


Educational technologies used in Primary Health Care to promote mental health: an integrative review


Tecnologias educacionais empregadas na atenção primária à saúde para promoção da saúde mental: revisão integrativa

Tecnologías educativas utilizadas en la atención primaria de salud para promover la salud mental: revisión integradora

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ABSTRACT

Objective: to identify and characterize the use of educational technologies aimed at promoting Primary Health Care users' mental health. **Methods:** an integrative literature review, carried out on the Virtual Health Library (VHL) digital platform and the databases SciVerse Scopus (Scopus) and Medical Literature Analysis and Retrieval System Online (MEDLINE), using the following combination of descriptors: "mental health" and "nursing" and "health promotion" and "Primary Health Care". Additionally, "educational technology" and "mental health" and "health promotion" were combined. Studies published between 2017 and 2022 in English, Spanish, and Portuguese were included. **Results:** ten articles and a thesis were included that allowed the identification of educational technologies such as psychoeducational interventions in groups, playful activities and the body mapping technique, online course, online educational manuals, leisure activities, information and communication technologies, and printed educational booklet. The target audience for which the technologies were intended included adults, adolescents, children, non-professional caregivers, and people with depression and physical comorbidity. **Conclusion:** Various educational technologies have been developed and applied to promote mental health in Primary Health Care. Those with the highest level of evidence are based on digital technologies and social interaction.

Descriptors: Educational Technology; Mental Health; Health Promotion; Primary Health Care.

RESUMO

Objetivo: identificar e caracterizar o uso de tecnologias educacionais voltadas à promoção da saúde mental de usuários na Atenção Primária à Saúde. **Métodos:** revisão integrativa da literatura, realizada na Plataforma digital da Biblioteca Virtual em saúde (BVS), e nas bases de dados Sciverse Scopus (SCOPUS) e Medical Literature Analysis and Retrieval System Online (MEDLINE), mediante a seguinte combinação de descritores: "saúde mental" and "enfermagem" and "promoção da saúde" and "atenção primária à saúde"; adicionalmente combinou-se tecnologia educacional" and "saúde mental" and "promoção da saúde". Foram incluídos estudos publicados entre 2017 e 2022, em inglês, espanhol e português. **Resultados:** foram incluídos dez artigos e uma tese que permitiram identificar tecnologias educacionais do tipo: intervenções psicoeducativas em grupos, atividades lúdicas e a técnica de body mapping, curso on-line, manual educativo on-line, atividades de lazer, tecnologias da informação e comunicação e cartilha educacional impressa. O público-alvo para qual as tecnologias destinaram-se foram, adultos, adolescentes, crianças, cuidadores não profissionais e pessoas com depressão e comorbidade física. **Conclusão:** uma diversidade de tecnologias educacionais tem sido desenvolvida e aplicada para promover a saúde mental na atenção primária à saúde. Aquelas que apresentam maior nível de evidência são baseadas em tecnologias digitais e interação social.

Descritores: Tecnologia Educacional; Saúde Mental; Promoção da Saúde; Atenção Primária à Saúde.

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RESUMEN

Objetivo: identificar y caracterizar el uso de tecnologías educativas orientadas a promover la salud mental de los usuarios en la Atención Primaria de Salud. **Métodos:** revisión integrativa de la literatura, realizada en la plataforma digital de la Biblioteca Virtual en Salud (BVS) y en el SciVerse Scopus (Scopus) y Medical Literature Analysis and Retrieval System Online (MEDLINE), utilizando la siguiente combinación de descriptores: “salud mental” y “enfermería” y “promoción de la salud” y “atención primaria de salud”. Además, se combinaron “tecnología educativa” y “salud mental” y “promoción de la salud” Estudios publicados entre 2017 y 2022 en inglés, español y portugués. **Resultados:** se incluyeron diez artículos y una tesis, que permitieron identificar tecnologías educativas como intervenciones psicoeducativas en grupo, actividades lúdicas y la técnica del body mapping, curso en línea, manual educativo en línea, actividades de ocio, tecnologías de la información y la comunicación y folleto educativo impreso. El público objetivo al que estaban destinadas las tecnologías fueron adultos, adolescentes, niños, cuidadores no profesionales y personas con depresión y comorbilidad física. **Conclusión:** se ha desarrollado y aplicado una diversidad de tecnologías educativas para promover la salud mental en la atención primaria de salud. Aquellos con mayor nivel de evidencia se basan en tecnologías digitales y la interacción social.

Descriptor: Tecnología Educativa; Salud Mental; Promoción de la Salud; Atención Primaria de Salud.

INTRODUCTION

Studies^(1,2) indicate an increase in the population's risk of mental illness in recent decades. Exposure to unfavorable economic, social, and environmental conditions, especially during the COVID-19 pandemic, reinforced this scenario, intensifying concerns about mental health⁽¹⁾.

Primary Health Care (PHC) is the main field of activity in preventing disorders and promoting mental health due to the greater capacity to create a bonding relationship with users, develop actions to promote care and assist in identifying disease manifestations⁽³⁾.

Including actions in the area of mental health in PHC corresponds to a direction of public policy in this field, constituting a strategy to cause ruptures in the traditional model of assistance and promote advances with the expansion of the psychosocial care clinic⁽⁴⁾.

In this context, effective communication and practice of dialogue are necessary to identify problems and search for solutions that reinforce community action and the achievement of personal skills to improve self-care practices and take responsibility for coping with diseases⁽⁵⁾.

Mental health care practice in PHC must include using technologies based on individuals' needs to promote efficient and quality care⁽⁶⁾. More specifically, the use of educational technologies in primary care can potentially improve access and quality of mental health care⁽⁷⁾; thus, its introduction into care settings and the resizing of care spaces becomes relevant⁽⁸⁾.

Technology can be understood as the result of processes implemented from everyday experience and research for developing scientific knowledge for material product construction or not, to provoke interventions in a given practical situation⁽⁹⁾.

Educational technologies applied to health education development have several modalities, including tactile and auditory, expository and dialogical, printed and audiovisual. The combination of these technologies helps to improve their applicability and increases performance in the relationship between professionals and the community, thus proposing updating knowledge and practices in health⁽⁹⁾.

In this context, this review aimed to identify and characterize the use of educational technologies to promote PHC users' mental health.

METHODS

This is an integrative literature review that carefully followed the succeeding steps⁽¹⁰⁾:

1. Definition of the team in charge;
2. Research question identification;
3. Protocol assessment;
4. Study selection and extraction and the choice of descriptors;
5. Study selection validity;
6. Data selection and extraction;
7. Data analysis and interpretation;
8. Presentation of results;
9. Discussion of results; and
10. Final considerations.

The guiding question of this research was: What educational technologies are developed or used to promote PHC users' mental health?

The question was constructed using the PICO⁽¹⁰⁾ strategy, considering: “P” (health problem) - mental distress; “I” (intervention) - educational technology; “C” (context) - PHC; “O” (outcome) - mental health

promotion. The report was prepared using the PRISMA recommendations⁽¹¹⁾.

A search for studies was carried out on the Virtual Health Library (VHL) digital platform and the databases SciVerse Scopus (Scopus) and Medical Literature Analysis and Retrieval System Online (MEDLINE). The descriptors adopted for the search were extracted from the Health Sciences Descriptors (DeCS) database. It was decided to perform a data search using the combination of subject descriptors crossed with the Boolean AND connector. “Mental Health” and “Nursing” and “Health Promotion” and “Primary Health Care” were combined. Furthermore, the combination of “Educational Technology” and “Mental Health” and “Health Promotion” and respective terms in English was used. Year (2017 to 2022) and languages (Portuguese, English and Spanish) filters were applied. The title, subject, and abstract fields were selected when searching the VHL platform. In MEDLINE, the title and abstract were selected, and in Scopus, the fields were keywords, title and abstract.

Dissertations, theses, and articles related to educational technologies for promoting PHC users' mental health, published in Portuguese, English, Spanish between April 2017 and April 2022, were included. Studies that did not meet the objective of the study, texts that were not available in full for free, and that were repeated among the databases were excluded.

The study selection was carried out independently by two researchers, from April to May 2022.

The collected data were tabulated in a Microsoft Office Excel spreadsheet (2010, Microsoft, United States).

For assessment, an instrument adapted based on literature⁽¹⁰⁾ was used, containing title, year of publication, journal, language, methodology, place of production of the publication, level of evidence, educational technology, and main theme.

The technologies were classified by their typologies⁽¹²⁾, such as technology for health education with the community, and grouped into three subgroups: expository and dialogical educational technologies, which take the form of lectures for participants; audiovisual educational technologies, which develop through communication via audiovisual tools; and printed educational technology.

A synoptic table was created to present the results based on the information extracted from the material included in the analysis.

The quality of evidence was classified according to literature recommendations⁽¹³⁾ (Table 1).

RESULTS

The integrative review sample consisted of ten studies (Figure 1)⁽¹¹⁾, nine of which were articles and one thesis.

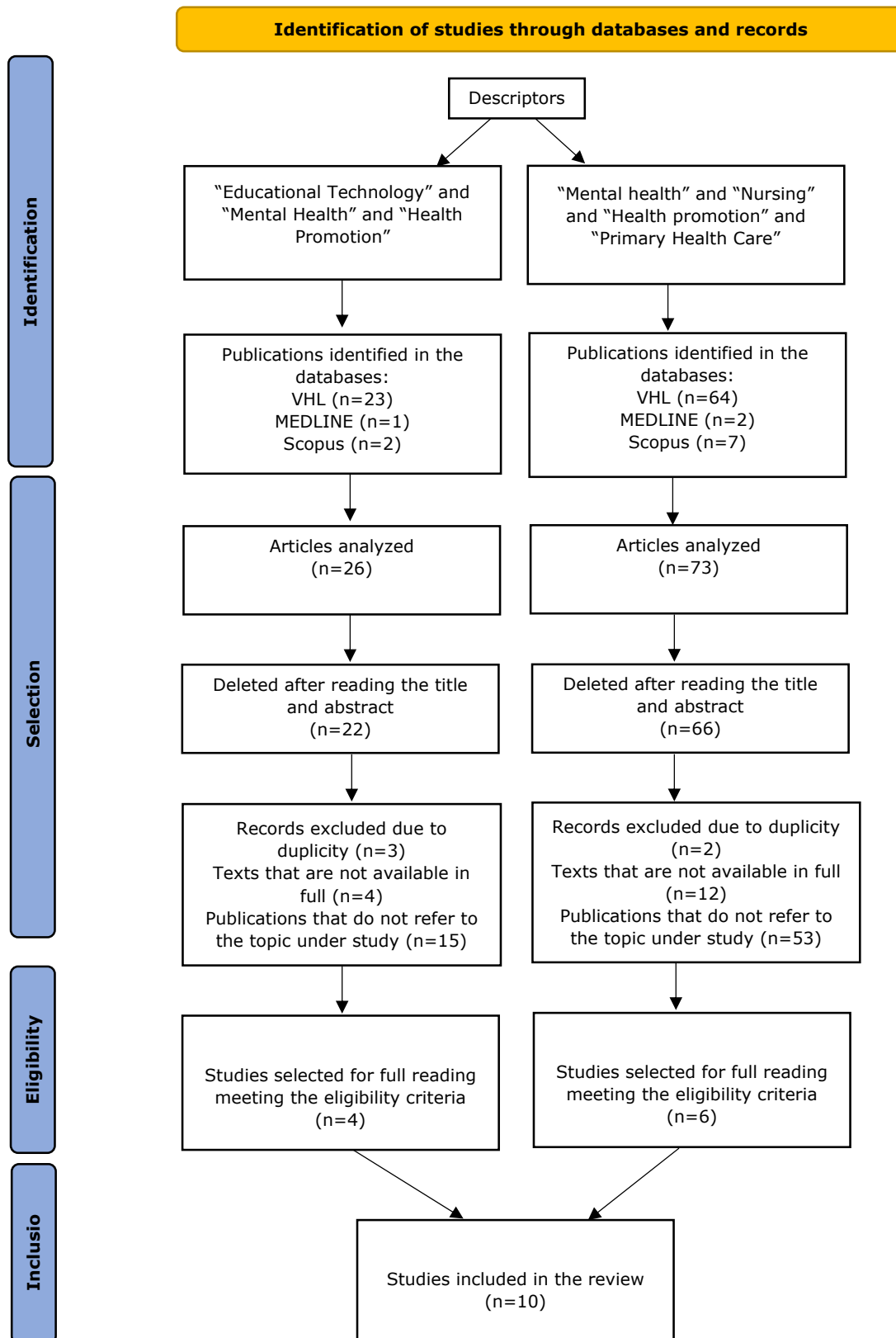
In relation to the origin of studies, four (40.0%) were developed in Brazil, two (20.0%) in Spain, one (10.0%) in South Africa, one (10.0%) in Italy, one (10.0%) in Portugal, and one (10.0%) in partnership between the United States (USA) and Brazil (Table 2)⁽¹⁴⁻²³⁾.

Regarding the authors' professional category, six (60.0%) studies were produced only by nurses, one (10.0%) by nurses in partnership with doctors, one (10.0%) by nurses in partnership with a physical therapist, physical education professional, psychologist, occupational therapist and nutritionist, one in partnership

Table 1 - Scientific studies: levels of evidence ⁽¹³⁾

Type of evidence	Level of evidence	Description
Systematic review or meta-analysis	I	Evidence from a systematic review or meta-analysis of all randomized controlled clinical trials or from guidelines based on systematic reviews of controlled clinical trials.
Randomized controlled study	II	Evidence obtained from at least one randomized, controlled and well-designed clinical trial.
Controlled study without randomization	III	Evidence from a well-designed and controlled study without randomization.
Case control study or cohort study	IV	Evidence from a study with a case-control or cohort design.
Systematic review of qualitative or descriptive studies	V	Evidence from a systematic review of qualitative and descriptive studies.
Qualitative or descriptive study	VI	Evidence from a single descriptive or qualitative study.
Opinion or consensus	VII	Evidence from the opinion of authorities and/or reports from committees of specialists/experts.

Figure 1 - Process of identification and selection of articles included in the literature review, 2022*



Note: *Flowchart prepared according to the model recommended by PRISMA⁽¹⁾, Virtual Health Library (VHL), SciVerse Scopus (Scopus), Medical Literature Analysis and Retrieval System online (MEDLINE).

Table 2 - Distribution of studies included in the integrative review according to year of publication, journal and country in which the study was carried out (n=10)

Title	Year	Journal	Country
Mental health in adolescence: Elaboration and validation of an educational technology for health promotion ⁽¹⁴⁾	2021	<i>Revista Brasileira de Enfermagem</i>	Brazil
A mobile app-based intervention program for nonprofessional caregivers to promote positive mental health: Randomized controlled trial ⁽¹⁵⁾	2021	JMIR Mhealth and Uhealth	Spain
<i>Promoção da saúde mental das crianças: contributos dos enfermeiros</i> ⁽¹⁶⁾	2020	<i>Acta Paulista de Enfermagem</i>	Portugal
<i>Validação de conteúdo e aparência de manual educativo para promoção da saúde mental infantil</i> ⁽¹⁷⁾	2020	<i>Revista Rene</i>	Brazil
Effectiveness of a psychoeducation group intervention conducted by primary healthcare nurses in patients with depression and physical comorbidity: study protocol for a randomized, controlled trial ⁽¹⁸⁾	2019	BioMed Central Health Services Research	Spain
An international study of middle school students; preferences about digital interactive education activities for promoting psychological well-being and mental health ⁽¹⁹⁾	2019	<i>Annali dell'Istituto Superiore di Sanita</i>	Italy
Promotion of women's mental health: the influence of physical health and the environment ⁽²⁰⁾	2019	<i>Revista Brasileira de Enfermagem</i>	United States/ Brazil
The use of information and communication technologies to promote healthy lifestyle behaviour: a systematic scoping review ⁽²¹⁾	2019	British Medical Journal (BMJ) Open	South Africa
<i>El ocio como práctica promotora de salud mental en la comunidad: relato de experiencia</i> ⁽²²⁾	2018	<i>Cultura de los Cuidados</i>	Brazil
<i>Construção e validação de cartilha para pais e cuidadores de crianças com transtorno de déficit de atenção e hiperatividade</i> ⁽²³⁾	2018	<i>Repositório institucional, Universidade Federal do Ceará</i>	Brazil

between (10.0%) nursing, computer engineering and mathematics, and one (10.0%) solely by psychologists.

Concerning the design of the studies (Table 3)⁽¹⁴⁻²³⁾, there was a predominance of methodological studies (27.3%), followed by quantitative pre- and post-test studies (18.2%), systematic scoping reviews (9.1 %), controlled clinical trials (9.1%), randomized clinical trials (9.1%), exploratory-descriptive studies (9.1%), integrative reviews (9.1%), and experience reports (9.1%).

Studies with lower levels of evidence predominated, with a majority of level of evidence VI, represented by four (40.0%) studies, two studies (20.0%) of the level of evidence V, two (20.0%) of the level of evidence IV, one (10.0%) of the level of evidence III, and one (10.0%) of the level of evidence II. Only two clinical trials were found among the analyzed studies, having stronger levels of evidence (Table 3).

When considering the target audience (Table 3), educational technologies were predominantly aimed at adults, adolescents and children, followed by non-professional caregivers, and people with depression and

physical comorbidities. It is noteworthy here that some studies had more than one target audience.

As for the educational technologies used in the studies (Table 4)^(12,14-23), dialogical expositions stood out.

DISCUSSION

The concentration of studies in Brazil can be justified, as it is the country with the highest prevalence of anxiety disorders in the world, the fifth in cases of depression, and the second with the highest number of depressive individuals in Latin America⁽²⁴⁾.

Society is suffering a psychosocial impact as a result of the coronavirus disease (COVID-19) pandemic, and a significant increase in mental disorders is expected throughout the world, which has encouraged researchers to produce multiple technologies to promote mental health in this affected population⁽²⁵⁾.

The studies analyzed highlight a variety of educational technologies that can be used to promote mental health in primary care. Studies have not yet been pro-

duced in sufficient numbers and robustness to indicate one of the most efficient technologies. Controlled clinical studies on this topic can be costly and complex, requiring public financing policies to generate robust evidence and efforts from researchers in mental health in PHC.

Expository and dialogical educational technologies

Expository and dialogical educational technologies used to promote mental health in PHC include health education nursing interventions⁽¹⁶⁾, psychoeducational interventions in groups⁽¹⁸⁾, playful activities and the body mapping technique⁽²⁰⁾, leisure activities⁽²²⁾, online courses⁽¹⁴⁾, and online educational manual⁽¹⁷⁾.

The use of expository and dialogical educational technologies in health education, is a critical and transformative social practice⁽²⁶⁾, enabling the development of autonomy and responsibility towards one's own health^(26,27) in health promotion and disease prevention.

Nursing professionals have educational action as one of their main guiding principles for health care. In school settings, the presence of this professional is a determining factor in promoting students' health through interactive and technical discussions, together with education professionals, enabling developing attitudes and values in all school community members and promoting healthy behaviors that result in individual and collective benefits⁽²⁷⁾. In this environment, health

Table 3 - Scientific production on educational technologies to promote mental health in Primary Health Care according to the level of evidence, study design, educational technology and main theme

Study design	Level of evidence	Educational technology	Main theme
Randomized clinical trial ⁽¹⁵⁾	Level II	APP: Intervention program based on a smartphone application	Assessment of the effectiveness of a mobile phone app-based intervention program to increase positive mental health for non-professional caregivers.
Controlled clinical trial ⁽¹⁹⁾	Level III	Technological tools and digital education activities – smartphone, tablet and collaborative games	Investigation into high school students' preferences in relation to technological tools and digital education activities to be used in the classroom to facilitate the implementation of a mental health promotion program.
Pre- and post-test quantitative study ⁽¹⁸⁾	Level IV	Group psychoeducational intervention, health education and relaxation technique	Group psychoeducational intervention led by primary care nurses for individuals with depression and physical comorbidity.
Pre- and post-test quantitative study ⁽²⁰⁾	Level IV	Fun activities (bingo, quiz) and body mapping technique	Group with psychosocial interventions to promote women's mental health, led by nurses.
Integrative review ⁽¹⁶⁾	Level V	Nursing interventions: health education	Nursing interventions to promote emotional well-being, associated with good physical health and general well-being of children and adolescents, within the family and in the community.
Scoping review ⁽²¹⁾	Level V	Information and communication technology (ICT): internet, cell phones, computers and websites	Mapping evidence on the use of ICT for health-promoting lifestyle behaviors among healthy adults.
Methodological study ⁽¹⁴⁾	Level VI	Online course	Appearance construction and validity of a digital educational technology to promote mental school adolescents' mental health.
Methodological study ⁽¹⁷⁾	Level VI	Online educational manual	Content and appearance validity of an educational manual to promote children's mental health.
Methodological study ⁽²³⁾	Level VI	Printed educational booklet	Booklet construction and validity to promote the health of children with Attention-Deficit/Hyperactivity Disorder (ADHD).
Descriptive experience report ⁽²²⁾	Level VI	Leisure activities	Description of the experience of multidisciplinary family health residents in planning and executing actions to promote mental health through leisure activities in the community.

Table 4 - Educational technologies for health education with the community identified in the literature according to their typologies⁽¹²⁾

Technologies	Type
	Online course ⁽¹⁴⁾
Expository and dialogical educational technologies	Nursing interventions: health education ⁽¹⁶⁾
	Online educational manual ⁽¹⁷⁾
	Group psychoeducational interventions ⁽¹⁸⁾
	Playful activities and the body mapping technique ⁽²⁰⁾
	Leisure activities ⁽²²⁾
Audiovisual educational technologies	Intervention program based on a smartphone application ⁽¹⁵⁾
	Technological tools and digital education activities ⁽¹⁹⁾
	Information and communication technology ⁽²¹⁾
Printed educational technologies	Printed educational booklet ⁽²³⁾

education programs aimed at raising awareness and supporting the psycho-affective, biological, and social needs of children within families⁽¹⁶⁾ can contribute to health promotion through resilience and healthy behavior promotion in children and adolescents.

In turn, psychoeducation can be used individually or in a group, and appears to be a favorable intervention for strengthening bonds, building support networks, and providing social/interpersonal support; however, group interventions can be more powerful, due to the creation of social bonds, group cohesion, and the possibility of sharing the same daily difficulties⁽²⁸⁾.

Group psychoeducational intervention proved to be effective for short-term therapeutic response and long-term remission of depression⁽¹⁸⁾ in people with comorbidities such as type 2 diabetes mellitus, ischemic heart disease, chronic obstructive pulmonary disease and/or asthma. It is also effective in empowering individuals in mental distress⁽²⁹⁾. In the case of people with ADHD, the positive points of psychoeducational intervention include increased knowledge of a specific problem, participation in treatment, motivation for new habits as well as satisfaction with psychological treatment⁽³⁰⁾.

In turn, recreational activities (bingo and quiz) and the body mapping technique⁽²⁰⁾, through ten meetings lasting approximately one hour and thirty minutes, proved promising, with improvements in the physical and environmental domains related to functional capacity and opportunities to acquire new skills. Among the psychosocial indicators positively influenced by

these technologies, social support, quality of life and self-esteem stand out, which have been identified as factors strongly related to women's mental health⁽²⁰⁾. Creative and playful pedagogical resources offer individuals reflection and possibilities of empowerment to take charge of their own care⁽³¹⁾, and body mapping favors introspection, personal connection, realization of meaning, and processing of emotions for participants⁽³²⁾, constituting important tools for promoting mental health in PHC.

Still in the line of interaction processes, leisure activities⁽²²⁾ are considered educational technologies capable of promoting mental health, as they provide greater involvement with the community through moments of socialization, greater bond formation between the population and the health team, increasing self-esteem, improving care for the body and mind. In this context, bingo games, photo books for women in the community, reflection sessions on self-esteem, cinema, karaoke, massage circuit, painting and bottle recycling workshop, mime games, beauty moments, secret friends/secret Santa, baby showers with diverse dynamics, tours, among others, can be used⁽²²⁾.

Through music, dance, parties, and various cultural manifestations, individuals express themselves and insert themselves into the world, building and reconstructing it⁽³³⁾. Thus, leisure spaces can have the character of an identity formation, providing multiple experiences⁽³⁴⁾.

Being socially involved influences the quality of life; therefore, it is necessary to outline measures to guarantee opportunities that favor this involvement. Physical activity involves structuring a routine and can be seen as a socialization activity, in addition to physical exercise, which improves mobility, improves physical well-being and generates the possibility of social participation⁽³⁵⁾.

For adolescents, sports and leisure activities have a relevant influence on quality of life through the promotion of psychomotor, sensory, cognitive, and social interaction stimuli. These experiences are essential for individuals' well-being and mental health promotion, acting as a protective factor against risks and vulnerabilities⁽³⁶⁾.

Online courses can also be valuable technologies in this context. The course "*conect@dos com a s@úde*"⁽¹⁴⁾, held in a virtual learning environment, in distance learning (DL), a blended learning modality, aimed to understand the factors that impact Brazilian adolescents' mental health. Experts validated it for application to the target audience, school adolescents, aligned with their specificities and preferences, to produce meaningful learning, considering their health needs. As it is a space for online dialogue, it can create a space generally appreciated by young people and allow access to people

who live in regions further away from the institution where healthcare professionals work.

In addition to the line of online dialogical digital technologies, there is the online educational manual⁽¹⁷⁾ called “I feel, therefore I think” (In Portuguese, *sinto, logo penso*), aimed at nurses and other healthcare professionals to promote school-age children’s mental health (8 to 12 years old). This technology is based on strategies that aim to promote children’s mental health so that they can healthily go through their developmental transition process — the school phase — by strengthening some skills of children’s emotional intelligence⁽¹⁷⁾.

The internet is characterized as a tool for searching for information, including health information, and can be used to combat diseases and promote health⁽³⁷⁾. DL teaching for training healthcare professionals has been expanding, generating quality teaching materials with clear, interactive, and personalized objectives based on the style of the course and the preferences of the target audience⁽³⁸⁾. An educational manual is a technology that can facilitate and standardize the health team’s guidelines, including contributing to clinical practice, promoting physical, mental, and social well-being for patients and families⁽³⁹⁾.

Audiovisual educational technologies

Audiovisual educational technologies used to promote mental health in PHC include information and communication technologies⁽²¹⁾, technological tools and digital education activities⁽¹⁹⁾, and intervention program based on a smartphone application⁽¹⁵⁾.

The use of information and communication technology (Internet, cell phones, computers and websites)⁽²¹⁾ has proven to be effective in ensuring improved physical health, positively influencing behavior and lifestyle in the area of health promotion in healthy adults.

In adolescents, the use of ICT-based strategies has become a tool that promotes new paths and alternatives for health education, enabling new approach methods⁽⁴⁰⁾. The spaces provided in digital media and their inclusion in the scope of health care intensify dialogue, optimize time, shorten distances, and promote the circulation of knowledge, powers and affections, providing social and collaborative learning⁽⁴⁰⁾.

Among the technologies preferred by high school students to be used in the classroom to facilitate the implementation of a mental health promotion program, the majority indicated smartphones to communicate or obtain information and tablets for better use in the classroom, in addition to collaborative games⁽¹⁹⁾. The program to promote psychological well-being and

mental health mediated by these technologies focused mainly on teaching skills that allow students to deal satisfactorily with stress. Topics covered included setting personal goals, adopting effective communication skills, using negotiation, dealing with stress and anger, and resolving conflict⁽¹⁹⁾.

The use of the diversity of smartphone and software functionalities can contribute to differentiated, attractive, and advantageous pedagogical practices for learning⁽⁴¹⁾. Education for young people demands approaches that favor students’ actions, combined with the various technological tools at their disposal, to maximize the development of skills⁽⁴²⁾. The use of collaborative games in the classroom represents an important tool as long as they enable students to build and demonstrate skills that demonstrate that they know how to select information appropriately and where to apply it. By doing this, educators provide moments of challenge, entertainment, and collaborative and competitive work during knowledge production⁽⁴³⁾.

The health sector has used applications strategically, given the significant population adherence to this form of ICT⁽⁴⁴⁾. Mental health support apps are generally considered effective in improving well-being and seeking help^(45,46). An application-based intervention program⁽¹⁵⁾ showed positive results increasing non-professional caregivers’ mental health and reducing their burden through daily activities based on ten recommendations to promote mental health for 28 days⁽¹⁵⁾. Although it has a limited coverage period, it can be useful in the context of short-term demands.

Printed educational technology

Printed educational technologies in this study were represented by only one type, an educational booklet⁽²³⁾, to promote the health of children with ADHD through the preparation of parents, which can be considered effective since its application made it possible to improve participants’ knowledge in most items regarding care for children with ADHD and promotion of the health of the actors involved.

Printed booklets constitute an important support material as a viable alternative in educating and raising awareness of patients regarding the health-disease process, providing individuals with conditions for self-management, and adopting healthy lifestyle habits⁽⁴⁷⁾. A successful experience with the use of an educational booklet was revealed in a randomized controlled clinical trial with 56 pre-operative bariatric surgery patients, in which the educational intervention mediated by a booklet proved to be more effective in improving knowledge and maintaining a

positive attitude towards bariatric surgery when compared to verbal guidance⁽⁴⁸⁾.

Faced with the growing risk of mental illness, it is urgent to develop, test and disseminate educational technologies that promote self-care practices and strengthen individuals' internal resources. These technologies can prevent psychological repercussions and raise awareness among the population regarding economic and social conditions, health, and environmental issues, with the aim of reducing harmful consequences and damage to health⁽⁴⁹⁾.

PHC is developed in urban and rural areas. Despite this, the research identified in this review, with an emphasis on educational technologies, focuses exclusively on the urban population, indicating a gap in knowledge production in this area. The care provided to the population living in rural areas requires a look at rural people's cultural and behavioral particularities, aiming at strategies that recognize widespread knowledge with its peculiarities, associating them with interdisciplinary scientific knowledge, ensuring comprehensive care through the exchange of knowledge⁽⁵⁰⁾.

Although the present study has mapped several technologies that may be useful, it is necessary to consider the limitations of this review. It is possible that the choice of descriptors limited the number of articles identified, as the descriptor "nursing" was included in the search for studies.

FINAL CONSIDERATIONS

The synthesis of the knowledge produced points to a diversity of educational technologies applicable to promoting mental health in PHC at different moments of the life cycle, presenting as a common element the search to promote the inclusion of users as protagonists in the self-care process, reinforcing the idea that dialogue and presentation of arguments strengthen health education movements and practices in this context. The technologies with the highest level of evidence are an intervention program based on a smartphone application, a program based on the use of a smartphone, tablet, and collaborative games, group psychoeducational intervention, playful activities, and body mapping techniques. Although the results of applying these technologies are positive, the number of studies and the level of robustness still do not support the recommendation of one of them as being more effective.

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Conflict of interest

None.

Authors' contributions - CRediT

KHG: data curation; formal analysis; investigation; methodology; resources; visualization; writing – original draft.

JKC: data curation; investigation; resources; writing – original draft.

LZ: conceptualization; project administration; supervision; validation; writing - review & editing.

DAAZ: project administration; supervision; writing - review & editing.

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