Gac Méd Caracas 2026;134(1):333-342
DOI: 10.47307/GMC.2026.134.1.28

Digital interventions in mental health: Critical reflections, recent evidence and challenges for integration into public health care policies

Intervenciones digitales en salud mental: reflexiones críticas, evidencia reciente y desafíos para la integración en las políticas públicas de atención sanitaria

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SUMMARY

Digital mental health interventions have become an effective, scalable, and cost-efficient alternative for addressing the persistent global gap in access to psychological care. Recent evidence demonstrates that Internet-based interventions, mobile applications, virtual reality environments, and hybrid therapeutic models significantly improve symptoms of depression, anxiety, emotional regulation, and resilience. Nevertheless, the accelerated expansion of these technologies calls for critical reflection on their ethical, technical, clinical, and policy implications, particularly in countries facing structural limitations within their healthcare systems. This article provides an analytical reflection on current advances, opportunities, and limitations of digital mental health interventions, while identifying key challenges for their sustainable integration into Latin American health systems. It highlights the need for robust regulatory frameworks, digital literacy strategies, sustainable financing models, and culturally grounded implementation practices that ensure equity, effectiveness, and continuity of care. Recommendations for ethical and context-sensitive integration into public health systems are provided.

Keywords: *Digital mental health, Internet-based interventions, virtual reality, public policy, healthcare systems.*

DOI: https://doi.org/10.47307/GMC.2026.134.1.28

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Recibido: 2 de diciembre 2025
Aceptado: 1 de febrero 2026

RESUMEN

Las intervenciones digitales para la salud mental se han consolidado como una alternativa eficaz, costo-efectiva y escalable frente a las brechas históricas en el acceso a la atención psicológica. La evidencia reciente indica que programas basados en Internet, aplicaciones móviles, realidad virtual y modelos

híbridos producen mejoras clínicas significativas en la depresión, la ansiedad, la regulación emocional y la resiliencia. Sin embargo, la expansión acelerada de estas tecnologías requiere una reflexión profunda sobre sus implicaciones éticas, técnicas, clínicas y de política pública, especialmente en países con limitaciones estructurales en sus sistemas sanitarios. Este artículo examina críticamente los avances actuales en las intervenciones digitales, sus oportunidades y limitaciones, así como los desafíos clave para su integración sostenible en los sistemas de salud de América Latina. Se reflexiona sobre la necesidad de marcos regulatorios sólidos, estrategias de alfabetización digital, modelos de financiación y lineamientos de implementación que garanticen la equidad, la efectividad real y la continuidad del cuidado. Finalmente, se ofrecen recomendaciones para que los sistemas de salud incorporen estas herramientas de forma ética, accesible y culturalmente pertinente.

Palabras clave: *Salud mental digital, intervenciones basadas en Internet, realidad virtual, políticas públicas, atención sanitaria.*

INTRODUCTION

Mental disorders represent one of the greatest burdens on contemporary health systems. Their high prevalence, functional impact, and socioeconomic consequences make it essential to develop innovative and sustainable alternatives that ensure timely access, continuity of care, and reduced disparities for historically underserved populations (1,2). In this context, digital mental health interventions (DMIs) have emerged as a dynamic field that combines clinical psychology with digital technologies to deliver evidence-based treatments at scale.

The evidence shows that digital interventions, including online psychological programs, mobile applications, hybrid therapy platforms, virtual reality (VR), augmented reality (AR), and mixed reality (MR), can produce clinical effects comparable to traditional psychotherapy in depression, anxiety, emotional disorders, and difficulties with affective regulation (3-7). In studies conducted in primary care, digital interventions have been shown to reduce depressive symptoms and improve functional indicators when properly implemented and well accepted by patients (1).

Additionally, advances in virtual and mixed reality enable the design of controlled, safe, and adaptive environments for therapeutic exposure, emotional training, and stress reduction, thereby enhancing the benefits of traditional psychotherapy while mitigating logistical, mobility, and stigma limitations (8-10). Complementarily, transdiagnostic internet-based approaches have shown strong evidence for emotion regulation, positive affect, and reduction of anxiety and depression (11-13).

Despite these advances, significant challenges remain, including high dropout rates, a lack of personalization, terminological heterogeneity, digital literacy gaps, limitations in technological infrastructure, and ethical concerns about privacy and confidentiality (14-17). In addition, health systems across countries, particularly in Latin America, still lack regulatory frameworks, care pathways, standardized protocols, and funding mechanisms that enable the implementation of these interventions to be conducted rigorously and equitably.

One of the central challenges lies in integrating these tools into healthcare systems operating under traditional models that offer little flexibility for technological innovation. The shortage of professionals specializing in Clinical and Health Psychology, the saturation of services, territorial and socioeconomic inequalities, and the stigma associated with psychological disorders make mental health identification tools a strategic opportunity to maximize access and reduce inequities (18-20).

This article offers a broad and critical reflection on the current state of digital interventions in mental health, reviewing their benefits, limitations, and transformative potential. It also addresses the importance of their integration into public policy, highlighting the need for robust regulatory frameworks, professional training strategies, digitalization of the healthcare system, and culturally appropriate, phased implementation programs.

As an additional contribution, the most relevant findings from the studies provided are integrated, including interventions for depression and anxiety, interventions for resilience, and prevention among university students, to inform

the path toward ethical, effective, and accessible digital mental health.

Current state of digital interventions in mental Health

Digital mental health interventions (DMIs) represent one of the most significant advances in contemporary clinical psychology. Since the late 20th century, and increasingly over the last decade, the combination of the internet, immersive technologies, and mobile platforms has transformed the therapeutic possibilities available to diverse populations. The growing body of research demonstrates that these interventions offer substantial improvements in depression, anxiety, emotional disorders, difficulties with affective regulation, and coping with stress (1-6).

In Europe, the United States, and, more recently, Latin America, internet-based psychotherapy programs grounded in cognitive-behavioral principles have demonstrated effectiveness, achieving effect sizes comparable to those of face-to-face therapy, particularly when they include interactive components, guided activities, and a user-centered design (1,3,11-13). These findings have spurred governmental and academic interest in developing scalable tools that address the structural challenges of healthcare systems. However, technological progress has been uneven and, in many contexts, still limited by regulatory barriers, ethical considerations, digital access gaps, and a lack of specific integration policies (14-17). Therefore, it is essential to analyze the clinical potential of these interventions and the methodological and structural challenges they pose.

Clinical effectiveness of Internet-based programs

The available literature demonstrates that internet-based cognitive-behavioral therapy (CBT) interventions represent the digital modality with the strongest scientific evidence. A representative example is the study by Mira et al. on interventions for depression in primary care, which reported significant reductions in depressive symptoms, functional improvements, and high program acceptability (1).

These interventions, known as IBIs (Internet-Based Interventions), share fundamental characteristics: structured self-application, interactive multimedia material, supervised or unsupervised activities, psychoeducational modules, cognitive restructuring, behavioral activation, and progress monitoring through secure platforms. Recent meta-analyses confirm that IBIs for depression and anxiety achieve effect sizes comparable to face-to-face interventions and even higher when moderate human support is provided (3,11-13). Furthermore, it has been shown that treatment acceptance plays a key role: users with higher expectations and greater confidence in the digital tool exhibit higher completion rates and better clinical outcomes (1).

This has direct implications for healthcare systems; merely implementing digital programs is insufficient. It is also necessary to ensure adequate processes for socialization, explanation, and initial orientation.

Transdiagnostic interventions and emotional regulation

The transdiagnostic approach has emerged as a highly relevant paradigm within digital clinical psychology. This model posits that multiple emotional disorders share underlying processes, primarily negative affect, emotional avoidance, cognitive biases, and difficulties in emotional regulation that can be addressed through a single therapeutic protocol. Díaz-García et al. show that online transdiagnostic protocols are effective in reducing anxiety, depression, and negative affect, and in improving quality of life, even without intensive supervision (11). The value of these approaches lies in their ability to simplify clinical staff training, enable single interventions for multiple diagnoses, be highly scalable, and increase equity by reducing individual costs. Furthermore, recent research has incorporated modules to enhance positive effects, a component historically neglected in digital treatments but essential for sustainable psychological well-being (11).

Interventions for resilience and coping

Mental health prevention and promotion have found an ideal setting in digital platforms. In young populations, particularly university students, resilience-building programs have been shown to improve coping strategies, reduce perceived stress, and lower the risk of developing emotional disorders (21-23).

The CORE protocol—Cultivating Our Resilience—is a digital, self-guided psychological intervention designed to strengthen resilience, reduce emotional distress, and promote well-being among university students. It has become a key reference in mental health promotion across Spain, Argentina, Colombia, and Mexico, owing to its rigorous validation through multicenter randomized controlled trials (RCTs). This program, based on Ryff's model of psychological well-being, has proven to be a high-potential tool for Latin American contexts, with the capacity for cultural adaptation and large-scale implementation (22-23).

Evidence suggests that resilience programs increase adaptive coping skills, reduce emotional distress in stressful situations, and can be more appealing than traditional treatments because they focus on personal growth. Given the substantial impact of academic and emotional stress on Latin American university students, these programs represent a strategic opportunity for public education and health policies.

Virtual reality and mixed realit y in psychotherapy

The use of immersive technologies such as virtual reality (VR), augmented reality (AR), and mixed reality (MR) has expanded rapidly. These tools enable the simulation of controlled, safe environments, facilitating exposure therapies, emotional training, and stress management (8-10).

Scientific evidence points to several advantages:

1. Proven Clinical Benefits:

   Greater control of the therapeutic stimulus; Safe repetition of feared scenarios; Greater adherence to phobias, anxiety, and trauma; Immersion that enhances emotional learning.

2. Opportunities Identified by Experts

   According to the SWOT (Strengths, Weaknesses, Opportunities, Threats) (Fortalezas, Debilidades, Oportunidades, Amenazas) analysis conducted by Ma et al. (8), the study evaluated the feasibility, challenges, and implementation potential of digital mental-health interventions for university students. The researchers identified strengths such as therapeutic flexibility, the ability to simulate environments that are impossible in real life, high applicability for anxiety and stress, and reduced bioethical and logistical risks. Threats were also identified, including a lack of standardization, high upfront costs, insufficient specialized training, and ethical gaps in the handling of biometric data.

3. Implementation Challenges

   The challenges identified include insufficient technological infrastructure, the absence of state regulations, and the risk of technological overdependence. In Latin America, these challenges require government investment, university-state partnerships, and intersectoral policies for healthcare digitalization.

Digital therapeutic alliance and patient-platform relationship

The therapeutic alliance (TA) has traditionally been considered one of the strongest predictors of clinical success. With the expansion of digital interventions, questions arose about whether a meaningful alliance can be established between a patient and an automated program. Herrero et al. introduce the WAI-TECH-SF, a specific measure for evaluating the patient-digital program alliance, demonstrating that digital TA predicts significant clinical changes; patients can develop trust, adherence, and a sense of collaboration even without constant human presence, and digital TA predicts treatment satisfaction (14). These findings have profound implications: the therapeutic relationship can be reconstructed within automated systems, provided the design incorporates elements of digital empathy, meaningful interaction, and timely feedback.

Current barriers and structural limitations of the field

Despite their potential, IDSMs (Internet-Delivered Self-Management interventions) face significant challenges that affect their actual implementation such as:

1. Terminology problems and lack of standardization: An international consensus indicates that the lack of conceptual uniformity affects research, training, and communication with patients (15), making it difficult to compare studies, regulate platforms, and design educational programs.
2. Dropout Rates and Lack of Adherence: Dropout rates are often due to low user motivation, lack of human feedback, unattractive design, and content overload.
3. Limitations of Digital Access: In rural or vulnerable regions, connectivity is insufficient, access to devices is limited, and technological literacy is uneven (16-17).
4. Ethical and Regulatory Risks: Risks related to data protection, privacy, secondary use of information, and the risk of unsupervised processing are identified.
5. Distrust towards digital tools: European studies identify concerns about privacy, effectiveness, and lack of human contact as the main barriers for users and professionals (16).

Reflections from Latin American Health Systems

The region faces structural challenges, including a shortage of psychologists *per capita*, fragmented systems, limited access to services, territorial inequality, stigma, and cultural barriers. In light of this, digital health information technologies (DHTs) offer a unique opportunity to expand health coverage. However, to integrate these technologies ethically and effectively, it is necessary to advance in: national regulatory frameworks, establishing guidelines for certification, supervision, and clinical use of digital tools; hybrid care models, combining in-person consultations with digital interventions to improve continuity of care; universal digital health literacy programs, reducing access gaps associated with socioeconomic status; a minimum technological infrastructure guaranteed by the State, including secure internet access, interoperable health platforms, and official use of electronic health records; community, intercultural, and territorial participation, especially in indigenous, rural, and vulnerable contexts; and sustainable financing strategies, linking with insurers, ministries of health, universities, and socially responsible technology companies.

Critical reflections and analysis for public policies

Critical reflections on the state of digital interventions in mental health

While scientific evidence demonstrates that mental health interventions (MHIs) yield significant clinical benefits, it is crucial to reflect on their current limitations and their potential to transform healthcare systems. Technological progress does not, in itself, guarantee effectiveness; multiple structural, cultural, economic, and ethical factors influence its impact.

MHIs are positioned as a necessary response to the growing demand for psychological services, but their actual implementation must be approached critically and with a long-term, systemic vision. The considerations presented below aim to contribute to the debate on how societies, especially those in Latin America, can integrate these technologies without reproducing historical inequalities or compromising clinical quality.

Essential ethical considerations

Ethics in digital health is a central, cross-cutting issue; despite progress, significant gaps remain that require immediate attention from universities, researchers, governments, and developers.

1. Data protection and privacy: Digital health services (DHSS) can collect large volumes of sensitive information, such as clinical data, usage patterns, emotional responses, and biometric data from VR and sensors. This necessitates robust privacy regulations, encryption standards, ongoing audits, and clear

rules on data storage and secondary use (14–17). In Latin America, many countries lack specific regulations governing digital health services, exposing users to additional risks in contexts where legal protection is limited.

2. Ethics of automated intervention: The automation of psychological support raises fundamental questions about the therapist's role, responsibility for adverse effects, algorithm-based clinical decision-making, and the potential for errors in automated interpretation. It is essential that the technologies used include explicit mechanisms for psychological emergencies, suicide risk detection, and immediate access to human professionals.
3. Risk of dehumanization and loss of interpersonal connection: Although studies demonstrate that therapeutic alliances can be established in digital contexts (14), there is legitimate concern about the decrease in human contact. Therefore, it is recommended that hybrid models be promoted that integrate meaningful human interaction.
4. Social justice and health equity: It is ethically unacceptable to promote digital interventions without ensuring that they do not widen the digital divide between those with and those without access to technology. Digital equity must be a guiding principle of all public policy in this area.

Methodological and scientific challenges

Although literature has advanced considerably, challenges remain that require rigorous research to consolidate the field.

1. Heterogeneity in Methodologies and Terminology: International consensus highlights the confusion caused by the multiplicity of terms used to refer to digital interventions (15), which hinders the comparison of studies and the synthesis of evidence.
2. Need for Longitudinal and Real-World Studies: Most studies are conducted under controlled conditions. Pragmatic designs are needed to evaluate effectiveness in real-world contexts, especially in vulnerable, rural populations with low digital literacy.
3. Personalization and cultural adaptability: Many digital programs have been developed in Europe or North America; their adaptation to Latin American contexts must account for language, cultural values, sociodemographic characteristics, and the specific needs of Indigenous and Afro-descendant communities.
4. Prevention and Promotion: A Still Underdeveloped Area: Despite advances in resilience and coping (21-23), preventive interventions require: greater systematization, multicenter studies, cost-effectiveness analysis, and scalability strategies.

Reflections on the formulation of public policies in digital mental health

The sustainable integration of social and cultural development (SCD) requires a serious, well-structured, and evidence-based public policy perspective. The following outlines the main elements that should guide this transformation.

1. Legal and Regulatory Framework: Health systems must establish specific regulations governing digital mental health services (DMS), including: certification of digital platforms, requiring scientific validation, security protocols and evaluation by specialized committees, guidelines for digital clinical practice, defining the professional scope, standards of care, required competencies and referral mechanisms, regulation of sensitive and biometric data, storage conditions, ethical authorization, limits on use for commercial or technological purposes, regulation of artificial intelligence (AI) in mental health, ensuring traceability, algorithmic transparency and accountability mechanisms.
2. Interinstitutional and Intersectoral Collaboration: Digital transformation cannot fall solely on healthcare systems; it requires coordination among Ministries of Health, Ministries of Information Technology, Universities and research centers, Hospitals and primary care networks, socially responsible technology companies, and public and private

insurers. Digital mental health, by its very nature, demands a collaborative, multi-sectoral structure.

3. Professional Training and Development: It is essential to develop continuing education programs for psychologists, psychiatrists, general practitioners, and healthcare personnel that include digital skills; digital health ethics; appropriate use of platforms; hybrid interventions; and clinical management of emergencies in digital contexts. Universities must incorporate these competencies into traditional academic training.
4. Digital Literacy for Users and Communities: To prevent widening gaps, health systems require digital health education campaigns, accessible materials in multiple languages and formats, community training in the basic use of health technologies, and strategies for rural, Indigenous, and low-income populations. Without digital literacy, digital mental health becomes a privilege rather than a right.
5. Technological Infrastructure and Connectivity as Social Determinants of Health: Internet access must be considered a structural determinant of digital health. Therefore, policies are needed that promote universal connectivity, access to secure devices, interoperable national platforms, and integrated digital health records. Without these foundations, implementation will be limited and unequal.
6. Sustainable Financing: An Essential Requirement: Economic sustainability is essential to prevent digital health interventions (DHIs) from relying solely on isolated projects. Governments must design public financing models, responsible public-private partnerships, incentives for national development, and insurance schemes that cover digital interventions. Without sustained investment, innovation becomes fragmented and lacks real impact.
7. Evaluation, Monitoring, and Continuous Improvement: It is necessary to establish ongoing monitoring programs that consider the quality of the tools, analyses of real-world usage data, clinical outcomes in vulnerable populations, and economic and social impacts. DHIs must be audited with the same rigor as in-person treatments.

Towards a Humanized Digital Mental Health: Guiding Principles

Based on the reviewed evidence, the following principles are proposed to guide ethical public policies: digital equity no program should be implemented without ensuring equal access; humanization of technology the therapeutic relationship remains central, and technology should strengthen it, not replace it; data security and protection absolute guarantee of privacy; scientific evidence and transparency every tool must demonstrate effectiveness, not just technological innovation; interculturality and territorial relevance adaptation of content to local contexts, especially for Indigenous and Afro-descendant populations; citizen participation users and communities must be active participants, not passive recipients; and shared responsibility of the State digital health should not depend on isolated private initiatives.

DISCUSSION

The expansion of digital mental health interventions (DMIs) is among the most significant advances of the last decade across public health, clinical psychology, and technological innovation. The evidence reviewed in this article, based on studies of internet-based interventions, transdiagnostic protocols, virtual reality, digital prevention, and resilience-building, paints a promising picture regarding effectiveness, accessibility, and user acceptability. However, this same picture is marked by profound tensions between technological promises and structural challenges. Hence, the need to critically analyze what these tools can and cannot contribute to healthcare systems, particularly in regions like Latin America, where social inequalities and limited technological infrastructure hinder large-scale implementation.

The studies reviewed demonstrate that mental health interventions (MHIs) can achieve clinical outcomes comparable to traditional face-to-face

interventions (1,3,11,14). This effectiveness has been documented in areas such as depression and anxiety in primary care, regulation of negative affect and strengthening of positive affect, prevention of emotional deterioration in university students, stress reduction and improved coping skills, and symptom management using virtual and mixed reality.

The accumulating scientific evidence suggests that these interventions are not only effective in controlled settings but also have the potential to function in real-world environments, provided that adequate technological and clinical support is available. However, efficacy should not be interpreted in isolation; clinical success depends on the degree of acceptability, the quality of the design, human support, the digital therapeutic alliance, and the user's ability to interact meaningfully with the platform. Studies on digital alliances confirm that therapeutic relationships do not disappear in digital environments; rather, they transform, adopting new forms of interaction based on user experience, personalization, and a sense of guidance (14).

This evidence suggests that technology should not be seen as a substitute for the therapist, but rather as an intelligent and complementary extension of clinical experience. Persistent gaps in adherence, dropout, and inequality persist, and despite advances, dropout rates remain a major limitation. This problem is especially relevant in developing countries, where digital literacy is limited, access to technological devices is unequal, connectivity is unreliable, and users may be unfamiliar with therapeutic self-administration.

European studies on barriers to acceptance (16) show that fear of privacy loss, preference for face-to-face contact, and doubts about effectiveness negatively influence adherence. These concerns are even more pronounced in contexts with fragmented healthcare systems or incomplete regulatory frameworks. Thus, although ICTs are presented as democratizing tools, their implementation without inclusive policies can increase digital inequality and, consequently, health inequality.

The transformative promise of digital prevention: the prevention and promotion of mental well-being among young people, especially university students, is one of the fields with the greatest potential in digital mental health (DMH). Studies such as those by CORE (21-23) show that resilience- and coping-focused programs can reduce the risk of developing emotional disorders, decrease academic stress, and improve quality of life.

Digital prevention is not only positioned as a cost-effective alternative but also an essential public health strategy for countries with limited resources. Its value lies in its capacity to intervene early, expand coverage, and prevent the saturation of traditional services. However, their real impact will depend on institutional willingness to integrate these programs into education and health policies, ensure connectivity and accessibility, and adapt content to local sociocultural contexts.

A key element emerging from the review is the centrality of public policies and ethical regulation, particularly the need for robust public policies. Without regulation, data security is at risk, clinical quality may be inconsistent, establishing standards of care becomes difficult, interventions may become unsupervised commercial products, and digital inequality may worsen.

For digital mental health initiatives (DMI) to fulfill their transformative promise, digital health must be recognized as a national priority. Policies must encompass regulatory frameworks, certifications, funding, infrastructure, professional training, interculturality, monitoring, and continuous improvement. Digital mental health cannot rely solely on isolated initiatives or individual researchers' efforts; it requires high-level policy decisions.

CONCLUSIONS

Digital interventions in mental health represent a historic opportunity to transform psychological care and expand service coverage effectively and sustainably. The reviewed evidence demonstrates that they are clinically effective in addressing depression, anxiety, emotional regulation, and resilience; they can improve accessibility, especially in contexts with professional shortages; they possess high preventive potential, particularly among young people and university students; they require robust regulatory, ethical,

and technical frameworks to ensure their safe implementation; they demand comprehensive, coordinated, and sustainable public policies; they can be integrated into hybrid models, strengthening the therapeutic relationship rather than replacing it; and they can reduce inequities, provided that states guarantee connectivity, digital literacy, and access to devices.

Digital mental health must be built on principles of equity, humanization, scientific evidence, and institutional co-responsibility. Only in this way can technologies become transformative tools and not factors of exclusion.

In short, digital mental health technologies (DMH) are not merely a technological advancement; they constitute a profound shift in how societies conceive of, prevent, and address human suffering. Their ethical, regulated, and culturally appropriate adoption will enable us to move toward more accessible, inclusive health systems that are better prepared for the mental health challenges of the 21st century.

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