

DIGITAL EDUCATIONAL TECHNOLOGY FOR HIV/AIDS PREVENTION AMONG ADOLESCENTS AND YOUNG PEOPLE: SCOPE REVIEW

TECNOLOGIA EDUCACIONAL DIGITAL PARA PREVENÇÃO DO HIV/AIDS ENTRE ADOLESCENTES E JOVENS: REVISÃO DE ESCOPO

TECNOLOGÍA EDUCATIVA DIGITAL PARA LA PREVENCIÓN DEL VIH/SIDA EN ADOLESCENTES Y JÓVENES: REVISIÓN DE ALCANCE

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ABSTRACT

Objective: to map scientific evidence on the use of digital educational technology in health related to HIV/AIDS, aimed at adolescents and young adults. **Method:** this is a scoping review based on the review method guided by the Joanna Briggs Institute. The survey of studies was carried out through access to five databases focused on the health area. **Results:** 1,147 studies were identified, of which only 12 were considered eligible to compose the final sample. It was found that digital educational technologies are diverse, with each study addressing a single type of technological resource, namely: educational game, multimedia application, computerized program, online module, application prototype, video chat, electronic learning, interactive media for disseminating messages, virtual environments, short messages, videos and websites. The content and technologies were aimed at Pre-Exposure Prophylaxis (PrEP), reducing adolescent sexual behavior, knowledge about HIV/AIDS, seeking to promote HIV/STI testing and condom use. **Conclusion:** digital educational health technologies were mapped and grouped into gadgets (devices), software and augmented reality. It is noteworthy that this study contributed to demonstrating the different types of health technologies regarding HIV/AIDS aimed at adolescents and young people. It is worth highlighting that the topics most covered in the studies involved ways of preventing HIV/AIDS and behaviors to reduce risk.

Keywords: Educational Technology; HIV; Adolescent Health; Disease Prevention.

RESUMO

Objetivo: mapear as evidências científicas acerca do uso de tecnologia educacional digital em saúde relacionadas ao HIV/aids, direcionada a adolescentes e jovens adultos. **Método:** trata-se de uma revisão de escopo com base no método de revisão orientado pelo Instituto Joanna Briggs. O levantamento dos estudos foi realizado por meio de acesso a cinco bases de dados voltadas à área da saúde. **Resultados:** foram identificados 1.147 estudos, sendo que apenas 12 foram considerados elegíveis para compor a amostra final. Verificou-se que as tecnologias educacionais digitais são diversificadas, sendo que cada estudo abordou um único tipo de recurso tecnológico, sendo: jogo educativo, aplicativo multimídia, programa computadorizado, módulo online, protótipo de aplicativo, chat de vídeo, aprendizagem eletrônica, mídias interativas para divulgação de mensagens, ambientes virtuais, mensagens curtas, vídeos e website. O conteúdo das tecnologias foram voltados Profílixia Pré-Exposição (PrEP), diminuir comportamento sexual de adolescentes, conhecimento sobre HIV/ aids, busca promover o teste de HIV/ IST e uso de preservativo. **Conclusão:** foram mapeadas as tecnologias educacionais digitais em saúde estando agrupadas em gadgets (dispositivos), softwares e realidade aumentada. Ressalta-se que este estudo contribuiu para demonstrar os diversos tipos de tecnologias em saúde acerca do HIV/AIDS voltados ao público adolescente e jovem. Vale destacar que os assuntos mais abordados nos estudos envolveram as formas de prevenção ao HIV/ aids e os comportamentos para redução de risco.

Palavras-chave: Tecnologia Educacional; HIV; Saúde do Adolescente; Prevenção de Doenças.

RESUMEN

Objetivo: mapear la evidencia científica sobre el uso de una tecnología educativa digital en salud relacionada con VIH/SIDA, dirigida a adolescentes y adultos jóvenes. **Método:** llevamos a cabo una revisión de alcance basada en el método de revisión guiado por el Instituto Joanna Briggs. El levantamiento de estudios se realizó mediante el acceso a cinco bases de datos enfocadas en el área de la salud. **Resultados:** se identificaron 1.147 estudios, de los cuales 12 fueron considerados elegibles para componer la muestra final. Se encontró que las tecnologías educativas digitales son diversas, abordando cada estudio un solo tipo de recurso tecnológico, como juegos educativos, aplicaciones multimedia, programas computarizados, módulos en línea, prototipos de aplicaciones, video chats, aprendizaje electrónico, medios interactivos para difusión de mensajes, entornos virtuales, mensajes cortos, videos y sitios web. El contenido de las tecnologías se centró en temas como Profílixia Pre-Exposición, reducción del comportamiento sexual de los adolescentes, conocimiento sobre VIH/SIDA, promoción de pruebas de VIH/TTS y uso de condones. **Conclusión:** se mapearon las tecnologías digitales educativas en salud, agrupadas en dispositivos, aplicaciones y realidad aumentada. Este estudio contribuye a demostrar los diferentes tipos de tecnologías sanitarias relacionadas con el VIH/SIDA dirigidas a adolescentes y jóvenes. Es importante resaltar que los temas más tratados en los estudios fueron formas de prevenir el VIH/SIDA y conductas para reducir el riesgo.

Descriptores: Tecnología Educativa; VIH; Salud del Adolescente; Prevención de Enfermedades.

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INTRODUCTION

The Human Immunodeficiency Virus (HIV) is responsible for the emergence of Acquired Immunodeficiency Syndrome, known as AIDS, which has challenged public health throughout the world, as the disease is not limited to a specific population, being an occurrence that presents variability according to behavioral determinants, whether individual or collective⁽¹⁻³⁾. However, a higher percentage of cases of HIV infection has been observed in adolescents and young people, especially males^(1,4). It is estimated that, in 2020 alone, there were around 410,000 young people aged 10 to 24 infected with HIV worldwide, of which 150,000 were adolescents aged 10 to 19⁽¹⁾.

Almost four decades have passed since the discovery of the disease, however, it continues to represent an important global health problem⁽⁵⁻⁶⁾. In Latin America alone, there are around 1.8 million people who have the disease, with Brazil in first place in the ranking of new infections.⁵ In the Brazilian national context, the Notifiable Diseases Information System (SINAN) recorded 381,793 cases since the beginning of the epidemiological strategy, which allows directing health actions⁽⁴⁾.

In addition to pharmacological management, it is important to make efforts to prevent the pathology known, especially in terms of sexual education⁽²⁾. Considering that adolescents and young people are considered a priority population in prevention strategies since they are inserted in contexts that increase their vulnerabilities, combined HIV prevention has been essential⁽⁷⁾.

That said, the specificities and needs of each public in relation to their vulnerability must be considered. Therefore, the combination of preventive methods brings important changes to deal with each person and social context in relation to HIV. The different prevention strategies offered may cover more people and situations. Thus, the use of Digital Educational Technology (TED) in health among adolescents and young people can contribute to health promotion and HIV/AIDS prevention⁽⁷⁻⁸⁾.

Research carried out with Chinese university students, regarding health risk behaviors for viral transmission, revealed that the lack of sexual knowledge, i.e., the lack of knowledge about prevention during sexual activities, is the main reason for the increase in rates of HIV infection, which grow by 30 to 50% per year⁽¹⁾. The lack of access to information is related to low adherence to prevention and diagnostic tests⁽⁹⁾. Therefore, to prevent the transmission of the disease, strategies with potential for success include TED⁽³⁾.

It is known that the use of technologies, especially digital ones, represent something undoubted in today's society, especially for young people. Thus, digital tools are considered a "meta-medium" to reach the population. Given this context, for the practice of health education, an inherent responsibility of the Nursing professional, the use of this tool must be considered as a method of enabling the effective participation of individuals in the educational process, as well as a means of favoring the construction of knowledge, in an innovative, dynamic and critical approach⁽⁹⁾.

Therefore, it is essential to consider educational technologies as a health education strategy aimed at HIV/AIDS for adolescents and young people, as this method can expand access to information and, consequently, favor the understanding of prevention strategies, reducing the rates of new infections. Therefore, the objective was to map the scientific evidence about the use of digital educational technology in health related to HIV/AIDS, aimed at adolescents and young adults.

METHODS

This is a literature review, of the scoping review type, which is characterized as a systematic and exploratory review. The study was guided by the following steps: definition and alignment of the objective and research question; development of inclusion criteria; description of the planned approach for searching, selecting and extracting data; search and selection of evidence; extraction and analysis of evidence; presentation of the results of the review/synthesis; summary of the evidence found in relation to the objective of the review, drawing possible conclusions and observing certain implications of the findings⁽¹¹⁾.

The acronym PCC (P: Population, C: Concept and C: Context) was adopted as a strategy to develop the research question⁽¹¹⁾, which led to the configuration of the following structure: Population – adolescents and young adults; Concept – digital educational technology in health; Context HIV/AIDS. It is worth noting that the concept considered to define the age of this population was individuals aged between 10 and 24 years old⁽¹²⁾.

Therefore, the following question was created: "What scientific evidence was found regarding the use of digital educational technology in health on HIV/AIDS aimed at adolescents and young people?"

To define the controlled and uncontrolled descriptors, a preliminary search was carried out in the Scopus and Web of Science databases and, from them, it was possible

to identify the controlled descriptors most used by experts on the subject. They were checked using the Health Sciences Descriptors (DeCS) tool for Portuguese databases and Medical Subject Headings (MeSH) for English databases. Thus, the Boolean terms AND and OR were used to form a search strategy in the information bases.

The search was carried out on the same day by one of the authors with competence and training from JBI Manual for Evidence Synthesis, while the selection of studies was carried out by two researchers independently from August to September 2021, in the following databases: Medical Literature Analysis and Retrieval System Online (MEDLINE), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Virtual Health Library (VHL), Scopus and Web of Science. Table 1 shows the search strategy used in each database to carry out this study.

It should also be noted that the Federated Academic Community available on the Coordination for the Improvement of Higher Education Personnel (CAPES) platform was used to seek sources of information and obtain a more comprehensive sample, as this facilitates access to various resources for access the different databases that are often closed access.

For the selection of studies, the inclusion criteria were articles without chronological or idiomatic publication limits, in the public and private domain; primary and secondary studies, editorials, books and guidelines that answered the review question. Duplicate studies were excluded.

The selection process took place by two independent reviewers based on a careful reading of the titles and

summaries of the studies, obtained from the databases, with studies that did not address the research question being removed.

Next, the articles selected for full reading were imported into the Mendeley® reference manager, duplicates were excluded and the full text was analyzed by pairs. A third reviewer was available to discuss impasses, however there was no disagreement between the two reviewers responsible for conducting this study. Furthermore, after selecting the articles for the final sample, a manual search for references was carried out.

For data extraction, the adapted JBI instrument was used, which included data on the study title, year of publication, author(s), objective of the study, methodological design, main findings and conclusions about the use of digital educational technology in health related to HIV/AIDS, aimed at adolescents and young adults⁽¹¹⁾. The data generated in the extraction were grouped into an electronic spreadsheet using Microsoft Office Excel 2016® software, and were analyzed using simple descriptive statistics. The synthesis of this process was expressed in the construction of a descriptive table.

After the extracted content, a mapping of the studies included in its extension and general distribution was prepared with the purpose of identifying in the findings the recurring themes of digital educational technology in health, which were grouped as gadgets (devices), software and augmented reality that were focused on HIV/AIDS for adolescents and young people, subsequently, a consistent descriptive analysis was carried out to address the guiding question of this scoping review.

Table 1. Search strategies according to the database.

Database	Search Strategy
MEDLINE	("educational technology" OR "tecnologia educacional" OR "tecnología educativa") AND (hiv OR "acquired immunodeficiency syndrome" OR "síndrome de imunodeficiência adquirida" OR "síndrome de inmunodeficiencia adquirida") AND (adolescent OR "young adult" OR <i>adolescente</i> OR "jovem adulto" OR "adulto joven")
CINAHL	((("educational technology" AND (hiv OR "acquired immunodeficiency syndrome") AND (adolescent OR "young adult"))
BVS	("educational technology" OR "tecnologia educacional" OR "tecnología educativa") AND (hiv OR "acquired immunodeficiency syndrome" OR "síndrome de imunodeficiência adquirida" OR "síndrome de inmunodeficiencia adquirida") AND (adolescent OR "young adult" OR <i>adolescente</i> OR "jovem adulto" OR "adulto joven")
Scopus	ALL ("educational technology") AND (hiv OR "acquired immunodeficiency syndrome") AND (adolescent OR "young adult")
Specificity	ALL ("educational technology") AND (hiv OR "acquired immunodeficiency syndrome") AND (adolescent OR "young adult")

Source: the authors, 2021

Furthermore, the results are presented in accordance with the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) checklist⁽¹³⁾.

As it is a Scope Review, the protocol was registered with the Open Science Framework (OSF) under registration no. 10.17605/OSF.IO/QK2G7. Likewise, as it constitutes a scoping review, consideration by the Ethics Committee for Research involving human beings was not required.

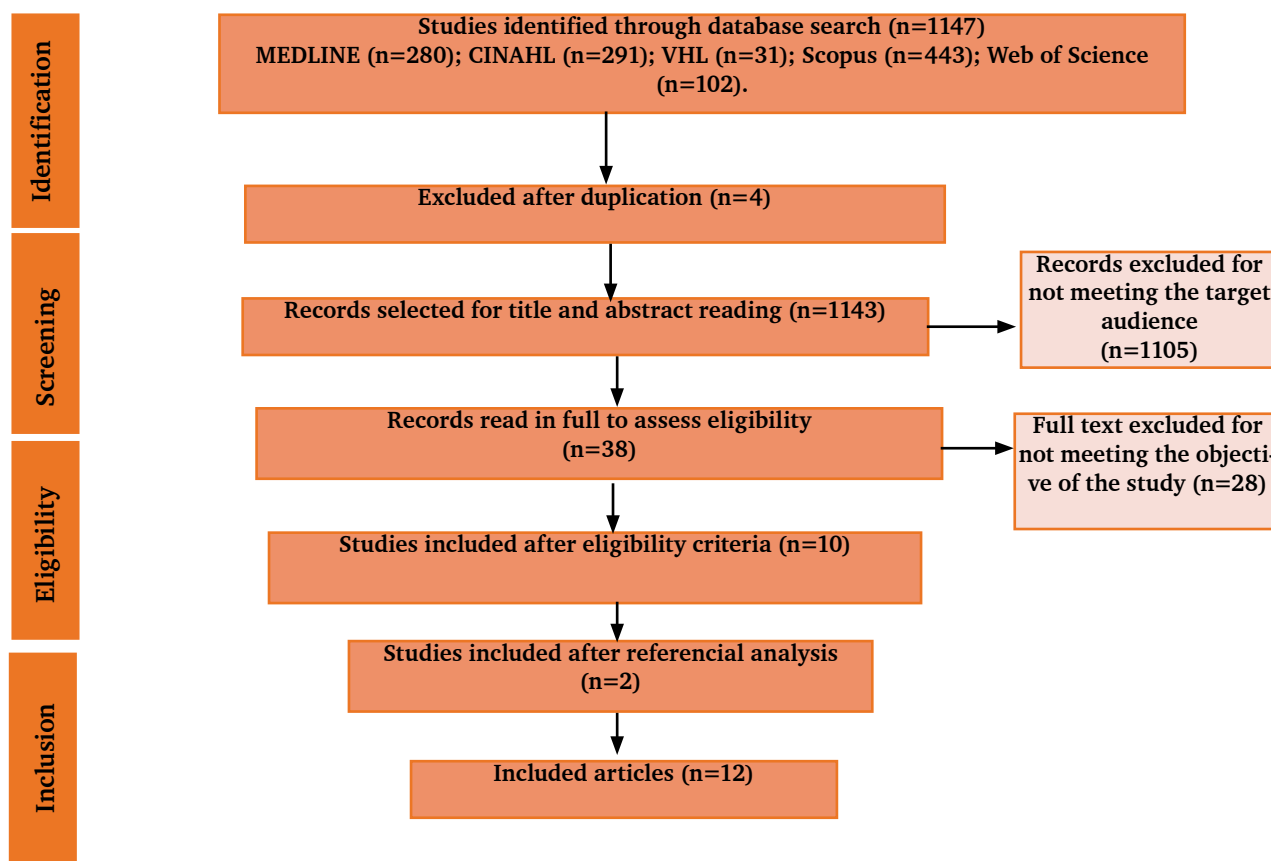
RESULTS

A variation was observed in the years of publication, with articles found between 2007 and 2019. Regarding databases, Web of Science presented seven studies, the largest number of studies.

With regard to the methodological design, it was observed that randomized clinical trials were the most frequent method, with 33.33%⁽¹⁴⁻¹⁷⁾, followed by qualitative studies⁽¹⁸⁻¹⁹⁾, and pilot studies⁽²⁰⁻²¹⁾, prospective⁽²²⁾, quasi-experimental⁽²³⁾, protocol⁽²⁴⁾, and quantitative⁽²⁵⁾.

It was found that digital educational technologies in health are diverse, with each study addressing a single type of technological resource, namely: educational game⁽¹⁸⁾, multimedia application⁽²⁰⁾, computerized program⁽²¹⁾, online module⁽²²⁾, application prototype⁽¹⁴⁾, video chat⁽²⁴⁾, electronic learning⁽²³⁾, interactive media for disseminating messages⁽¹⁹⁾, virtual environments⁽²⁵⁾, short messages⁽¹⁵⁾, videos⁽¹⁶⁾ and website⁽¹⁷⁾, these being grouped according to the form of strategy used as: gadgets (devices)^(15,21, 23), software^(14, 17,18,20) and augmented reality^(16, 22,24- 25).

Figure 1. Flowchart of the study selection process for composing the scoping review sample – Maringá, Paraná, Brazil. 2021



Fonte: Adaptado do Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews, 2018.

Source: adapted from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews, 2018.

Table 1. Synthesis of forms of digital health educational technology on HIV/AIDS aimed at adolescents and young people. Maringá, PR, 2021.

Year/ Country/ Database	Method	Type of TED/ Content of educational technologies	Search Strategy
2007/ United States/ SCOPUS ⁽²⁵⁾	Cross-sectional study Intervention with students aged between 14 and 18	Virtual environments (computers)/ HIV prevention: reducing sexual behavior in high-risk adolescents	Adolescents in the computerized intervention were significantly less likely to engage in sexual activity and reported significantly fewer partners. For some young people, computers are a viable way to provide information about prevention and promote skill development
2010/ Asia/ SCOPUS ⁽¹⁹⁾	Descriptive qualitative study Participation of teenagers aged 14 to 16	Interactive media for disseminating messages through games/ HIV health awareness HIV/AIDS prevention to reduce risk behaviors	Good receptivity among adolescents to the use of new interactive media to disseminate sensitive health messages. Among the study's key findings, Game Play led to changes in adolescents' attitudes and intentions
2011/ Africa/ Referential Analysis ⁽¹⁶⁾	Randomized clinical trial African-American women, ages 14 to 18	Videos through the computer (videos)/ HIV prevention	Study provides preliminary support for the effectiveness of a computer-delivered adaptation of a proven HIV prevention program for African American adolescent women. These computer-delivered interventions are disseminated at a lower cost than human-delivered interventions, which can positively influence HIV risk behaviors.
2014/ United States/ Web of Science ²¹⁾	Pilot study Intervention with African-American adolescent women	Digital Intervention (DAI) is a computerized program/ Promoting the adoption and maintenance of HIV / STI risk reduction behaviors	The audio computer-assisted research interview showed that clinic staff believed DAI was innovative and engaging. The professionals indicated that the clinic's clients also had a positive perception of DAI. However, the low frequency of DAI administration to clients was noted due to time, low patient volume, and the way in which the clinical team presented the DAI to patients
2014/ South Africa and Ireland/ SCOPUS ⁽²³⁾	Quasi-experimental study using experimental and control groups South African and Irish participants aged 11 to 16	Electronic learning (e-learning) with computers in classroom teaching/ Knowledge about HIV/AIDS	There was internalization of knowledge about HIV/AIDS during the forum among students in the experimental group, while classroom discussions faced structural barriers. Learning outcomes were demonstrated by higher grades achieved by the experimental group than the control group
2015/ United Kingdom/ Web of Science ⁽¹⁸⁾	Qualitative study of focus group approach Rural adolescents' perceptions of the acceptability and relevance of web-based gaming	Web-Based Educational Game/ HIV Prevention	The game proved to be educational and fun, but lacked real-life scenarios and player control
2015/ Chile/ Web of Science ⁽²²⁾	Prospective cohort study (pre-test-intervention-post-test) Intervention with Chilean adolescents and young people	Online modules/ Internet-based STI and HIV prevention (I-STIPI)	There was a significant increase in levels of knowledge about STI and HIV, attitudes towards condom use and perceived self-efficacy, and a reduction in risky sexual behaviors with uncommitted partners

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Year/ Country/ Database	Method	Type of TED/ Content of educational technologies	Search Strategy
2015/ United States/ Referencial Analysis ⁽¹⁷⁾	Randomized clinical trial With young men who have sex with men between the ages of 15 and 24	Website/ Web that seeks to promote HIV / IST testing	High acceptability among young men who have sex with men in both conditions. It was noted that the majority of these participants completing the intervention had a clinically significant effect suggesting preliminary efficacy for the intervention.
2018/ United States / Web of Science ⁽²⁰⁾	Randomized clinical trial Male participants aged between 14 and 18 years old and with same-sex attraction	Guy2Guy (G2G) is a text-based HIV prevention/ HIV prevention program for sexual minority male adolescents	The text message-based intervention has proven success in improving HIV testing for a group that is underserved and at high risk of acquiring HIV. Technology-based interventions, such as G2G, can be delivered to a greater number of young people in diverse geographic settings.
2018/ United States / Web of Science ⁽²⁰⁾	Pilot study Intervention with mobile application (eHealth) developed for adolescents and young people	Mobile App (eHealth)/ HIV / STI testing among gay, bisexual, and other young men who have sex with men (MSM)	Racial minorities clicked on fewer app features than white people. Use was associated with older age and higher education and a greater number of methods for connecting online. The app helps understand how users interact with eHealth interventions.
2018/ United States/ Web of Science ⁽¹⁴⁾	Randomized clinical trial P3 (Prepared, Protected, emPo-wered) app-based intervention among adolescents	Application prototype/ HIV Prevention, to increase adherence to Pre-Exposure Prophylaxis (PrEP)	Interventions improved adherence, retention in clinical care, and PrEP persistence among adolescents.
2019/ United States / Web of Science ⁽²⁴⁾	Protocol Proposed intervention (We Prevent) and pilot test with adolescents	Video Chat/ HIV Prevention, demonstrated through self-reported reductions in condomless sex and increases in knowledge and acceptance of pre-exposure prophylaxis	We Prevent assists with Couples HIV Testing and Counseling (CHTC), through a telehealth platform, to provide the behavioral skills to reduce HIV risk in current and future young gay, bisexual, and other men who have sex with men relationships.

Source: research data.

Caption: CHTC: Couples HIV Testing and Counseling; DAI: Digital Intervention; G2G: Guy2Guy; HIV: Human immunodeficiency virus; MSM: young men who have sex with men; STI: Sexually Transmitted Infections; P3: Prepared, Protected, emPowered; PrEP: Pre-Exposure Prophylaxis.

In order to achieve the objective of this study, the information was synthesized. This information is organized in Table 1.

DISCUSSION

In this study, the sensitivity values corresponding to the results map the main forms of digital educational technology (TED) in health focused on HIV/AIDS for adolescents and young people. These involved the use of

gadgets (devices),^(15,21,23) software^(14,17,18,20) and augmented reality^(16,22,24-25).

The use of computers through an online program was one of the tools implemented to promote the adoption and maintenance of HIV/AIDS risk reduction behaviors among African-American⁽²¹⁾, South African and Irish⁽²³⁾ adolescents. The cell phone, through text messages, provided HIV prevention measures for male adolescents of sexual minorities (cisgender man; gay; bisexual and/or queer (non-cisgender)⁽¹⁵⁾). In view of this, it is clear that digital educational materials are essential to meet the demands

and needs of gadget users, as they provide real-time elements⁽²⁶⁾, interaction between peers, in addition to varied resources that can be used to promote health. These tools assist in the process of education, distance learning and knowledge construction⁽²⁷⁾ on various topics, including those related to health.

It should be noted that due to the COVID-19 pandemic, health services that meet this demand were drastically affected, generating exponential growth in this period in the use of digital educational technologies. This fact provides adolescents and young adults with information about HIV/AIDS⁽²⁸⁾.

Therefore, it is necessary to verify the implementation and acceptability of interventions aimed at HIV/AIDS through these technologies, since adolescents and young people have used these tools to a great extent, as they are already part of this population's way of life. Therefore, having knowledge about the most effective platforms for health interventions with adolescents and young people facilitates their general use, as these strategies must be flexible so that they can be incorporated appropriately into the busy daily lives of this public⁽²⁹⁾.

Even so, the quality of health of adolescents and young people can be closely linked to the appropriation of knowledge about the problems and problems that affect the lives of this population. In the specific case of HIV/AIDS, such quality of life and health may also be related to the ability to understand information aimed at preventing this disease by adolescents and young people, with a view to reducing risk behaviors and, finally, the desire to transform these interventions in protective practices⁽³⁰⁾.

The educational game⁽¹⁸⁾, multimedia application⁽²⁰⁾, website⁽¹⁷⁾ were devices used as intervention strategies through digital educational technology in health, aiming at HIV prevention and with the purpose of increasing HIV testing, adherence to PrEP and addressing issues related to sexual health behaviors among adolescents and young people. These tools are considered fun, creative, attractive, dynamic and playful for the health education process for this age group from 10 to 24 years old, thus stimulating the interest of this audience and ensuring their participation. The application of educational materials such as HIV prevention materials in these interventions, aimed at promoting health and preventing diseases, has been appreciated by this target audience⁽³¹⁾.

Learning through games has promoted active participation among adolescents and young people, increasing competition between them, making them considered satisfactory tools for obtaining knowledge, as they

help in the acquisition and understanding of the content covered⁽³²⁾.

Interactive media for disseminating messages through games was a resource used to raise awareness in health related to the HIV/AIDS prevention and risk behaviors⁽¹⁹⁾. TED in health have provided a convergence with learning and recognition of health care, in order to stimulate changes and guarantee healthy behaviors in terms of the health and disease process. Even if there are no immediate changes in the behavior of these adolescents and young people, these tools provide reflection on their practices and attitudes in the future⁽³⁰⁾.

The online module⁽²²⁾, video chat^(16,24) and virtual environments⁽²⁵⁾ were augmented reality strategies for HIV prevention, addressing topics such as sex with condoms, knowledge regarding pre-exposure prophylaxis and sexual behavior. The popularization of the internet has provided interaction between people, as virtual environments have facilitated the learning process⁽³²⁾. For the most part, TED are innovative tools and methods, which contribute to the exemplification of real and fictional scenarios. However, it should be noted that, to use TED, a critical evaluation of the content must be carried out, using pedagogical theories, in order to obtain positive results⁽³³⁾.

These tools have an efficient and very viable application for health education practices, even more so considering that their use has increased in today's society, especially among adolescents and young people in this pandemic period^(28,32). Unprotected sex increases cases of sexually transmitted infections such as HIV. Inappropriate use or lack of condoms can cause various damages and health problems⁽³⁴⁾. Thus, interventions involving the theme of HIV/AIDS based on scientific evidence, and using digital educational technology modalities, offer support to reach those individuals or population segments that are at greatest risk, such as adolescents and young people.

Even more so, when considering that this new generation is born and grows up surrounded by technologies. From this perspective, digital inclusion is a natural condition, in which health education plays an important role, encouraging critical-reflective thinking among subjects. In this way, adolescents and young people gain autonomy in their life path and are empowered to carry out self-care and make health decisions⁽³⁰⁾.

Although these resources are already disseminated globally, facilitating access to all information, especially in spaces already occupied by young people⁽³⁵⁾; there are still individuals who do not have access to these resources,

either due to lack of resources at home or because they live in places where internet access is precarious⁽³⁶⁾.

Access to the internet has often been a limiting factor in the continued provision of education, as many users are only connected via mobile networks or which are unstable. Furthermore, the lack of access to these resources is even more present in rural areas, among black and low-income people. Therefore, ensuring equal access to TED and the internet is still a fundamental factor in allowing the continuity of the teaching-learning process in health education⁽³¹⁾.

In this context, it is essential to join forces for the validation and accessibility of digital educational Technologies in health aimed at adolescents and young people, even more so when the subject is HIV/AIDS, which permeates issues involving sexuality and personal identity⁽³⁸⁾.

It is also noteworthy that this public presents a distancing attitude in relation to health services, especially within the scope of primary health care. Therefore, the demand for the service occurs fundamentally for curative actions, with situations involving health promotion and disease prevention activities being rare⁽³⁹⁾ in this clientele. Given this, healthcare professionals, especially nurses, can include TED in health as a care tool for adolescents and young people⁽⁴⁰⁾.

Technologies aimed at young people can positively impact nurses' clinical practice because, if articulated appropriately, they can modify possible attitudes that improve the health and quality of life of this young population. TED, as they are present in the daily lives of adolescents and young people, bring the possibility of being used in education and health promotion⁽⁴⁰⁾. However, it appears that there are still gaps in the promotion of Nursing care to work directly with this specific audience.

This study has as a limitation the impossibility of attesting the effectiveness of digital educational technologies in health related to HIV/AIDS, aimed at adolescents and young adults illustrated in this manuscript, as the chosen method only allows mapping such technologies. Furthermore, gray literature that could perhaps help answer the study question was not included. However, it is believed that the study can contribute to stimulating the basis, development and/or implementation and validation of new interventions with digital educational Technologies in health aimed at HIV/AIDS and adolescents and young people.

CONCLUSION

This scoping review provided the mapping of the following forms of digital educational Technologies in health on HIV/AIDS aimed at adolescents and young people: educational game, multimedia application, computerized program, online module, application prototype, video chat, interactive media for disseminating messages through games, virtual environments, messages via cell phone and website.

It is noteworthy that this study contributed to demonstrating the different types of TED in health about HIV/AIDS aimed at adolescents and young people. It is worth highlighting that the topics most discussed in the studies involved ways of preventing HIV/AIDS and behaviors to reduce risk. Therefore, it is suggested that the implementation of TED among this public be increasingly encouraged, in order to prevent the spread of HIV/AIDS among adolescents and young people, through strategies and languages that are more compatible with the lifestyle of each group of the population.

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