

# Health education programs in schools for adolescents: an integrative literature review

Programas de educação em saúde em escolas para adolescentes: revisão integrativa da literatura

Programas de educación en salud en escuelas para adolescentes: una revisión integrativa de la literatura

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## Abstract

**Introduction:** Health education projects in schools create opportunities to transform reality, as students help spread knowledge to the community. **Objective:** To analyze health education programs for young people in schools, to verify the use of information and communication technology as intervention strategies. **Method:** An integrative review of the literature was conducted, searching articles in the PubMed, LILACS, Scopus, and Embase databases, considering the last 10 years. **Results:** The final sample had 27 studies. Various types of strategies and resources were used; some of them included

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### Authors' contributions:

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LPM, WQB: study design; methodology; article writing; critical review; guidance.

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information and communication technology, while others did not use them. The most used resources were audiovisual projection (present in 13 articles) and discussion and dialog (present in 16 articles). As for program assessment, 26 articles reported the results – which were positive in 23 and average in three of them. **Conclusion:** This study demonstrated that countless strategies and resources are used to develop effective health education projects. The use of technological resources (such as electronic tutors in remote activities) predominated in Brazilian studies.

**Keywords:** Health Education; Adolescent Health; School Health Services; Health Promotion; Public Health.

## Resumo

**Introdução:** Projetos de educação em saúde em escolas possibilitam a criação de oportunidades e transformação da realidade, em que os alunos tornam-se disseminadores do conhecimento para a comunidade. **Objetivo:** Analisar programas de educação em saúde para jovens em escolas, a fim de verificar o uso de tecnologias de informação e comunicação como estratégias para as intervenções. **Método:** Foi realizada uma Revisão Integrativa da literatura. As buscas foram realizadas nas bases de dados PubMed, LILACS, Scopus e Embase, considerando os últimos 10 anos. **Resultados:** A amostra final contemplou 27 estudos. Diferentes tipos de estratégias e recursos foram utilizados, algumas envolvendo tecnologia de informação e comunicação, outras não. Dentre estes recursos, os mais utilizados foram projeção audiovisual presente em 13 artigos, e discussão e diálogo, presentes em 16 artigos. Em relação à avaliação dos programas, 26 artigos descreveram os resultados, em 23 casos os resultados foram positivos, e em três casos os resultados foram regulares. **Conclusão:** Este estudo demonstrou que são inúmeras as estratégias e recursos utilizados no desenvolvimento de um projeto de educação em saúde eficaz. Nos estudos desenvolvidos no Brasil, houve predominância da utilização de recursos tecnológicos, como o uso de tutores eletrônicos para atividades à distância.

**Palavras-chave:** Educação em Saúde; Saúde do Adolescente; Serviços de Saúde Escolar; Promoção da Saúde; Saúde Pública.

## Resumen

**Introducción:** Los proyectos de educación para la salud en las escuelas permiten la creación de oportunidades y la transformación de la realidad, en la que los estudiantes se convierten en difusores del conocimiento a la comunidad. **Objetivo:** Analizar los programas de educación para la salud de los jóvenes en las escuelas, con el fin de verificar el uso de las tecnologías de la información y la comunicación como estrategias de intervención. **Método:** Se realizó una revisión bibliográfica integradora. Las búsquedas se realizaron en las bases de datos PubMed, LILACS, Scopus y Embase, considerando los últimos 10 años. **Resultados:** La muestra final comprendía 27 estudios. Se utilizaron diferentes tipos de estrategias y recursos, algunos con tecnologías de la información y la comunicación, otros no. Entre estos recursos, los más utilizados fueron la proyección audiovisual, presente en 13 artículos, y el debate y el diálogo, presentes en 16 artículos. En cuanto a la evaluación de los programas, 26 artículos describieron los resultados, en 23 casos los resultados fueron positivos y en tres casos los resultados fueron regulares. **Conclusión:** Este estudio demostró que existen numerosas estrategias y recursos utilizados en el desarrollo de un proyecto de educación sanitaria eficaz. En los estudios desarrollados en Brasil, hubo un predominio del uso de recursos tecnológicos, como el uso de tutores electrónicos para las actividades a distancia.

**Palabras clave:** Educación en Salud; Salud del Adolescente; Servicios de Salud Escolar; Promoción de la Salud; Salud Pública.

## Introduction

Health education plays an important role in motivating changes in the population's health behaviour, enabling those who have been educated to spread knowledge and participate in debates in other sectors to improve the quality of life. Health education is defined as "1- An educational process of constructing knowledge about health in the population to raise awareness on the topic, rather than aiming at health professionals and careers. 2- A set of practices in the sector that helps increase the people's autonomy in care and debates with professionals and administrators to obtain healthcare according to their needs"<sup>1</sup>.

In its pedagogical framework, health education requires the development of critical thinking to carry out transforming methods that make people socially autonomous and capable of taking decisions regarding their and other people's health<sup>2</sup>.

When carried out in schools, educational projects can transform the environment in terms, not only of traditional education, but also health education. Hence, they create opportunities to transform reality beginning with young people and even the community, as they spread knowledge – which is essential to medium- and long-term results. Including technology in these projects' strategies can help people change their behaviours.<sup>3-6</sup>

This study is an integral part of a larger project, named "Development of a conceptual model for training young leaders applied to health education", which aimed to develop a conceptual model to be used as a replicable method to train young leaders and social entrepreneurs in health education projects. The integrative review presented in this study was the first stage of this project, being essential

to know and understand health education projects used in different countries with various topics.

## Objective

To analyze health education programs for adolescents at school, focusing on the use of information and communication technology as a strategy in the interventions.

## Methods

### *Research strategy*

This is an integrative review of the literature, whose research question was, "What are the health education programs for adolescents at school and how are they developed?"

Six stages were followed to carry it out, namely: identifying the topic, developing the research question, searching the literature, extracting information, outlining the synthesis and descriptive summary, and indicating practical implications and further research. These stages were defined based on guidelines<sup>7</sup> adapted to the needs of the study. The research report was structured according to PRISMA<sup>8</sup>.

Despite being focused on randomized clinical trials, PRISMA can be used as a basis to report systematic reviews of other studies, particularly intervention assessments<sup>8</sup>. Its recommendations help researchers to organize their reports. Since this study is an integrative review, the PRISMA checklist meta-analysis and protocol items were not used.

The integrative review research question was structured based on PICOS, which is an anagram whose components form the research question<sup>9</sup>, described in Chart 1.

**Chart 1.** Components of the integrative review

Description	Research Components
Population	Students aged 10 to 19 years of schools that received the training programs in the last 10 years
Intervention	Health education programs
Comparison	Comparison between experimental and control groups; comparison pre- and post-intervention; and comparison between strategies and tools used in the programs
Outcome	Increased knowledge of the topics in the participating programs
Study type	Published qualitative and quantitative studies

The search strategy for the integrative review of the literature defined the following databases: PubMed, LILACS, Scopus, and Embase. It approached national and international health literature in Portuguese, English, and Spanish, between 2010 and July 2020, the month when the search in the databases was finished.

The search strategy used terms in the Health Science Descriptors (DeCS) and controlled descriptors in the Medical Subject Headings Section (MeSH), combining keywords, synonyms, and Boolean operators, as described in Chart 2.

**Chart 2.** Descriptors used in the databases

PICOS	Descriptors
P	("students" OR "student") AND ("adolescent" OR "adolescents" OR "adolescence" OR "teen" OR "teens" OR "teenager" OR "teenagers")
I	"health education" AND ("schools" OR "school" OR "secondary schools" OR "secondary school")

The final search strategy used a combination of PICO elements and the Boolean operator AND – i.e., P AND I. The Embase, PubMed, and

Scopus databases were searched in English, while the LILACS database was searched in English and Portuguese, as shown in Chart 3.

**Chart 3.** Search strategy

Databases	Search terms
Embase	("students" OR "student") AND ("adolescent" OR "adolescents" OR "adolescence" OR "teen" OR "teens" OR "teenager" OR "teenagers") AND "health education" AND ("schools" OR "school" OR "secondary schools" OR "secondary school")
Pubmed	
Scopus	
LILACS	
LILACS	("estudantes" OR "estudante") AND ("adolescente" OR "adolescentes" OR "adolescência" OR "jovem" OR "jovens" OR "juventude") AND "educação em saúde" AND ("escolas" OR "escola" OR "instituições de ensino")

### *Selection Criteria*

The inclusion criteria were as follows: articles with any study design, published in Portuguese, English, or Spanish, describing health education and promotion programs for adolescents (aged 10 to 19 years) at school – in case they included other ages, they should be assessed separately –, with knowledge transmitted by proponents to the young people.

The exclusion criteria were articles not found or unavailable to free access; secondary studies; unapplied protocols; ongoing programs; programs described in another article, thus hindering its understanding; programs not encompassing adolescents, not carried out in schools, or not directly related to the topic in question; studies citing programs but not describing their activities, strategies, or topics; studies describing the program as a whole, but not the specific edition; studies describing pre-existing programs; studies citing many editions, thus compromising the understanding of what took place in each school; programs characterized as healthcare instead of health education; studies describing a part of the edition, rather than it all; studies only surveying students who had already participated in programs; studies whose intervention used only materials, with no knowledge shared by the proponents; studies from which necessary information could not be obtained; and studies whose public was limited to very specific characteristics, other than sex.

### *Data Analysis*

Studies were selected based on independent reading by three reviewers. If there were divergences, a fourth reviewer solved the issue.

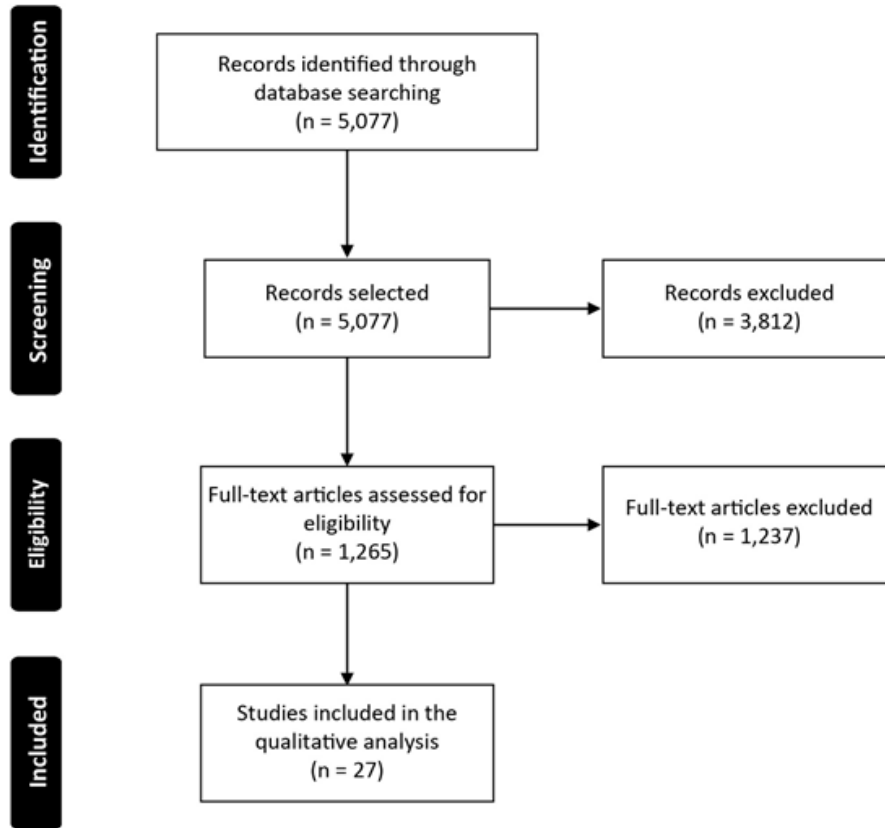
The first selection stage encompassed the title and abstract independent reading by the three reviewers to define which studies would be read in full text in the second stage. The selection was based on eligibility criteria, which were defined according to the research question. At the end of the process, the reviewers met to discuss their individual selections.

### **Results**

Altogether, 5,077 studies were identified – 1,721 in PubMed, 1,868 in Scopus, 559 in Embase, and 929 in LILACS (599 of these 929 were found using English terms, and the other 330, using Portuguese terms).

At the end of the first selection, 1,265 articles were selected for the second stage. They were independently read in full text by the three reviewers to define the studies that would be included in the research, according to the eligibility criteria based on the research question. At the end of the process, the reviewers met to discuss the articles each one had selected. In this stage, they diverged on the inclusion of five articles, which were evaluated by the fourth reviewer.

After this process, 27 studies were selected for data analysis and extraction. The study selection process is described in Figure 1, which was developed by the author, and adapted from the flowchart recommended by PRISMA<sup>8</sup>.



**Figure 1.** Flowchart of the integrative review

Hence, the final sample comprised 27 articles, whose data underwent descriptive analysis. Information extracted from the articles to be studied included the year of publication, the language of publication, the country where the project was carried out, study design, topic approached, participating schools (number and description), participating

students (number, age range, sex), strategies and resources used, assessment method, and results.

The 27 selected articles are presented in Chart 4, summarized according to authors, the country where the projects were carried out, year of publication, topic, participating schools and students, and assessment.

**Chart 4.** Articles included in the integrative review

Authors (year) and country	Topic and Objective	Participating schools and students	Strategies	Assessment
Silva, Dantas, Carneiro, and Melo <sup>10</sup> (2019) Brazil	Oral hygiene "[...] to assess the effectiveness of an oral health education activity carried out in a middle school [...], approaching the students' knowledge and behavior regarding oral hygiene"	1 public school Both sexes 12 to 16 years old	Plays; large dental arch models, toothbrushes, and dental floss.	Questionnaires before and after the intervention to assess knowledge
Oliveira, Corrêa, Vieira, Blasca, Brasolotto <sup>11</sup> (2018) Brazil	Voice changes and habits "[...] To develop and apply a training program on voice changes and healthy habits, based on the Young Doctor Project, and analyze the immediate effects of its application"	1 public school Both sexes 13 to 15 years old	Audiovisual projections with brief texts, illustrations, and videos; virtual environment; spreading knowledge: audiovisual projection with texts, images, and videos.	Questionnaires before and after the intervention to assess knowledge
Blasca, Oliveira, Falsetti, Piccino, and Corrêa <sup>12</sup> (2017) Brazil	Hearing health "[...] To verify students' social motivation and attitudes after participating in a hearing health training educational program"	4 public schools 14 to 15 years old	3D iconography; virtual environment; spreading knowledge: lectures and plays.	Questionnaires before and after the intervention to assess social attitudes when platform motivational aspects are included
Gomes, Câmara, and Souza <sup>13</sup> (2016) Brazil	Accidents at work "[...] To estimate the knowledge of accidents at work before and after health education activities among students in an area impacted by a landfill, so they can share what they learned with other students and stimulate them to take preventive measures"	1 public school Both sexes 10 to 17 years old	Discussion and photos	Questionnaires before and after the intervention to assess knowledge
Ribeiro, Martins, Gubert, Almeida, Silva, and Afonso <sup>14</sup> (2016) Brazil	Transformations in the body and pregnancy in adolescence "[...] To describe adolescents' perception of the transformations in their bodies and of the risks and consequences of pregnancy in adolescence, based on the personal adolescent health record"	1 public school Both sexes 14 to 16 years old	Approaching topics dialogically and reading the materials.	Interview before and after the intervention to assess knowledge (before) and opinion (after)
Santana, Alvarenga, Cruz, Quadros, and Jacob-Corteletti <sup>15</sup> (2016) Brazil	Hearing "[...] To verify school-age young people's habits and attitudes regarding the use of personal sound devices and assess their level of knowledge about the harmful effects of exposure to amplified music on hearing, before and after an educational lecture"	1 public school Both sexes 10 to 17 years old	Interactional lectures with audiovisual resources: texts, images, and videos.	Questionnaires before and after the intervention to assess knowledge, habits, and attitudes



Authors (year) and country	Topic and Objective	Participating schools and students	Strategies	Assessment
Oliveira, Soares, and Silva <sup>16</sup> (2016) Brazil	Drugs "[...] To report the experience of using emancipatory survey-actions as a strategy to develop media educational programs on drugs, presenting their potential to pose real-life problems related to the young people's lives"	1 public school Both sexes 15 to 17 years old	Creating a social media group; Developing posters and a newspaper; researching photos; plays; research in newspapers, magazine, and the Internet; dialog circles; movies; music; comics; presentation of the activities; discussion; creating a radio program.	Not described
Maximino, Picolini-Pereira, and Carvalho <sup>17</sup> (2014) Brazil	Genetic syndromes "[...] To develop and analyze an educational program in genetic syndromes for elementary students applied in two Brazilian states, using an Interactive Tele-education model"	4 public/private schools Both sexes 13 to 14 years old	Audiovisual projection with images and videos; virtual environment; discussion; spreading knowledge.	Problem-situation questionnaire before and after the intervention; Assessment of knowledge with the FPM checklist to evaluate motivational aspects
Toassa, Leal, Wen, and Philippi <sup>18</sup> (2010) Brazil	Nutritional guidance "[...] To describe fun activities used in nutritional guidance of adolescents participating in the Young Doctor Project"	2 public schools Both sexes 15 to 17 years old	Interactive activities; discussion; drama	Qualitative assessment with observation
Corrêa, Silva, Barros, Pardo-Fanton, and Blasca <sup>19</sup> (2015) Brazil	Hearing health "[...] To develop and assess hearing health educational actions for middle-school students, spreading knowledge to the population, grounded on the principles of the Young Doctor Project"	1 public school Both sexes 13 to 15 years old	Audiovisual projection with images, videos, and 3D iconography; virtual environment; interactive activities; spreading knowledge: posters, audiovisual projection with pictures and videos.	Questionnaire before and after the intervention; Assessment of the satisfaction with the platform and knowledge
Yamaguchi, Ojio, Foo, Michigami, Usami, Fuyama, et al. <sup>20</sup> (2020) Japan	Mental health "[...] To confirm the effects of the SMHLP in a stronger design"	1 public school Both sexes 15 to 16 years old	Cartoons; discussion; drama.	Questionnaires before and after the intervention to follow up and assess knowledge
Komofale, Olorunmoteni, and Fehintola <sup>21</sup> (2020), Nigeria	Stroke "[...] To determine the baseline knowledge of secondary school students in Ile-Ife about stroke and its risk factors. [...] To compare the difference in stroke knowledge among the intervention and control group after the intervention"	8 public/private schools Both sexes 10 to 19 years old	Oral presentation; handing out pamphlets; audiovisual material.	Questionnaires before and after the intervention to assess knowledge





Authors (year) and country	Topic and Objective	Participating schools and students	Strategies	Assessment
Soto-Perez-de-Celis, Smith, Rojo-Castilho, Hurria, Pavas-Vivas, Gitler-Weingarten, et al. <sup>22</sup> (2017) Mexico	Breast cancer "[...] we assessed the educational program's feasibility by measuring its acceptability, appropriateness, and possibility for integration into middle school curricula. [...] we assessed changes in knowledge on breast cancer following the program among the participants, and the intergenerational transmission of that knowledge to their female relatives"	1 public school Females 12 to 16 years old	Audiovisual projection; printed facts; myth letters; white board; demonstration model; book; card; magazine; drama; discussion; emphasis on the importance of sharing knowledge at home.	Questionnaires before and after the intervention to follow up and assess knowledge
Ojio, Yonehara, Taneichi, Yamasaki, Ando, Togo, et al. <sup>23</sup> (2015) Japan	Mental health "Improving knowledge and beliefs about mental health (or mental health literacy [MHL]) may promote appropriate help-seeking by adolescents who are suffering from mental health problems"	1 school Both sexes 14 to 15 years old	Cartoons; blackboard; photos; group discussion.	Questionnaires before and after the intervention to follow up and assess knowledge and behavior
Ghrayeb, Rusli, Rifai, and Ismail <sup>24</sup> (2013) State of Palestine	Nutrition "[...] To assess the impact of a classroom nutrition education intervention program on the nutrition knowledge of high school students in Tarqumia, Palestine"	4 schools Both sexes 16 to 18 years old	Audiovisual projection; lesson plans; visual resources; brochures; notebooks.	Questionnaires before and after the intervention to assess knowledge
Madeni, Horiuchi, and Iida <sup>25</sup> (2011), Tanzania	Reproductive health "[...] To evaluate a reproductive health awareness program for the improvement of reproductive health for unmarried adolescent girls and boys in urban Tanzania using a questionnaire assessing their knowledge, attitude, and behavior"	3 schools Both sexes 11 to 16 years old	Picture drama; demonstration material; blackboard; posters; discussion.	Questionnaires before and after the intervention to assess knowledge and behavior
Radhika, Gunathilaka, Udayanga, Kasturiratne, and Abeyewickreme <sup>26</sup> (2019), Sri Lanka	Dengue "[...] To determine the existing level of awareness of dengue infection and assess the effectiveness of dengue awareness programs on school children to improve the existing knowledge and preventive practices on dengue"	10 schools 13 to 15 years old	Audiovisual projection; videos; discussion.	Questionnaires before and after the intervention to assess knowledge and awareness

<b>Authors (year) and country</b>	<b>Topic and Objective</b>	<b>Participating schools and students</b>	<b>Strategies</b>	<b>Assessment</b>
Morrill, Abel, Januszewski, and Chamberlain <sup>27</sup> (2017) USA	Electronic cigarettes "[...] To describe the development and delivery of an interactive presentation and survey tool by doctor of pharmacy (PharmD) candidates. [...] To foster engagement and interest in the topic amongst the student audience via an interactive presentation. As well as provide PharmD candidates with increased practice in presentation and communication skills"	3 schools 14 to 18 years old	Audiovisual projection; interactive presentation; interactive game; discussion; video clips.	Questionnaire after the intervention to assess perception, use, and knowledge
Ngadimon, Islahudin, Mohamed Shah, Hatah, and Makmor-Bakry <sup>28</sup> (2017) Malaysia	Antibiotics "[...] To assess the effect of antibiotic education on knowledge and involvement in medication SDM among adolescents, in an attempt to promote antibiotic education of younger patients"	Public schools Both sexes 13 to 17 years old	Oral presentation.	Questionnaire before and after the intervention to assess knowledge, attitudes, and preferences in shared decision-making
Marto, Borbinha, Filipe, Calado, and Viana-Baptista <sup>3</sup> (2017) Portugal	Stroke "[...] To assess the impact of stroke education on middle school students, in terms of students' and parents' acquired stroke knowledge"	7 public schools Both sexes 12 to 14 years old	Oral presentation; audiovisual resources; vignettes; posters; interactive activities; pamphlets; sharing knowledge: educational pamphlet and magnetic poster.	Questionnaire before and after the intervention to follow up and assess knowledge
Corrêa, Freire, Zabeu, Martins, Ferreira, Francisconi, et al. <sup>4</sup> (2015) Brazil	Cleft lip and palate "[...] To develop and implement a health education strategy based on the dynamic methodology of the YDP while addressing the topic of CLP and to evaluate the performance of school-aged children regarding the acquisition of knowledge about CLP after attending the YDP"	1 private school Both sexes 13 to 15 years old	Audiovisual projection with illustrations and videos; virtual environment; quiz; reflections; sharing knowledge: pamphlets, plays, games, workshops, and speeches.	Questionnaires before and after the intervention to assess knowledge
Maiti, Chatterjee, Ali, Jana, Bera, and Ghosh <sup>5</sup> (2012), India	Communicable diseases "1. To assess awareness level regarding communicable diseases among rural school children. 2. To evaluate the feasibility, acceptability and effectiveness of health awareness package in the rural schoolers. 3. To implement efficient health care delivery system for school students at rural sectors"	3 schools Both sexes 10 to 15 years old	Audiovisual projection with movies; informative pamphlets; discussion on myths and truths.	Questionnaires before and after the intervention to assess knowledge
Amano, Yokota, Sakamoto, Shigehatake, Inoue, Ishigami, et al. <sup>6</sup> (2014) Japan	Stroke "[...] To examine the efficacy of our stroke education program for junior high school students and their parents"	3 private schools 12 to 13 years old	Poster; magnetic poster; audiovisual projection; drama. Sharing knowledge: slide images, magnetic poster.	Questionnaires before and after the intervention to follow up and assess knowledge

Authors (year) and country	Topic and Objective	Participating schools and students	Strategies	Assessment
Shahapur and Shahapur <sup>29</sup> (2013) India	Oral health "[...] To assess the effectiveness of oral health education on oral hygiene status of high school going children"	1 public school Both sexes 13 to 15 years old	Audiovisual projection; charts; educative models; presentation;	Oral assessment before and after the intervention; Plaque assessment
Azevedo, Pinheiro, Yaphe, and Baltazar <sup>30</sup> (2013) Portugal	Antibiotics "[...] To evaluate: (1) knowledge concerning the use of antibiotics in Portuguese students [...] (2) the efficacy of a teaching intervention in improving students' knowledge concerning antibiotic use"	2 schools 14 to 16 years old	Audiovisual projection; discussion	Questionnaire before and after the intervention to assess knowledge and attitude
Padhyegurjar and Padhyegurjar <sup>31</sup> (2012), India	HIV/AIDS "[...] (1) Assessing the level of baseline knowledge regarding HIV / AIDS among [...] school students. (2) To assess the impact of health education session on knowledge levels (3) Retention of various aspects of information over the period of one year. (4) To assess changes in their attitudes if any"	1 private school Both sexes 13 to 18 years old	Flipchart	Questionnaire before and after the intervention to follow up and assess knowledge
Shenoy and Sequeira <sup>32</sup> (2010), India	Oral health " To determine whether DHE given at three-week intervals for 18 weeks was more effective than DHE given at six-week intervals for 18 weeks in improving oral health knowledge, practices, oral hygiene status, and gingival health [...] To determine if there was retention of oral health knowledge and improved practices, 18 weeks after cessation of the program, in subjects who received DHE at three-week intervals for 18 weeks. To determine if the socioeconomic status played a role in influencing oral health knowledge, practices, oral hygiene status, and gingival health of schoolchildren"	6 schools 12 to 13 years old	Audiovisual projection; demonstration models; charts; photo albums; posters.	Oral assessment questionnaire before and after the intervention; assessment of practices, knowledge, plaque levels, and gingival status

Of the 27 articles, 18 (66.7%) were published in English, and nine (33.3%) in Portuguese.

The methodological design was reported in 18 (66.6%) studies – four of them (22.3%) were cross-sectional, which was the most recurrent. Three studies (17%) were quasi-experimental; two (11.1%) were intervention and pilot studies. Quantitative, descriptive, and prospective study; descriptive qualitative study; exploratory study; experience report; preliminary study; cluster randomized trial; and interventional and follow-up study represented one article each (5.5%).

The topics approached in the studies encompass various health issues: oral health; vocal change and habits; hearing health; accidents at work; changes in the body and pregnancy in adolescence; drugs; genetic syndromes; nutritional guidance; mental health; stroke; breast cancer; reproductive health; dengue; electronic cigarettes; antibiotics; cleft lip and palate; communicable diseases; and HIV/AIDS.

The number of students involved in the projects ranged from 10 to 2,194. In Brazil, all programs involved less than 100 students, whereas in the other countries (except for one program in Portugal) more than 100 students participated in them.

Only five (18.6%) studies had an intervention and a control group – three of which (60%) provided the intervention to the controls at the end of the study. In the other two (40%) articles, control students did not receive the intervention.

The programs used the following strategies: plays, drama, role-playing, picture drama; presentation models and materials; audiovisual projection, Microsoft PowerPoint, slides; texts, written information, lesson plans; illustrations, images, photos; videos; virtual and online environment; 3D iconography; discussions, dialog, debates, verbalization; material reading; social media; dialog circles; movies, cartoons, animations, video clips, vignettes; music; comics, child books; interaction, activities, games; pamphlets, leaflets, magnetic posters, printed material; audiovisual material; white or blackboard; posters, flipcharts; reflections.

The most used of these resources were audiovisual projections, Microsoft PowerPoint, and slides (present in 13 articles), and discussions, dialog, debates, and verbalization (present in 16 articles). Other ones were also used often, such as plays, drama, role-playing, and picture drama (present

in seven articles), and illustrations, images, and photos (present in seven articles).

The students of 11 (40.7%) studies also participated in activities and helped develop them, including research, lectures, plays, and drama, preparing material, developing classes, speeches, and seminars, and spreading knowledge.

Positive results were reported in 24 (88.9%) studies, while the other three (11.1%) reported average results. None of the studies reported negative results.

## Discussion

“[...] From a critical perspective, education is based on the analysis of social realities, aiming to reveal their characteristics and the relationships that condition and determine them. This perspective can focus on either explaining purposes to reproduce educative processes or work on their contradictions to transform such purposes, setting the goal of constructing subjects and projects that transform the society”<sup>33</sup>.

Hence, although the programs in these studies were carried out in different countries, with local cultures and public specificities, some strategies were widely used, especially technological ones. Also, they generally had positive results. On the other hand, some strategies were not as effective in certain programs, which may have been due to the culture where they were carried out or the need to include other strategies.

As pointed out in the results of the integrative review, three studies had average results. In the study conducted in India<sup>31</sup>, some aspects of knowledge increased, but researchers also reported the tendency of losing information on other aspects. The only strategy used in this program was the flipchart, and the authors concluded that other strategies are needed to reinforce knowledge and attitudes in school education about AIDS.

In a study conducted in Brazil<sup>15</sup>, significant changes occurred in only some of the aspects assessed. It used strategies such as a lecture with audiovisual resources, written information, images, and videos. The authors concluded that continuous actions are needed to prevent hearing loss, also including the school and families in such actions.

The results of the study conducted in Tanzania<sup>25</sup> indicated improved knowledge and behaviour regarding sexuality and decision-making. However,

the score on attitude did not have statistical differences. It used strategies such as image drama, reproductive health material, audiovisual resources (blackboard and posters), and group discussions.

No other eligible study was conducted in the same country (Tanzania)<sup>25</sup> to compare the strategies used; therefore, it was not possible to develop a pattern. It must be pointed out that such strategies may not have been the most adequate ones for the public.

As for the study conducted in India<sup>31</sup>, the other three conducted in the same country had positive results and used more than one strategy (flipchart). Hence, using only one strategy may have been an important factor in the result of that study.

The study conducted in Brazil<sup>15</sup> used audiovisual resources as a strategy – which were also applied in studies with positive results. However, in these cases, additional strategies were used, besides the audiovisual resources.

It was also verified that programs whose strategies include students as protagonists in the learning process had positive results. This demonstrates the great importance of knowing and analyzing the public to whom a health education program is developed, knowing people's culture, preferences, what calls their attention, and the community to which they belong, including their needs. Thus, they can propose adequate strategies and resources to motivate participants to get involved in the activities. Young people must participate actively in the training process as part of the community, being empowered with knowledge and critical thinking to recognize their and the community's health<sup>34</sup>.

In this approach, the topics addressed in the Young Doctor Project (of which, some editions are present in this review) are chosen together with the community and according to their needs, which links their mutual responsibility<sup>35</sup>.

The School Health Program stands out among the policies that involve sectors of the Brazilian Ministries of Health and of Education. The objective of this strategy is to “[...] develop health promotion actions coordinated between health and education sectors, aiming at comprehensive care and education to improve the health of the public in schools<sup>36</sup>”. In 2021-2022, 5,422 municipalities in all Brazilian states adhered to this program<sup>36</sup>.

Some technological resources were used as strategies to carry out the programs: audiovisual projection, Microsoft PowerPoint, slides; virtual and online environments; 3D iconography; social

media; audiovisual material; illustrations, images, photos; videos; movies, cartoons, animations, video clips, vignettes<sup>3-6,11-13,15-17,19-27,29,32</sup>.

These technological resources are present in at least one of the studies conducted in Brazil. However, three such studies did not use technological resources<sup>10,14,18</sup>. The first one used plays, large dental arch models, toothbrushes, and dental floss<sup>10</sup>. The second one used a dialogical approach and reading with students<sup>14</sup>. The third study used interactive activities, discussions, and drama<sup>18</sup>. Other countries that carried out programs without technological resources were Malaysia, where the educational material was orally presented in a speech<sup>28</sup>, and one of the studies in India, which used only a flipchart<sup>31</sup>.

Hence, health education programs in schools carry out national and international projects focused on improving people's quality of life.

## Conclusion

This review aimed to analyze health education programs for adolescents at school. This analysis also aimed to verify the use of information and communication technology as an intervention strategy.

The analysis of the 27 articles addressed in this integrative review led to the conclusion that countless strategies and resources are used to develop effective health education projects. The use of technological resources (such as electronic tutors in remote activities) predominated in Brazilian studies.

Data analysis made it possible to predict that the organization of health education programs for students at school must consider the place where they will be carried out, including the infrastructure, income, and public, to evaluate whether using such technologies will be effective – as they may be unfavourable complicating factors, rather than functional and innovative ones.

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