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EDUCATIONAL TECHNOLOGIES FOR FIRST AID TEACHING: INTEGRATIVE REVIEW

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Leonardo Saboia Paz[1], Raimundo Augusto Martins Torres[2], Elizabeth Chagas Gomes[3] and Etelvina Sampaio Melo[4]

ABSTRACT

First aid should be included in health promotion policies, as an instrument to strengthen good health conditions for young people. Thus, the study aimed to analyze the evidence available in the literature regarding educational technologies aimed at teaching adolescents with an emphasis on first aid. To this end, we chose to perform an integrative review, which analyzed primary research articles indexed in the National Library of Medicine and National Institutes of Health, Latin American and Caribbean Literature on Health Sciences, Nursing Database, Google Scholar, Scopus, and Web of Science databases, without date restriction. The search was conducted in December 2022; The data were submitted to critical analysis and qualitative synthesis and presented in a descriptive way. 4 studies were selected and 4 educational technologies were found, aimed at teaching first aid. The approach to the theme with adolescents was present in all studies and the success of the strategies for the teaching of first aid was proven. The study made it possible to identify educational technologies for the teaching of first aid, aimed at the adolescent public and evidenced the effectiveness of these tools in health promotion.

Keywords: Educational Technology. Adolescent. First aid.

[1]State University of Ceará – UECE / Brazilian Company of Hospital Services - EBSERH
[2]State University of Ceará – UECE
[3]State University of Ceará – UECE
[4]State University of Ceará – UECE

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INTRODUCTION

First aid is an initial conduct that aims to help people affected by a health problem, and can be performed by anyone, even if they are not a health professional. In this sense, it is necessary to provide educational training to the lay public, through the dissemination of knowledge about first aid, aiming to contribute to the prevention of accidents, for safe and precise action in emergency situations, thus reducing the risk of death or secondary injuries (SINGLETARY et al., 2015)

Important institutions such as the Ministry of Health, the Red Cross and *the American Heart Association (AHA)* reinforce that first aid education influences the reduction of injuries and morbidity and mortality rates. In this way, these institutions produce evidence-based recommendations, with the objective of contributing to the implementation of community-oriented educational strategies, which favor the initial approach to victims in an expanded or universalized way, to act in all possible scenarios (SOUSA et al., 2018).

In this regard, first aid should be included in health promotion policies, as an instrument to strengthen good health conditions for young people. In the area of Health Informatics, Digital Information and Communication Technologies (DICT) are in evidence and need to be used correctly and effectively. Thus, the popularization and growth in the use of technologies, such as *the Internet* and mobile telephony, have generated important effects on health care (TORRES; ABREU; VERAS, 2015).

In addition, the tools have contributed strongly to health education, through educational technologies in health, being embedded in a systematized set of knowledge that enables the planning, execution, control and monitoring of educational or training processes in health, formal or informal, based on the construction and intervention through equipment or artifacts (SILVA et al., 2021).

The occurrence of accidents among adolescents requires special attention, knowing how to prevent and act in the face of accidents becomes indispensable for young students. Accidents in the school environment are frequent, making it necessary to have an appropriate approach to avoid irreversible sequelae or death. Therefore, the need for health education strategies focused on the production of knowledge and the training of young students on first aid (RIBEIRO et al., 2019).

Therefore, the acquisition of knowledge about first aid is essential, especially in the school environment, as it is one of the places where urgent situations and emergencies can occur, due to the agglomeration of adolescents performing activities inside and outside

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the classroom. Such a situation gives any student the chance to witness a situation and needs to act, in order to avoid complications secondary to the injury witnessed (MOURA et al., 2018).

In this way, the school plays a fundamental role in the development of young people. It should be a dialogical environment of social interaction, where technological resources and communication enable cooperation and transformation. The insertion of DICT in the daily school routine makes it possible to carry out health education activities, interactive practices, exchange of knowledge and experiences (TORRES et al., 2018).

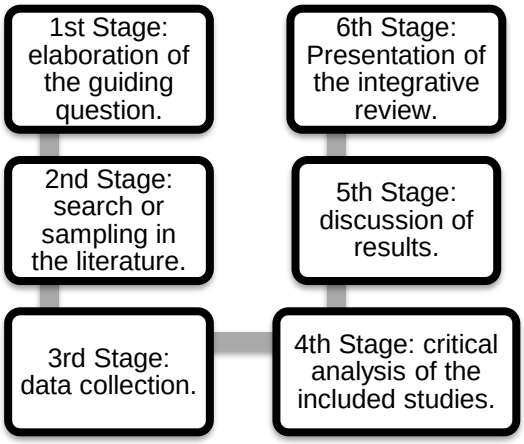
In view of the above, this article intends to deepen and systematize knowledge about educational technologies aimed at adolescents with an emphasis on first aid, through an integrative literature review of scientific works produced nationally and internationally.

METHOD

This is a qualitative research that presents as a method the integrative review of the Literature. An integrative literature review was chosen because it is a method that makes it possible to synthesize and gather the results of research, delving into the desired theme. And also for directing and grounding the practice, allowing the inclusion of experimental and non-experimental studies, for a complete understanding of the phenomenon analyzed (GIL, 1994; SOUZA, 2010).

In order to meet the proposed objective, we followed six steps as recommended by Souza et al., (2010), thus, the steps as shown in figure 1 were contemplated for the integrative review.

Figure 1 - Steps of the integrative review.



Source: Prepared by the author.

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The research question was prepared according to the PICo (Population, Interest, Context) strategic model, considering the following structure: P – adolescents; I – use of educational technologies; First aid (SANTOS, 2007). Subsequently, the following question was constructed: "What educational technologies aimed at adolescents are used for the teaching of first aid available in the scientific literature?".

To prepare the research question, the Health Sciences Descriptors (DeCS/BIREME) and the *Medical Subject Headings (MeSH terms) were* consulted: Educational Technology / *Educational Technology;* Adolescent / *Adolescent* / Adolescent; First Aid.

Data collection took place online, in December 2022, through access to the following databases: *PubMed/Medline (National Library of Medicine and National Institutes of Health)*; LILACS (Latin American and Caribbean Literature on Health Sciences); BDENF (Nursing Database); *Google Scholar*; *Scopus*; *Web of Science.*

The inclusion criteria defined for the selection of articles were: articles published in Portuguese, English and Spanish; articles in full that portrayed the theme related to integrative review and articles published and indexed in these databases in the last ten years. The exclusion criteria were: book chapters, news, editorials, dissertations, theses, experience reports and studies that were inconsistent with the questioning of the research.

The searches were performed using the combination of the Boolean operator "*AND"* between the descriptors and the Boolean operator "*OR*" between the synonymous words, with the combinations in Portuguese, English and Spanish, adapting the combinations and respecting the singularities of each database. Thus, the following crossings were carried out: "Educational Technology" *and* "Adolescents" *and* "First Aid"; "*Educational Technology" and "Adolescent" and "First Aid"*; "*Tecnología Educacional" and "Adolescentes" and "Primeros Auxilios".*

Regarding the analysis of the selected studies, we opted for the proposal validated by Ursi and Gavão (2006), which included aspects related to the authors of the studies; the place, year and country of its development; the level of evidence; to the objective; to the results and conclusion of the same with regard to the guiding question.

Regarding the methodological approach, the studies were classified by means of 6 levels of evidence, namely: Level I - characterized by the systematic review of controlled, randomized, well-designed studies; Level II - characterized by the presence of at least one randomized, controlled study with an adequate design and size; Level III- characterized by the presence of studies without randomization, well designed, time series, paired control

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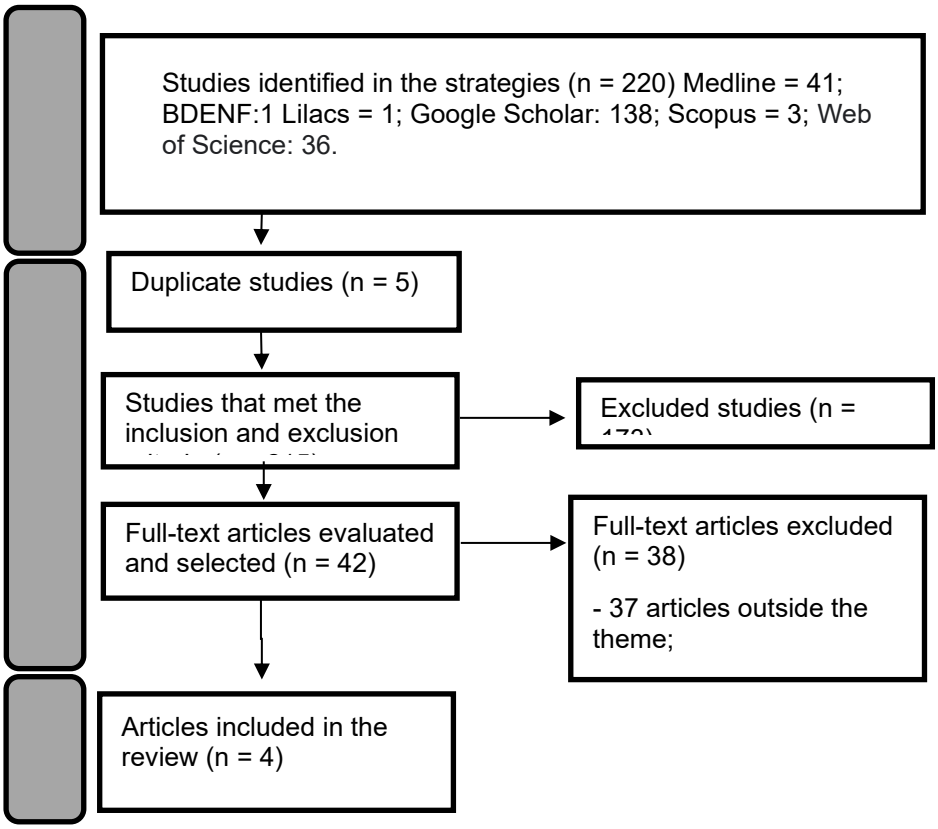
case or pre and post cohort; Level IV - characterized by the presence of well-designed non-experimental studies and qualitative studies; Level V - characterized by the presence of experience reports or case reports; Level VI – characterized by the presence of descriptive studies, opinions of authorities or reports of expert committees (URSI; GAVÃO, 2006).

After searching the databases, a total of 220 scientific articles appeared. Next, the inclusion and exclusion criteria were applied, and 42 articles were selected for full reading, of which 9 were excluded because they did not meet the inclusion criteria. Thus, a sample of 4 articles was established for data analysis and discussion, according to the flowchart presented below (Figure 1).

As this is an integrative review, the research was not submitted to the Research Ethics Committee, however the authorial discussions present in the publications used for the development of the study were maintained.

Figure 2 – Flowchart of the selection stages of the studies included in the integrative review, 2022



Source: Prepared by the author.

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RESULTS

Chart 1 shows the four studies that were part of the sample, in terms of title, the database where the study was collected, the journal, the year of publication, and the professional category of the authors of the article and the country where the study was carried out.

Chart 1 - Profile of the publications selected for the study. Fortaleza, Ceará, Brazil, 2022.

Study	Database	Periodic	Year of publication	Country of the research	Authors' professional category
Controlled randomized clinical trial comparing Face-to-face training in person en el aprendizaje teórico de la resuscitación cardiopulmonary entre los estudiantes de secundaria	*MEDLINE*	*Emergencies*	2018	Spain	Not informed
An experimental study exploring the impact of vignette gender on the quality of university students' mental health first aid for peers with symptoms of depression	*MEDLINE*	*BMC Public Health*	2016	England	Not informed
Educational gymkhana – how to save a life: strategy on first aid for adolescents	*LILACS*	Plural Science	2021	Brazil	Nurse and students
First aid board game development for school children as educational learning technology	*Google Scholar*	*Brazilian Journal of Development*	2021	Brazil	Nurses

Source: Prepared by the Author

Next, the articles were systematized according to the methodology adopted, the level of evidence, the intervention adopted, the results and conclusion of the studies (Chart 2).

Chart 2 - Synthesis of the studies that make up the sample of the integrative review. Fortaleza (CE), 2022.

Study Type/Level of Evidence	Goal	Technology Educational	Intervention Outcomes	Conclusion
Randomized controlled trial / Level	Compare face-to-face training, with traditional	Videos	Students have improved their knowledge of CPR and AED, but they	Audiovisual resources are considered effective tools for the training

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of Evidence II	pedagogical method through a theoretical lecture, versus non-face-to-face training, with audiovisual method through videos, in learning.		cannot claim to have increased their practical skills. They did not learn differently depending on the method. Some groups did better with video training than with traditional training.	of students, no differences were found between face-to-face training and audiovisual training with multimedia videos in theoretical learning.
Randomized / Level of Evidence II	To investigate the quality of first aid actions in mental health of university students.	Vignette	Students reported low scores for mental health first aid actions, only eight students stated their intention to assess the risk of harm. Students in courses not related to mental health reported worse scores.	Most students lack the mental health first aid skills to support friends suffering from symptoms of depression. First aid training favors harm reduction.
Action Research/ Level IV	Describe an educational strategy on first aid for adolescents.	Educational gymkhana	Participants were interested in learning about first aid, especially when accompanied by the use of educational technologies.	It contributed to the learning about first aid of the students, which allowed them to prevent possible health problems, in addition to making them possible disseminators of knowledge.
Methodological/ Level IV	Develop an educational technology, such as a board game, for the teaching of first aid.	Board Game	The game was developed in board format, addresses content about traffic accidents, falls, drowning, burns, intoxication and suffocation.	It is a playful and motivating teaching-learning tool that can be used for teaching first aid to school-age children and adolescents.

Source: Prepared by the Author

The selected articles (n = 4) came from 3 countries, published in Spanish, English and Portuguese. The sample size of the analyzed articles ranged from 27 to 2225 participants, one of which is a methodological development study, with no sample.

The educational technologies present in the studies are focused on first aid education, two studies contemplated diseases that mainly affect children and adolescents, among which, the following stand out: traffic accidents, falls, drowning, burns, intoxication and suffocation (choking). Two other studies covered specific health problems, one of

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them, basic life support (BLS) and cardiopulmonary resuscitation (CPR) and the other addresses problems related to mental health.

Regarding the type of studies, the 4 studies presented different methods, however, 2 studies presented level of evidence II and two others presented level IV. Considering the year of publication, two articles were published more than five years ago.

Regarding the professionals responsible for performing the interventions, only two studies mention that the actions were performed by nurses, and one also involves students. Still analyzing the results, two point out that the authors and participants of the research reside in European countries and the other studies were carried out by Brazilian researchers and with Brazilians.

The educational strategies were well designed in all studies and the four are anchored in specific audiovisual resources, such as: educational videos, vignette, and electronic game. And one study presented diversified strategies, a gymkhana, which involved practical activities (realistic simulations, games and *quizzes*) and diversified material resources (cups, pies, cookies, balloons).

Considering the technologies described in Chart 2, the effectiveness of the technologies was evidenced in all studies, along with the interest in learning anchored by these educational technologies. In this context, it is important to emphasize that the result presented by a study demonstrated the equivalence between traditional training (with theoretical lectures) and audiovisual training (videos).

DISCUSSION

The existence of current and significant studies contributes to Evidence-Based Practice (EBP), therefore, it is important that there are studies to increase all types of production, especially literature reviews. According to the search criteria established in this review, the number of studies found in the last ten years is limited to 4 articles. In fact, the small number of studies with evidence levels II and IV, the lack of articles at levels I, III, V and VI are factors that hinder the practice of professionals who want to use or develop educational technologies on first aid for adolescents, due to the derisory number of studies available to support scientific and technological production (SOARES et al., 2018).

Among the authors of the studies, nurses stand out in 50% of the studies and in the others it was not possible to identify the training. This result is justified by the performance of this professional category in various health care services, especially in the provision of

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urgent and emergency care. In addition, technologies are already incorporated into nursing care, either as an organizational model of work, or enhancing the development of educational activities, with the objective of transforming and improving the quality of life of users (SILVA et al., 2021).

In all studies, the target audience of the technologies was adolescent students, and in 1 study, the technology was applied to university adolescents, and in the others, to adolescent students in basic education. Adolescents tend to spend approximately one third of the day at school, favoring the possibility of complications in the school environment, with a high probability that the student will witness the fact and, thus, need to be prepared to act in these situations, even preventing secondary damage to the victims (GRIMALDI et al., 2020).

Thus, the use of innovative methodologies and the production of educational technologies in educational institutions, with a focus on first aid, are examples of innovation in the teaching-learning processes, which favor the development of competencies and skills relevant to the current scenario, as well as the education in health of students (MATOS; MAZZAFERA, 2022).

Technologies can be classified as light, light, hard and hard, with soft technologies being those that are related to relationships; the soft hard are those of structured knowledge, such as theories, and the hard are those of material resources. Thus, the studies that presented the video, the vignette, and the virtual board game as a technological intervention presented hard technologies, and the study that presented the gymkhana as a technological intervention presented a soft technology (RIBEIRO DE MOURA, 2022).

In order for a technology to achieve the proposed educational objective, it is important to analyze the pertinent teaching strategies. The technologies surveyed enabled an increase in the knowledge of its target audience about first aid after the intervention, and also pretermitiated the formation of a situational diagnosis on the proposed theme (CARVALHO ET AL., 2018).

Therefore, the positive result resulting from the application of educational technologies is due to the fact that these resources are consolidated as important tools for innovation. And to be increasingly present in society and inserted in the routine of adolescents. On the other hand, it is worth noting that the teaching of first aid in Brazil is

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still not very widespread, with a lack of knowledge on the subject, a fact that can be considered a public health problem (JACOBOVSKI; FERRO, 2021).

As a limitation of the research, we highlight the low number of studies on the theme addressed. Therefore, for future research, it is suggested the application or construction of new technologies aimed at the training of adolescents in first aid in Brazil and worldwide. In addition, a low level of evidence was demonstrated in part of the studies referred to in the results. It is worth noting that the objective of the review was to survey technologies used in the literature, so the categorization does not lead to the exclusion of these studies.

In this sense, the study will serve as a basis to stimulate the construction and use of educational technologies for the training of adolescents in the global and national context.

FINAL CONSIDERATIONS

The integrative review made it possible to identify in the literature 4 educational technologies aimed at teaching first aid to the adolescent public. It was observed that the educational interventions in all studies were aimed at students of basic and higher education and that their knowledge improved after the interventions.

Among the multiprofessional team in the health area, the studies showed that nursing is the prominent professional category in the creation and use of technologies for training adolescents in first aid.

Thus, we point to the need for more studies, with higher levels of scientific evidence, especially on health education, on first aid for adolescents, which deal with the construction and validation of educational technologies, in order to also contribute to Evidence-Based Practice.

The strengthening of higher education institutions, with support for research aimed at the development of new educational technologies on first aid, as well as the formalization of partnerships between these institutions and professionals, in order to enable the process of health education on first aid for adolescents.

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