



Impact of Implementing New Technologies to Innovate and Transform Primary Care: The Technology Nurse

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Abstract: Primary care currently serves the population by combining virtual care, face-to-face care, and innovative technologies. The technology nurse is the ideal professional to merge healthcare practice with technology in the healthcare environment. They help professionals and citizens to make effective use of these new tools. This nurse should be part of a multidisciplinary team comprising computer scientists, healthcare professionals, electro-medical technicians, information systems specialists, and professionals from the institution's technical department. Digital health is driving a change in ethical standards and professional codes of ethics. The impact of digitization in primary care can be seen through improved access, quality of care, efficiency, and the safety and sustainability of the system. We need more evidence on the positive impact of e-Consultation on preventive and health promotion activities undertaken in primary care.

Key words: digitalization; primary care; information and communication technology (ICT); digital health; nurse technologist; e-Consultation

1. Introduction

Currently, the healthcare system, including primary healthcare, is undergoing a significant shift towards digitalization of clinical care. Many strategic plans in our environment incorporate it as a fundamental element. The other commonalities of these reform projects are the participation of professionals, comprehensive care for chronic diseases, research and innovation, and digital health [1, 2, 3].

During the pandemic, primary healthcare services played a crucial role in combating the coronavirus. The risk of infection among healthcare professionals and patients promotes remote information processing: telephone calls, remote consultations, and video conferences (non face-to-face care) [2]. Professionals and citizens have had to adapt to this new situation. The new technologies, which, among many advantages, allow health promotion and education, better follow-up of chronic processes and remote administrative procedures, have made it possible for people to participate more actively in their health processes [5].

There is enough literature to show that digital solutions can help manage the COVID-19 crisis, reduce its impact on human health, and ensure the maintenance of the health system [4, 5, 6]. The experience of COVID-19 provides us with an

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opportunity to change the traditional way of working and promote the empowerment of patients through digital platforms. Progress has been made in new methods for virtual care and managing population health. For this reason, decision-makers need to ensure their funding and allow people to continue combining virtual care, face-to-face care, and new technologies as they currently do [7].

According to the World Health Organization, telemedicine is the use of information and communication technology (ICT) by healthcare professionals to exchange effective information for diagnosis, treatment, disease prevention, research, evaluation, and continued training, providing "health services (where distance is a decisive factor)." All of these are aimed at improving the health of the people and communities.

Remote healthcare is a tool that allows for remote monitoring of patients, among other things, exchanging clinical information to monitor, treat, and diagnose diseases. It can be synchronous (instant response, such as video calls or phone calls), or asynchronous through text, voice, image, or audio (email or electronic queries). Asynchronous queries can delay the response of professionals to users, so in emergency queries, this is not the most suitable path [8].

In order to implement new technologies in our healthcare system, we must know what resources we have and which resources are most useful for our environment and people. eHealth is a set of ICTs used in healthcare systems for prevention, diagnosis, treatment, monitoring, and health management. Its purpose is to improve healthcare, reduce costs, and enhance the sustainability of the healthcare system (Figure 1).

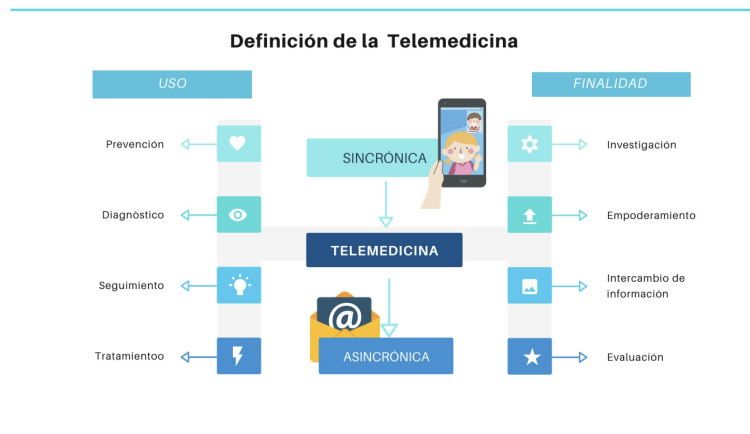


Figure 1. Overview of information and communication technology implementation.

We believe that the most useful primary healthcare application technologies are health applications, wearables, big data, and artificial intelligence (Figure 2).

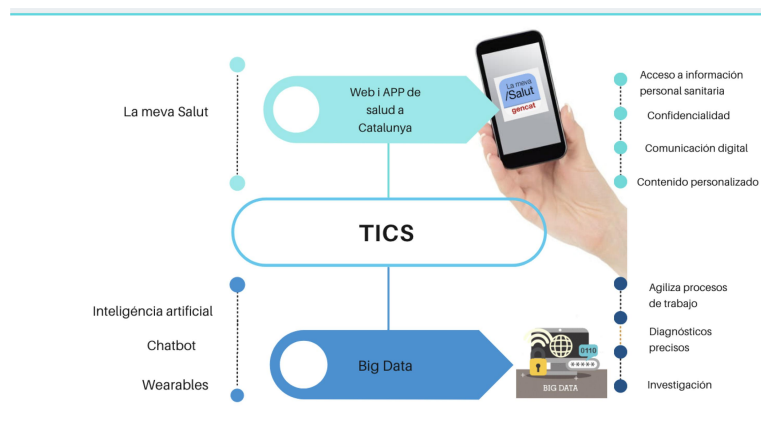


Figure 2. Overview of digital technologies applicable to primary healthcare.

In order to implement such technologies, we need healthcare professionals specializing in digital health. For us, nurses who have a horizontal perspective on nursing are one of the professionals who can best play this role. Specifically, we proposed the image of a technical nurse.

2. Technology Nurse

Health professionals specializing in digital health, especially technical nurses, are crucial for implementing new technologies and enhancing their impact, as they incorporate technical aspects into the profession. They are very helpful for other professionals and citizens to take advantage of all the opportunities provided by eHealth. We need nurses specialized in digital health who can refer to and support decisions regarding the devices and ICTs used in the nursing field on a daily basis.

It is completely necessary and essential to include nurses in different departments of digital health. Given the continuous development of ICT, nurses should continue to receive training on existing technologies and their operations. However, due to the limited supply of training in digital health, formal training in this field should be encouraged.

The combination of nursing and technology visions will enable these professionals to receive training, choose appropriate technologies for different health activities, and provide support in the face of potential difficulties during implementation.

Technical nurses are professionals who must have a complete understanding of where to implement nursing activities with different techniques. Their main functions include:

- New service technology reference.
- Collaborate on selecting equipment and programs that you wish to introduce to the center.
- Provide new technology training to professionals.
- Monitor the use and operation of existing digital health tools in the center.

In order to have this new type of professional, it is necessary to provide the latest high-quality training, and each institution should provide training based on this professional profile.

Selecting and implementing new technologies without taking into account the professionals who will use them increases the likelihood that the right ones will not be chosen, leading to a refusal by healthcare professionals to use the devices and programs acquired. If this failure occurs, we will experience a negative economic impact, as the technology implemented will be misused or will have to be replaced. In addition to the economic factor, this situation would also have a negative impact on the professionals who have to use them, with repercussions for their patients (Figure. 3).



Figure 3. Overview of the functions of technical nurses.

In order for technical nurses to play a role on a global scale, they must become members of a multidisciplinary team composed of computer scientists, health professionals, electronic medical technicians, information systems experts, and professionals from the technical secretariat of the institution. Through this approach, information systems will have a cross-disciplinary perspective, which will help maintain correct control over technology and solve all possible problems.

3. Ethical Considerations

Managing information through new technologies has brought serious ethical dilemmas. In this field, the privacy, security, and responsibility of using clinical data should be taken as the standard. In addition, the practical application of ICT may encounter problems in terms of interoperability between systems and lack of transparency in the use of collected data. All of these require the establishment of ethical standards unique to the technical field when using information and storing this data, ensuring its confidentiality and protection [11]. This new situation requires the revision of ethical standards and codes of conduct for professionals in the field of digital health.

4. Impact Assessment

In order to evaluate the impact of the use of ICT on primary healthcare, it is necessary to consider the factors that determine the successful implementation of intervention measures: ensuring access, quality of care, and efficiency, in order to adopt the best strategy to ensure its development, implementation, and final evaluation [12]. Ensuring immediate access for users and professionals can improve healthcare, and technology achieves permanent and real-time connectivity through the exchange of information between the two for monitoring, treating, and diagnosing diseases [13].

Digital methods are a promising solution as they can provide health information remotely for remote diagnosis, monitoring, and treatment of patients, thereby improving the quality of professional care and ensuring higher efficiency. The currently available digital tools have increased patient empowerment and improved their participation in health decision-making and disease control [2].

As mentioned above, ICT has improved the access and quality of care, thereby increasing the efficiency and security of healthcare. Health information is stored electronically and can be stored, analyzed, or retrieved for diagnosis, treatment, or prevention of diseases, reducing the likelihood of errors. In addition, it improves patient monitoring by avoiding duplication of diagnostic tests. Therefore, its impact can be evaluated by considering improvements in diagnosis, clinical management, continuity of care, and more patient-centered care.

At the professional and organizational levels, significant individual efforts are needed to manage changes in daily nursing activities. This reform of the health organization may create predictable resistance. We can plan for change, try to overcome it, and ensure implementation. If we ensure confidence in the direction of the project, we will reduce the negative emotions of fear and frustration that professionals may experience. To adapt to new technologies, healthcare workers need sufficient information to understand their functions and usefulness. They must understand it as a pathway for career development.

During the pandemic, additional investments were made in digital solutions. The increase in institutional spending on computer equipment and digital solutions to remotely control patients has forced a change in the nursing process in primary healthcare centers. The current additional cost can ensure future sustainability, as it has been proven that digital interventions can improve the accessibility and quality of healthcare by reducing the costs of long-term healthcare systems [2, 9, 13, 14] (Figure 4).

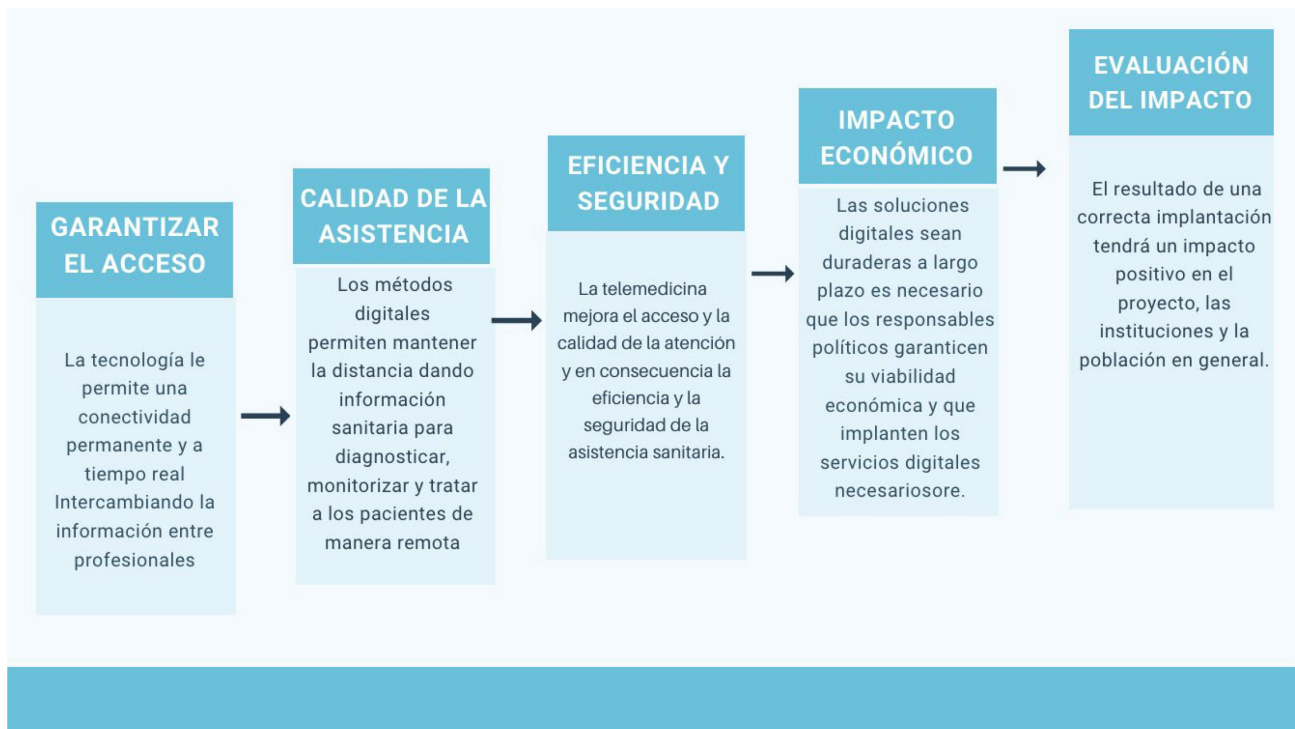


Figure 4. Outline for assessing the impact of telemedicine on primary healthcare.

5. Digitization Project Led by Nurses

Primary healthcare serves as the initial point of contact for individuals to address major acute or chronic health issues, integrating health and social care with a focus on prevention and promotion of health. However, the pandemic has hindered the implementation of many recommendations outlined in the activity plan for prevention and health promotion [15, 16], as these recommendations are typically delivered in person. Therefore, there is a need for more evidence to support alternative remote information processing interventions using existing digital media, which may become standard practices for new primary healthcare models aimed at increasing non face-to-face care.

Currently, in our work center, the CAP of Sarrià de Ter (Girona), a research study is being carried out on alcoholism screening in primary care through e-Consultation, led by nurses trained in digital health. This study, which will begin at the end of this year, is in its preliminary phase. It aims to assess the acceptance of nursing intervention through the e-Consultation to record alcohol consumption in people aged 15 to 60 years old. The aim is to increase the recording of alcohol consumption in electronic medical records (ECAP) and to favor the early detection of excessive consumption using the shortened version of the self-administered AUDIT-C questionnaire.

Various studies have shown that compared to face-to-face screening, using digital self-management questionnaires can more accurately identify information and identify more risky behaviors [17]. There is evidence to suggest that the risk perception of excessive drinking is lower, so this intervention is an opportunity for early detection of risky consumption, thereby reducing damage to health [18].

If the intervention achieves positive results, it will reflect on the importance of conducting primary prevention activities in a non face-to-face manner. This study paves the way for designing new nursing processes related to public health that promote healthy habits and disease prevention based on population needs through information and communication technology. It will also make people aware of the limitations and difficulties of such interventions, so that improvement suggestions can be proposed in the future to ensure the implementation of comprehensive care processes.

6. Conclusions

The doctor-patient relationship is undergoing changes, and more and more patients have the resources and convenience to search for information online. In this field, eHealth enables us to take action in a more personalized way [19]. Digitalization enables us to provide a self-care management lines, promote health for all age groups, provide advice on diseases and health processes, increase personal motivation, and empower citizen health.

This society demands a change in the healthcare model. Firstly, it needs more information from its reference professionals, with solutions based on ICTs. The participation of the patient and the healthcare professional in its implementation is key to its operation, as it improves healthcare, reduces clinical variability among professionals, avoids duplicity of diagnostic tests and reduces errors in medical treatment, among many other advantages.

We can say that digital lines cannot replace face-to-face visits, but they do help us avoid the progress of novel coronavirus infection, and have proved to be an indispensable tool for professionals to get closer to patients [20].

Similarly, the use of the aforementioned digital solutions can contribute to the emergence of a new healthcare professional with knowledge and use of information and communication technology, which will be key to implementing information and communication technology. This professional profile must have a good understanding of the nursing department in order to implement the most suitable digital solutions. These professionals are pioneers in spreading knowledge about eHealth solutions to other professionals and patients, who are motivated, willing to accept new changes, and constantly trained. If this career profile is not introduced, it will be difficult to achieve change.

In the United States, organizations working with eHealth have already demonstrated its effectiveness and highlighted the importance of empowering patients to take control of their own health. Governments must be prepared to drive change and motivate both professionals and patients for these initiatives to be successful [21].

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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