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Application Of Technologies in Community Health Promotion Strategies: Analysis of Innovative Models in Family Medicine

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Abstract

A documentary review was conducted on the production and publication of research articles on the variables Technology, Community Health, Family Medicine, and Innovation, using the Scopus database from 2018 to 2023. The bibliometric analysis identified 18 publications, organized into graphs by Year, Country, Area of Knowledge, and Type of Publication. A qualitative analysis highlighted the perspectives of various authors. The United States led with 6 publications. Medicine was the primary area of knowledge with 13 documents on technologies in community health. The most common type of publication was the Journal Article, comprising 67% of the total.

Keywords: *Technology, Community Health, Family Medicine, Innovation*

INTRODUCTION

Family medicine is a medical specialty that has no genesis in the progress of medical and technological sciences. This branch arises from a social pressure that seeks to meet social needs of a priority nature, both at the community level and for the State itself. Family medicine is based on Primary Health Care (PHC), which has a bio-psychosocial framework to address community and individual health (ITURBE, 1987)(SANTOS SUÁREZ, 2001)

Family and community medicine and health have an ideological, strategic, and practical correlation with PHC. That is why the World Health Organization defines PHC as the best way to give health to peoples and communities. Its slogan "Health for All" proposed four strategies that seek to structure the health system to achieve health equity, social justice, making reforms in health services and adapting them to primary care. (OMS, 1978)(OMS, La atención primaria de salud: Más necesaria que nunca. OMS: Ginebra, 2008)

Reforms that ensure that health systems contribute to achieving health equity and social justice first, giving priority above all to individual access and social protection in health.

Reforms that organize health services in the form of primary care according to people's needs and expectations

Reforms that replace the exaggerated dependence on control systems, stimulating entrepreneurship, with the aim of addressing the complexities of current health systems.

Reforms that improve the health of communities, by integrating public health interventions and primary care and establishing healthy public policies for all sectors.

In relation to this, the World Health Organization describes digital and technological tools in health as "a set of tools of digital health strategies, such as the application of information and communication technologies ICT to health".(OMS, Estrategia mundial sobre salud digital , 2019)

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During the last few years, technologies have been within the reach of our environment, but it was at the beginning of the Covid-19 pandemic that the use of these technologies for care became very indispensable, since they allow easy access and management, which allows us to provide timely and quality care for the entire population. thus allowing us to address all regions holistically.

Non-governmental organizations (NGOs) that provide community health services play a vital role in caring for the most vulnerable populations. The use of technological resources has been of vital importance for these communities as it optimizes patient care and management. Below are some of the technologies applied.

Use Of Electronic Systems for Medical Records: Electronic systems for medical records allow efficient and assertive management of patient data. This technological tool allows you to store medical information, medical records and patient data digitally. This resource innovates care coordination, ensuring comprehensive and continuous care.

Telemedicine and Online Consultations: Telemedicine has evolved the way health care is delivered in communities. Since online consultation platforms allow NGOs to provide health care services remotely, allowing patients to receive care without having to travel. This fact minimizes geographic gaps and improves access to health care.

The implementation of technological resources in the health sector has presented a series of health benefits in communities.

Increased Operational Efficiency: The incorporation and use of technology optimizes patient management processes, allowing Non-Governmental Organizations to effectively utilize their limited resources and provide care to a greater number of users

Expansion and Reach of Care: Resources such as telemedicine and the use of applications focused on health care allow care to be provided to communities that in one way or another have difficulty accessing them

Quality Improvements: Technology facilitates access to up-to-date information, media knowledge sharing, and care coordination, enabling high-quality care for patients

This article describes the main characteristics of publications indexed in the Scopus database related to Technology, Community Health, Family Medicine, and Innovation from 2018-2023. It also highlights the perspectives of various authors affiliated with institutions. The World Health Organization and NGOs endorse the use of technology in health for providing quality patient care. By effectively leveraging these technologies, NGOs can optimize resources, expand their reach, and provide comprehensive community care, aligning with the principles of PHC and family medicine to ensure "Health for All."

General Objective

To analyze the production of research papers on Technology, Community Health, Family Medicine, and Innovation registered in Scopus from 2018-2023 from a bibliometric and bibliographic perspective.

METHODOLOGY

A quantitative analysis using a bibliometric approach is conducted on scientific production related to Technology, Community Health, Family Medicine, and Innovation based on information from Scopus. Additionally, a qualitative analysis examines examples of research works in these areas to describe different authors' positions on the topic. The search is conducted using Scopus tools and parameters outlined in Figure 1.

Methodological Design

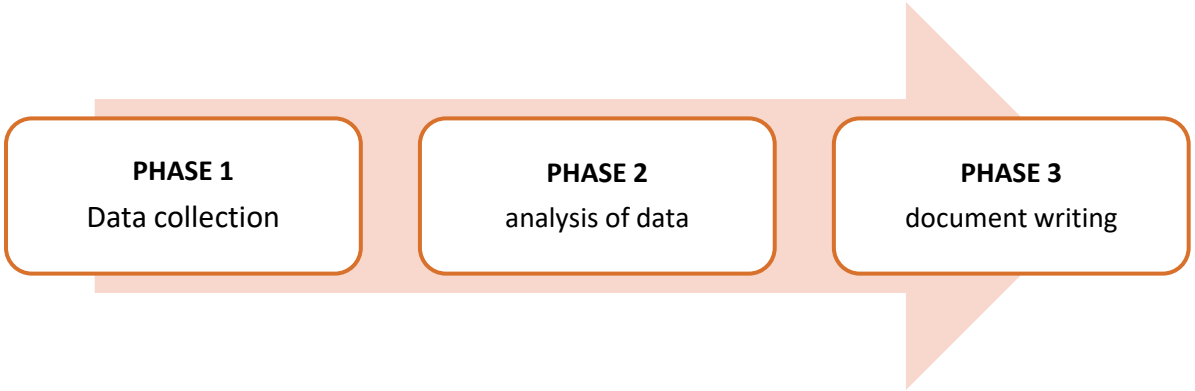

Figure 1. Methodological design

Source: Authors' own creation

Phase 1: Data collection

Data collection was carried out through the Search tool on the Scopus website, through which a total of 20 publications were identified. To this end, search filters were established consisting of:

TITLE-ABS-KEY (technology, AND community AND health, AND family AND medicine, AND innovation) AND PUBYEAR > 2017 AND PUBYEAR < 2024

Published documents whose study variables are related to the study of Technology, Community Health, Family Medicine and Innovation

Without distinction of country of origin.

Without distinction of area of knowledge.

No distinction of type of publication.

Phase 2: Construction of Analytical Material

The information identified in the previous phase is organized. The classification will be made by means of graphs, figures and tables based on data provided by Scopus.

Co-occurrence of Words.

Year of publication

Country of origin of the publication.

Area of knowledge.

Publication Type

Phase:3 Drafting of Conclusions and Outcome Document

After the analysis carried out in the previous phase, we proceed to the drafting of the conclusions and preparation of the final document.

RESULTS

Co-occurrence of Words

Figure 2 shows the co-occurrence of keywords within the publications identified in the Scopus database.

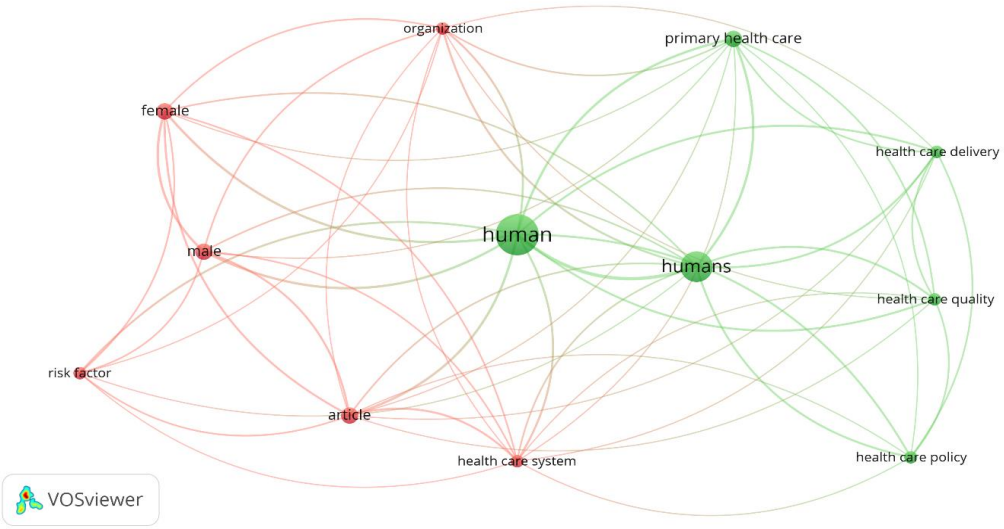

Figure 2. Co-occurrence of words

Source: Authors' own elaboration (2024); based on data provided by Scopus.

Primary Health Care was the most frequently used keyword within the studies identified through the execution of Phase 1 of the Methodological Design proposed for the development of this article. Health Systems is among the most frequently used variables, associated with variables such as Risk Factor, Health Policies, Community Health, ICT. From the above, it is striking that the institutions that provide health services, hand in hand with ICT resources, are committed to the adoption of digital strategies, ensuring that all users have access to and can use these tools appropriately according to their health needs, with the aim that the integration of these resources is effective and helps to improve care and quality health.

Distribution of Scientific Production by Year of publication

Figure 3 shows how scientific production is distributed according to the year of publication, taking into account that the period between 2018 and 2023 is taken.

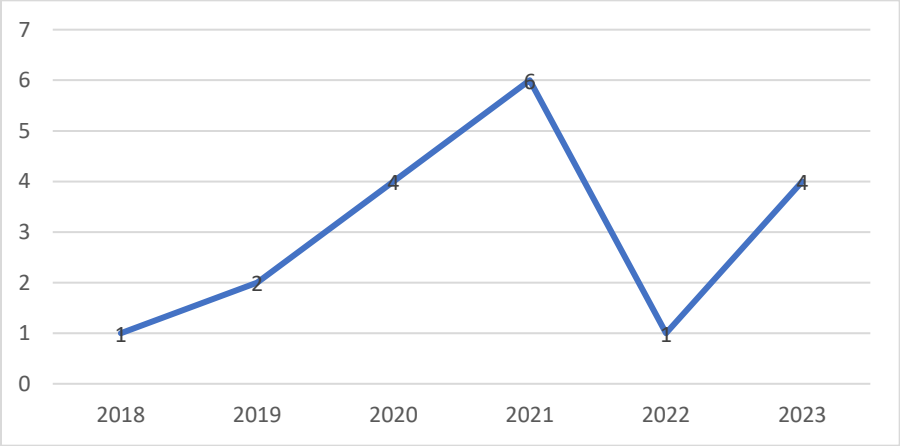

Figure 3. Distribution of scientific production by year of publication.

Source: Authors' own elaboration (2024), based on data provided by Scopus.

An increase in the number of publications registered in Scopus during 2021 is noticeable, reaching 6 documents published in indexed journals. This rise can be attributed to influential articles such as "Pro-inflammatory cytokines predict the incidence of diabetic peripheral neuropathy over 5 years in Chinese patients with type 2 diabetes: a prospective cohort study." Inflammation has been linked to the pathogenesis of diabetic peripheral neuropathy (DPN) in cross-sectional studies, but prospective studies in diabetic patients are rare. This study aimed to assess whether pro-inflammatory cytokines could predict the incidence of DPN over a five-year follow-up.

Methods: 315 diabetes patients without DPN were followed from five community health centers in Shanghai starting in 2014, with an average follow-up of 5.06 years. 106 patients were selected based on the integrity of their blood samples to measure pro-inflammatory cytokines, including interleukin-6 (IL-6), tumor necrosis factor-α (TNF-α), vascular endothelial growth factor (VEGF), and intercellular adhesion molecule 1 (ICAM-1). Neuropathy was assessed by MSNI at baseline and follow-up.

Findings: 63 out of 106 patients developed DPN after 5.06 ± 1.14 years. Baseline plasma levels of TNF-α, IL-6, and ICAM-1 were higher in the neuropathic group ($p<0.05$). Increased plasma levels of TNF-α (HR: 8.74 [95% CI: 1.05–72.68]; $p<0.05$) and ICAM-1 (HR 23.74 [95% CI: 1.47–383.81]; $p<0.05$) were associated with the incidence of DPN after adjusting for known risk factors (Zheng, 2021).

Distribution of Scientific Production by Country of Origin

Figure 4 shows the distribution of scientific production by the nationality of the authors.

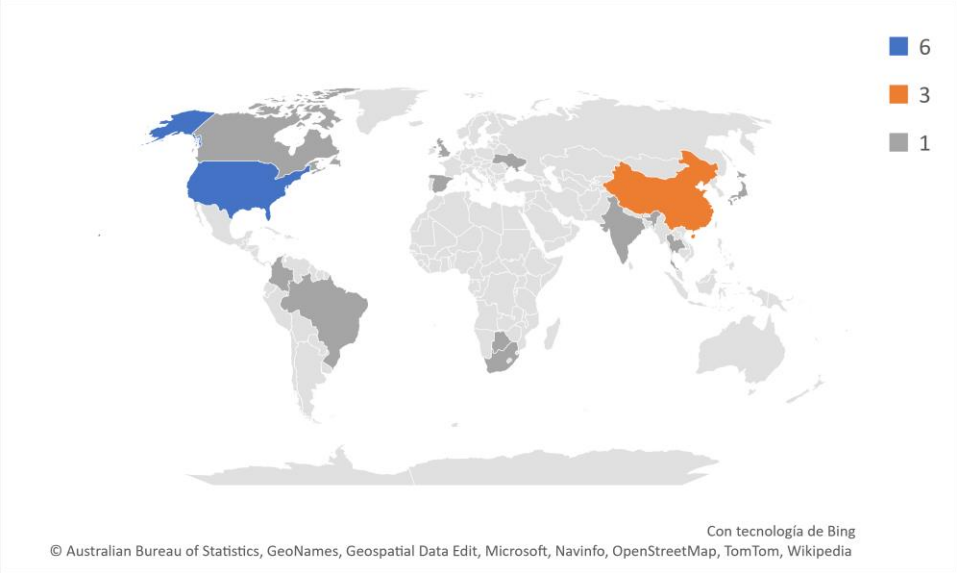

Figure 4. Distribution of scientific production by country of origin.

Source: Authors' own elaboration (2024); based on data provided by Scopus.

The distribution of scientific production by country of origin considers records from institutions, establishing the United States as the leading country with the highest number of publications indexed in Scopus during 2018-2023, totaling 6 publications. China ranks second with 3 scientific papers, and Canada is third with 1 document, including the article titled.

"Adolescents with diabetes: a report on care and teaching practice" To report the interprofessional and intersectoral experience of the Doce Alegría Project that practices the care of adolescents with type 1 Diabetes Mellitus, implemented between 2015 and 2016. Data synthesis: The interprofessional team consisted of professors and undergraduate students of medicine, psychology, nursing, pharmacy, nutrition, dentistry, physical education and pedagogy from the Regional University of Blumenau (FURB), nurse from the university

polyclinic, professor and student of master's degree in collective health and medical residency in pediatrics. Health care and education activities were carried out at the university, in basic education schools, primary health care units, referral hospitals and in the community. These activities were designed to understand and comprehend the health needs of patients. Patient-centered care and health education are important tools in chronic disease management. The impact on the target audience was perceived through attendance at the proposed activities, greater adherence to medical consultations, greater connection with the service and better understanding of type 1 Diabetes Mellitus. Perceptions and knowledge of professors, undergraduate and graduate students of health careers allowed innovations in technologies for teaching and comprehensive health care.(Vargas, 2020)

Distribution of Scientific Production by Area of Knowledge

Figure 5 shows the distribution of scientific publications by area of knowledge, reflecting the various research methodologies used.

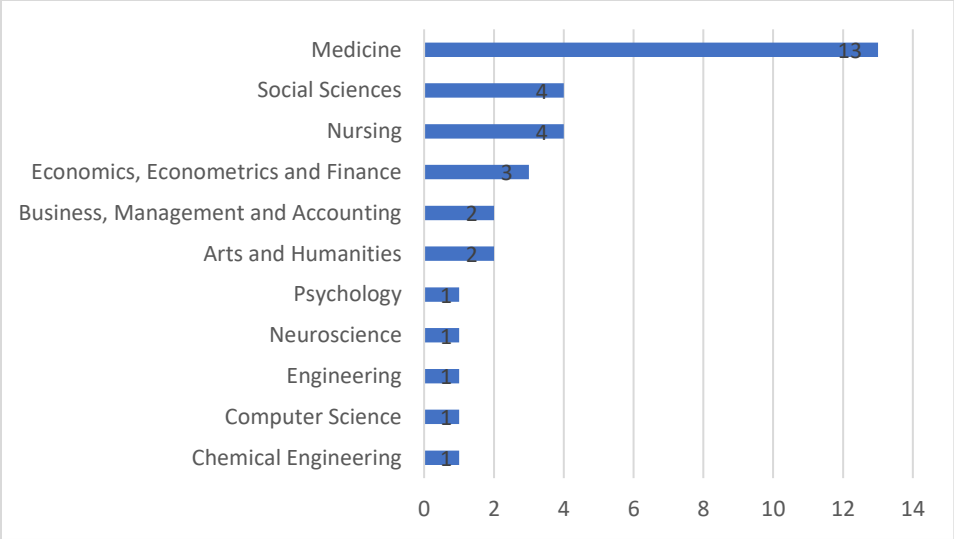

Figure 5. Distribution of scientific production by area of knowledge.

Source: Authors' own elaboration (2024); based on data provided by Scopus.

Medicine was the area with the highest number of publications in Scopus, totaling 13 documents focused on Technology, Community Health, Family Medicine, and Innovation. Social Sciences ranked second with 4 articles, followed by Nursing with 4. The significant impact is exemplified by the Medicine article titled "Discussion on the development and ethical issues of smart medicine in cancer health management in China." This study explores cancer health management experiences and challenges in China, emphasizing the role of smart medicine technologies like IoT, smart terminals, big data, and AI in improving cancer management. However, it also highlights ethical issues such as privacy, resource equity, individual autonomy, and responsibility. The government, medical institutions, community health organizations, and the public must address these ethical challenges to promote the standardized and sustainable development of smart medicine in cancer health management in China (Zhang, 2021).

Type of Publication

Figure 6 shows how the bibliography is distributed according to the type of publication chosen by the authors

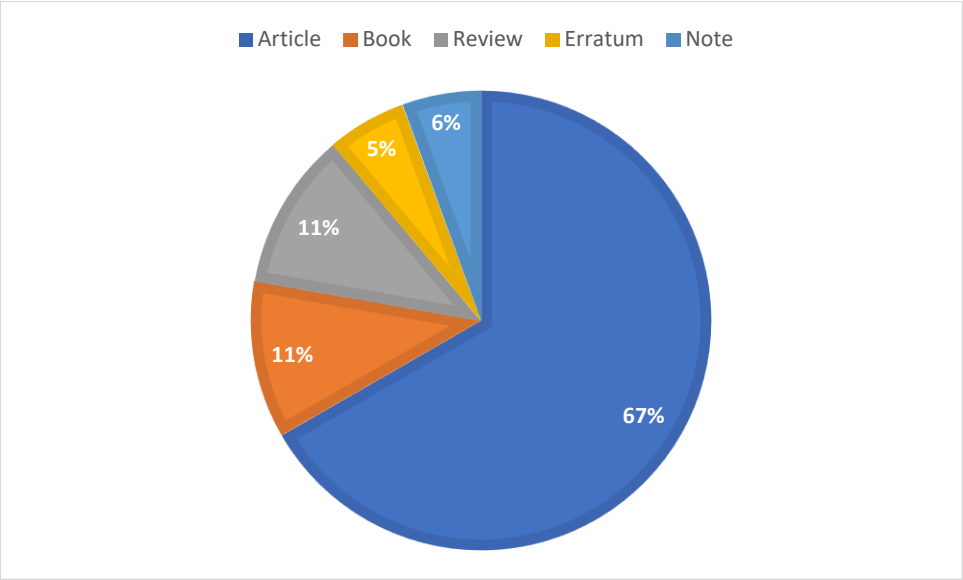

Figure 6. Publication Type

Source: Authors' own elaboration (2023); based on data provided by Scopus.

The most frequently used publication type by researchers referenced in this document was the Journal Article, accounting for 67% of the total production analyzed, followed by Book Chapters at 11%. Journals represented 11% of the research papers published from 2018-2023 in Scopus-indexed journals. Notably, "Redesigning Primary Care Practice: Challenges for Improving Behavioral Health Care for a Vulnerable Patient Population" examined a program integrating mental health into family medicine in an economically challenged urban setting. This program utilized a behavioral health technology platform, a collaboration of community mental health agencies, and a community health worker (CHW). Among 202 patients, 196 were analyzed; 56% tested positive for anxiety, 38% had moderate to severe depression, and 34% had post-traumatic stress disorder. A statistically significant difference in depression diagnosis was found compared to a control group. Despite navigation assistance from a CHW and assured care access, only 27% of patients complied with behavioral health referrals. Further qualitative analysis revealed complex patient factors affecting follow-up decisions regarding behavioral health care (Swavely, 2020).

CONCLUSION

The bibliometric analysis revealed that the United States had the highest number of published records in Technology, Community Health, Family Medicine, and Innovation, with a total of 6 publications in the Scopus database. It was also established that applying theories in Medicine, Family Medicine, and Community Medicine requires a comprehensive and continuous approach to prioritize family well-being and community development in the PHC framework.

On the other hand, the importance of technologies for the development of digital health strategies is concluded. Among these strategies are telemedicine, applications associated with artificial intelligence, health applications, among others, these tools allow patients to have better access and health care. These resources make patients aware of self-care, management and timely treatment, allowing greater approach to the routes by health service provider institutions.

The integration of these digital health strategies allows health systems to positively impact the general population and innovates in the quality of care in different services. That is why it is important that all health service provider institutions, as well as the cooperation of NGOs, implement technological strategies in the provision of services and care, since this seeks to provide greater agility, leadership and cohesion in the face of a complex health system to improve the quality of services and the health of patients. allowing for a more accessible, longitudinal, user-focused, comprehensive and coordinated system.

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