Enfermería Global
ISSN 1695-6141
Revista electrónica cuatrimestral de Enfermería
Nº 77
Septiembre-Diciembre 2025
www.um.es/eglobal/

REVIEWS

Educational health technologies in the leprosy context: a Scoping Review

Tecnologías sanitarias educativas en el contexto de la lepra: Revisión de Alcance

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https://doi.org/10.6018/eglobal.653291

elocation-id: e653291

Received: 08/03/2025
Accepted: 28/08/2025

ABSTRACT:

Introduction: The objective of this research was to map the production of educational health technologies in the leprosy context at the global level.
Material and methods: This is a scoping review conducted in accordance with the methodological structures set forth by the Joanna Briggs Institute and the Preferred Reporting Items for Systematic reviews and Meta-Analyses checklist, extension for Scoping Reviews. Searches were carried out in the following databases: Medline, Web of Science, Scopus, CINAHL, Embase, LILACS and BDENF, in addition to dissertation and these repositories, as well as in Google Scholar to support the review.
Results: Twenty-five studies between 2008 and 2024 were included, where the country that produced the most educational technologies aimed at leprosy was Brazil and the main technologies demonstrated were apps.
Conclusions: Educational technologies targeted at leprosy have developed significantly, benefiting both health professionals and people affected by the disease. This progress not only improves the patients' quality of life but is also essential for prevention and awareness raising regarding leprosy.

Keywords: Leprosy; Health technologies; Educational Technology.

RESUMEN:

Introducción: El objetivo de esta investigación consistió en mapear la producción de tecnologías sanitarias educativas en el contexto de la lepra a nivel global.
Material y métodos: Se trata de una revisión de alcance llevada a cabo de acuerdo con las estructuras

metodológicas del *Joanna Briggs Institute* y la lista de comprobación de la extensión *Preferred Reporting Items for Systematic reviews and Meta-Analyses for Scoping Reviews*. Se realizaron búsquedas en las siguientes bases de datos: Medline, Web of Science, Scopus, CINAHL, Embase, LILACS y BDENF, así como en repositorios de disertaciones y tesis, y en Google Académico para apoyar la revisión.
Resultados: Se incluyeron 25 estudios de 2008 a 2024, donde el país que produjo más tecnologías educativas dirigidas a la lepra fue Brasil y las principales tecnologías demostradas fueron aplicaciones.
Conclusiones: Las tecnologías educativas dirigidas a la lepra se han desarrollado significativamente, beneficiando tanto a los profesionales sanitarios como a las personas afectadas por la enfermedad. Estos avances no solo mejoran la calidad de vida de los pacientes, sino que también son fundamentales para prevenir y concientizar sobre la lepra.

Palabras clave: Lepra; Tecnologías sanitarias; Tecnología educacional.

INTRODUCTION

Leprosy is an infectious disease caused by the *Mycobacterium leprae* and *Mycobacterium lepromatosis* bacteria. It is an old condition that has affected mankind for centuries. It is a disorder whose initial signs are related to neurological changes and, later on, to dermatological ones. Leprosy can progress to severe lesions, disabilities and deformities [(1)]. It is Neglected Tropical Disease (NTD) still present in more than 120 countries, with 200,000 new cases reported each year at the global level. Leprosy was eradicated as a Public Health problem worldwide (identified as prevalence below 1 case for every 10,000 inhabitants) in 2000 (according to World Health Assembly Resolution No 44.9) and in 2010 in most countries. However, Brazil, India and Indonesia recorded more than 10,000 new cases still in 2019, with Brazil ranking second in number of cases at the global level, only behind India. These data show that leprosy continues to be an important health problem, both in the national and in the national scenario [(2)].

It was based on the 2021-2030 Global Strategy (toward zero leprosy) that the 2024-2030 National Strategy to Combat Leprosy was devised with a view to a leprosy-free Brazil. Goal 4 in this strategy reflects the importance of the Unified Health System (*Sistema Único de Saúde*, SUS) to face stigma and discrimination against people affected by the disease, through social inclusion, guarantee of rights and dignity [(3)].

However, the stigmatization process is an everyday reality that can generate and deepen preconceptions in relation to individuals or groups in situations of vulnerability. This promotes discriminatory attitudes that feed social inequalities and exert direct effects on health conditions. People living with leprosy face important negative impacts such as reduced quality of life and well-being, as well as higher risks of developing anxiety and depression [(4)].

With a view to contributing to these individuals' quality of life, health education actions that promote dialog between users and professionals (mainly mediated by technologies) can ease collective knowledge construction. This will only become a reality if and when this population group's knowledge and reality are respected, with the possibility of implementing attitudinal changes [(5)].

In this scenario, educational technologies prove to be effective in health promotion, as they improve the patients' and professionals' understanding and coping ability. In other words, they allow understanding how their own attitudes affect their health condition (patients) and impact on the promotion and provision of therapeutic plans (health professionals) [(6)].

These technologies allow disseminating updated information about leprosy and combating the stigma associated with the disease, which is essential to improve care quality and to reduce the patients' social exclusion [7]. A number of studies show that interactive education methods have been effective in enhancing knowledge about leprosy prevention and treatment, as well as in promoting behavioral changes that help reduce the social and psychological stigma inherent to the disease.

Therefore, an exploratory review can provide an overview of the existing educational technologies targeted at leprosy and, with that as a starting point, gaps and new possibilities might emerge for technological products that may be more sustainable and assertive in terms of exchanging knowledge about the disease.

In this sense, a preliminary search was made in order to identify possible reviews with similar or different themes and to contribute to selecting appropriate descriptors. This preliminary search was conducted in international databases and in the Virtual Health Library (*Biblioteca Virtual em Saúde*, BVS). The study entitled "*Tecnologías sanitarias para el manejo de la lepra en la Atención Primaria de Salud: una revisión exploratoria*" ("Health technologies for leprosy management in Primary Health Care: An exploratory review") stands out. There are differences between the studies, as the current paper focused on the educational technologies used for leprosy in all care and training settings.

Given this, the review objective is to map the scientific evidence related to the production of educational health technologies in the leprosy context.

METHOD

An exploratory review conducted according to the methodological structures set forth by the Joanna Briggs Institute (JBI), following the theoretical framework proposed by Peters et al [8] and based on these nine steps: 1) Defining and aligning the review objective and question; 2) Developing and aligning inclusion criteria; 3) Describing the planned approach to evidence searching, selection, extraction, analysis and presentation; 4) Searching for the evidence; 5) Selecting the evidence; 6) Extracting the evidence; 7) Analyzing and synthesizing the evidence found; 8) Presenting the results; and 9) Summarizing the evidence concerning the review objective. It is worth adding that the study followed the recommendations set forth in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA-ScR) [9] (Tricco et al., 2018). The review protocol was registered in the Open Science Framework (OSF) (https://doi.org/10.17605/OSF.IO/36D5F) in June 2024.

The search was conducted between July 2024 and October 2024. The PCC mnemonics was used to formulate the guiding question, as follows: Population (P) – Leprosy; Concept (C) – Educational technologies; and (C) – At the global level. The following research question was defined based on these preceding elements, as follows: "Which are the educational health technologies produced about leprosy at the global level?".

In order to identify keywords and descriptors, a search was made in the Brazilian database for national descriptors, *Descritores em Ciências da Saúde* (DeCS), and in the one for international descriptors, *Medical Subject Headings* (MeSH). Consequently, a number of descriptors and *AND/OR* Boolean operators were combined considering

the language and particularities of each database, thus applying the most relevant ones in the studies dealing with the topic of interest. The ECU (Extraction, Conversion, Combination, Construction, Use) method was used to address the research made in these various descriptor sources, as indicated by Araújo [10].

The eligibility criteria for this exploratory review included publications on educational health technologies about leprosy, with no language or year restrictions. The materials accepted were as follows: primary studies, experience reports and quantitative/qualitative research studies with any design, in addition to theses and dissertations available in full in an institutional account. The following exclusion criteria were adopted: publications not answering the research question; as well as duplicate research studies, case reports, letters, notes, editorials, appraisals, case studies, abstracts in congress annals, reports, reviews, secondary reviews, incomplete articles and studies in project phase or still not presenting results.

Therefore, the following databases were used as search fields for the research: Medline (Medical Literature Analysis and Retrieval System Online) via PubMed, Web of Science, Scopus, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Embase (Excerpta Medica Database), LILACS (*Literatura Latino-Americana e do Caribe em Ciências da Saúde*) and BDENF (*Biblioteca Virtual de Enfermagem*). The databases were accessed from the Journals portal maintained by the Coordination for the Improvement of Higher Education Personnel (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*, CAPES) belonging to the Federated Academic Community (*Comunidade Acadêmica Federada*, CAFe), through an institutional account. The Gray Literature was also researched, using the following databases: Brazilian Digital Library of Theses and Dissertations (*Biblioteca Digital Brasileira de Teses e Dissertações*, BDTD) and the CAPES Theses and Dissertations Catalog, in addition to the Google Scholar search tool.

Due to the specific characteristics inherent to the databases and repositories, the strategies adopted were adjusted whenever necessary. The information about the search is specified in Table 1.

Table 1: Search strategies applied in the data sources, July 2024. Cajazeiras, PB, Brazil, 2024.

DATA SOURCES	SEARCH STRATEGIES
- EMBASE	(Leprosy) AND ("Educational Technology" OR Technology OR "Teaching materials")
- PUBMED - Scopus -Web of Science - CINAHL	(Leprosy OR "Hansen's Disease" OR "Hansen Disease") AND ("Educational Technology" OR Technology OR "Teaching materials")
- BDENF - LILACS	(Leprosy OR "Hansen's Disease" OR "Hansen Disease") AND ("Educational Technology" OR Technology OR "Teaching materials") (Hanseníase OR "Doença de Hansen") AND ("Tecnologia Educacional" OR Tecnologia OR "Materiais de Ensino")
- BDTD	(Hanseníase) AND ("Tecnologia educacional")

DATA SOURCES	SEARCH STRATEGIES
- Theses and Dissertations Catalog	(Hanseníase) AND ("Tecnologia educacional")
- Google Scholar	(Hanseníase) AND ("Tecnologia educacional" OR "Materiais de ensino")

Source: Prepared by the author (2024). Cajazeiras, Paraíba, Brazil, 2024.

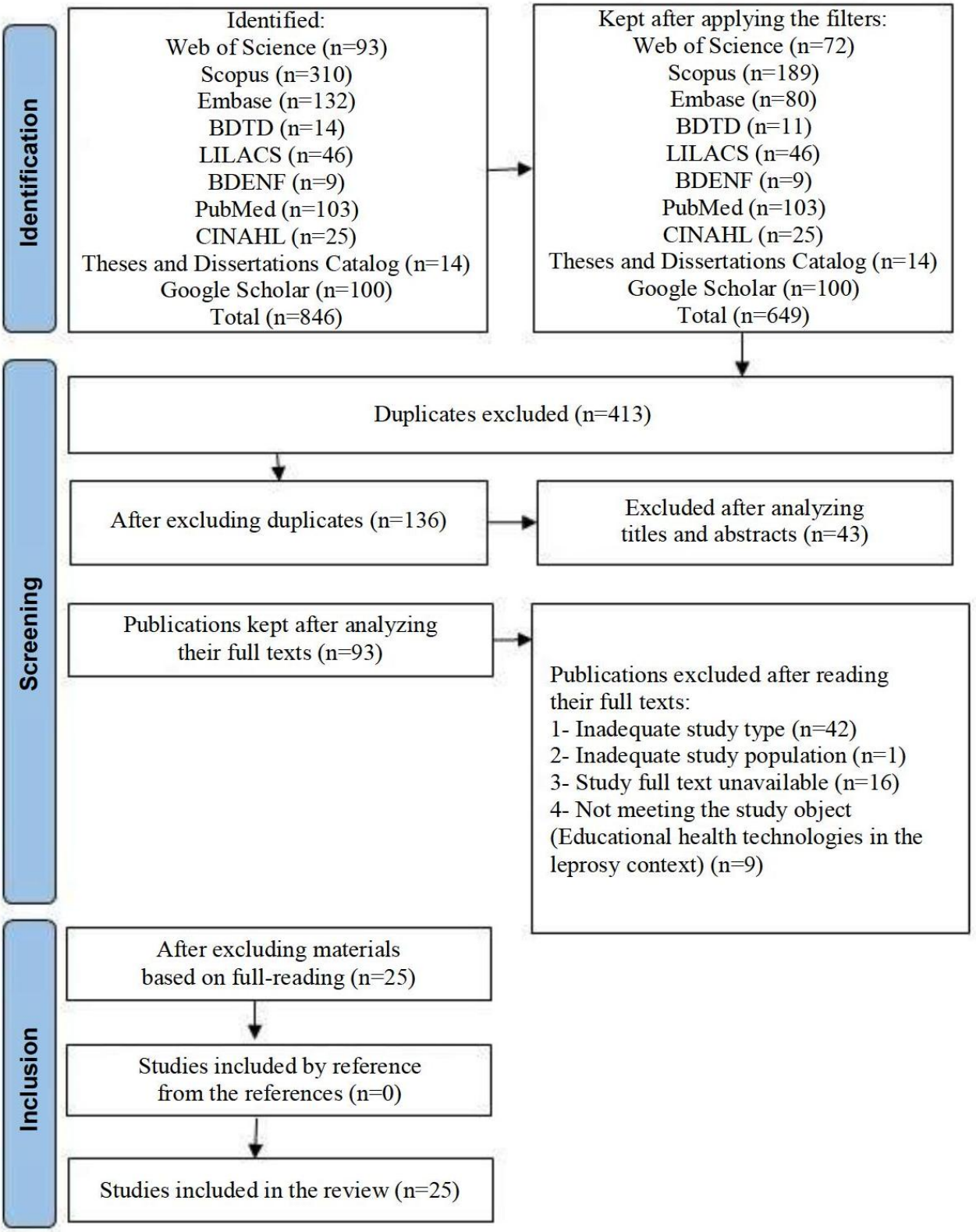
The results obtained from the data sources were transferred to the *Rayyan*® software in order to remove duplicates, in addition to blindly selecting and screening studies. Data selection was through an independently conducted double verification process, and any and all discrepancies were solved by resorting to a third reviewer, using *Microsoft Excel*® spreadsheets.

As a first step, the title and abstract from each study were read. This was followed by a comprehensive analysis of the papers selected, according to the criteria established. The form suggested by the JBI was adapted for data collection, seeking to ease the information synthesis based on these variables: title, publication year, publication type, country, objective, methodological design, target audience, type of educational technology, theme, purpose, validation, impacts due to using the technologies and challenges for their use. The data were extracted by two reviewers and subsequently organized, analyzed and presented in a *Microsoft Excel*® spreadsheet. The data extracted were descriptively analyzed and arranged in charts and graphs, with statistics processed by means of absolute and relative frequencies.

RESULTS

A total of 846 potentially eligible studies were identified after applying the strategy; 649 documents remained after screening and 413 of these were removed for being duplicates. The pair of reviewers excluded 43 documents after reading their titles and abstracts and, therefore, 93 articles were read and analyzed in full. After applying the exclusion criteria, 25 studies comprised the final review sample. For the strategy to search and summarize the publications, the recommendations from the flowchart corresponding to the study selection process for exploratory reviews were used, adapted from the PRISMA guides and as shown in Figure 1.

Figure 1: Flowchart showing the selection of publications for the exploratory review, according to the PRISMA-ScR recommendations.

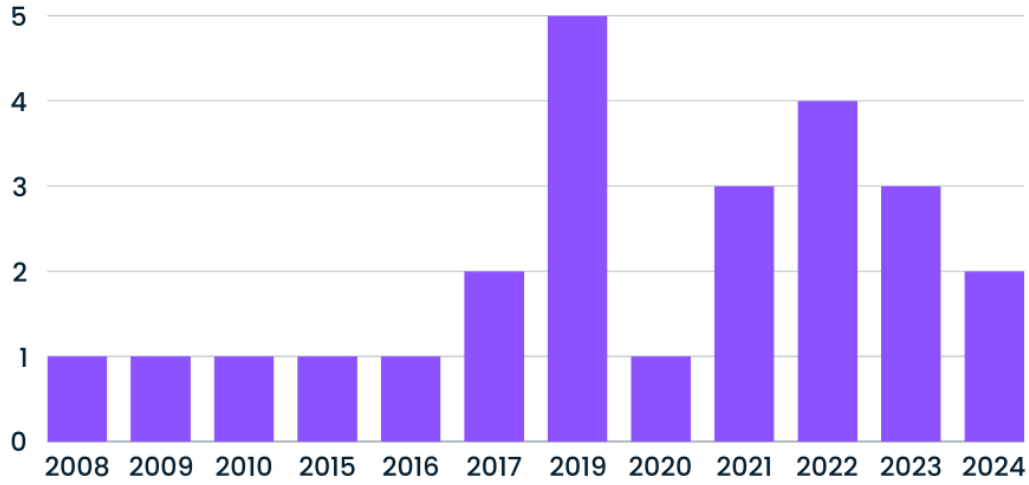


Source: Prepared by the author (2024). Cajazeiras, Paraíba, Brazil, 2024.

As for publication type, 18 studies (72%) were scientific articles, 5 were MSc theses (20%) and 2 were PhD thesis (8%).

The studies included in this review showed the diversity of educational health technologies targeted at leprosy. They were published between 2008 and 2024 and distributed as follows in terms of publication year (Figure 2):

Figure 2: Graphical representation of the publication year corresponding to the studies included in this review.



Source: Prepared by the author (2024). Cajazeiras, Paraíba, Brazil, 2024.

The studies analyzed were published between 2008 and 2024, which represents a 17-year period (Table 2). The highest number of educational technologies produced in the leprosy context was found in 2019, with a total of five. Ranking second, 2022 had four productions, whereas 2021 and 2023 recorded three each. Two productions were detected in 2024; in turn, 2008, 2009, 2010, 2015, 2016 and 2020 had only one technology each.

Table 2: Characterization of the studies included in this scoping review (study variables). Cajazeiras, PB, Brazil, 2024.

Study	Author	Type of educational technology	Methodological design	Target audience	Country
S1[11]	Deps et al.	Artificial Intelligence	Perspective article	Health professionals (physicians and nurses)	Brazil
S2[24]	Araújo et al.	Web radio	Experience report	Young students	Brazil
S3[17]	Gonçalves	Shadow Theater	Intervention study (quali-quanti)	Young students	Brazil
S4[21]	Sampaio et al.	Cordel	Methodological study	Health professionals and people with leprosy	Brazil
S5[34]	Santos	App	Methodological study	Elementary School teachers	Brazil

Study	Author	Type of educational technology	Methodological design	Target audience	Country
S6[18]	Leroy et al.	Professional training	Experience report	Health professionals	Brazil
S7[25]	Santos	Game	Methodological study	Young students	Brazil
S8[26]	Ferreira	*Podcast*	Quasi-experimental study	Young students	Brazil
S9[12]	Diniz	App	Quasi-experimental study	Integrated High School teachers	Brazil
S10[22]	Paixão	Remote course	Not specified	Health professionals	Brazil
S11[13]	Barbieri et al.	Artificial intelligence	Action-Research	Health professionals	Brazil
S12[14]	Matos et al.	Mobile app	Methodological study	Health professionals	Brazil
S13[15]	Santos	*Storyboard*	Action-Research	Young students	Brazil
S14[16]	Neves	Game	Action-Research	Youths aged less than 15 years old	Brazil
S15[23]	Theint et al.	Guide	Report	Health professionals, volunteers and people with disabilities	Myanmar
S16[28]	Lal et al.	Mobile phones	Experience report	Leprosy patients	India
S17[29]	Gupta	Educational video	Experience report	People with leprosy and therapists	India
S18[35]	Soares et al.	Serial album	Descriptive study	Employees from the Lauro de Souza Lima Institute	Brazil
S19[30]	Martins et al.	Booklet	Experience report	Leprosy patients	Brazil
S20[19]	Nobre et al.	Booklet	Experience report	Leprosy patients	Brazil
S21[31]	Carvalho et al.	Guide	Experience report	Leprosy patients	Brazil
S22[20]	Junior et al.	Booklet	Methodological study	Leprosy patients	Brazil
S23[32]	Galiza et al.	Booklet	Methodological study	Leprosy patients	Brazil
S24[33]	Tavares et al.	Booklet	Methodological study	Leprosy patients	Brazil
S25[27]	Francisco	Game	Methodological study	Young students	Brazil

Source: Prepared by the author (2024). Cajazeiras, Paraíba, Brazil, 2024.

Of the 25 studies included in the review, 88% were from Brazil, 8% from India and 4% from Myanmar. Most of the papers (18 [72%]) are scientific articles, followed by 5 MSc theses (20%) and 2 PhD theses (8%). Around 24% of the studies [11-16] resorted to current digital technologies such as apps and Artificial Intelligence, which evidenced a growing trend to integrate these technologies into health education and continued health education.

As for the challenges to using the technologies, several barriers were identified. The Artificial Intelligence solution developed pointed out difficulties related to high-quality data availability and to adaptability of the existing processes to the IA models [11]. The Mobile apps emphasized some users' limitations in cell phone use [14]. In the case of the Storyboard, the challenges included lack of technological equipment and inflexibility in the participants' time schedules [15]. The Shadow Theater author reported difficulties continuing the visits to the schools [17], whereas Professional training faced problems related to the users' interaction with the technology developed [18]. One of the Booklets' author mentioned the language barriers and limitations found in the target audience as for Internet use [19]. In turn, the other Booklet faced challenges to present the material to the target audience in a simple and appealing way [20]. In all, 18 studies (72%) presented no challenges (or it was not possible to identify them) in relation to using technologies.

The methodologies varied between methodological study (32%), experience report (28%), action-research (12%), quasi-experimental study (8%), intervention study (4%), report (4%), descriptive study (4%) and perspective article (4%), thus reflecting the diversity of approaches to reach different population groups. Only one study (4%) failed to specify its methodological design.

Corresponding to 28% of the studies, articles [11,13-14,18,21-23] were targeted at health professionals, offering update resources and continuing education. These technological tools can contribute to progress and efficacy in health care, translating themselves into improvements for the patients and, thus, contributing to more effective and humanized Public Health.

The studies focused on youths [15-17,24-27] (28% of the total) had the objective of raising awareness about leprosy by using various technologies such as drama, games, apps and podcasts, allowing the young participants to learn about health in ways they considered interesting and relevant.

In turn, eight studies [19-20,28-33] (32% of the total) were focused on helping leprosy patients in the most varied ways, whether through self-care or by disseminating information about healthier eating habits, as well as by developing mobile technologies as a way to improve communication with patients and family members, guiding, educating and answering their questions regarding treatments, symptoms and secondary effects, among others.

In addition, two studies [12,34] (8%) had teachers as target audience (Elementary School ones in the first and High School ones in the second). Another study (4%) was developed for employees from the Lauro de Souza Lima Institute [35].

The impact related to using each technology were multiple; however, it is noted that 13 studies (52%) allowed students, teachers, health professionals and employees to

improve their knowledge about leprosy, its symptoms and initial signs. Eight studies (32%) enabled empowering leprosy patients for their self-care, as well as getting them closer to scientific knowledge, breaking away with communication barriers. Three studies (12%) were focused on enhancing contact between health teams and leprosy patients. One study (4%) instrumentalized the adolescents' potentialities and stimulated their creativity for them to take on a leading attitude.

The settings for which the technologies were developed varied between primary care (28%), secondary care (20%) and school environment (32%), whereas four studies failed to specify the *locus* (16%). In primary care, the technologies included training [18], Education at a Distance [22], booklet [19,30,33], mobile app [14] and mobile phone [28]. As for secondary care, Artificial Intelligence [11,13], educational video [29], serial album [35] and booklet [32] stood out. Web radio [24], shadow theater [17], apps [12,34], games [16,25,27], podcast [26] and storyboard [15] were used in the school environment. The studies that failed to specify the *locus* were those that employed the cordel [21], guide [23,31] and booklet [10] technologies.

As for validation of the technologies, it was evidenced that nine (36%) were validated, namely: app [34], games [25,27], podcast [28], remote course [22], mobile app [14], serial album [35] and booklets [32-33]. In all, 13 technologies were not validated, which corresponds to 52% of the studies; in addition, it was not possible to identify their validation in 3 studies [14,16,28].

DISCUSSION

Considering the diversity of strategies identified, the Discussion was organized according to the target audience of the educational technologies, which allows understanding the interventions developed and the results obtained in each specific context more clearly.

1. Professional qualification/training

The introduction of Artificial Intelligence (AI) in healthcare is an important advance, especially in improving the training and qualifications of professionals. In addition to helping make diagnoses more accurate and treatments more effective, AI technologies also increase safety and ensure that the practices adopted are based on scientific evidence. In the case of leprosy, AI is useful in analyzing data for contact tracing and personalizing treatment. All of this helps to reduce the stigma that still surrounds the disease. Thus, the use of these tools represents an important step in the fight against underdiagnosis and in the prevention of physical sequelae caused by late diagnoses [11-13].

In this context, the training of health professionals is another fundamental element for the quality and efficiency of the services offered to the population and in reducing health problems. The studies analyzed reinforce that training that introduces new technologies and care practices is essential to create more dynamic and collaborative learning environments [18]. In addition to updating knowledge, training also makes it possible to discuss topics that often do not appear in traditional protocols and integrates practical experiences that enrich professional performance. These programs help health workers keep up with changes in the field, strengthening both individual skills and collaborative

learning [36]. Therefore, continuing education is not only a matter of technical updating, but also an important step toward improving the quality of care provided.

In line with the need for continuing education, offering distance learning courses for health professionals has proven to be an effective response to the demand for accessible and ongoing training. In this context, distance learning focused on leprosy stands out for its efficiency, as it expands the reach and allows professionals from more remote regions to actively participate in their learning [22]. In addition, the flexibility of this modality helps professionals fit their studies into their daily routine, making training more practical and tailored to their needs. Research shows that these courses encourage constant updating, promoting continuing education, which positively reflects on the quality of care [37].

Another example is the use of mobile applications in the field of health, which emerges as an innovative strategy to promote self-care and support the treatment of various diseases, including leprosy. These tools are also promising technological solutions to assist healthcare professionals in caring for patients and monitoring their contacts, as they facilitate the timely monitoring of clinical cases of leprosy and significantly reduce treatment abandonment. However, there are challenges related to the digital divide, increased workload, and low commitment by health professionals to implementing new technologies [14].

Finally, the serial album, used to improve the knowledge of professionals linked to the Lauro de Souza Lima Institute, proved to be effective in the health education process, being widely used to convey information in a clear, visual, and interactive way [35]. This tool also has great potential to encourage the empowerment of professionals, as it makes information more interactive and personalized to the reality of the group [38].

2. Patients and family members

Mobile phones have proven to be an effective tool in healthcare. They allow healthcare professionals to actively listen to patients and family members, answer questions with personalized supervision, assist in the early detection of signs and symptoms, and provide guidance on necessary actions, treatments, and their side effects. This direct communication creates a space of trust and acceptance, in addition to encouraging patients to remain in treatment. In addition to providing information, the use of cell phones helps to demystify prejudices and taboos associated with leprosy, facilitating collective and integrated learning that broadens understanding of the disease [28]. Therefore, mobile phones have the potential to improve access to information and health services, especially in communities far from health facilities, in addition to promoting self-care and health education among users [39].
Similarly, booklets support patients in their self-care needs. They combine dynamism with essential information to prevent, minimize, or rehabilitate lesions caused by leprosy. Therefore, by participating more directly in their own health and well-being, patients strengthen their self-confidence and self-esteem, reducing misinformation about their condition and strengthening their independence [19-20,30,32-33].

In the context of self-care and information access, a methodological study points out how cordel literature, a popular tool, can be effective in health education for both professionals and patients. The format, which combines rhyme and narrative, is an attractive way to convey important guidelines, respecting local culture and creating a

sense of belonging. Thus, this type of culturally adapted communication serves as an example of how health education can be more efficient when it considers the social context in which it is inserted, breaking down linguistic and cultural barriers [21].

Corroborating this discussion, several studies point out that popular literature is an effective tool for health education, especially in communities where the population has an emotional connection with their cultural manifestations, which increases adherence to this type of technology [40].

3. Popular/Community education

Web radio has emerged as an innovative tool for disseminating information about leprosy among school-age children. The experience report presented demonstrates how this technology can be used to promote health in an accessible and attractive way, directly impacting leprosy care. The use of media formats that engage with youth culture, such as podcasts and live broadcasts, makes learning about health more interesting and interactive, creating a bridge between information and practice. Web radio has proven to be an effective strategy for stimulating learning and knowledge about topics that are rarely discussed in the family and school environment [24]. At the same time, the educational process is no longer based on a rigid structure, allowing users to take on a central role and actively participate in the learning process [41].

Complementarily, shadow theater has proven to be a powerful resource for engaging young people in debates about health. It is recognized that there is a barrier when it comes to leprosy. In this sense, this artistic resource stimulates creativity and facilitates the approach to complex topics in a playful and understandable way, contributing to deconstructing prejudices and eliminating myths surrounding the disease [17]. Thus, theater proves to be a tool that, in addition to fostering critical thinking, promotes the dissemination of acquired knowledge [42].

Similarly, the use of podcasts in health interventions has also gained prominence, especially among students. The audio format allows information to be consumed at any time and place, in a practical way. This flexibility attracts young audiences who are looking for ways to learn that can be integrated into their routines. In this context, podcasts contribute as tools in the teaching-learning process about leprosy, enabling the construction of knowledge [26]. Thus, podcasts are consolidated as resources that enhance teaching and learning in health, thanks to their ability to be reproduced unlimitedly and easily accessed via cell phones anytime, anywhere [43].

Another like it, games as a teaching strategy have proven effective in health education aimed at adolescents and different audiences. They make learning more fun and encourage the active participation of young people. Games help address sensitive topics, stimulating debate and learning in a dynamic way, keeping pace with the evolution of the educational process. In this way, participants develop a sense of responsibility not only for their own health but also for that of their community, broadening their understanding of the impacts of leprosy [16,25,27]. In view of this, educational games are more effective pedagogical tools than traditional teaching strategies, such as lectures, text readings, practical laboratory training, or lectures, especially when applied to adolescents, a group that benefits significantly from playful and interactive methodologies [44].

In addition, the development and application of the storyboard enhanced the skills and stimulated the creativity of adolescents, promoting their protagonism in the development of a digital game about leprosy. This process increased young people's interest in the topic, while strengthening their active participation in the dissemination of knowledge and lived experiences [15].

Finally, digital applications emerge as a practical and modern solution for health education. Studies demonstrate how these resources can be adapted to different audiences, from elementary school teachers to adolescents. The interactivity and accessibility offered by the applications allow users to learn at their own pace, which is fundamental for the assimilation of health information [12,34].

4. Health professionals and patients

Firstly, it has been demonstrated that the guides are tools that seek to meet the need for training and support for family members, people with disabilities, volunteers, and professionals in low- and middle-income countries, using appropriate communication technologies. Thus, they enable these individuals to seek help even when living in remote areas, with the aim of developing skills and expanding access to healthcare for leprosy [31]. Similarly, the guides facilitate the development of skills and expand access to healthcare, assisting in the understanding and management of diseases through the use of these technologies [23].

On the other hand, developed to support patients in the postoperative period, the educational video proved to be essential for conveying information in a dynamic and attractive way. It facilitates the understanding of complex concepts, contextualizes content in visual scenarios, and contributes to overcoming communication barriers [29]. Thus, educational videos are a valuable tool in health education, helping to minimize side effects, such as language barriers, in addition to promoting health literacy among the leprosy population and encouraging adherence to treatment [45].

Several educational technologies targeted at supporting professionals, patients and family members alike in the leprosy context have been presented so far, standing out for their ability to ease learning and self-care.

On the other hand, it is necessary to point out the importance of validating these technologies to ensure credibility of the materials, as they will later on be made available to health services. Consequently, it is understood that it is fundamental to validate an Educational Technology (ET) for it to offer adequate and assertive teachings [46]. Most of the times, this phase of the process is in charge of subject matter experts, who analyze the ET components and provide recommendations for the technology to be understood by more people from the target audience, thus increasing the effectiveness of the content offered [47].

However, this absence of formal validation reduces reliability of the conclusions about the efficacy of these technologies in the practice, reason why it is a precaution beacon for future studies and implementations. In fact, validating a technology not only ensures its functionality but also allows for its safer adaptation to its real use context, especially in Public Health environments where precision and safety are crucial. Consequently, in order to reach a more solid evidence base, it is fundamental for future research studies

to prioritize technology validation processes, offering a rigorous assessment regarding their impact on professional training and on patient care.

In addition to the importance of validating educational technologies to ensure their effectiveness and adequacy to their real use contexts, the data show the diversity of scenarios for which technologies have been developed, evidencing efforts to adapt them to the specific needs inherent to each context. In this sense, in primary care technologies promote training of professionals and patients alike, expanding access to information and strengthening preventive care, especially in hard-to-access areas [14,18-20,22-23,28,30-33]. In turn, in secondary care tools like Artificial Intelligence [11,13], educational videos [29] and serial albums [35] play a crucial role in care individualization, improving specific diagnoses and treatments.

Likewise, in the school setting interactive technologies such as games and podcasts [16,25-27] foster playful and accessible learning, involving children and adolescents as knowledge multipliers. On the other hand, tools with no delimited scenario such as cordels and guides [21,23,31] show significant adaptability, expanding their use to different population segments and contexts. It is worth noting that this versatility is essential to maximize the positive impact exerted by these technologies on health and education.

It was possible to notice some important challenges while developing the research: although an exhaustive effort was made to encompass several databases and to include Gray Literature, some relevant studies may not have been included due to access limitations. This factor limited breadth of the conclusions and hindered having a comprehensive view of all the technological initiatives in leprosy education.

Another gap observed corresponded to the limited number of educational technologies on leprosy targeted at health education. This research deficit reveals certain scarcity of adequate technologies and pedagogical strategies to prepare future health professionals, which may jeopardize care quality and control of the disease. In addition, the deficit in terms of didactic materials and training approaches draws the attention to a gap in professional training for permanent education, which perpetuates absence of specialized knowledge and reproduction of stigmas. Consequently, these limitations evidence the urgent need to foster studies and develop educational technologies targeted at leprosy, strengthening training of future health professionals as well as qualifying those already active in the professional, thus preparing them to deal with this condition.

Finally, this mapping of educational technologies targeted at leprosy enabled broadly identifying and understanding the educational health technologies used in the context of this disease. Thus, the educational technologies addressed in this study are fundamental to detect gaps in information dissemination and as guidance to devise new tools that can improve teaching about leprosy prevention, diagnosis and treatment. Therefore, this mapping contributes to Public Health care evolution and to strengthening the fight against leprosy.

CONCLUSION

The current study allowed mapping the health education technologies produced with leprosy as a focus, based on 25 studies found in the data sources. These technologies

were as follows: Artificial Intelligence in two cases [11,13], web radio in one [24], shadow theater in one [17], cordel in one [21], apps in two [12,34], training in one [18], games in three [16,25,27], podcast in one [26], mobile app in one [14], storyboard in one [15], guides in two [23,31], educational video in one [29], serial album in one [35], booklets in five [19-20,30,32-33], remote course in one [22] and mobile phone in one [28].

It is clear that educational technologies have the potential to promote health in an inclusive and dynamic way. The studies analyzed indicate that these resources are effective strategies for professional training. They contribute to improving the quality of care, speeding up diagnoses, expanding access to information, and engaging diverse audiences. These resources reinforce the commitment to more accessible, humanized healthcare that is aligned with the needs of the population.

In addition, the findings of this review highlight the practical impact that such technologies can have in the context of leprosy, especially by transforming the way prevention, diagnosis, and treatment are approached. It is also important to note their importance in reducing the social stigma associated with the disease, considered one of the main obstacles to early diagnosis and treatment adherence. Through these tools, reliable information can reach both affected communities and professionals in the field, strengthening the dissemination of knowledge.

In the current review, was identified a significant gap in the development of technologies targeted at specific groups such as older adults and people with psychological problems, also affected by leprosy.

These groups oftentimes face additional challenges that might be mitigated with more inclusive and customized tools. Another gap identified consisted in the absence of technologies developed for professional health education, as the training process is of utmost importance for early diagnoses in leprosy. In addition, we detected certain scarcity of accessible resources for people with disabilities, such as those with visual/auditory impairments and individuals in wheelchairs. This limitation evidences the need to expand efforts in terms of devising technologies that consider the diversity inherent to health conditions and promote inclusion.

ACKNOWLEDGMENTS

To the Júlio Bandeira University Hospital, linked to the Brazilian Hospital Services Company (*Empresa Brasileira de Serviços Hospitalares*, EBSERH) and to the CNPq (National Council for Scientific and Technological Development).

FUNDING

This study was conducted with support provided by the National Council for Scientific and Technological Development (CNPq) and is part of the project entitled "*Desarrollo, validación y evaluación de tecnologías cuidativo-educativas en el campo de las enfermedades infectocontagiosas*" ("Development, validation and assessment of care-educational technologies in the field of infectious and contagious diseases"), supported by the CNPq (Process No. 404432/2023-9) according to CNPq/MCTI call No. 10/2023 (Section A – Emerging groups) and to the Technological Initiation Program (*Programa*

de Iniciação Tecnológica, PIT), linked to the Júlio Bandeira University Hospital/EBSERH.

REFERENCES

1. Randhawa A, Suneja P, Suneja S, Khullar G, Sharma VK. Leprosy: what is new. **Int** J Dermatol. 2022 [citado 2024 jul 14];61(6):733-8. Disponible en: https://doiorg.ez292.periodicos.capes.gov.br/10.1111/ijd.15998. doi: https://doi.org/10.1111/ijd.15998.
2. Organização Mundial da Saúde (OMS). Health technologies. 2023; [citado 2024 jul 14].
3. Brasil. Ministério da Saúde (MS). Hanseníase. Boletim Epidemiológico. 2022; [citado 2024 jul 14].
4. Stangl AL, Earnshaw VA, Logie CH et al., Stangl A.L., Earnshaw V.A., Logie, C.H. et al. The Health Stigma and Discrimination Framework: a global, crosscutting framework to inform research, intervention development, and policy on health-related stigmas. BMC Med [Internet], 2019 [citado 2024 jul 20]. Disponible en: https://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-019-1271-3. doi: https://doi.org/10.1186/s12916-019-1271-3.
5. Vasconcelos EM, Vasconcelos MOD, Silva MOD. Contribuição da educação popular para a reorientação das práticas e da política de saúde no Brasil. Rev FAEEBA Educ Contemp [Internet]. 2015 [citado 2024 jul 22];24(43):89-106. Disponible en: http://educa.fcc.org.br/scielo.php?pid=S0104704320150001000 89&script=sci_abstract&tlng=pt. doi: https://doi.org/10.2015/jan.jun.v24n43.008.
6. Silveira MS, Cogo ALP. Contribuições das tecnologias educacionais digitais no ensino de habilidades de enfermagem: revisão integrativa. Rev Gaúcha Enferm [Internet]. 2017 [citado 2024 jul 22];38(2):e66204. Disponible en: https://lume.ufrgs.br/bitstream/handle/10183/165043/001025106.pdf?sequence=1&isAllowed=y.doi: http://dx.doi.org/10.1590/1983- 1447.2017.02.66204.
7. Darmi M, Hidayati L, Zulfiah M, Arbiansyah A, Oktariati S. Health education method on leprosy prevention: Integrative review. Arch Razi Inst. 2024 [citado 2024 jul 22];79(1):1-12. Disponible en: https://pmc.ncbi.nlm.nih.gov/articles/PMC11345475/. doi: 10.32592/ARI.2024.79.1.1.
8. Peters MDJ, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil, H. Chapter 11: Scoping Reviews (2024 version). In: Aromataris E, Munn Z, editors. JBI Manual for Evidence Synthesis [Internet]. Adelaide: JBI; 2024 [citado 2024 ago 8]. Disponible en: https://synthesismanual.jbi.global.
9. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Annals of Internal Medicine [Internet]. 2018 [citado 2024 ago 8]. Disponible en: https://www.acpjournals.org/doi/10.7326/M18-0850. doi: https://doi.org/10.7326/M18-0850.
10. Araújo ARO. Recuperação da informação em saúde: construção, modelos e estratégias. ConCI [Internet]. 2020 [citado 2024 sep 16]; 2595-4768. Disponible en: http://www.repositorio.ufc.br/handle/riufc/52993.
11. Deps PD, Yotsu R, Furriel BCRS,de Oliveira BD, de Lima SL and Loureiro RM. The potential role of artificial intelligence in the clinical management of Hansen's disease (leprosy). Front. Med [Internet]. 2024 [citado 2024 ago 12];11:1338598. Disponible en: https://pmc.ncbi.nlm.nih.gov/articles/PMC10959095/. doi: 13.3389/fmed.2024.1338598.

12. Diniz JR. Efeito da tecnologia educacional “infohansen” no conhecimento de professores sobre hanseníase [Dissertação de Mestrado]. Recife: Universidade Federal de Pernambuco; 2023. 79 p.
13. Barbieri RR, Shetty V, Shetty S, Rao PN, Collinet J, Pannell RS, et al. Reimagining leprosy elimination with AI analysis of a combination of skin lesion images with demographic and clinical data. Lancet Reg Health Am [Internet]. 2022 [citado 2024 sep 18];9:100192. Disponible en: https://pmc.ncbi.nlm.nih.gov/articles/PMC9903738/. doi: 10.1016/j.lana.2022.100192.
14. Matos DP, Torres MD, da Silva LSR, Dos Santos CAAS, de Oliveira FJF, de Araújo MFM, de Oliveira Serra MAA. Hansenapp: Development of a mobile application to assist primary healthcare providers to control leprosy. Trop Med Int Health [Internet]. 2022 [citado 2024 ago 25];27(8):719-726. Disponible en: https://onlinelibrary.wiley.com/doi/10.1111/tmi.13795. doi: 10.1111/tmi.13795.
15. Santos TA, Araújo B de FP de, Brandão Neto W, Araújo EC de, Vasconcelos EMR de, Monteiro EMLM. Protagonismo De Adolescentes Na Criação De Um Storyboard Para Um Jogo Digital Sobre Hanseníase. Cogitare Enferm [Internet]. 2021;26:e71478. Available from: https://doi.org/10.5380/ce.v26i0.71478.
16. Neves RSD. "Hansen PrevPlay": ferramenta digital de prevenção e educação em saúde no combate à hanseníase em menores de 15 anos. [Dissertação de Mestrado]. Belém: Universidade Federal do Pará; 2023.
17. Gonçalves A, Castro GC. Afastando as sombras da hanseníase no jardim São Marcos, Campinas, SP, pelo teatro de sombras. Hansen Int [Internt]. 2010 [citado 2024 ago 15];35(1):21-28. Disponible en: https://periodicos.saude.sp.gov.br/hansenologia/article/view/35117/33594. doi: https://doi.org/10.47878/hi.2010.v35.35117.
18. Leroy FS, Coelho A. da C.O, Niitsuma ENA, Gomes, FB, Lanza FM, Ribeiro G. de C., et al. Educação permanente em saúde: a experiência do uso da educação a distância na capacitação em ações de controle da hanseníase. EmRede - Revista De Educação a Distância [Internet], 2017 [citado 2024 ago 28];4(1), 235–250. Disponible en: https://www.aunirede.org.br/revista/index.php/emrede/article/view/176/250. doi: https://doi.org/10.53628/emrede.v4i1.176.
19. Nobre PF da R, Pedreira NP, Sousa LCB de, Castro NJC de. Construção de uma cartilha sobre autocuidado da hanseníase em contexto amazônico. Revista Recien - Revista Científica de Enfermagem [Internet]. 2022 [citado 2024 sep 07. Disponible en: https://recien.com.br/index.php/Recien/article/view/635. doi: 10.24276/rrecien2022.12.38.238-246.
20. Mayron FMS, Ferreira J. Gomes FJ, Albertina M. Construção De Tecnologias Em Enfermagem Para À Promoção Da Saúde Portadores De Hanseníase. IOSR Journal of Nursing and Health Science [Internet]. 2016 [citado 2024 sep 08];5(3):32–7. Disponible en: https://www.iosrjournals.org/iosr-jnhs/papers/vol5-issue3/Version-3/E0503033237.pdf. doi: 10.9790/1959-0503033237.
21. Pinto RMF, Pinheiro RA, Queiroz DT, Mota JVF, Mota FGA, Gonçalves VF, et al. Construção de tecnologia educativa para pessoas acometidas pela hanseníase. Conjecturas [Internet]. 2021 [citado 2024 ago 20];21(5):920-32. Disponible en: https://www.researchgate.net/publication/357087364_Construcao_de_tecnologia_educativa_para_pessoas_acometidas_pela_hanseniase. doi: 10.53660/CONJ-438-505.
22. Paixão MP. Modelo de educação a distância em hanseníase voltado para rede de detecção de casos e diagnóstico. Tesesuspbr [Internet]. 2008 [citado 2024 oct 02];

Available from: https://teses.usp.br/teses/disponiveis/5/5144/tde-17122008-192918/pt-br.php. doi: https://doi.org/10.11606/T.5.2008.tde-17122008-192918.
23. The Leprosy Mission. Na Introductory Manual to Remote Service Provision for Supporting People with Disability and Leprosy. Mianmar: Norwegian Agency for Exchange Cooperation. 2022 [citado 2024 sep 05]. Disponible en: https://www.leprosy-information.org/resource/introductory-manual-remote-service-provision-supporting-people-disability-and-leprosy.
24. Araújo F, Torres AM, de Abreu DP, Veras da CBB, Silva RF da, Castro Júnior R. de; Tavares BF, Alves M. Uso de Webrádio na construção de saberes e fazeres em Saúde Coletiva junto a jovens escolares como dispositivo de cuidado no Sistema Único de Saúde. Saúde em Redes[Internet], 2019 [citado 2024 ago 12]. Disponible en: http://revista.redeunida.org.br/ojs/index.php/rede-unida/article/view/2436. doi: 10.18310/2446-4813.2019v5n3p265-274.
25. Santos TA. Game educacional sobre hanseníase: uma construção embasada no protagonismo de adolescentes escolares. Ufpebr [Internet]. 2019 [citado 2024 ago 31]; Available from: https://repositorio.ufpe.br/handle/123456789/35670.
26. Ferreira MC. Intervenção educativa utilizando um podcast educacional sobre hanseníase. [Dissertação de Mestrado]. Recife: Universidade Federal de Pernambuco; 2019. 105 p.
27. Francisco MM. Construção e validação de um jogo da memória sobre hanseníase para adolescentes [dissertação]. Recife: Universidade Federal de Pernambuco; 2019. Avaliable from: https://repositorio.ufpe.br/handle/123456789/34107.
28. Lal V., Das S, Pal S., Dhali SR, Sarkar. A, Srinivas G. Improving quality of care using mobile technology: experiences from the Urban Leprosy Project in Kolkata, India. Leprosy Review [Internet]; 2017 [citado 2024 sep 06];88;2;270-273. Disponible en: https://leprosyreview.org/admin/public/api/lepra/website/getDownload/5f512a402bea3019726d5b89. doi: 10.47276/lr.88.2.270.
29. Pankaj G. Use of Audio-Visual aids in teaching post operative exercises to person affected by Leprosy. Leprosy Review [Internet] 2015 [citado 2024 sep 06];86;3;251-253. Disponible en: https://leprosyreview.org/admin/public/api/lepra/website/getDownload/5f51105a2bea30197056e211. doi: 10.47276/lr.86.3.251.
30. Martins RMG, Dias ÍKR, Sobreira CLS, Santana KFS, Rocha RMGS, Lopes MSV. Desenvolvimento de uma cartilha para promoção do autocuidado na hanseníase. Revenferm UFPE online [Internet]. 2019 [citado 2024 sep 07];13:e239873. Disponible en: https://periodicos.ufpe.br/revistas/index.php/revistaenfermagem/article/view/239873. doi: https://doi.org/10.5205/1981-8963.2019.239873.
31. Theint ZM, Htun ZL, Swe KM, Kuipers K, Kuipers P. Remote disability and leprosy services via basic communications technology. Leprosy Review [Internet]. 2022 [citado 2024 sep 05];93;2;166-171. Disponible en: https://leprosyreview.org/article/93/2/20-22025. doi: 10.47276/lr.93.2.166.
32. Martins, FAR, Galiza FT de, Campelo V, Barbosa AM, Santana ML da S, Soares T, et al. Construção E Validação De Tecnologia Educativa Para Orientação Nutricional De Pessoas Com Hanseníase. Revista Interfaces: Saúde, Humanas E Tecnologia [Internet]. 2024 [citado 2024 sep 07];12(1),3869–3877. Disponible en: https://interfaces.unileao.edu.br/index.php/revista-interfaces/article/view/1520. doi: https://doi.org/10.16891/2317-434X.v12.e1.a2024.pp3869-3877.
33. Cabral BT, Amorim SAA, Martins RMG, Albuquerque GA, Cavalcante EGR, Lopes MSV. Validação de cartilha educativa para promoção do autocuidado a pessoa com hanseníase. Revista Recien - Revista Científica de Enfermagem [Internet]. 2021

[citado 2024 sep 15]. Disponible en: https://www.recien.com.br/index.php/Recien/article/view/514. doi: 10.24276/rrecien2021.11.36.289-299.
34. Zailde S. Tecnologia educacional sobre hanseníase para professores do Ensino Fundamental. Ufpebr [Internet]. 2020 [citado 2024 ago 28]. Available from: https://repositorio.ufpe.br/handle/123456789/38666.
35. Marciano LHSC, Prado RBL, Quaggio CMP, Nardi SMT. Proposta pedagógica para aprimorar os conceitos básicos em hanseníase: álbum seriado como um recurso no processo de orientação. Hansen int [Internet]. 2008 [citado 2024 sep 07];33(2):17-24. Disponible en: https://periodicos.saude.sp.gov.br/index.php/hansenologia/article/view/36238/34540.
36. Haraguchi LMM, Sañudo A, Rodrigues E, Cervigni H, Carlini EL de A. Impact of the Training of Professionals from São Paulo Public Health System in Phytotherapy Practice. Rev bras educ med [Internet]. 2020 [citado 2024 ago 28];44(1):e016. Available from: https://www.scielo.br/j/rbem/a/LhQmyY5gvq6rPct9bdfqzMP/. doi: https://doi.org/10.1590/1981-5271v44.1-20190190.ING.
37. Emília A, Ferreira EB, Sousa RR, Castro E, Mariana. Educação a distância e formação continuada: em busca de progressos para a saúde. Revista Brasileira de Educação Médica {Internet]. 2013 [citado 2024 oct 02];37(4):578–83. Disponibel en: https://www.scielo.br/j/rbem/a/wMpbPmDWTff5MbHSmM99BPz/. doi: https://doi.org/10.1590/S0100-55022013000400014.
38. Fernandes CS, Xavier ATA, Lopes MVO, Oliveira CJ, Andrade FLJP, Cavalcanti MCD. Construction and validation of a serial album for companions of patients with stroke. Rev Bras Enferm [Internet]. 2022 [citado 2024 sep 07];75(4):e20210843. Disponible en: https://www.scielo.br/j/reben/a/r4jKxRpPTWbbPQ4tD9vF5sB/?lang=en. doi: https://doi.org/10.1590/0034-7167-2021-0843.
39. Anstey Watkins JOT, Goudge J, Gómez-Olivé FX, Griffiths F. Mobile phone use among patients and health workers to enhance primary healthcare: A qualitative study in rural South Africa. Social Science & Medicine [Internet]. 2018 [citado 2024 sep 06];198:139–47. Available from: https://www.sciencedirect.com/science/article/pii/S027795361830011X?via%3Dihub. doi: 10.1016/j.socscimed.2018.01.011.
40. Sood, S., Henderson Riley, A., & Alarcon, K. Entertainment-Education and Health and Risk Messaging. *Oxford Research Encyclopedia of Communication [Internet].* 2017 [ciatdo 2024 ago 20]. Disponible en: https://oxfordre.com/communication/display/10.1093/acrefore/9780190228613.001.0001/acrefore-9780190228613-e-245. doi: 10.1093/acrefore/9780190228613.013.245.
41. Coccoli M, Liscia A, Minuto F, Stanganelli L. The use of Web-Radio in mobile learning.. Jounal of E-Learning and Knowledge Society [Internet]. 2014 [citado 2024 ago 12];10(3):147-157. Disponible en: https://www.researchgate.net/publication/288277428_The_use_of_WebRadio_in_mobile_learning. doi: 10.20368/1971-8829/962.
42. Goldstein TR. Why Theatre Education Matters: Understanding Its Cognitive, Social and Emotional Benefits.Teachers College Press; 2024.
43. Firmino C, Frade F, Moutinho L, Valentim O, Antunes AV, Longo J. O Uso do Podcast Enquanto Ferramenta Complementar ao Ensino Presencial em Enfermagem: Revisão Scoping. Revista Lusófona de Educação [Internet]. 2024

[citado 2024 sep 05];61(61). Available from: https://revistas.ulusofona.pt/index.php/rleducacao/article/view/9318.
44. Nascimento KG do, Ferreira MBG, Felix MM dos S, Nascimento J da SG, Chavaglia SRR, Barbosa MH. Effectiveness of the serious game for learning in nursing: systematic review. Revista Gaúcha de Enfermagem [Internet]. 2021 [citado 2024 ago 31]. Disponible en: https://www.scielo.br/j/rgenf/a/mn5rXzDC4ctrQb9YspqmNJy/?lang=pt. doi: https://doi.org/10.1590/1983-1447.2021.20200274.
45. Mortola LA, Muniz RM, Cardoso DH, Azevedo NA, Aline, Clarice. Vídeo educativo sobre a quimioterapia oncológica: tecnologia na educação em saúde. Ciênc cuid saúde [Internet]. 2021 [citado 2024 sep 06]; e50365–5. Available from: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-1339625.
46. Alexandre NMC, Coluci MZO. Validade de conteúdo nos processos de construção e adaptação de instrumentos de medidas. Ciênc saúde coletiva [Internet]. 2011 [citado 2024 nov 09];16(7):3061–8. Available from: https://www.scielo.br/j/csc/a/5vBh8PmW5g4Nqxz3r999vrn/. doi: https://doi.org/10.1590/S1413-81232011000800006.
47. Medeiros RK da S, Júnior MAF, Pinto DPSR, Vitor AV, Santos VEP, Barichello E. Modelo de validação de conteúdo de Pasquali nas pesquisas em Enfermagem. Revista de Enfermagem Referência [Internet]. 2015 [citado 2024 nov 09]; IV(4):127-135. Disponible en: https://www.redalyc.org/articulo.oa?id=388239974007. doi: http://dx.doi.org/10.12707/RIV14009.