Review Article

Health educational strategies for people living with HIV: scoping review

Estratégias educativas em saúde para pessoas vivendo com HIV: revisão de escopo

Estrategias educativas en salud para personas que viven con el VIH: revisión de alcance

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Abstract

Objective: To map the scientific production on educational strategies and the content covered in the education of people living with HIV.

Methods: This is a scoping review in which the selection of articles was carried out in April 2021 and updated in October 2022 in ten data sources; the review followed the assumptions established by the Joanna Briggs Institute and the checklist of Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews. The results were descriptively analyzed and summarized in a chart.

Results: A total of 17 studies were selected, predominantly published in 2017; The USA and Brazil were the countries with the largest number of productions. Most studies sought to evaluate the impact and effectiveness of strategies and develop or validate health education instruments and prevention activities. Concerning the content covered by the strategies, five categories were formed: initial guidance on HIV/AIDS, general care, healthy living, sexual health, and emotional support. The educational strategies that stood out concerning greater patient adherence to treatment are related to the development of systems, programs, and multimedia. The booklets promoted empowerment and autonomy for people living with HIV.

Conclusion: The main educational strategies were mapped, with emphasis on booklets, printed material, multimedia resources, systems, forms, and workshops, covering initial guidance on HIV/AIDS, pharmacological treatment, general care, healthy living, sexual health, and social and emotional support.

Resumo

Objetivo: Mapear a produção científica sobre as estratégias educativas e os conteúdos abordados na educação de pessoas vivendo com HIV.

Métodos: Esta é uma revisão de escopo em que a seleção dos artigos foi realizada em abril de 2021 e atualizada em outubro de 2022 em dez fontes de dados; a revisão seguiu os pressupostos estabelecidos pelo *Joanna Briggs Institute* e o *checklist* dos *Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews*. Os resultados foram analisados descritivamente e sintetizados em um quadro.

Resultados: Foram selecionados 17 estudos com publicação predominante em 2017; Estados Unidos da América e Brasil foram os países com a maior quantidade de produções. A maioria dos estudos buscou avaliar o impacto e a eficácia das estratégias e desenvolver ou validar instrumentos de educação em saúde e atividades de prevenção. Em relação ao conteúdo abordado pelas estratégias, foram formadas cinco categorias: orientação inicial sobre HIV/AIDS, cuidados gerais, vida saudável, saúde sexual e suporte emocional. As estratégias educativas que se destacaram em relação à maior adesão dos pacientes ao

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tratamento estão relacionadas com o desenvolvimento de sistemas, programas e multimídia. As cartilhas promoveram empoderamento e autonomia de pessoas vivendo com HIV.

Conclusão: Foram mapeadas as principais estratégias educativas, com destaque para cartilhas, material impresso, recursos multimídia, sistemas, formulários e oficinas/*workshops*, abordando orientação inicial sobre HIV/AIDS, tratamento farmacológico, cuidados gerais, vida saudável, saúde sexual e suportes social e emocional.

Resumen

Objetivo: Mapear la producción científica sobre las estrategias educativas y los contenidos abordados en la educación de personas que viven con el VIH.

Métodos: Esta es una revisión de alcance, cuya selección de artículos se realizó en abril de 2021 y se actualizó en octubre de 2022 en diez fuentes de datos. La revisión siguió las premisas establecidas por el *Joanna Briggs Institute* y la *checklist* de los *Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews*. Los resultados fueron analizados descriptivamente y sintetizados en un cuadro.

Resultados: Se seleccionaron 17 estudios con publicación predominante en 2017. Estados Unidos de América y Brasil fueron los países con mayor cantidad de producciones. La mayoría de los estudios buscó evaluar el impacto y la eficacia de las estrategias y elaborar o validar instrumentos de educación para la salud y actividades de prevención. Con relación al contenido abordado por las estrategias, se formaron cinco categorías: instrucciones iniciales sobre VIH/SIDA, cuidados generales, vida saludable, salud sexual y apoyo emocional. Las estrategias educativas que se destacaron con relación a una mayor adhesión de los pacientes al tratamiento están relacionadas con el desarrollo de sistemas, programas y multimedia. Las cartillas promovieron empoderamiento y autonomía de personas que viven con el VIH.

Conclusión: Se mapearon las principales estrategias educativas, con énfasis en cartillas, material impreso, recursos multimedia, sistemas, formularios y talleres/*workshops*, que abordaron instrucciones iniciales sobre VIH/SIDA, tratamiento farmacológico, cuidados generales, vida saludable, salud sexual y apoyo social y emocional.

Open Science Framework (OSF): https://osf.io/754uk/?view_only=6491865a3d12424d81af2c4099c112c3

Introduction

The number of people infected with the Human Immunodeficiency Virus (HIV) in the world has been estimated at 38.4 million. Around 1.5 million people were infected with HIV in 2021. In Brazil, about 435 thousand cases of HIV infection were reported from 2007 to June 2022.[1]

From this perspective, these individuals are at risk of developing neoplasia and opportunistic infections associated with Acquired Immune Deficiency Syndrome (AIDS). However, the improvement in the effectiveness of antiretroviral therapy (ART) and multidisciplinary monitoring contributed to improvements in the quality of life of the affected population, reducing the number of deaths due to acute complications.[2]

We highlight that a delay occurred in the diagnosis and treatment of patients due to the COVID-19 pandemic, which directly impacted services aimed at prevention and harm reduction.[3] The difficulty in accessing centers and units to carry out screening tests for HIV diagnosis during the Pandemic was observed in countries such as Brazil, Japan, China, and Belgium.[4-6]

Thus, the impacts caused by COVID-19 contributed to accentuating inequalities related to the fight against HIV. We also emphasize that a social stigma associated with HIV and related to beliefs and negative thoughts towards infected people is also widespread, causing discrimination and social isolation.[1,7]

Assistance to people living with HIV/AIDS (PLWHA) must be seen by health professionals from a perspective of comprehensive care, in which strengthening their autonomy to practice self-care is possible. Health services need to be aware of new resources and skills that can be used for the benefit of patients, especially those associated with health education, which is essential to promote the quality of life of people living with HIV.[8]

Thus, health education is a strategy of adherence to pharmacological treatment, as it uses clarification approaches about the health-disease process (such as transmission, prevention, and models of treatment); it aims at the evolution of patients in individual practices and behaviors, providing autonomy and quality of life, and collaborating with humanized care, thus reducing the chances of non-adherence to treatment.[2]

From this perspective, the use of educational strategies, such as Health Educational Technologies (TES/HET), can contribute to the teaching-learning process, strengthening health education actions.

Thus, they can be presented in printed, dialogued, or audiovisual forms; the latter form is crucial in the teaching-learning process as it can promote significant results in the acquisition of knowledge if appropriate materials, principles, and appropriate forms of communication are involved.[9]

When defining nurses as qualified for education based on TES, the following didactic elements are highlighted: use of objective and clear language, insertion of images and punctuation of the most common doubts that should make up the educational strategies.[8,9] Furthermore, TES must provide comprehensive care, promoting self-care, autonomy, and socialization of knowledge. These characteristics are not considered when the resource is produced without due preparation.[10]

Thus, it is important that HIV/AIDS be the subject of more studies by the scientific community as it is an important factor of morbidity and mortality and social disparity. This study was then justified by the need to seek educational strategies that contribute to teaching people living with HIV and can be used by health professionals.

Therefore, the objective of the present study was to map the scientific production on educational strategies and the content approached in the education of people living with HIV.

Methods

This was a scoping review to map the main scientific concepts and evidence existing in the literature on a given area of knowledge, identifying their gaps. The study was developed according to the guidelines of the Joanna Briggs Institute Review Manual,[11] following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.[12]

We highlight that the PRISMA-ScR checklist consists of seven items (title, summary, objectives, research, selection of sources of evidence, synthesis of results, and expected results). Therefore, to prepare a scoping review the following steps were followed: (1) definition of the research question and objectives; (2) definition of eligibility criteria; (3) description of the planned approach, search and selection of studies, data extraction, and presentation of evidence; (4) search for evidence; (5) selection of evidence; (6) extraction of evidence; (7) analysis of extracted evidence; (8) presentation of results; and (9) summary of evidence concerning the objective of review.[11-12]

To preserve the legitimacy of the review and identify duplicity of studies a preliminary search was carried out on the following international registration platforms: International Prospective Register of Systematic Reviews (PROSPERO), Open Science Framework (OSF), The Cochrane Library, JBI Clinical Online Network of Evidence for Care and Therapeutics (COnNECT+), and Database of Abstracts of Reviews of Effects (DARE). The results found showed the scarcity of this topic in the literature, indicating that carrying out this study would be important. Furthermore, the study protocol was registered on the OSF platform: <https://osf.io/754uk/?view_only=6491865a3d12424d81af2c4099c112c3>.

The PCC (Population, Concept, and Context) mnemonic was used to formulate the research question.[11] Thus, people living with HIV were designated as the study population, health educational strategy as the concept, and health services as the context. The following question was then created: "What health educational strategies and content are addressed in Health Services for teaching people living with HIV?"

The data searches were carried out in April 2021 and updated in October 2022 by consulting the collection of the following data sources: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Science Direct, *Literatura Latino-Americana em Ciências da Saúde* (LILACS), Scientific Electronic Library Online (SciELO), Scopus, Web of Science, Virtual Library of Nursing (BDENF), and Medical Literature Analysis and Retrieval System Online (MEDLINE/PubMed). For gray literature (dissertations and theses), the Digital Library of Theses and Dissertations (BDTD) and Google Scholar were also consulted.

The descriptors used were based on the Descriptors in Health Sciences (DeCS) and Medical

Subject Headings (MeSH): HIV Infections, Acquired Immunodeficiency Syndrome, Health Education, Educational technology, Teaching, and Health Services. The Boolean operators "AND" and "OR" were used in the crossing, following the particularities of each source. Access to the data sources mentioned above was made *via* the Periodical Portal of the Coordination for the Improvement of Higher Education Personnel (CAPES), using remote access to the content of the Federated Academic Community (CAFe), a paid tool from the Federal University of Rio Grande do Norte (UFRN).

The following search strategies were configured in their respective databases: (("HIV Infections" OR AIDS OR "Acquired Immunodeficiency Syndrome") AND ("Health Education" OR "Educational technology" OR Teaching)) AND ("Health Services") was used in PubMed; Science Direct and SciELO: ("HIV Infections" OR AIDS OR "Acquired Immunodeficiency Syndrome") AND ("Health Education" OR "Educational technology" OR Teaching) AND "Health Services" was used in CINAHL; "HIV infections" OR AIDS OR "Acquired Immunodeficiency Syndrome" [Words] AND "Health Education" OR "Educational technology" OR Teaching [Words] AND "Health Services" [Words] was used in the LILACS database; TITLE-ABS-KEY ("HIV Infections" OR aids OR "Acquired Immunodeficiency Syndrome") AND TITLE-ABS-KEY ("Health Education" OR "Educational technology" OR teaching) AND TITLE-ABS-KEY ("Health Services") was used in SCOPUS. ((ALL=("HIV Infections" OR AIDS OR "Acquired Immunodeficiency Syndrome")) AND ALL=("Health Education" OR "Educational technology" OR Teaching)) AND ALL=("Health Services") was used on the Web of Science; ("HIV Infections" OR AIDS OR "Acquired Immunodeficiency Syndrome") AND ("Health Education" OR "Educational Technology" OR Teaching) AND ("Health Services") was used in BDENF; (All fields: "HIV Infections" OR AIDS OR "Acquired immunodeficiency syndrome" AND All fields: "Health Education" OR "Educational technology" OR Teaching AND All fields: "Health Services") was used in the Digital Library of Theses and Dissertations (BDTD); and ("HIV Infections") AND ("Educational technology") AND ("Health Services") was used in Google Scholar.

Publications fully and freely available electronically, without restrictions on language, time frame, and objective of the study were included. Summaries, letters to the editor, opinion articles, and studies that deviate from the proposed theme were excluded.

The inclusion of studies was carried out rigorously, first consulting titles and abstracts and then reading the articles in full. The selection was made simultaneously by two independent evaluators on the same day, on different electronic devices. Disagreements were resolved with the help of a third reviewer, who then decided whether or not the questioned article would be incorporated into the review.

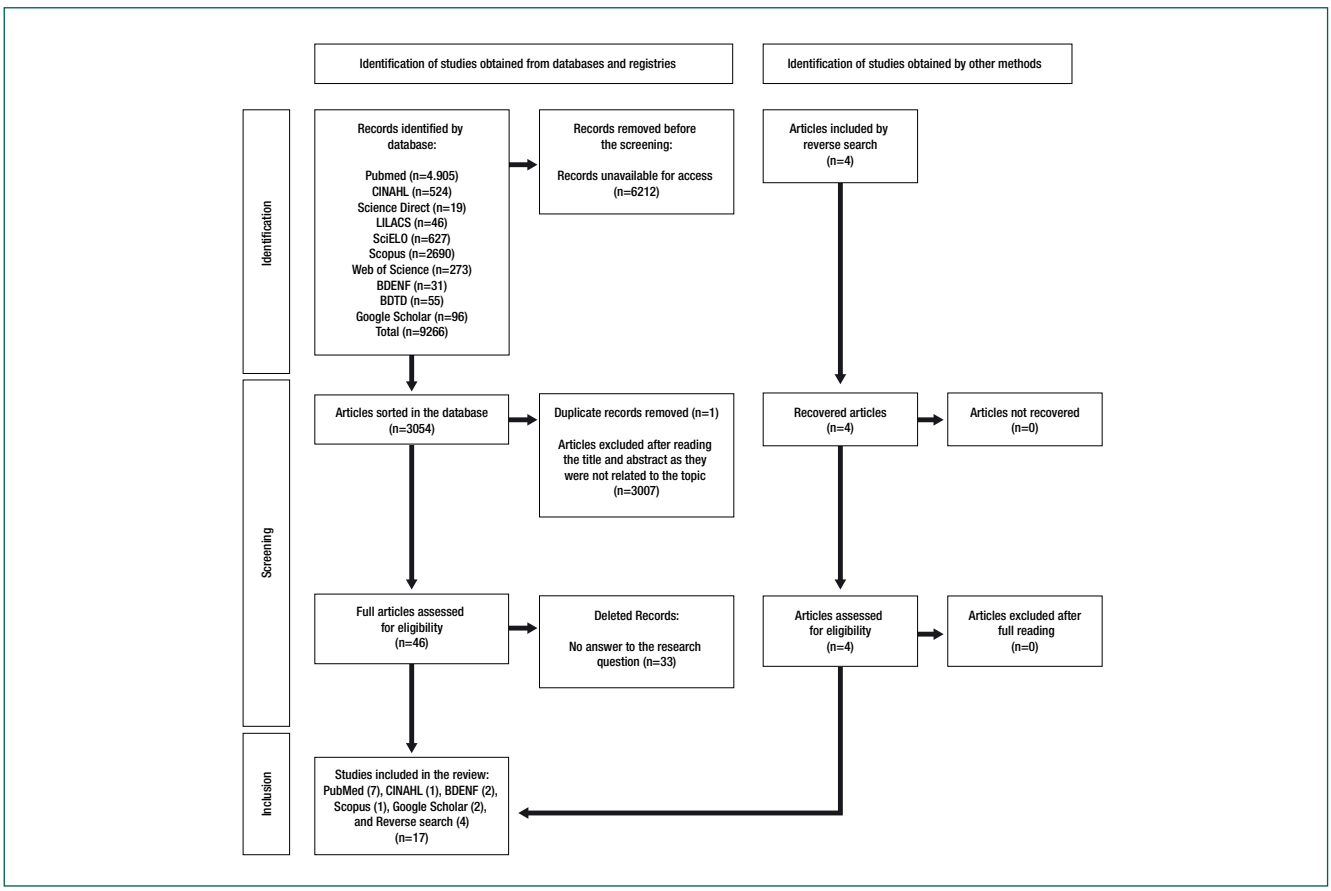
After selecting the final sample, the data obtained was organized and summarized in a chart with the following variables: year of publication, country, content of educational strategies, and content categories. The results were analyzed using descriptive statistics. In addition, the PAGER methodology was used. It was developed by researchers to offer a more detailed approach to findings and improve the quality of reporting evidenced in scoping reviews, extending the rigor of results through consistent analysis through the following elements: Standards, Advances, Gaps, Evidence of Practice, and Research Recommendations.[13]

The present study was not submitted to the Ethics and Research Committee (CEP/ERC) as the data included were in the public domain.

Results

A total of 9,266 studies were obtained from the searches in data sources; after applying the inclusion and exclusion criteria, 46 studies were evaluated and 17 were selected to compose the final sample; two of them were from grey literature (Figure 1).

Regarding the year of publication, studies in the period 1994-2022 were identified; more scientific articles were published in 2017 (4; 23.5%), 2018



Source: Adapted from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews, PRISM-ScR.

Figure 1. Flowchart of study selection

(3; 17.6%), 2019 and 2020 (2; 11.7%). In other years, only one was published (1; 5.8%). As for publishing countries, the USA (USA) and Brazil published the largest number of studies (7; 41.1%), followed by the United Kingdom (2; 11.7%), with the development of educational technologies in this area. In the total studies, the objectives were the following: evaluate the impact, effectiveness, and effect of a given educational strategy in the care retention process and reducing stigma and learning of participants (7; 41.1%), developing and validating a health education instrument (5; 29.4%), developing a new tool based on educational needs encountered by this population (3; 17.6%), and developing health prevention and promotion activities (2; 11.7%). Regarding the results, information about HIV/AIDS was generally content in educational strategies, adequate drug treatment, measurement of viral load, knowledge about prevention and prophylaxis, sexual health and emotional support for patients, sexual partners and family members, development of self-care, autonomy, and stigma reduction, as well as monitoring, medical coverage and referral, and promotion of HIV testing. The studies showed relevant elements in the composition of educational resources, which were distributed into five categories: initial guidance, general care, healthy living, sexual health, and emotional support (Chart 1). The educational strategies identified in the articles were the following: booklets and printed educational materials (8; 47.0%), systems on care, support, and communication (3; 17.6%), multimedia (4; 23.5%), forms and interviews (2; 11.7%), and instant messaging and workshops (1; 5.8%). These results are presented in chart 1.

The PAGER methodology was used to enhance the rigor, increase the quality of this review, and provide a consistent approach to the analysis and reporting of the selected studies. The PAGER structure is shown in chart 2.

Chart 1. Categorization of studies on identification, country, year, educational strategies, content of strategies, and content categories

ID*, Country, Year	Educational strategies	Content of Educational Strategies	Content Categories
Santos et al. (2019) [2] Brazil	Educational game	General knowledge about HIV/AIDS; Quality of life in PLWHA; Knowledge about treatment and adherence; myths and truths.	General Care Healthy life
Teixeira et al. (2019) [9] Brazil	Printed booklet	Forms of transmission, personal, environmental, and food hygiene; Daily care to live well; General care.	General Care Healthy life
Gustafson et al. (1994)[14] USA	CHESS (*Comprehensive Health Enhancement Support System*)	General information about HIV, referrals to service providers, support in making difficult decisions, and networking with experts.	Initial Guidelines on HIV/AIDS
Woods et al. (1998) [15] USA	HAPPENS Program	HIV counseling, testing in support services, mental health care; health status screening, care, and multidisciplinary support.	General Care Emotional Support
Kalichman, Hudd, Diberto (2010)[16] USA	HIV prevention program - Healthy Relationships	Skills in communicating HIV status to friends, family, and sexual partners; management skills for safe sex and reducing the risk of HIV transmission.	Sexual Health
Rivera et al. (2015)[17] UK	Multicomponent video	Education on general HIV concepts, HIV testing, counseling, and reduction in HIV stigma.	Emotional support General Care
Tanner et al. (2016)[18] USA	Social media (*weCare)*	Diagnosis time, specific care, family challenges, sexual education, and pre-exposure prophylaxis.	Emotional support General Care
Killingo, Taro, Mosime (2017)[19] South Africa	Workshops	Education about treatment, organization of mobilization workshops for knowledge construction and testing.	General Care
Leadbal et al. (2017) [20] Brazil	Structured form (sociodemographic characterization)	Guidance on family planning, nutrition, side effects of antiretroviral medications, and information on participation in Non-Governmental Organizations (NGOs).	Sexual Health Healthy life General Care
Bayona et al. (2017) [21] EUA	Mobile Phone Technology *(mHealth)*	Mental health, coping behaviors, interpersonal support, physical symptoms, knowledge about HIV, and care coordination.	Emotional Support Initial Guidelines
Lima et al. (2017) [22] Brazil	Printed booklet	Prevention of vertical transmission of HIV; general concept of HIV/AIDS; forms of transmission; diagnostic tests, and care during the antenatal and postpartum periods.	Initial guidelines General Care
Brasil et al. (2018) [23] Brazil	Printed booklet	Specific questions about HIV, aspects related to way of life, and notary information; patients' rights.	General Care Healthy life
Atanga et al. (2018) [24] UK	Composite Adhesion Score (CAS) (Questionnaire)	Treatment and correct use of antiretroviral medications (general care), and side effects of antiretroviral drugs.	General Care
Neumann et al. (2018) [25] USA	Educational Video	General concepts about HIV, treatment, the importance of consultations, monitoring, and overcoming barriers to starting treatment.	General Care
Jesus et al. (2020)[26] Brazil	Printed-type instructional educational material	Quality of life, nutrition, physical exercise, coping with the diagnosis of HIV seropositivity, sexuality, and sexual health.	Healthy life Emotional Support Sexual Health
Maloney et al. (2020) [27] USA	Electronic and multimedia technologies	Emphasis on education about diagnosis and treatment, behavior change, and diagnostic testing.	General Care
Frazão, Gusmão, Guedes (2022),[28] Brazil	Printed booklet	Sexual and reproductive health, combined prevention, pre- and post-exposure prophylaxis, and family planning.	Sexual Health

*ID: article identification

Chart 2. PAGER structure based on the studies analyzed

Standards	Advances	Gaps	Evidence for practice	Search recommendations
Booklets and educational material[2,9,22-23,26]	They promoted the empowerment and autonomy of people living with HIV.	Reduced number of participants.	Nurses, the professionals who promote health education in their daily practices, must use these educational materials.	To carry out research to validate the materials and booklets and their effectiveness.
Systems[14-16]	They improved quality of life and encouraged adherence to medical care.	Difficulties in implementing programs.	Need to make programs and systems accessible to all people.	Need for research comparing non-technological methods with educational programs and systems.
Forms and interviews [20,24]	Promotion of therapeutic adherence and prevention, with significant responses on viral suppression.	Small sample number.	Need to expand the study to more than one service, in addition to including both genders.	To expand the study from/on a professional and management perspective, as well as evaluate result indicators.
Multimedia[17-18,21,25,27]	Effective communication, reduced stigma, and improved adherence to medication treatment.	Study population restricted to urban areas.	Expand the study to areas with poor internet access, especially for people with difficult access to information (*e.g.*, rural areas).	To develop information sheets to facilitate access. Promote privacy and safe browsing among participants. Involvement of a multidisciplinary team.
Instant Messaging[22]	Promoting greater involvement in their care and feeling of being supported.	The study population was recruited at a single location and only information about the initial phases of care is illustrated.	The instrument can be used as a type of telehealth intervention to elucidate gaps in the continuum of care.	To apply the study in other locations and expand it to other phases of care.
Workshops [19]	Ability to apply on a larger scale and be adapted to national and regional contexts.	All stages of the model require high investments of time and resources and indicators have not yet been developed to assess the effectiveness of the instrument.	Education, along with donations to partner organizations in society, can create positive results by increasing the applicability of the instrument.	To establish structures to evaluate the effectiveness of the instrument and create alternative content delivery methods to reduce investments.

Discussion

From the analysis of the selected studies, it is possible to verify that the scope presents important information about the contents covered by the health educational strategies aimed at people living with HIV. Elements relevant to this research were thus identified and categorized in these studies: initial guidance[14,8,20,22] and general care,[2,15-17,18-27] sexual health,[16,18,20,28] emotional support[15,17,21,26] and healthy living.[2,9,20,23,26]

As for educational strategies, the use of booklets and teaching materials can be highlighted as one of the most used instruments, being evidenced as an excellent resource for PLWHA. The process of validating the booklets with experts and the population was an essential factor that contributed to adapting the instruments.[9,22-23,27-28]

In general, positive and relevant outcomes from the use of these strategies were highlighted as the available information and knowledge offered increased coping power.[9] Furthermore, the active participation of the target audience enabled greater autonomy and self-care, which was evidenced by greater adherence to consultations and exams, and better hygiene and nutrition. This allowed us to realize that the content of these instruments is essential to support the construction of a new strategy aimed at people with HIV.[9,23,27,28]

Furthermore, educational strategies related to the development of systems and programs are widely used (23.0%), showing benefits for improving life quality and social and emotional support. Advice on diagnostic tests provided by systems and programs was a key point for the observed increase in demand for health services.[14,15]

Thus, the contributions of educational technologies focused on multimedia, such as the use of videos and computer-mediated communication to clarify doubts of people living with HIV/AIDS, are highlighted. The use of educational videos contributed to reducing HIV stigma, strengthening knowledge of PLWHA, and improving adherence to antiretroviral treatment.[15,16,23]

From this perspective, the study by Tanner *et al.* (2016) is highlighted. They developed the *weCare* social media to improve health care and outcomes for men who have sex with men (MSM) living with HIV. The intervention addresses aspects related to sexual health and HIV, respecting the community's culture. Through the educational strategy, it was possible to notice an improvement in HIV-related stigma and retention of care, which is essential for developing a new educational strategy.[18]

In the results, it is important to highlight that content about healthy eating and self-care is still in its infancy. Physical exercise is a significant factor for HIV patients, as it positively contributes to the immune system by increasing CD4 T-cells in the cardiovascular system, reducing the percentage of fat, and improving the lipid profile, which can interfere with complications due to non-communicable degenerative diseases.[26,29]

Regarding dietary aspects, people with HIV may present progressive malnutrition associated with reduced food intake. This agrees with the observed change in nutrient absorption, increase in energy demands that cause weight loss, and reduction in micronutrients, directly weakening the functioning of the immune system, thus providing a favorable environment for opportunistic infections.[30]

Questions about seropositive pregnant women or vertical transmission were also rarely included in the content of educational strategies. These topics are important to be presented by health professionals, as seropositive pregnant women can transmit HIV to their children. Therefore, starting antiretroviral therapy (ART) at the beginning of pregnancy is necessary, interrupting breastfeeding to reduce the possibility of infection.[17,31]

The reinforcement of studies on the importance of using language and methods that are easy to understand for PLHIV is another relevant point as a significant number of people with low education were identified in the results.[2,9,14,15,22-25,27]

Furthermore, the importance of maintaining the privacy and anonymity of these patients is highlighted as blaming and HIV shame was more present in people with low levels of education, younger age, and unemployed.[19,20]

Maloney *et al.* (2020) reaffirmed that educational technologies are compatible with the ways of

living well for people with HIV and suggested the strategy of using educational materials that help to adhere to drug treatment as it is through specific medication that patients can achieve a reduction in viral load and CD4 T-cell count.[27]

In this sense, videos, systems, programs,[14,15,17,25] forms[20], and interviews[24] were the educational strategies highlighted regarding patient adherence to the proposed treatments. The results of the present study can contribute not only to a better understanding of the process of health education using educational resources for people living with HIV but also to sensitize managers in the formulation of public policies for the design and implementation of educational resources in Primary Health Care and hospital care.

The exclusion of articles published in restricted-access journals was the main limitation of this study. Furthermore, the predominance of articles focusing on prevention but not diagnosis and treatment of people with HIV also made the selection of studies difficult.

Conclusion

The main educational strategies and content covered in the education of people living with HIV were mapped. Booklets and printed educational materials, multimedia, systems, forms, and workshops are the educational strategies in use. The content of these strategies includes initial guidance on HIV/AIDS, pharmacological treatment, general care, healthy living, sexual health, and social and emotional support. Focusing on the relevant aspects of the strategies and content addressed in teaching people living with HIV will improve their knowledge and conduct concerning the disease, reducing both stigma and non-adherence to treatment and the number of deaths caused by AIDS.

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