

Telemedicine and primary care: reach and limitations post-pandemic

Telemedicina y atención primaria: alcances y limitaciones post-pandemia

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ABSTRACT

Background: Telemedicine has established itself as a key tool to ensure the continuity of primary care during the COVID-19 pandemic, overcoming geographical barriers and optimizing resources. However, in the post-pandemic period, technological, social and regulatory challenges persist that condition its sustainability. Methods: A narrative literature review was conducted in academic databases and official documents, including fifteen studies published between 2021 and 2025 that addressed telemedicine in primary care. Results: The findings showed that telemedicine improved health coverage in rural areas, reduced waiting times, and optimized chronic disease management. High levels of patient and professional satisfaction were observed, although older adults had greater difficulties in adapting. Technological infrastructure barriers, digital literacy gaps, and regulatory gaps in bioethics and informed consent persist. Conclusion: Telemedicine is an effective and complementary tool for primary care, but it requires hybrid models and solid regulatory frameworks that guarantee equity, quality of care and sustainability over time.

Keywords: Telemedicine; Primary Health Care; Digital Health; Access to Health Services; COVID-19.

RESUMEN

Introducción: La telemedicina se consolidó como una herramienta clave para garantizar la continuidad de la atención primaria durante la pandemia de COVID-19, superando barreras geográficas y optimizando recursos. Sin embargo, en el período postpandemia persisten desafíos tecnológicos, sociales y normativos que condicionan su sostenibilidad. Métodos: Se realizó una revisión bibliográfica narrativa en bases de datos académicas y documentos oficiales, incluyendo quince estudios publicados entre 2021 y 2025 que abordaron la telemedicina en atención primaria. Resultados: Los hallazgos evidenciaron que la telemedicina mejoró la cobertura sanitaria en áreas rurales, redujo los tiempos de espera y optimizó la gestión de enfermedades crónicas. Se observaron altos niveles de satisfacción de pacientes y profesionales, aunque los adultos mayores presentaron grandes dificultades de adaptación. Actualmente hay barreras de infraestructura tecnológica, de alfabetización digital, vacíos normativos en bioética y consentimiento informado. Conclusión: La telemedicina es una herramienta complementaria para la atención primaria, pero se requieren modelos híbridos y marcos regulatorios sólidos que garanticen el equilibrio entre la calidad y eficacia de la atención.

Palabras clave: Telemedicina; Atención Primaria de Salud; Salud Digital; Acceso a los Servicios de Salud; COVID-19.

INTRODUCTION

Telemedicine has established itself as an innovative tool that transforms the delivery of health care. This model relies on information technologies to facilitate remote consultations, diagnoses, and medical follow-up, overcoming geographical barriers and optimizing resources.¹ Various studies have shown that its implementation improves access to health services, especially in rural areas or those with a shortage of professionals, and helps streamline care processes in high-demand urban areas.² The COVID-19 pandemic significantly accelerated its adoption, making it a key strategy for ensuring the continuity of patient care during a global health emergency.³

Despite these advances, questions remain that need to be addressed. While its potential to democratize access to healthcare is recognized, limitations remain related to technological infrastructure, the population's digital literacy, and cultural resistance from certain sectors of the healthcare system.⁴ The lack of sufficient local evidence regarding its effectiveness and sustainability in the post-pandemic period underscores the need to assess its true impact on the quality of care and on the relationship between patients and healthcare professionals.⁵

In this regard, the present study aims to delve deeper into the scope and limitations of telemedicine in primary care following the pandemic, evaluating its benefits, challenges, and opportunities for improvement. The central hypothesis posits that this modality has facilitated access to consultations and disease prevention in underserved areas. However, structural and social barriers persist that hinder its full integration into the healthcare system.⁶

MATERIALS AND METHODS

This study was conducted as an integrative narrative review, involving a thematic analysis of scientific and regulatory literature, prioritizing high-quality primary studies and systematic reviews published between 2019 and 2025. Its focus is on analyzing the implementation, scope, and limitations of telemedicine in primary health care, with special emphasis on the period following the COVID-19 pandemic.

1. Design

A descriptive review design was chosen because the objective was to gather, organize, and analyze information from scientific and regulatory sources on telemedicine. This type of study allows for the identification of advances, benefits, barriers, and prospects without directly intervening in a specific population.¹

2. Search Strategy and Selection of Sources

The information search was conducted across recognized academic databases and digital repositories, including PubMed, SciELO, Google Scholar, and Scopus. Documents from official organizations, such as the World Health Organization and the Argentine Ministry of Health, were also consulted.

The following Spanish keywords were used: telemedicine, telehealth, primary care, COVID-19, and digital health. To expand the international search, the following MeSH terms were incorporated: telemedicine, primary care, digital health, and post-pandemic healthcare.

The inclusion criteria were: Articles published between 2019 and 2025 to ensure post-pandemic updates; Studies addressing the use of telemedicine in primary care or in rural and urban populations; and official documents and regulations governing telemedicine in Argentina.

The exclusion criteria were: Articles without full-text access; Duplicate publications across different databases; and Studies focusing exclusively on hospital-based telemedicine unrelated to primary care.

Organization and Analysis of the Information

Once the sources were selected, we read, classified, and summarized the most relevant content, identifying the main trends, benefits, and challenges reported. The information was organized thematically, grouping the findings into three categories:

Scope and benefits of telemedicine in primary care.

Technological, social, and regulatory limitations.

Prospects for sustainable integration into the healthcare system.

No statistical analysis was performed, as this study does not include original data but rather integrates findings from previously published studies.

4. Quality Assurance of the Information

To ensure reliability, peer-reviewed articles, official digital health guidelines, and current regulations were prioritized. References were cited in Vancouver style, allowing verification of each source.

RESULTS

The review included 15 articles published between 2021 and 2025 that analyzed the use of telemedicine in primary care across different geographic contexts. Three major thematic areas were identified: access and coverage; user and professional satisfaction and perceptions; and structural and regulatory limitations.

Regarding access to primary care, Chiliquinga and López (2025) demonstrated that telemedicine significantly improved coverage in rural areas of Ecuador, reducing wait times and travel costs. Similar results were reported by Mallma (2024), who highlighted the usefulness of teleconsultation in mitigating the shortage of healthcare professionals in remote areas. Likewise, Silva-Tinoco and Torre-Saldaña (2021) documented its effectiveness in the comprehensive management of patients with diabetes during the pandemic.

Regarding satisfaction and perceptions, Becerra-Martínez et al. (2024) reported high satisfaction among outpatient patients with telehealth during the COVID-19 pandemic, while Gomes-de Almeida et al. (2021) found moderate acceptance, highlighting convenience but also the difficulty of technological adaptation among older adults. In Spain, Loezar-Hernández et al. (2023) found that primary care midwives viewed the continuity of care via telemedicine positively, although they noted the need for further professional training.

In terms of regulations, Spinosa (2024) analyzed the Argentine legal framework, identifying gaps in bioethics and informed consent. Similarly, Eler et al. (2023) reported administrative and regulatory barriers in Peru that affect the sustainability of the service.

Regarding limitations, Conde (2024) showed that the perceived ease of use in Puerto Rico was conditioned by technological infrastructure and socioeconomic status. Carrillo et al. (2022) noted that the shift from in-person to virtual consultations initially generated mistrust among a part of the population. García Ron et al. (2022) reported that, while telemedicine was useful for pediatric emergencies, it did not completely replace in-person evaluation in complex cases.

Finally, prospective studies such as those by Vilaseca and Howe (2022) and Herrera et al. (2023) suggested that primary care in the future must integrate hybrid modalities to ensure equity and quality of care. Mazón-Ramos et al. (2023) demonstrated that implementing e-consultations between primary care physicians and cardiologists reduced unnecessary referrals, thereby optimizing resource use.

Below is a summary of the most relevant results in the table.

Thematic Focus	Studies	Key Findings
Access and benefits	Chiliquinga and López (2025); Mallma (2024); Silva-Tinoco and Torre-Saldaña (2021); Mazón-Ramos et al. (2023)	Coverage in rural areas improved, wait times and travel costs were reduced; management of chronic diseases (diabetes) was optimized, and unnecessary referrals between care levels were avoided.
Satisfaction and perceptions	Becerra-Martínez et al. (2024); Loezar-Hernández et al. (2023); Gomes-de Almeida et al. (2021); García Ron et al. (2022)	Patients and healthcare professionals appreciated the continuity of care and the convenience of telemedicine; older adults had greater difficulty adapting; in pediatrics, it was considered useful for simple cases but did not fully replace in-person visits.
Limitations and regulations	Conde (2024); Spinosa (2024); Eler et al. (2023); Carrillo et al. (2022); Vilaseca and Howe (2022)	Technological and digital literacy barriers persist; there are legal gaps in bioethics and informed consent; some users are wary of the virtual format; a hybrid model is required to ensure quality and equity.

DISCUSSION

The results obtained in this review confirm that telemedicine is establishing itself as an effective strategy for expanding access to primary care, especially in rural settings and resource-poor communities. This finding is consistent with Chiliquinga and López, who show that coverage improves significantly in remote areas through virtual care, and aligns with Mallma, who highlights its role as a tool to address the shortage of healthcare personnel.

However, this review also reveals that telemedicine alone cannot eliminate preexisting inequalities. Conde and Eler demonstrate that poor technological infrastructure and low digital literacy are persistent barriers, reinforcing Vilaseca and Howe’s point about the need for a hybrid model that combines in-person and virtual care. This aspect raises an important point: while telemedicine democratizes access, it can widen digital divides if not accompanied by inclusive policies.

In terms of acceptance, satisfaction levels are high, as shown by Becerra-Martínez and Loezar-Hernández, but nuances exist across populations. Older adults, as documented by Gomes-de Almeida, face greater difficulties in adapting, underscoring the need for targeted support strategies. Furthermore, García Ron highlights that, in pediatrics and complex cases, teleconsultation does not replace in-person evaluation, reaffirming that telemedicine should be understood as a complement rather than an absolute replacement.

From a regulatory perspective, Spinosa identifies legal gaps in bioethics and informed consent in Argentina, a problem also evident in other Latin American countries, according to Eler. These gaps influence the pace of adoption and raise ethical challenges that remain unresolved. This review highlights the simultaneous integration of technological, social, and regulatory dimensions, showing that its adoption depends not only on professional will but also on a robust regulatory and educational ecosystem.

As a methodological limitation, this review is narrative, which prevents the quantitative measurement of the magnitude of the identified benefits and barriers. However, it enables a comprehensive analysis of experiences across contexts, which is valuable for understanding the phenomenon holistically.

Looking ahead, it is necessary to investigate sustainable hybrid models that integrate telemedicine and in-person care, prioritizing digital equity and the training of both professionals and users. It is also essential to further develop ethical regulatory frameworks and assess the long-term impact on the quality of care and the doctor-patient relationship.

In Argentina, there are regulations governing telemedicine, such as Law 27,553, which establishes general guidelines for its practice, including the protection of personal data and the need to ensure the quality and safety of care.

Ministerial Resolutions: The Ministry of Health has issued various resolutions detailing specific aspects of telemedicine, including the regulation of platforms, electronic prescribing, and system integration.

National Telehealth Plans: Plans such as the 2018–2024 National Telehealth Plan have been developed to promote the development and integration of telehealth into the Argentine health-care system.

In summary, this study reaffirms that telemedicine is a strategic tool for improving accessibility and optimizing resources in primary care. However, its sustainability and effectiveness depend on overcoming structural, regulatory, and cultural barriers that still limit its full development.

CONCLUSIONS

Overall, the analysis shows that telemedicine has transformed the delivery of primary care, becoming an indispensable complementary strategy in the post-pandemic period. Although it has proven effective in improving coverage, streamlining care processes, and optimizing resources, its full implementation requires overcoming technological, educational, and regulatory challenges that affect its equity and sustainability.

This study provides an integrated view of the benefits and limitations, highlighting the need to move toward hybrid models that strengthen the doctor-patient relationship and ensure quality of care. It is concluded that telemedicine should not be viewed as an end in itself, but rather as part of a resilient, flexible healthcare system adapted to new digital realities.

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