

REVIEW

Telehealth and telemedicine projections in the post-covid-19 era. A scoping review

Las proyecciones de la Telesalud y telemedicina en la era post covid-19. Una revisión de alcance

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Cite as: Hechenleitner-Carvallo M, Ibarra-Peso J. Telehealth and telemedicine projections in the post-covid-19 era. A scoping review. Data and Metadata. 2025; 4:633. <https://doi.org/10.56294/dm2025633>

Submitted: 04-02-2024

Revised: 11-07-2024

Accepted: 22-03-2025

Published: 23-03-2025

Editor: Dr. Adrián Alejandro Vitón Castillo 

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ABSTRACT

Introduction: before the COVID-19 pandemic, telemedicine and telehealth faced legal, technological, and cultural regulatory limitations. The health crisis boosted its massive adoption, enhancing its continuity over time. The objective of this review is to determine the projections of telehealth and telemedicine in the post-COVID-19 era and the factors that condition its growth.

Method: a systematic review was carried out following the PRISMA-ScR guidelines. The databases consulted were PubMed, Web of Science, and Scopus. 19 relevant studies were selected from an initial total of 96.

Results: the pandemic accelerated the adoption of telemedicine, maintaining its use in areas such as mental health and chronic diseases. Factors associated with the use and development of technologies, added to cultural and economic aspects, have hindered its growth.

Conclusions: telehealth and telemedicine have improved access to health, but their sustainability requires resolving technological inequalities, in addition to guaranteeing privacy and security standards.

Keywords: Telemedicine; Telehealth; Pandemic; Covid-19.

RESUMEN

Introducción: antes de la pandemia de COVID-19, la telemedicina y la telesalud enfrentaba limitaciones regulatorias legales, tecnológicas y culturales. La crisis sanitaria impulsó su adopción masiva potenciando su continuidad en el tiempo. El objetivo de esta revisión es determinar las proyecciones de la telesalud y telemedicina en la era post-COVID-19 y los factores que condicionan su crecimiento.

Método: se realizó una revisión sistemática siguiendo las guías PRISMA-ScR, LAS bases de datos consultadas fueron PubMed, Web of Science y Scopus. Se seleccionaron 19 estudios relevantes de un total inicial de 96.

Resultados: la pandemia aceleró la adopción de telemedicina, manteniendo su uso en áreas como salud mental y enfermedades crónicas. Factores asociados al uso y desarrollo de las tecnológicas, sumados a aspectos culturales y económicos han obstaculizan su crecimiento.

Conclusiones: la telesalud y la telemedicina han mejorado el acceso a la salud, pero su sostenibilidad requiere resolver desigualdades tecnológicas, además de garantizar estándares de privacidad y seguridad.

Palabras clave: Telemedicina; Telesalud; Pandemia; Covid-19.

INTRODUCTION

During the COVID-19 pandemic, telehealth accelerated its pace of growth and development, not only because of the need that existed at the time, but also because the obstacles that existed until then, such as regulatory barriers, poor infrastructure, and technological limitations, began to decrease, so the low acceptance that existed both by patients and health professionals began to disappear.⁽¹⁾ The pandemic created a global push to support, by all possible means, the implementation of digital solutions for the diagnosis, treatment, and monitoring of patients, which triggered efforts at all levels to promote telehealth and telemedicine.^(2,3)

The increase in demand for health care, especially in those sectors most affected by COVID-19, significantly increased the volume of telehealth services not only associated with the detection and treatment of this disease, but in all areas of care.⁽⁴⁾ Along with this increase in the use of telehealth and telemedicine, a significant phenomenon was observed: significantly greater patient satisfaction with their health care.⁽⁵⁾ This change was the immediate result of changes in regulations and technological investment that encouraged the dissemination of telehealth and telemedicine by insurance companies and health care providers.⁽⁶⁾

Various studies during the pandemic have shown that telehealth and telemedicine are an effective alternative in the care of patients with chronic diseases, as well as in primary care, allowing for physical decongestion in health centers.⁽⁷⁾ At the same time, these modalities have allowed a significant reduction in disparities in access to health care, especially in rural areas or areas without the availability of specialists⁽⁸⁾ demonstrating their effectiveness in areas such as mental health, management of chronic diseases and follow-up of postoperative care. However, there are still factors that need to be improved, such as the accessibility of technologies, the training of professionals to manage these technologies and the overcoming of cultural aspects related to privacy, among others, which continue to limit their application.^(9,10,11,12) Both telemedicine and telehealth have great potential but require the development of more comprehensive regulatory models that guarantee ethical treatment and adequate protection of patient privacy to become a real complement to the provision of in-person health care.^(13,14)

The objective of this scoping review is to establish the projections that telehealth and telemedicine have in the post-covid-19 era and the factors that are determining their growth.

METHOD

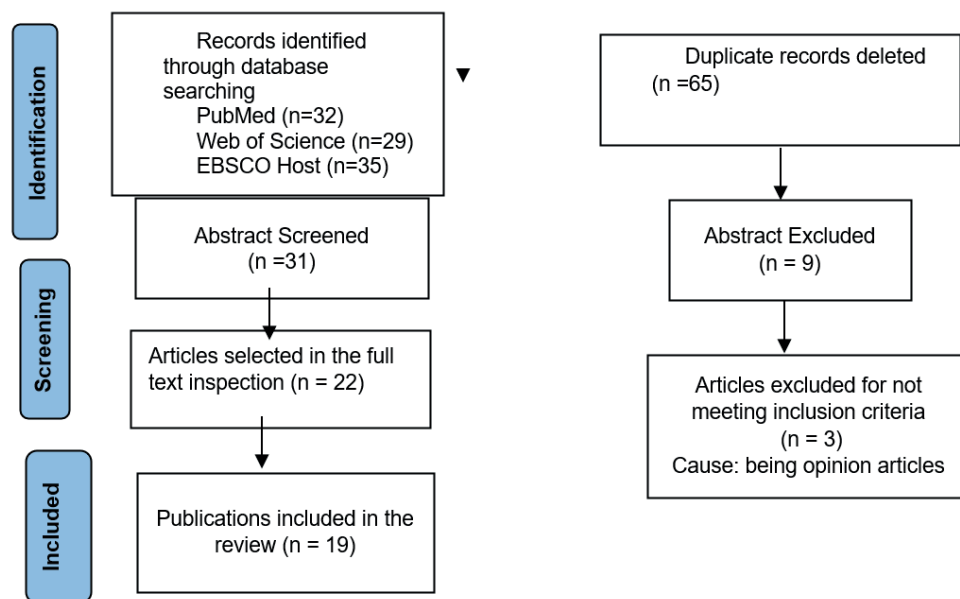


Figure 1. PRISMA flowchart obtained from the information selection process

A systematic review was carried out for the development of this research, the PRISMA ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Scoping Review) guidelines were used.^(15,16) The Web of Science, PubMed, and Scopus databases were used for the search.

The search algorithm used was:

(["Telehealth" O "telemedicine"]) AND (["post pandemia"] OR [post covid])

The inclusion criteria for the selection of articles were:

1. Be a free access item
2. Written in Spanish or English.
3. The research must be classified as an "article" in the databases consulted.

The exclusion criteria were:

1. Be a review, opinion or reflection article.
2. Not declaring the study population.

The main findings and characterization of the study population were extracted from the selected articles. Figure 1 summarizes the search process, where a total of 96 articles were registered according to the keywords used. After reading the abstracts and applying the inclusion and exclusion criteria, 22 articles were selected for an in-depth reading that allowed 19 articles included in this research to be reached.

RESULTS

Table 1 shows both the characteristics of the sample and the main findings of each of the studies selected in this research. It is important to mention that 14 of the 19 studies analyzed were carried out almost immediately after the pandemic officially ended.

Table 1. Summary of selected articles

Author	Sample	Finding
Ashley et al. ⁽¹⁷⁾	The cohort included 70 primary health care (PHC) professionals who participated in a national survey. Participant selection was purposive, using stratification based on professional affiliation, work setting, geographic distribution, age, demographics, and gender identity. The subgroup designated for interviews consisted of 33 physicians.	Research findings suggest that telehealth has emerged as a viable and sustainable alternative for primary health care (PHC) in the aftermath of the pandemic, with healthcare providers recognizing the need for rapid adaptation and competent utilization of technological resources.
ALsharif ⁽¹⁸⁾	The research covered a sample of 234 people, all of whom were healthcare consumers using telehealth services in the context of Saudi Arabia.	A significant 73,8 % of participants engaged in telemedicine primarily out of necessity, while only 10,3 % did so out of personal interest or initiative. Younger men were found to be less likely to continue using health apps compared to older women. Concerns about privacy and security were among the determinants of reluctance to engage in telemedicine, along with sociocultural factors such as gender roles and prevailing social norms.
Aldekhyel et al. ⁽¹⁹⁾	The sample consisted of 385 participants of both genders, all of them Saudi citizens.	The research revealed that 87 % of subjects demonstrated a strong propensity to use telemedicine services. A notable correlation was identified between e-health knowledge and perceptions about telemedicine, with a correlation coefficient of $\alpha = 0,460$ ($p < 0,001$). Having a favorable attitude toward telemedicine significantly increases the likelihood of having the intention to use it ($p < 0,001$).
Adler-Milstein et al. ⁽²⁰⁾	The sample consisted of 18 456 people. All subjects had at least one primary care telemedicine visit between March 1, 2019, and February 29, 2020 and at least one post-pandemic visit between March 1, 2021 and February 28, 2022.	People with dementia decreased their visits in people to 55,37 % opting for telemedicine once the pandemic was over. One factor that was significantly associated with the option to use telemedicine was the distance from home and the clinic where the patient was being seen. People over 90 years of age were more likely to use telemedicine. Limited English proficiency was a factor in not opting for telemedicine.
Yu et al. ⁽²¹⁾	The study population consisted of 1 535 people diagnosed with breast cancer, 601 people diagnosed with colorectal cancer, and 1 145 people diagnosed with lung cancer.	9,8 % of oncology treatment following the COVID-19 pandemic was delivered via telemedicine. Physicians specializing in medical oncology who were affiliated with multiple healthcare institutions were less likely to conduct telehealth consultations, especially those focusing on lung malignancies.
Pongiglione et al. ⁽²²⁾	The study involved 80 people diagnosed with osteoporosis who were being treated at the Humanitas Hospital in Milan (Italy).	Participants were in favor of using telemedicine, regardless of whether they had used it before. Age, technological proficiency, and social support did not show a significant correlation with telemedicine use. Men reported a lower level of concern regarding their privacy when using telemedicine than women.
Poitras et al. ⁽²³⁾	49 individuals who participated in the training of trainers within the primary care research initiative were surveyed.	Patients diagnosed with a chronic disease expressed high satisfaction with telemedicine in the post-pandemic period. Among the positive aspects of telemedicine were the time and cost savings.

Naghdi et al. ⁽²⁴⁾	The sample size was 26 health professionals who participated in several groups of questionnaires.	<p>Patients indicated that it was important for them to be able to choose the modality of consultation.</p> <p>The individual characteristics and the environment in which the patient is located are relevant when choosing the modality of care.</p> <p>The use of telemedicine promoted a more patient-centered care model. 75 % of participants reported having greater flexibility to reschedule appointments and therefore preferred telehealth for their follow-up and consultation processes.</p> <p>All participants noted that accessibility improved, with 60 % of them observing a decrease in in-person visits after Covid-19.</p>
El Naamani et al. ⁽²⁵⁾	The sample size was 93 patients and 33 neurosurgery physicians who participated in the survey about their experience with telemedicine.	<p>77 % of respondents expressed extreme satisfaction with telemedicine care.</p> <p>Physicians expressed varying levels of comfort in diagnosing via telemedicine, with 21,9 % feeling extremely comfortable.</p> <p>Convenience was identified as the most important advantage of telemedicine, followed by cost-effectiveness and protection against infectious diseases.</p>
Mayaka et al. ⁽²⁶⁾	The study recruited a total of 100 participants from Grubb Pharmacy's HCV and HIV database, using a telephone recruitment method with the help of pharmacists.	<p>Factors such as perceived usefulness and intrinsic motivation were associated with the acceptability of telehealth services, especially among the African-descendant population. 80 % of the participants in the study expressed their intention to use the telehealth platform.</p>
Masongo et al. ⁽²⁷⁾	The research involved 42 Australian oral and maxillofacial surgeons.	<p>The study found that while telehealth in oral and maxillofacial health care is expected to grow, it will not completely replace in-person consultations due to the various barriers and challenges identified by consultants.</p> <p>The consultants expressed their willingness to continue using telehealth, particularly for post-operative follow-ups, but stressed their concern about diagnostic capabilities and the importance of maintaining a strong doctor-patient relationship.</p>
Marson et al. ⁽²⁸⁾	The sample size was 338 practicing dermatologists in the United States	<p>The research indicated that teledermatology utilization and execution show substantial disparities among dermatologists in the United States. This divergence was associated with the temporal context in which they integrated the technology into their clinical practices. A statistically significant correlation was identified between the timing of adoption and the operational capabilities of the platforms used. Individuals who adopted the technology in the post-COVID era were less inclined to engage with digital platforms.</p>
Marson et al. ⁽²⁹⁾	The sample consisted of 338 dermatologists registered in the United States.	<p>Dermatologists with a decade or less of practice experience were more likely to adopt teledermatology before the onset of the COVID-19 pandemic compared to their counterparts with two decades or more of clinical experience. Following the COVID-19 pandemic, dermatologists affiliated with private practices who have accumulated more than 20 years of experience were more likely to adopt teledermatology exclusively. A significant proportion of non-adopters, representing 81,3 %, expressed no intention to incorporate teledermatology into their practice.</p>
Lee et al. ⁽³⁰⁾	The sample consisted of 17,950 adult otolaryngology patients who were seen via telehealth at three Stanford-affiliated clinics between January 1, 2019, and December 31, 2022.	<p>Between 2019 and 2022, the number of people using telemedicine increased from 3 102 to 4 616. Patients making use of telemedicine were mainly young women.</p> <p>No significant differences were found in terms of ethnicity or race.</p>
Lantheaume et al. ⁽³¹⁾	14 oncologists were interviewed using a semi-structured survey	<p>Only 12 % of oncology consultations carried out by professionals are done via telemedicine. Technical limitations were identified as the main obstacles to implementing teleconsultation, even though doctors recognized its potential for monitoring their patients.</p>
Kim et al. ⁽³²⁾	The study involved 135 women diagnosed with pelvic floor disorders.	<p>The study assessed patients' perceptions and willingness to continue synchronous telemedicine visits to treat pelvic floor disorders beyond the COVID-19 pandemic.</p>

		Most participants (88,9 %) felt that the quality of their telemedicine consultations was better than expected, and 89,6 % expressed a desire to continue telemedicine care. Despite positive experiences, 19,4 % reported struggling with technology.
Shih et al. ⁽³³⁾	The sample size was 200 patients who completed the survey about their telehealth visit preferences.	The study found that of patients with advanced cancer, 67 % preferred virtual visits over in-person visits during the COVID-19 pandemic, and 61 % maintained this preference after the pandemic. Patients of Hispanic or Latino ethnicity and those experiencing increased dyspnea were less likely to prefer videoconference consultations.
Chimonas et al. ⁽³⁴⁾	The study included a total of 602,233 consultations, focusing on patients with breast and prostate cancer, the two most common non-dermatological malignancies in women and men.	The study found that the use of telemedicine in breast and prostate cancer patients increased from 2 % before the COVID-19 pandemic to 50 % during its peak, and then decreased to 30 % after the peak.
Bates et al. ⁽³⁵⁾	The sample consisted of 239 caregivers of pediatric patients with a urological diagnosis.	The pandemic increased the likelihood that caregivers will use telemedicine in medical consultations, positively predisposing to its use after the end of confinement. The predisposition to use telemedicine is influenced by the severity of the child's condition.

DISCUSSION

The articles analyzed indicate a significant increase in the adoption of telehealth and telemedicine after the pandemic, managing to maintain continuity of care in various contexts.^(21,25) Thus, areas such as oncology maintained online consultation as a complementary tool to reduce the burden of patients waiting.⁽³¹⁾ In many other areas, such as dermatology and pediatric urology, the pandemic was the driving force behind the online modality that has managed to continue after the end of confinement.^(29,35) Despite this high acceptance, it is important to mention that research carried out in the immediate aftermath of the pandemic shows much more positive results in the face of the continuity of telemedicine and telehealth. Studies carried out long after the end of confinement show a decline in the number of online consultations, although these are clearly higher than those that existed before the pandemic.

Among the factors that have stimulated the continuity of telehealth and telemedicine is the type of medical specialty, and the needs of the patient. This is how patients with diseases associated with mental health, chronic diseases such as cancer, osteoporosis or those who live far from health centers, have seen this modality of care as a very favorable alternative.^(20,21,22,33) For example, the 89,6 % of patients in the urogynecological area stated that they were willing to continue with online consultations given the convenience it implied for them.⁽³²⁾

On the other hand, among the factors that have affected the continuity of telehealth care are the advanced age and socioeconomic level of the patients, in addition to language limitations, in the case of migrants, and the low digital literacy of the population.^(19,23,26,30) This, added to an inadequate technological infrastructure, makes it less likely that this type of care modality will have sustained growth over time.⁽²¹⁾

From the perspective of health providers, although telemedicine has improved access to medical care for patients in rural areas,²⁴ there is still the impossibility of performing physical examinations, which limits diagnosis.^(25,27,33) As an alternative, hybrid systems are proposed that take the best of the online and face-to-face modalities to overcome the technical limitations that exist currently.⁽¹⁷⁾

The continuity of telehealth and telemedicine also depends on the development of concrete financing and professional training policies.^(17,31) In addition, it is crucial to co-design strategies with patients and professionals, addressing technological and cultural barriers, which will allow the development of flexible strategies focused on the needs of each patient.^(23,27)

Although telemedicine and telehealth in general have been shown to be able to expand access to care, their continuity over time requires resolving technological inequalities, ethical aspects associated with information privacy, and digital security when carrying out online health care.

The continuity of telehealth and telemedicine, especially in Latin America, requires the coordination of many actors, such as universities, public and private health centers, and the government. It is necessary to develop policies that can guarantee equity in technological access, which is one of the main problems for the continuity of these forms of care, given that we still have significant differences in access to the network in the different Latin American countries, with technological gaps that can only be overcome with the joint help of private and public organizations linked to health care.

CONCLUSIONS

The pandemic gave a positive boost to the development of telehealth and telemedicine, especially in areas such as mental health and those associated with chronic diseases. However, its growth faces significant challenges related to the technological divide, digital literacy, and socioeconomic and linguistic inequalities in the case of migrants. The benefits associated with accessibility and time and cost savings can be enhanced if work is done on the development of appropriate policies and professional training. Limitations such as the lack of physical exams and technical barriers can be worked on through hybrid models that integrate the best of face-to-face and virtual care. The continuity of telehealth and telemedicine involves addressing technological inequities and ensuring ethical standards of privacy and security. This, coupled with the development of patient-centric solutions, will be crucial for its consolidation.

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FINANCING

This work was supported by the Regional Government of Biobío under the Regional Innovation Fund for Competitiveness (FIC-R - 2021), Code BIP 40036011.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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