

Information and communication technologies used in health promotion: an integrative review

RESUMO | Objetivo: identificar na literatura científica estudos sobre a utilização das tecnologias de informação e comunicação de promoção em saúde com os usuários dos serviços de saúde e juventudes. Método: Revisão Integrativa, realizada entre os meses de maio a junho de 2021, nas seguintes bases de dados: Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS); National Library of Medicine – National Institutes of Health (MEDLINE/PUBMED); Índice Bibliográfico Español en Ciencias de la Salud (IBECs); e na Base de Dados de Enfermagem (BDENF), utilizando os descritores: Tecnologia da Informação; Promoção da Saúde; Enfermagem; e Serviços de Saúde Escolar. Resultados: Foram selecionados 12 estudos. As tecnologias utilizadas para a promoção em saúde, foram: prontuários eletrônicos, aplicativos; web rádio; tecnologias para registros de saúde: Health Record (EHR); curso online; aplicativo; blogs; sensores de redes sociais online, entre outros. Conclusão: Foi compreendido quais TICS estão sendo utilizadas em alguns países, como ações inovadoras para incremento das práticas de tecnologias em promoção da saúde.

Descritores: Promoção da saúde; Tecnologia da informação; Serviços de Saúde.

ABSTRACT | Objective: to identify studies in the scientific literature on the use of information and communication technologies for health promotion with users of health services and youth. Method: Integrative review, carried out from May to June 2021, in the following databases: Latin American and Caribbean Literature in Health Sciences (LILACS); National Library of Medicine – National Institutes of Health (MEDLINE/PUBMED); Bibliographic Index Español en Ciencias de la Salud (IBECs); and in the Nursing Database (BDENF), using the descriptors: Information Technology; Health promotion; Nursing; and School Health Services. Results: 12 studies were selected. The technologies used for health promotion were: electronic medical records, applications; Web radio; technologies for health records: Health Record (EHR); online course; application; blogs; online social network sensors, among others. Conclusion: It was understood which TICS are being used in some countries as innovative actions to increase technology practices in health promotion.

Keywords: Descriptors: Health promotion; Information Technology; Health services.

RESUMEN | Objetivo: identificar estudios en la literatura científica sobre el uso de tecnologías de la información y la comunicación para la promoción de la salud con usuarios de servicios de salud y jóvenes. Método: Revisión integrativa realizada de mayo a junio de 2021, en las siguientes bases de datos: Literatura Latinoamericana y del Caribe en Ciencias de la Salud (LILACS); Biblioteca Nacional de Medicina - Institutos Nacionales de Salud (MEDLINE / PUBMED); Índice Bibliográfico Español en Ciencias de la Salud (IBECs); y en la Base de Datos de Enfermería (BDENF), utilizando los descriptores: Tecnología de la Información; Promoción de la salud; Enfermería; y servicios de salud escolar. Resultados: Se seleccionaron 12 estudios. Las tecnologías utilizadas para la promoción de la salud fueron: historias clínicas electrónicas, aplicaciones; Radio web; tecnologías para registros de salud: Health Record (EHR); curso por Internet; solicitud; blogs; sensores de redes sociales online, entre otros. Conclusión: Se entendió qué TICS se están utilizando en algunos países como acciones innovadoras para incrementar las prácticas tecnológicas en la promoción de la salud.

Palabras claves: Promoción de la salud; Tecnologías de la información; Servicios de salud.

Karlla da Conceição Bezerra Brito Veras

Nurse. Doctoral student at the Postgraduate Program in Clinical Care in Nursing and Health at the State University of Ceará (UECE). Master in Health Education from the State University of Ceará (UECE). Fortaleza, (CE).
ORCID: 0000-0001-7464-1992

Raimundo Augusto Martins Torres

Nurse. Doctor in Education from the Federal University of Ceará (UFC). Master in Nursing from the Federal University of Ceará (UFC). Fortaleza, (CE).

rá (UFC). Fortaleza, (CE).
ORCID: 0000-0002-8114-4190

Edine Dias Pimentel Gomes

Nurse. Doctor in Education from the Federal University of Ceará (UFC). Master in Nursing from the Federal University of Ceará (UFC). Fortaleza, (CE).
ORCID: 0000-0001-5990-6358

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INTRODUCTION

Communication interactions have changed markedly in contemporaneity. Thus, the popularized, and called information and communication technologies (or ICT), including the internet and online social networks, produce fascination among different audiences, as well as as a form of health promotion in health services.

Thus, the creation of institutional websites and the use of social media

managed by public health services brought to virtual environments, for example, communication practices that can streamline the flow of data and information for decision-making by managers, for the production of knowledge in networks and to expand communication channels with users aiming at democratizing access to services.⁽¹⁾

Therefore, in institutional communication, the use of technological devices in health services can meet different objectives and interests, in official communication channels or not. Thus, the guiding questions of this study were: What information and communication technologies in health are used for the health promotion of young people or for health services?

In this context, it is extremely important to seek technologies that will help to promote health care, in order to offer perspectives on their contribution to learning, knowledge acquisition, skills development and reflection on self-care in health.

In this sense, the aim of the study was to identify studies in the scientific literature on the use of information and communication technologies for health promotion with users of health services and youth.

METHOD

This is an Integrative Literature Review on the use of information and digital technologies in Health Promotion, used in health services.

The review comprises six stages, namely: 1) identification of the theme and selection of the hypothesis or research question for the elaboration of the integrative review; 2) establishment of inclusion and exclusion criteria for studies/sampling or literature search; 3) definition of information to be extracted from selected studies/categorization of studies; 4) evaluation of the studies included in the integrative

Table 1. Description of the PICO strategy. Fortaleza (CE), Brazil, 2021.

Initials	Description	Analysis
P	Patient	Youth and or Users of Health Services
I	Intervention or indicator	Digital Technologies for Health Promotion
C	Compare or control	Does not apply
O	Outcomes	Does not apply

Source: The authors, 2021.

review; 5) interpretation of results; 6) presentation of the knowledge review/synthesis.⁽²⁾

Thus, for the definition of the first stage of the research, which is the identification of the theme and choice of the research question, it was carried out based on the PICO strategy, which represents an acronym for P= Patient/problem, I= Intervention, C= Comparison and O= Outcomes (outcome), and to carry out a review, at least two must be used.⁽³⁾

In the present review, the acronym PICO was used, since there is no comparison. P=patients with "Youth and/or Users of health services", I=digital technologies; Context: Information and communication technologies for health promotion in health services.

Since the aim of the study was not to compare interventions or verify their results, elements C and O were not used; however, the context recommended in this type of study was used.⁽⁴⁾

Also, for the proper systematization of the study, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)⁽⁵⁾ checklist was used, which consists of a checklist with 27 items and a four-step flowchart. It aims to help authors improve reporting in systematic reviews and meta-analyses.

The selection of articles took place between May and June 2021, in the following databases: Latin American and Caribbean Literature on Health Sciences (LILACS); National Library of

Medicine – National Institutes of Health (MEDLINE/PUBMED); Índice Bibliográfico Español en Ciencias de la Salud (IBECS); and in the Nursing Database (BDENF).

The Health Sciences Descriptors (DeCS) were used for consultation in the IBECS, BDENF and LILACS databases, in Portuguese: "Information Technology (Tecnologia da Informação)"; "Health promotion (Promoção da Saúde)"; and "Nursing (Enfermagem)", associated through the Boolean operator AND and the descriptor "School Health Services (Serviços de Saúde Escolar)", associated with the Boolean operator OR, as a way to include a greater number of articles. The articles were selected in Portuguese, English and Spanish.

The time frame was used, with the purpose of highlighting publications on the subject in question, from the last 10 years, in the period from 2011 to 2021. As an exclusion criterion, manuscripts that did not answer the guiding question (QN), duplicate articles, integrative or literature review articles, monographs, theses, dissertations, opinion articles, comments, previous notes and manuals were selected. And as inclusion criteria: being an original article; available in Portuguese, English and Spanish; with limits related to the year of publication, of the last 10 years.

To identify the level of evidence in the studies, the instrument validated by Ursi was used,⁽⁶⁾ which includes the step of evaluating the studies using the reference level of evidence, which

ch has seven levels, depending on the study design. (WHITTEMORE; KNAFL, 2005).⁽⁷⁾

The framework presents seven levels of evidence, depending on the study design: level I – systematic reviews or meta-analysis of randomized controlled clinical trials (RCT); level II - at least one RCT; level III - well-designed clinical trials, without randomization; level IV - case control or cohort; level V - systematic review of qualitative or descriptive studies; level VI - a single descriptive or qualitative study; Level VII - opinion from authorities and/or reports from expert committees. Levels I and II are considered strong evidence, III and IV moderate evidence and V to VII studies with weak scientific evidence.

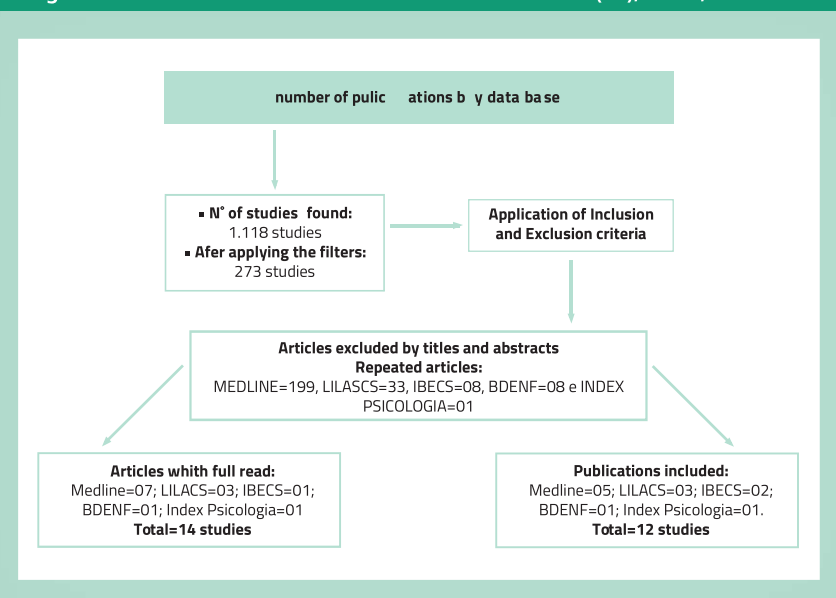
After the selection of articles, a deeper reading was carried out, and in this way, the titles and abstracts were read by the researcher, and the lack of relevance of the study resulted in its exclusion.

At the end, the complete downloads of the studies were made, creating two libraries and Excel spreadsheets with identical content for the complete selection of complete post-reading, organization and summarization of the main information, constituting a database, enabling the researchers to analyze the applicability of the review, which included the following variables: article number (N), title, authors, study country, year of publication, game themes and age group. Studies “A” for articles and numbers 1 to 12 were also used to identify, for example: (A1, A2, A3...A12).

RESULTS

A total of 1.118 articles were identified by searching the databases and after applying the filters: studies from the last 10 years, in the languages: English, Portuguese and Spanish, with main subjects: Information Technology,

Image 01- PRISMA flowchart of article selection. Fortaleza (CE), Brazil, 2020.



Source: The authors, 2021.

Health Promotion, Care Primary Health Care, Health Education, Health Care and Electronic Health Records, 273 studies were left to be analyzed. The 273 studies were identified in the MEDLINE=216, followed by LILACS=36, IBECs=10, BDNF=09 and INDEX PSICOLOGIA=02.

After detailed reading of the manuscripts and discarding duplications when the same work was found in two or more databases, 12 articles were selected for analysis that answered the research question, as shown in the PRISMA flowchart recommended for review studies⁽⁸⁾ in image 01.

Thus, it is possible to observe the synthesis of articles (Table 03) according to title; journal, level of evidence, year of publication and country of publication. Of the 12 (100%) articles studied, the majority, eight studies are Brazilian; an article from the country of Cuba; an article from the United States; an article from Chile; and an article from China.

The table below contains information regarding the twelve studies selected in order to answer the guiding ques-

tion established by the PICO strategy. The article code, title, journal, author, level of evidence, year and country of publication follow in the table below.

It is noteworthy that as to the year of publication of the articles, they ranged from 2014 to 2020, highlighting the year 2020, with 5 studies (A2, A3, A4, A5), followed by 2019 (A6, A9), 2018 with two articles (A7, A8), 2015 with an article (A11) and 2014 (A12).

DISCUSSION

As technologies used for health promotion, in the article (A1), research carried out at the University of Medical Sciences of Pinar del Río, Cuba, on technological mediation in university extension for health promotion, it is evident that the use of ICT is scarce, despite the multiple possibilities it can offer.⁽⁹⁾

In Cuba, according to the article (A1), the use of ICT in health services is evidenced through the electronic medical record, in the implementation of applications such as “Galen Clinics”, “Patris”, “Images” and “Cassandra

Table 03. Article code, title, journal, author, level of evidence and year of publications.

ID	Title	Journal	Type of study	Level of Evidence	Year/ Country
A1	Technological mediation in university extension for health promotion (La mediación tecnológica en la extensión universitaria para la promoción de salud)	Revista Médica de Santiago de Cuba	Brief Communication	Level VII	2020. Cuba.
A2	Mental health of young people and COVID-19: discourses that produce educational web care mediated in webradio. (Saúde mental das juventudes e COVID-19: discursos produtores do webcuidado educativo mediados na webrádio.)	Revista Nursing	Exploratory-descriptive research with a qualitative approach.	Level VI	2020. Brazil.
A3	Impact of health information technology optimization on clinical quality performance in health centers: A national cross-sectional study.	Plos One	Descriptive cross-sectional study	Level VI	2020. U.S.A.
A4	Blogs and social networks in family health care: what's new in online communication? (Blogs e redes sociais na atenção à saúde da família: o que a comunicação online traz de novo?)	Revista Eletrônica de Comunicação e Informação em Saúde.	Quali-quantitative study, using digital tracking data collection methods.	Level VI	2020. Brazil.
A5	Social networks as tools for the prevention and promotion of health among youth.	Psicologia: Reflexão e Crítica	Reflective and Descriptive Study.	Level VI	2020. Brazil.
A6	Youth protagonism in the construction of the Unified Health System: an online educational intervention. (O protagonismo juvenil na construção do Sistema Único de Saúde: uma intervenção educativa on-line.)	Revista Saúde e Pesquisa	Intervention research with a quali-quantitative approach..	Level VI	2019. Brazil.
A7	Better food choices among users of the Digital Food Guide: a report from Brazil. (Melhores escolhas alimentares entre usuários do Guia Alimentar Digital: um relatório do Brasil.)	Reciis - Revista Eletrônica de Comunicação Informação e Inovação em Saúde.	Cross-sectional study.	Level III	2018. Brazil.
A8	Local spatial obesity analysis and estimation using online social network sensors.	Journal of Biomedical Informatics	Experimental Study.	Level III	2018. China.
A9	Educational technologies in adolescent empowerment about depression. (Tecnologias educacionais no empoderamento do adolescente acerca da depressão.)	Rev enferm UFPE	Descriptive study, experience report type.	Level VI	2019. Brazil.

A10	School from the perspective of Generation Z adolescents. (A escola na perspectiva de adolescentes da Geração Z.)	Revista Eletrônica de Enfermagem	Qualitative Study.	Level VI	2017. Brazil.
A11	Health communication: use of a web radio with schoolchildren. (Comunicação em saúde: uso de uma web rádio com escolares.)	Journal of Health Informatics	Relato de Experiência	Level VI	2015. Brazil.
A12	Theoretical and methodological bases for an education program on healthy nutrition in schools. (Bases teóricas y metodológicas para un programa de educación en alimentación saludable en escuelas.)	Revista Chilena de Nutrição	Experience report	Level VI	2014. Chile.

Source: The authors, 2021.

”, which make it possible to automate the transmission of images and the flow of information in radiology, cardiology and computed tomography, respectively, as well as in the necessary exchanges for interconsultations. ⁽¹⁰⁾

In the study (A2), there is the webradio, which is a device that anchors the webcare-producing communication on the Internet. ⁽¹¹⁾ According to the study, the online channel “webradio”, in the promotion of mental health can help in the development of strategies for approaching, listening and interacting with people in the context of social isolation caused by the new coronavirus pandemic. And also in the study (A11), he mentions the web radio, where he described the experience of nursing students in promoting health care with young school children about STD/AIDS through the use of a web radio. ⁽¹²⁾

The research (A3), conducted in the United States, shows that in 2011, the Medicare and Medicaid Service Centers (CMS) implemented the Medicare Medicaid Electronic Health Record (EHR) Incentive Programs to encourage physicians and practices to adopt, implement, update and demonstrate significant use of health record technology. ⁽¹³⁾

In the article (A4), the creation of online communication environments in primary care services in the city of Rio de Janeiro, in Brazil, is investigated, se-

lecting the case of the “Observatory of Information and Communication Technology in Health Systems and Services” . ⁽¹⁴⁾ The downside is that the use of blogs by primary care services indicated a more diffused trend in communication, concerned with recording activities, but not with communicational exchanges. ⁽¹⁵⁾

Also as SUS strategies, in the article (A6), an online course was developed, with three learning units: Health - before and after SUS; Participation in Youth Health and Protagonism; and Health Services, with 22 teenagers from a vocational public school. ⁽¹⁶⁾

Thus, in the study (A5), it is discussed that social networks increase the amount of opportunities for interaction with people from all over the world, the ability to access social support or help in the construction of one's own identity. ⁽¹⁷⁾

In study (A7), the Digital Food Guide (GAD - Guia Alimentar Digital) was presented, an application for smartphones, where users record their food intake and receive data from food groups and the Diet Quality Index, a score associated with the GAD. ⁽¹⁸⁾ In the study (A8), carried out in China, an analysis of the estimate of local spatial obesity was performed, using online social network sensors, in which each individual user is considered an online social network 'sensor' that can provide valuab-

le information about health. ⁽¹⁹⁾ And in the article (A9), there was the experience of using educational technology as a way to empower public school adolescents about depression and the factors associated with it. ⁽²⁰⁾

In research (A10), carried out in Brazil, the study offers contributions to rethink education aimed at the digital generation, in the sense of incorporating new languages and innovations into teaching, in addition to guiding the definition of plans and lines of care and health care that consider the new relationships between teens and technology. ⁽²¹⁾ Finally, in study (A12), carried out in Chile, an innovative, participatory and practical methodology was presented using ICT. ⁽²²⁾

In the research, it was seen that it is necessary to have innovative models of food and nutrition education in schools, which consider the current situation of knowledge and consumption habits of children, for an intervention based on their knowledge and motivations.

CONCLUSION

The construction of this study allowed us to understand which information technologies are being used in some countries, showing that most studies are positive about the proposal with the use of ICT in health promo-

tion, with the majority being the cre- and increase of technology practices
ation of computerized communication in health promotion actions in health
environments, demonstrating easy use services.

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