade, in 2014 (Dispatch no. 110-A/2014, January 3), the teaching of BLS was introduced for the first time in basic education. The objectives and descriptors of this topic were later confirmed by the Essential Learning Outcomes (DGE, 2018a) in 2018. BLS training in basic education is reinforced in the Physical Education subject at the secondary education level (DGE, 2018b).

Given the lack of studies on the methods employed in BLS education in Portugal, this work considered the following starting question: What are students' perceptions of the methods used in BLS education in the Natural Sciences subject in the 9th grade?

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2. METHODS

The study adopted a descriptive, cross-sectional, and analytical survey design. The population consisted of students enrolled in the 10th grade in scientific and technological courses during the 2019-2020 academic year in Portugal. This population was chosen because the BLS content is typically covered in the third academic term, making data collection difficult in the same year. Additionally, various studies indicate that learning outcomes on this topic are assessed several months after its introduction.

2.1 Sample

The sampling method was non-probabilistic accidental, with all respondents belonging to the group of students attending the 10th grade, representing both sexes. This sample was considered representative of the population. Sample size was determined using a significance level and sampling error (*e*) criterion proposed by Gailmard S (2014), i.e., CI ≥ 95%, with $e \leq 5\%$.

2.2 Data collection instruments

An original questionnaire was developed after reviewing some of the scientific literature dedicated to questionnaire design (Huot, 2002; Moreira, 2009). Due to the constraints of the COVID-19 pandemic, the questionnaire was administered electronically via Google Forms. The sample of students was distributed across the 7 NUT II territorial units, with the majority of respondents from the Central region (50.9%) and the smallest portion in the Algarve region (2.2%). The Northern and Lisbon Metropolitan Area regions had an equal percentage of respondents (11.4%), the Alentejo region had 11.9%, and the Autonomous Regions of the Azores and Madeira had 6.7% and 5.7%, respectively. The overall response rate was 1.77%. A total of 1215 valid responses were obtained.

Close-ended opinion questions with referenced scales (Moreira, 2009) were developed, and for some of them, open-ended questions resulted from the choice of a close-ended question. Some of these items allowed for multiple responses (see Supplementary Material).

The questionnaire was anonymously answered, and the management of collected information followed the ethical principles of scientific research in Social Sciences.

2.3 Statistical analysis

The collected data were processed and analyzed using both quantitative and qualitative analysis techniques. The information was exported to .xls format and imported into the software IBM SPSS Statistics v.24. Univariate statistical analysis was conducted to describe some characteristics of one or more variables revealed by the data sample. The open-response questions in the questionnaire were analyzed through manual content analysis, involving categorization and recording of occurrences.

3. RESULTS

Regarding sex, approximately 59.3% of respondents were female. Participants presented a mean age of 15.8 years. Data revealed that 92.9% of students completed the 9th grade in the academic year 2018-2019.

Approximately 38.3% of students stated that BLS learning only took place during the 9th grade. The remaining students (61.7%) reported a variety of situations in which contact with BLS education occurred (Figure 1).

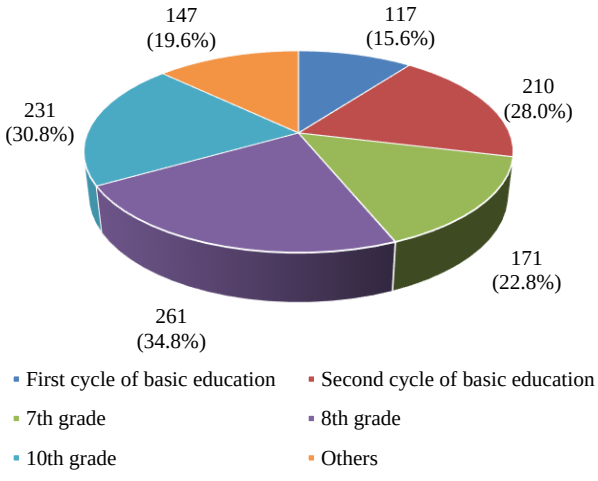

Figure 1 - Educational situations beyond the 9th grade where contact with BLS training occurred (n=750)

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Table 1 presents the results regarding other contexts mentioned for contact with BLS, and highlight the importance attributed to the firefighters as agents of Civil Protection and providers of BLS training. Self-learning is presented as the second prominent context for contact with the topic. Respondents mentioned that, driven by their curiosity, they watched videos at home or consulted books. It is worth noting that three students mentioned contact with BLS in real-life situations. One of them emphasized, "I didn't feel competent to apply BLS".

Table 1 - Other contexts indicated for contact with BLS, besides the 9th grade Natural Sciences discipline (n=52)

Contexts	n	%
Extracurricular enrichment activities	6	11.5
Self-learning	18	36.6
Firefighters	33	63.5
Summer camps	12	23.1
Family context	6	11.5
Training course	9	17.3
School sport	3	11.5
Physical Education discipline	3	5.8
Citizenship Education	6	11.5
Nurses	3	5.8
Scouts	9	17.3
Cultural events dedicated to health	3	5.8
Other school activities	9	17.3
Real-life situations	3	5.8

From the respondent's perspective, some of the topics related to BLS should have been approached differently in the 9th grade. Only 22.2% of the respondents considered no need for changes (Table 2). BLS for babies is one of the topics that, according to students (65.4%), should have been approached differently, indicating a weak or absent coverage of the subject matter. Airway obstruction maneuvers for pregnant women and obese patients follow closely (60.3% and 52.2%, respectively), confirming the limited understanding of the protocol in response to the control question. Although there are no specific protocols for pregnant women and obese individuals, the phrasing of the questions may have led students to be concerned about these topics, revealing their altruism. However, their responses indicate a lack of knowledge of BLS algorithms.

Among students who indicated "Other topics" (5.1%), the content analysis of 20 assertions did not reveal any new insights. Approximately 6.3% of them mentioned BLS for the elderly, and with an equal rate, emphasis should be given (n=48) for the statement that topics should be covered until each student feels capable of responding in case of a necessity of intervention.

Table 2 - Topics that should have been approached differently in BLS education in the 9th grade (n=945)

Contexts	n	%
Airway obstruction maneuvers for pregnant women	570	60.3
Airway obstruction maneuvers for obese individuals	493	52.2
Rescuer safety	273	28.9
Victim safety	318	33.7
BLS for babies	618	65.4
BLS for pregnant women	657	69.5
Other topics	48	5.1

Students were also asked about the methods/techniques used during their BLS training in the 9th grade (Table 3). Observation of practice performed by the activity leader emerged as the most utilized method (57.3%) for BLS learning, followed by individual practice (50.9%) and practical case simulation sessions (49.6%). It is noteworthy that pair practices between students did not receive any selection. Responses recorded under "Other", besides those listed, did not bring anything new, with the majority being null.

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Table 3 - Methods/techniques used in BLS training in the 9th grade (n=1215)

Contexts	n	%
Expository method	522	43.0
Lectures	525	43.2
Small group discussions	354	29.1
Individual practices	618	50.9
Observation of practice performed by the activity leader	696	57.3
Watching exemplifying videos	456	37.5
Practical case simulation sessions	603	49.6
Pair practices between students	0	0.0
Other	36	3.0

Regarding the educational resources employed, the use of an anatomical simulation mannequin for BLS practice was the most mentioned educational resource (79.0%), as shown in Table 4. However, the fact that this value does not reach 100% is concerning. The result is not surprising given the revelation of 50.9% for individual practices and 57.3% for demonstrations performed by the activity leader. It is inferred that 21% of all students may not have personally witnessed BLS practices on a mannequin, and approximately half of them did not have any opportunity to practice simulated BLS actions.

Students also mentioned other resources: an inflation device (n=3, 4.2%); books (n=6, 8.3%); and the students themselves for BLS practice and assessment of ventilation signs (n=15, 20.8%). Approximately 38.8% of respondents considered that the time dedicated to BLS in the 9th grade was sufficient.

Table 4 - Educational resources used in BLS training (n=1215)

Contexts	n	%
Slides	630	51.9
Videos	582	47.9
Adult mannequin	960	79.0
Child mannequin	162	13.3
Infant mannequin	189	15.6
Other	72	5.9

BLS was not studied in the 9th grade by 10.4% of respondents. Among those who stated they studied BLS, the modal value was 3-4 hours dedicated to the subject, with 35.3% considering 1-2 hours. For 71.7% of the students, up to 3-4 hours were used in BLS education.

Most students (67.3%) who indicated they would like to see changes would appreciate more time dedicated to the topic, representing the opinion of 41.5% of respondents. Results revealed that 23% would like the topic to be approached with more time and in a different manner, and 9.7% indicated that a different approach was necessary. Students proposed extensive and relevant changes (Table 5).

Table 5 - Proposed changes in the approach to BLS education (n=311)

Contexts	n	%
Time		
- 3-4 hours	27	8.7
- 5-6 hours	75	24.1
- 7-8 hours	9	2.9
- 10-12 hours	18	5.8
Other approach		
- More theory	8	2.6
- More simulations	9	2.9
- Opportunity for all students to practise	51	16.4
- To address the topic before, during, and after the 9th grade	30	9.6
- To establish a discipline for first aid	6	1.9
- To use mannequins	15	4.8
- To practise BLS on infants	21	6.8
- To practise BLS on children	24	7.7
- Airway obstruction techniques in pregnant women	3	1.0
- Having a certified instructor for BLS education	9	2.9
- Practicing until reaching an adequate proficiency level	3	1.0
- To include videos	3	1.0

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Among the students who agreed to introduce changes in BLS education in the 9th grade (n=744), only 41.8% provided proposals, grouped into two categories: time and other approaches. Regarding the time allocated to BLS training, it is noted that 67.3% of the respondents advocated for an increase in the number of training hours. Notably, 24.1% believe that the topic should be covered for 5-6 hours. Approximately 16.4% of the students mentioned that such a change would allow everyone to engage in individual practice.

Additionally, some comments entered in the response platform were also considered:

- "I only had one practical/theoretical class with some members from 112. The problem was the limited time of the class, which didn't allow everyone to practice, and nobody was able to train in airway obstruction. I think double the time would have been enough, so around 3 hours." (ID 550)
- "I think 1 hour is too short, as there are always some interruptions for questions in case of doubts... and it would be good to have videos (for example) to also help understand better how to proceed." (ID 1184)
- "More time and examples showing how to do it instead of watching videos, otherwise, nobody learns anything." (ID 823)
- "The topics should be explored more calmly (especially the practical part)." (ID 662)
- "As much time as necessary to learn well and make sure people are prepared." (ID 582)
- "I would have liked practical demonstrations with mannequins to be done." (ID 327)

Students indicated that the individual responsible for teaching CPR in the Natural Sciences discipline was primarily the subject teacher (29.6%), garnering the highest selection. This was followed by the teacher who was also a firefighter (25.9%), the teacher who was also a nurse (18.3%), firefighters (16.5%), nurses (6.4%), and others (3.2%).

The evaluation of the theoretical component of BLS learning was not conducted in 36.3% of the cases. Students pointed out evaluations in the form of oral questions (19.8%), specific worksheets (11.9%), assessment sheets (29.4%) or other methods (2.7%). Regarding this latter, only student participation was indicated. Interviewees also mentioned that the practical component of BLS was similarly not assessed in most cases (50.9%). Evaluation of this element was conducted by peer practice (25.7%), individual practice (20.2%) or by other methods (3.3%). Among the other assessment methods, observation, group practice, and student engagement in activities were highlighted. Two of the collected comments are presented here due to their illustrative importance in revealing the situation:

- "Less than half of the class managed to put the training into practice, so there were no assessments, which I don't find fair because everyone should put it into practice and there shouldn't be just one school year to have the training, but rather, the training should be provided every year because it's an important subject that shouldn't be forgotten or covered in just one year." (ID 663)
- "The class was divided into groups of four people: two of them performed the practice while the other two evaluated whether they were doing it well or not, and vice versa." (ID 264)

Efforts were made to understand what students considered relevant to improve their capacity to intervene in the community regarding BLS. Among the proposals (n=1215), the majority suggested a first aid discipline (37.0%), followed by a mandatory non-disciplinary CPR course (36.3%) (Table 6).

Table 6 - Proposals for improving SBV training capacity, by the "sex" variable (n=404). F=female; M=male.

Question	*f* (%)
Extracurricular activity (e.g., first aid club)	270 (22.2)
Non-disciplinary mandatory CPR course	441 (36.3)
Mandatory first aid discipline	450 (37.0)
Other modality	54 (4.4)

Among those who indicated "Other modality" the following responses stood out:

- "Although CPR is part of the curriculum in the 9th grade, it should be addressed in other grade levels. In my opinion, priority should be given to such topics through training sessions throughout the year, although without quantitative grading." (ID 503)
- "Focus more on the material taught in CPR and less on trivial matters. Have CPR training not only in the 9th grade." (ID 63)
- "Have someone specialized in the subject teach us, three times a year." (ID 14)

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4. DISCUSSION

Findings regarding the number of hours dedicated to the theme of CPR deviate from those indicated by Miró et al. (2012), who concluded that the necessity of an integrated program throughout the school year, in addition to a single session, was ideally between 5-10 hours. The number of hours reported by the participating students in this study corroborates Bohn et al. (2012), who suggested that training should occur annually for children aged 12 or older, recommending the maintenance of 2 hours of annual training.

Regarding the diversity of techniques and methods used in teaching BLS, the results diverge from the suggested variety of methodologies that contribute to the acquisition and maintenance of knowledge and skills, as indicated by the authors (Greif et al., 2015). The data contradict the literature (Greif et al., 2015; ERC, 2015; Nishiyama et al., 2008; Van de Voorde et al., 2021), which concludes that all citizens should be trained in performing chest compressions as a minimum requirement for CPR. The materials used in CPR education, as reported by the students, do not meet the diversity suggested by MIUR and MS (2015) and RCUK (2011).

Regarding the individual responsible for teaching CPR in the 9th-grade Natural Sciences discipline, the study the study reveals that it was primarily the subject teacher in most of the cases indicated (29.6%), aligns with others that indicate that trained teachers are capable of educating their students in CPR, notably those conducted by Aaberg et al. (2014), Bohn et al. (2012), Bollig et al. (2011); Boné et al. (2020), Böttiger et al. (2017b), Cuijpers et al. (2016), Isbye et al. (2007), Lorem et al. (2008), Lukas et al. (2016), and Toner et al. (2007). In this sense, Böttiger et al. (2017b) also stand out, advocating that training can be provided by qualified teachers or healthcare professionals with equal efficacy, and Greif et al. (2021), who conclude that teachers are the most pedagogically qualified instructors to teach CPR to children.

As for the evaluation of learning outcomes, results herein contradict what is advocated by the literature, particularly concerning the feedback provided to students in real time, as stated by Saraç and Ok (2010), with a very positive impact on optimizing performance in CPR.

CONCLUSION

This study reveals that there were instances of BLS education conducted without mannequins, without videos, and without qualified instructors, which should not occur. All BLS training should have a solid foundation, with accredited trainers in this field and appropriate equipment: adult and infant anatomical mannequins that allow for monitored simulated CPR training, and individual ventilation masks with one-way valves. Simulated airway obstruction training (for both adults and infants) is very important. The number of hours allocated is minimal, with some cases reporting only one hour dedicated to the topic, which is manifestly insufficient. In these cases, emphasis is placed on circulation and cerebral perfusion (chest compressions), while artificial ventilation is omitted from practice.

Approximately half of the students received BLS training through practical case simulation sessions but did not engage in individual practice with adult BLS mannequins. Training was limited to observing the practice conducted by the instructor and watching illustrative videos. The overwhelming majority of students did not receive training in pediatric BLS. Therefore, changes in the pedagogical management of time and resources are considered necessary.

Therefore, based on the evidence found, regular implementation of education and training is considered pertinent to ensure efficient execution of the first two links in the CoS. To achieve this, the following must be encouraged:

a) Early CPR education for students, following recognized quality standards, throughout compulsory schooling, accompanied by periodic training;
b) Commemoration of events related to the theme: e.g., European 112 Day - February 11; World First Aid Day - second Saturday of September; World Heart Day - September 29; European Day of the Restart of the Heart - October 16;
c) Inclusion of CPR-AED training in the initial and continuing education of teachers;
d) Establishment of a school culture of first aid, manifested in altruistic acts of citizenship promoting community health and well-being.

AUTHORS' CONTRIBUTION

Conceptualization, JB; data curation, MB and JB.; formal analysis, MB; investigation, MB; methodology, JB; project administration, MB; resources, MB; software, JB; supervision, JB; validation, JB; visualization, NO; writing-original draft, MB and JB; writing-review and editing, NO.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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