

Educational technologies on basic life support for adolescents: scoping review protocol

Tecnologias educacionais sobre suporte básico de vida para adolescentes: protocolo de scoping review

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Submission: 06/03/2022

Approved: 01/17/2023

RESUMO

Objetivo: mapear as produções sobre tecnologias educacionais construídas para ensinar suporte básico de vida para adolescentes. **Método:** Protocolo de revisão de escopo conduzido a partir da metodologia do *Joanna Briggs Institute*. Os achados serão reportados utilizando a extensão do *checklist Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews*. O protocolo está na *Open Science Framework*. A questão norteadora foi elaborada com base no mnemônico PCC: População (adolescentes), Conceito (tecnologias educacionais) e Contexto (suporte básico de vida). Serão utilizadas três bases via Biblioteca Virtual em Saúde e quatro bases via Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior. Dois revisores independentes selecionarão os artigos usando os programas *EndNote®* e *Rayyan®*, obedecendo critérios de elegibilidade. O *Google Scholar* e as referências dos estudos primários serão consultados como estratégias adicionais. Os resultados serão apresentados em quadros, fluxograma e discussão narrativa.

Descritores: Reanimação Cardiopulmonar; Tecnologia Educacional; Adolescente.

ABSTRACT

Objective: to map the productions about educational technologies built to teach basic life support for adolescents. **Method:** Scope review protocol conducted based on the Joanna Briggs Institute methodology. Findings will be reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews checklist extension. The protocol is in the Open Science Framework. The guiding question was elaborated based on the PCC acronym: Population (adolescents), Concept (educational technologies) and Context (basic life support). Three databases will be used via Virtual Health Library and four databases via the Journal Portal of the Coordination for the Improvement of Higher Education Personnel. Two independent reviewers will select the articles using the *EndNote®* and *Rayyan®* programs, obeying eligibility criteria. *Google Scholar* and references from primary studies will be consulted as additional strategies. The results will be presented in tables, flowchart and narrative discussion.

Descriptors: Cardiopulmonary Resuscitation; Educational Technology; Adolescent.

INTRODUCTION

Guidelines from the American Heart Association (AHA) and the European Society for Resuscitation highlight that the science of education in Cardiopulmonary Resuscitation (CPR) is a key variable for improving survival outcomes after a Cardiopulmonary Arrest (CPA). Thus, the teaching of Basic Life Support (BLS) through the promotion of CPR teaching must persist in a disseminated way to increase the prevalence of CPR and improve the results of Out-of-Hospital Cardiac Arrest (EHCPA), whose survival rates are at the same level since 2012^(1,2).

Among the audiences that require training, we have the adolescents. Despite being able to recognize and treat a patient with EHCPA, there are structural, political and educational limitations that make it difficult to teach CPR to this population. As an impact of this assertion, a study pointed out that adolescents had little knowledge about what they should do to help someone in CPA⁽³⁾. So, the need-to-know strategies based on evidence that are capable of im-

proving the knowledge of adolescents about CPR is pointed out. The AHA and the World Health Organization (WHO) postulate that training should occur in schools for children and adolescents through use of educational technologies based on instructional design^(1,4).

In this perspective, mapping the scenario that involves the use of educational technologies for teaching Hands-Only CPR to adolescents is an essential step to guide actions to improve the health education process. An integrative review research identified the teaching and learning strategies of cardiopulmonary resuscitation aimed at lay people. However, there was no mapping of educational technologies undertaken in the educational process⁽⁵⁾. Among the gaps that need to be explored, there is the lack of knowledge of the list of the most adopted technologies and their effectiveness, theoretical references are followed, and mainly if they went through a validation process.

Preliminary searches performed through May 27, 2022 in Medical Literature and Retrieval System Online (MEDLINE) via National Center for Biotechnology Information (NCBI/PubMed); Web of Science, SCOPUS, EMBASE, Cumulative Index to Nursing & Allied Health Literature (CINAHL) via Thomson Reuters collection, Virtual Health Library, COCHRANE and Google Scholar did not find ongoing or completed scoping reviews that presented aspects related to the aim of this study. Thus, the scoping review study is relevant, which aims to map educational technologies designed to teach basic life support to adolescents.

METHOD

This study is a scoping review protocol that will be conducted following the method proposed by the Joanna Briggs Institute (JBI)⁽⁶⁾ and its findings will use the checklist Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)⁽⁷⁾. The strategy of this protocol is on an open science platform that can be verified at: https://osf.io/bsczm/?view_only=4f04b314048e43d494761bed3412328e.

Review question

The question was formulated based on the PCC (Population, Concept and Context) strategy. Thus, the question is: "What are the educational technologies elaborated/used on basic life support for adolescents?"

Inclusion criteria

Participants

This scope review will consider adolescents aged between 10 and 19 years old, following the definition proposed by the WHO for adolescents⁽⁸⁾. This definition was chosen because it is a delimitation of international scope.

Concept

This review will include studies that mention the use of educational technologies designed to teach BLS to adolescents. Educational technologies provide the improvement of knowledge, scientific increment and the acquisition of new skills⁽⁹⁾. Studies that did not use material technologies will be excluded. However, it is known that technologies are the result of material products, or not, with the aim of generating interventions in practical situations⁽¹⁰⁾. However, not delimiting the concept of technology would make the scope of the review unfeasible, due to the possibility of covering management and assistance technologies that include, for example, relationships such as bonding, empowerment and reception. Thus, studies that expose educational strategies but do not mention educational technologies will also be excluded, since these strategies have already been well delimited by the current literature⁽⁵⁾.

Context

Studies should contextualize BLS teaching for adolescents in the pre-hospital setting, but will not be limited to considering cultural factors, such as geographic location and/or specific social, cultural or gender interests. In the scenario, BLS is considered one of the factors that influence survival, especially in cases of EHCPA, where a bystander can provide immediate CPR⁽¹¹⁾.

Types of evidence sources

This study will be based on any existing literature, of any methodological design. Searches will be performed on the following (MEDLINE) via (NCBI/PubMed); (CINAHL) via Thomson Reuters collection, Web of Science (WOS)- main collection via Clarivate Analytics and Embase via Elsevier, accessed through the Journal Portal of the Coordination for the Improvement of Higher Education Personnel (CAPES); Latin American and Caribbean Literature on Health Sciences (LILACS), Spanish Bibliographic Index on Health Sciences (IBECS) and Nursing Database (BDENF) via the Virtual Health Library (VHL). Google Scholar

search will be considered as additional strategies.

Search strategy

To develop the search strategy, the study question, eligibility criteria, particularities of each database and which descriptors and/or keywords could retrieve the studies were observed. Figure 1 shows the bases and the respective strategies used.

The search strategy followed three steps as recommended in the literature⁽⁶⁾. In the first one, a search was carried out in the MEDLINE databases (NCBI/PubMed) and then, studies were searched in CINAHL. This initial search consisted of analyzing the terms contained in the title and abstract and the indexing terms used to search for the articles. In the second step, a second search was performed using all identified keywords and index terms across all included databases. In the third stage, the researchers will search the reference lists for possible studies that mention educational technologies whose focus is similar to the object of this study. It should be noted that studies published in any language and without time limits will be considered.

Selection of studies

The results will be imported into EndNote Web where the investigation of duplicity of bibliographic references, obtained from different data sources,⁽¹²⁾ will happen. For analysis, selection and exclusion of articles, the software Rayyan (Qatar Computing Research Institute, Doha, Qatar)⁽¹³⁾ will be used. Articles will be included or

excluded first by reading the title and abstract. They will then be read in full and evaluated according to the inclusion/exclusion criteria. In cases of disagreement between reviewers, the opinion of a third reviewer will be requested. The studies coming from the gray literature will have the same standardized dynamics for the analysis of the published literature (peer review).

Data extraction

For the extraction of information from the articles, an instrument will be developed based on the template available in the JBI manual⁽⁶⁾. The instrument for descriptive mapping of the study variables will be built in Microsoft Office Excel 365/2022, in the form of a synoptic table, whose variables will be, at first: year, country, study design, objectives, educational technology, level of evidence of the study, theoretical framework for building the technology, authors' professional category, validation process, results and conclusion.

It should be noted that, as reviewers map each source, it may become apparent that additional unanticipated data is usefully mapped. In order to familiarize the review team with the extraction of results, a pilot stage will be carried out. In turn, the process of screening the studies will be described according to the guidelines of the PRISMA-ScR⁽⁷⁾.

Evidence analysis

JBI's meta-aggregative approach or meta-ethnographic approaches will not be carried out since they are beyond the purpose of a scoping

Database Search Strategy	
MEDLINE/PubMed	
P AND C AND C= 1567	(("Adolescent"[Mesh Terms] OR (Adolescent) OR (Adolescence) OR (Adolescents) OR (Adolescents, Female) OR (Adolescents, Male) OR (Teenager) OR (Teenagers) OR (Teens) OR (Youth) OR ("High School") OR ("School Children") OR ("Middle school") OR ("High school students")) AND ("educational technology"[MeSH Terms] OR "teaching materials"[MeSH Terms] OR "technology"[MeSH Terms] AND "health education"[MeSH Terms]) OR (educational technology) OR (teaching materials) OR (Instructional Technology) OR (Technology, Educational) OR (Technology, Instructional) OR (Audiovisual Aids) OR ("Instructional Film and Video") OR (e-learning) OR (Multimedia) OR (mobile phone application) OR (mHealth) OR (Communications Media) OR (Education, Distance) OR (Pamphlets) OR (audio-Video Demonstration) OR (Virtual Reality) OR (Education Resuscitation) OR (web course) OR (serious game))) AND ((Basic Cardiac Life Support) OR "resuscitation"[MeSH Terms] OR "cardiopulmonary resuscitation"[MeSH Terms] OR "heart massage"[MeSH Terms] OR (Resuscitation) OR (Cardiopulmonary Resuscitation) OR (Heart Massage) OR (CPR) OR (B-CPR) OR (CO-CPR) OR (Code Blue) OR (Life Support, Basic Cardiac) OR (Mouth-to-Mouth Resuscitation) OR (cardio pulmonary resuscitation) OR (reanimation) OR (resuscitation orders) OR (cardiac massage) OR (massage, heart))

CINAHLP AND C AND C
= 232

((MH "Adolescence") OR (Adolescent) OR (Adolescence) OR (Adolescents) OR (Adolescents, Female) OR (Adolescents, Male) OR (Teenager) OR (Teenagers) OR (Teens) OR (Youth) OR ("High School") OR ("School Children") OR ("Middle school") OR ("High school students")) AND ((MH "Educational Technology") OR ((MH "Technology") AND (MH "Health Education")) OR (Educational Technology) OR (MH "Teaching Materials") OR (Teaching Materials) OR (Instructional Technology) OR OR (Technology, Educational) OR (Technology, Instructional) OR (Audiovisual Aids) OR ("Instructional Film and Video") OR (e-learning) OR (Multimedia) OR (mobile phone application) OR (mHealth) OR (Communications Media) OR (Education, Distance) OR (Pamphlets) OR (audio-Video Demonstration) OR (Virtual Reality) OR (Education Resuscitation) OR (web course) OR (serious game)) AND ((MH "Resuscitation") OR (MH "Resuscitation Orders") OR (MH "Resuscitation, Cardiopulmonary") OR (MH "Bystander CPR") OR (MH "Heart Massage") OR (Resuscitation) OR (Cardiopulmonary Resuscitation) OR (Heart Massage) OR (CPR) OR (B-CPR) OR (CO-CPR) OR (Code Blue) OR (Life Support, Basic Cardiac) OR (Mouth-to-Mouth Resuscitation) OR (cardio pulmonary resuscitation) OR (cardiopulmonary resuscitation) OR (reanimation) OR (resuscitation orders) OR (cardiac massage) OR (massage, heart))

LILACS; IB ECS; BDEF/VHL**P AND C AND C = LILACS = 40**BDEF = 17
IB ECS = 29

(mh: "Adolescent" OR (adolescent) OR (adolescente) OR (adolescente) OR (adolescentes) OR (adolescência) OR (jovem) OR (jovens) OR (juventude) OR (adolescencia) OR (adolescentes) OR (joven) OR (juventud) OR (jóvenes) OR (adolescence) OR (adolescents) OR (adolescents, female) OR (adolescents, male) OR (teenager*) OR (teen*) OR (youth*) OR mh:m01.060.057*) AND (mh: "Educational Technology" OR (educational technology) OR (tecnologia educativa) OR (tecnología de instrucción) OR (educational technologies) OR (instructional technologies) OR (instructional technology) OR (technologies, educational) OR (technologies, instructional) OR (technology, educational) OR (technology, instructional) OR (tecnología instrucional) OR (tecnología educativa) OR (tecnología de instrucción) OR mh:j01.897.280* OR (mh: "Technology" AND mh: "Health Education") OR mh: "Teaching Materials" OR (teaching materials) OR (materiais de ensino) OR (materiales de enseñanza) OR (material, teaching) OR (materials, teaching) OR (teaching material) OR (materiais didáticos) OR (material didático) OR (material de ensino) OR (material didático) OR (material de enseñanza) OR (materiales didáticos) OR mh:l01.178.820* OR mh:sp8.946.234.316* OR (audiovisual aids) OR ("instructional film AND video") OR (e-learning) OR (multimedia) OR (mobile phone application) OR (mhealth) OR (communications media) OR (education, distance) OR (pamphlets) OR (audio-video demonstration) OR (virtual reality) OR (education resuscitation) OR (web course) OR (serious game)) AND ((basic life support) OR mh: "Resuscitation" OR (resuscitation) OR (ressuscitação) OR (resucitación) OR mh:e02.365.647* OR mh: "Cardiopulmonary Resuscitation" OR (cardiopulmonary resuscitation) OR (reanimação cardiopulmonar) OR (reanimación cardiopulmonar) OR (basic cardiac life support) OR (cpr) OR (cardio pulmonary resuscitation) OR (cardio-pulmonary resuscitation) OR (code blue) OR (life support, basic cardiac) OR (resuscitation, cardio-pulmonary) OR (resuscitation, cardiopulmonary) OR (bystander cpr) OR (b-cpr) OR (co-cpr) OR (código azul) OR (manutenção das condições vitais cardíacas básicas) OR (reanimação boca-a-boca) OR (reanimação cardiorrespiratória) OR (ressuscitação cardiopulmonar) OR (suporte básico de vida) OR (suporte das condições vitais cardíacas básicas) OR (apoyo vital básico cardíaco) OR (azul código) OR (reanimación cardiopulmonar básica) OR (reanimación cardiorrespiratoria) OR (resucitación cardiopulmonar) OR mh:e02.365.647.110* OR mh:sp8.946.117.190.180.105*) AND (db: ("LILACS" OR "IB ECS" OR "BDEF"))

WOS	
P AND C AND C = 7	(TS=(Adolescent*) OR TS=(Adolescence) OR TS=("Adolescents, Female") OR TS=("Adolescents, Male") OR TS=(Teenager*) OR TS=(Teen*) OR TS=(Youth) OR TS=("High School") OR TS=("School Children") OR TS=("Middle school") OR TS=("High school students")) AND (TS=("Educational Technology") OR TS=("Technology" AND "Health Education") OR TS=("Teaching Materials") OR TS=("Instructional Technology") OR TS=("Technology, Educational") OR TS=("Technology, Instructional") OR TS=("Audiovisual Aids") OR TS=("Instructional Film and Video") OR TS=(e-learning) OR TS=(Multimedia) OR TS=("mobile phone application") OR TS=(mHealth) OR TS=("Communications Media") OR TS=("Education, Distance") OR TS=(Pamphlets) OR TS=("audio-Video Demonstration") OR TS=("Virtual Reality") OR TS=("Education Resuscitation") OR TS=("web course") OR TS=("serious game")) AND (TS=("Basic Life Support") OR TS=("Basic Cardiac Life Support") OR TS=(resuscitation) OR TS=("cardiopulmonary resuscitation") OR TS=("heart massage") OR TS=(CPR) OR TS=(B-CPR) OR TS=(CO-CPR) OR TS=("Code Blue") OR TS=("Life Support, Basic Cardiac") OR TS=("Mouth-to-Mouth Resuscitation") OR TS=("cardio pulmonary resuscitation") OR TS=(reanimation) OR TS=("resuscitation orders") OR TS=("cardiac massage") OR TS=("massage, heart"))
EMBASE	
P AND C AND C = 1038	('adolescent'/exp OR adolescent OR teenager OR 'adolescence'/exp OR adolescence OR teenage OR adolescents OR (adolescents, AND female) OR (adolescents, AND male) OR teenagers OR teens OR youth OR 'high school' OR 'school children' OR 'middle school' OR 'high school students') AND ('educational technology'/exp OR 'educational technology' OR 'technology, educational' OR ('technology'/exp AND ('health education'/exp OR 'education, health' OR 'health education' OR 'health fairs' OR 'health science education' OR 'health sciences education')) OR (teaching AND materials) OR (instructional AND technology) OR (technology, AND instructional) OR (audiovisual AND aids) OR 'instructional film and video' OR 'e learning' OR multimedia OR (mobile AND phone AND application) OR mhealth OR (communications AND media) OR (education, AND distance) OR ('audio video' AND demonstration) OR (virtual AND reality) OR (web AND course) OR (serious AND game) OR pamphlets OR (education AND resuscitation)) AND ('resuscitation'/exp OR 'bystander cpr' OR 'bystander-initiated cpr' OR 'cardio pulmonary resuscitation' OR 'cardiopulmonary resuscitation' OR 'chest compression' OR 'reanimation' OR 'resuscitation' OR 'resuscitation orders' OR 'heart massage'/exp OR 'cardiac massage' OR 'closed chest cardiac massage' OR 'closed chest heart massage' OR 'closed chest massage' OR 'closed heart massage' OR 'external heart massage' OR 'heart external massage' OR 'heart massage' OR 'massage, heart' OR (Basic Cardiac Life Support) OR (Life Support, Basic Cardiac) OR (CPR) OR (B-CPR) OR (CO-CPR) OR (Code Blue) OR (Mouth-to-Mouth Resuscitation))
Google Scholar 350	"Cardiopulmonary Resuscitation" AND "Educational Technology" AND Adolescent.

Source: Elaborated by the authors, 2022.

Figure 1 - Search Strategy. Teresina, PI, Brazil, 2022

Study Identification				
Authors/Professional Category	Year/Country/Language	Objectives	Design	Evidence level
Participants				
Sample size			Study setting	
Main Results and Conclusions				
Technology		Theoretical Reference	Validation Process	

Source: Elaborated by the authors, 2022.

Figure 2 - Data extraction instrument. Teresina, PI, Brazil, 2022

review(6). However, when seeking to highlight the quality of the information source, the inserted articles will have their quality evidenced through JBI's Critical Appraisal Tools (<https://jbi.global/critical-appraisal-tools>);

Results presentation

The results will be presented in tables and dia-

grams that will accompany a descriptive summary (of the research variables) of the conceptual categories.

CONFLICT OF INTERESTS

The authors have declared that there is no conflict of interests.

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Final approval of the version to be published: Luz PK, Machado RS, Oliveira RKC, Galindo Neto NM, Marques MCMP, Barros NL, Andrade EMLR

Responsibility for the text in ensuring the accuracy and completeness of any part of the paper: Luz PK, Machado RS, Oliveira RKC, Galindo Neto NM, Marques MCMP, Barros NL, Andrade EMLR



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