



Integration of Digital Health, Telemedicine, and Healthcare Service Management: Implications for Quality of Care and Health System Sustainability – A Scoping Review

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ABSTRACT

Digital health and telemedicine have evolved into structural components of modern healthcare systems, fundamentally transforming how access, service delivery, and care coordination are organized. While their adoption accelerated during the COVID-19 pandemic, their broader implications for healthcare service management, quality of care, and system sustainability remain variably understood. This scoping review aims to synthesize current evidence on the integration of digital health, telemedicine, and healthcare service management, with a focus on their impact on quality of care and health system sustainability. A scoping review design was applied following PRISMA-oriented principles. Literature published between 2020 and 2026 was identified from major scientific databases, including PubMed, Scopus, and ScienceDirect. Studies were included if they examined digital health or telemedicine interventions and reported outcomes related to healthcare access, service quality, patient experience, efficiency, or sustainability. Evidence was synthesized across four domains: digital health ecosystem, access to care, service quality, and efficiency–sustainability. The findings indicate that digital health and telemedicine expand healthcare access by reducing geographical and temporal barriers, improve service quality through enhanced coordination and communication, and increase operational efficiency by optimizing resource utilization and reducing unnecessary hospital visits. In addition, digital health contributes to system sustainability by enabling flexible, adaptive service delivery models and improving system resilience. However, these benefits are conditional on factors such as infrastructure readiness, interoperability, governance frameworks, and digital equity. Digital health and telemedicine should be conceptualized as healthcare service-management infrastructure rather than standalone technologies. Their impact on quality and sustainability depends on effective integration with clinical workflows, organizational processes, and policy frameworks. Future health systems must focus on governance, equity, and continuous performance evaluation to realize the full potential of digital transformation.

Keywords: digital health; telemedicine; healthcare service management; quality of care; health system sustainability; health system innovation

I. INTRODUCTION

Digital health and telemedicine should be interpreted not merely as technological innovations, but as structural transformations in how healthcare systems organize access, coordinate services, and manage clinical and operational processes. In contemporary health systems, digital platforms increasingly function as foundational infrastructure that connects patient care, information systems, and managerial decision-making into a single integrated ecosystem (Budd et al., 2020; Kruse & Heinemann, 2022). This transformation reflects a

broader shift from facility-based service delivery toward distributed, technology-enabled care models that emphasize accessibility, responsiveness, and continuity of care (Keesara et al., 2020; Iyengar et al., 2020).

From a healthcare service management perspective, telemedicine expands the spatial and temporal boundaries of care delivery by enabling services beyond traditional institutional settings (Mann et al., 2020; Wosik et al., 2020). It supports remote consultation, monitoring, and follow-up across different levels of care, thereby reducing geographical barriers and improving system responsiveness (Kruse et al., 2023; Golinelli et al., 2020). This transformation is particularly relevant in the post-pandemic context, where health systems must balance increasing demand with limited capacity while maintaining quality and safety standards (Whitelaw et al., 2020; Omboni et al., 2022).

The integration of digital health into service management introduces a new paradigm of healthcare coordination and control that relies on real-time data and interconnected systems. Digital platforms enable continuous patient monitoring, enhanced clinical documentation, and improved data exchange across providers, thereby strengthening alignment between clinical and managerial functions (Kruse & Heinemann, 2022; Golinelli et al., 2020). In this context, digital health operates simultaneously as a clinical support tool and a system-level coordination mechanism that shapes workflow design, resource allocation, and performance monitoring (Wosik et al., 2020; Iyengar et al., 2020). This integration supports the transition toward data-driven and patient-centered healthcare delivery models (Rahimi et al., 2024; Kruse et al., 2023).

The managerial relevance of digital health becomes particularly evident when analyzed through quality of care and health system sustainability frameworks (World Health Organization, 2021; Whitelaw et al., 2020). From a quality perspective, digital health improves communication, enhances coordination, and reduces fragmentation across care pathways (Keesara et al., 2020; Budd et al., 2020). From a sustainability perspective, digital health supports cost containment, resource optimization, and resilience through flexible service delivery models (Omboni et al., 2022; Golinelli et al., 2020). However, these benefits are not inherently guaranteed and depend on governance, infrastructure readiness, and organizational integration.

Despite its rapid expansion, the evidence base remains conceptually fragmented, with many studies focusing on isolated indicators such as utilization, satisfaction, or cost. This fragmented perspective limits understanding of how digital health interacts with broader healthcare service management systems and organizational performance (Rahimi et al., 2024; Budd et al., 2020). Therefore, a system-level analytical approach is required to integrate technological, clinical, and managerial dimensions into a unified framework.

This review contributes to the literature by proposing a novel integrative framework of digital health–service management integration. Unlike prior studies that tend to evaluate digital health and telemedicine as separate technological interventions or clinical service modalities, this review conceptualizes them as organizational and managerial infrastructures that reshape healthcare access, service quality, operational efficiency, and sustainability. The proposed framework integrates technological readiness, workflow alignment, governance, digital equity, and outcome measurement into a single analytical model. This service-management lens provides a more comprehensive explanation of why digital health produces variable outcomes across healthcare systems and under what organizational conditions it can contribute to sustainable quality improvement.

Furthermore, digital health implementation introduces significant challenges related to inequality, interoperability, governance, and system complexity (Iyengar et al., 2020; Omboni et al., 2022). Limited digital access, variations in technological infrastructure, and disparities in digital literacy may influence the effectiveness of telemedicine interventions across

populations (Kruse & Heinemann, 2022; Wosik et al., 2020). Without appropriate governance and policy alignment, digital transformation may exacerbate disparities and create variability in service quality and outcomes (Rahimi et al., 2024; World Health Organization, 2021).

Given these considerations, this study aims to conduct a scoping review of the integration of digital health, telemedicine, and healthcare service management, with a particular focus on their implications for quality of care and health system sustainability. This review seeks to answer How does the integration of digital health and telemedicine into healthcare service management systems influence quality of care and health system sustainability? What conditions determine its effectiveness? By synthesizing current evidence through a service-management lens, this study contributes to a more comprehensive understanding of digital health as a socio-technical system that shapes both clinical outcomes and organizational performance.

II. METHODS

The analysis was organized using an integrated framework that captures the intersection between digital systems and healthcare service management. Inclusion criteria focused on studies examining digital health or telemedicine in healthcare contexts with outcomes related to access, quality, patient experience, efficiency, or sustainability, while exclusion criteria removed purely technical studies, non-integrated consumer apps, and non-empirical publications.

Literature was retrieved from multidisciplinary databases (PubMed, Scopus, ScienceDirect, SpringerLink, SAGE, Taylor & Francis, IEEE Xplore) using structured keyword combinations, followed by manual screening of references to ensure completeness. Study selection was conducted in three stages (identification, screening, eligibility), and data were extracted using predefined variables covering study characteristics, intervention types, context, outcomes, and implementation factors. Due to study heterogeneity, findings were synthesized narratively based on predefined analytical domains.

The study selection process followed the PRISMA-ScR flow structure as shown in Figure 1. The initial search identified 684 records from PubMed, Scopus, ScienceDirect, SpringerLink, SAGE, Taylor & Francis, and IEEE Xplore. After duplicate removal, 512 records remained for title and abstract screening. A total of 389 records were excluded because they did not meet the inclusion criteria or were not directly related to digital health, telemedicine, healthcare service management, quality of care, or health system sustainability. Subsequently, 123 full-text articles were assessed for eligibility. Of these, 76 articles were excluded because they focused only on technical system design, non-integrated consumer applications, disease-specific outcomes without service-management relevance, or lacked sufficient discussion of implementation conditions. Finally, 47 studies were included in the narrative synthesis.

Table 1. Analytical Framework and Key Variables

Component	Description	Key Focus
Study Design	Scoping review with PRISMA-oriented reporting	Mapping broad evidence
Analytical Domains	1) Digital ecosystem 2) Access 3) Quality 4) Efficiency–Sustainability	System-level integration
Inclusion Criteria	Digital health / telemedicine + healthcare context + service outcomes	Relevance to management
Exclusion Criteria	Technical-only, non-integrated apps, non-empirical studies	Maintain rigor
Data Sources	PubMed, Scopus, ScienceDirect, Springer, SAGE, T&F, IEEE	Multidisciplinary coverage
Search Strategy	Boolean keywords (digital health + management + outcomes)	Structured retrieval
Selection Process	Identification → Screening → Eligibility	Methodological consistency
Data Extraction	Study design, intervention, context, outcomes, implementation factors	Systematic comparison
Synthesis Method	Narrative synthesis	Cross-context interpretation

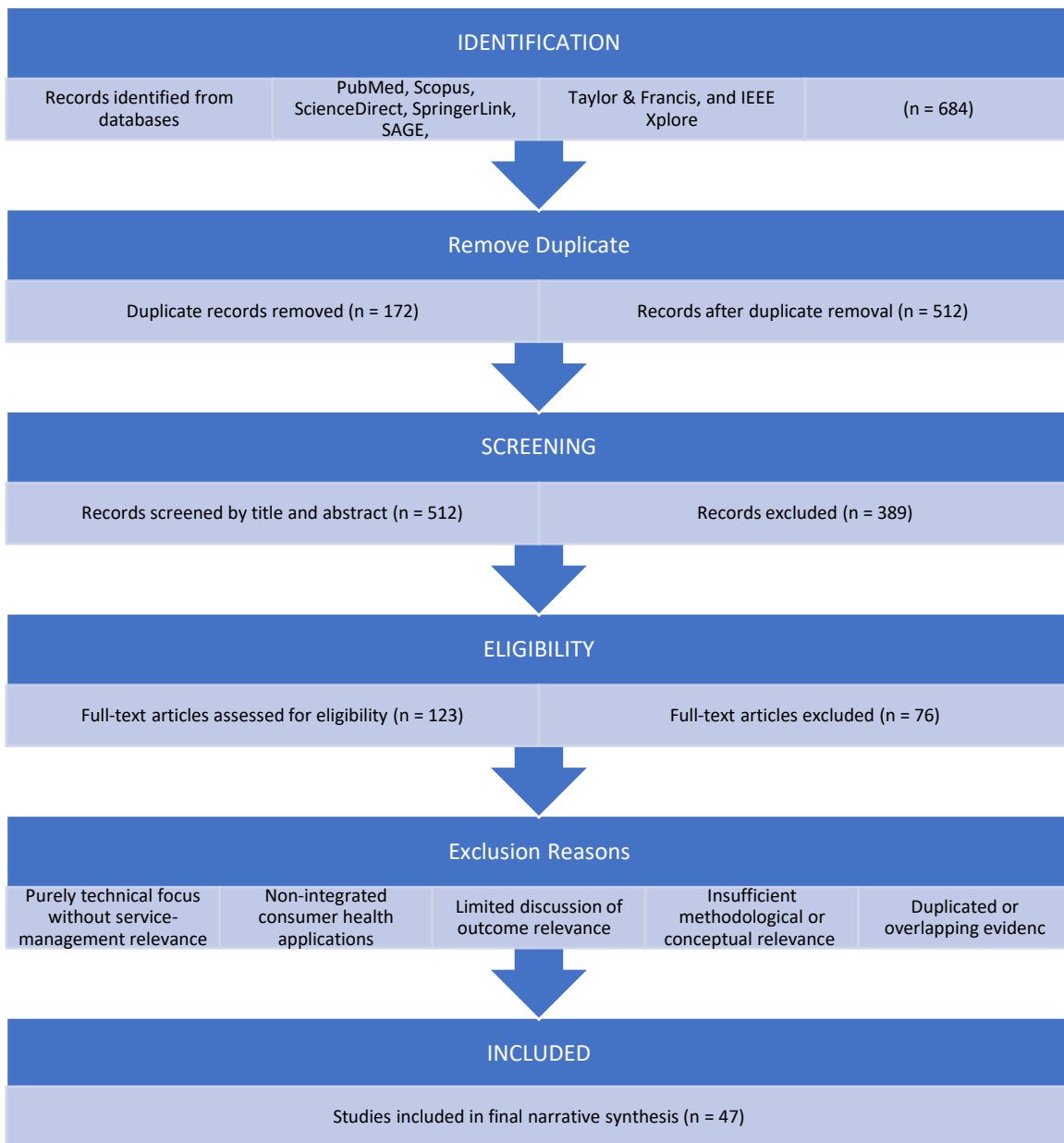


Figure 1. PRISMA-ScR Flow Diagram

Ethical Considerations

This study is based exclusively on previously published literature and does not involve human participants, patient data, or clinical intervention. Therefore, formal ethical approval was not required. Academic integrity was maintained through transparent reporting, accurate citation practices, and avoidance of fabricated or unsupported claims.

III. RESULTS AND DISCUSSION

Results

The literature consistently demonstrates that the integration of digital health and telemedicine represents a transition from fragmented service delivery toward coordinated, platform-based healthcare systems (as described in table 2). Rather than functioning as isolated clinical tools, digital health technologies increasingly operate as system-level infrastructure

that connects patient access, clinical processes, and managerial control within a unified service architecture.

A recurring pattern across studies is the shift from traditional hospital-centered care toward distributed care models supported by telemedicine and digital platforms. These models extend healthcare delivery across spatial and temporal boundaries, enabling continuous interaction between patients and healthcare providers while simultaneously enhancing operational control at the organizational level (Rahimi et al., 2024; Kruse & Heinemann, 2022).

However, the evidence also indicates that outcomes are not uniform. Improvements in quality, efficiency, and sustainability depend heavily on integration factors such as governance, infrastructure readiness, interoperability, and workforce adaptation. This confirms that digital health should be interpreted as a conditional value system, rather than a universally effective solution.

Table 2. Synthesis of Core Results

Domain	Key Findings	Service Management Implication
Digital health integration	Platforms connect clinical care, administration, and data systems	Shifts healthcare toward integrated service ecosystems
Access to care	Telemedicine reduces geographical and time barriers	Expands population coverage and service reach
Service quality	Improved coordination and communication	Reduces fragmentation and improves continuity
Patient experience	Increased convenience and engagement	Positions patient as active participant
Efficiency	Reduced hospital utilization and improved workflows	Supports operational optimization
Sustainability	Enables adaptive, flexible care models	Strengthens system resilience and cost control

1. Digital Health Ecosystem and Service Integration

The findings indicate that digital health should be conceptualized as an integrated ecosystem that links multiple layers of healthcare delivery rather than as a standalone technology. Digital platforms facilitate coordination between clinical decision-making, administrative processes, and patient interactions, allowing healthcare organizations to manage services more holistically.

This ecosystem perspective highlights the convergence of clinical, informational, and managerial domains, where patient data flows continuously across system boundaries and informs both clinical and operational decisions. As a result, healthcare delivery becomes increasingly data-driven and responsive to dynamic patient needs. Moreover, digital health platforms support interoperability between service units, enabling coordination across departments, institutions, and levels of care. This integration reduces duplication of services, enhances visibility of patient pathways, and improves alignment between clinical and managerial objectives.

2. Telemedicine and Access to Care

Telemedicine is consistently identified as a driver of improved healthcare access. By eliminating geographical constraints and reducing reliance on physical infrastructure, telemedicine allows patients to access healthcare services more quickly and conveniently. This is particularly beneficial for populations in rural or underserved areas, where access to specialized services is often limited.

Beyond physical access, telemedicine also enhances temporal accessibility, allowing patients to receive care without delays associated with scheduling, transportation, or facility congestion. This reduces waiting times and improves responsiveness within healthcare systems (Mann et al., 2020; Kruse & Heinemann, 2022). However, access improvements are influenced by digital infrastructure and literacy. The benefits of telemedicine may not be equally distributed, and disparities in access to technology can create unequal service outcomes across populations.

3. Service Quality and Patient Experience

The integration of digital health is associated with improvements in service quality, primarily through enhanced communication, documentation, and coordination. Digital platforms enable real-time sharing of clinical information, reducing fragmentation and ensuring continuity across care episodes.

Improved data availability supports more informed clinical decision-making and reduces errors associated with incomplete or delayed information. In addition, digital health systems facilitate standardized processes and clinical pathways, contributing to consistency in care delivery (Keesara et al., 2020). From a patient perspective, digital health improves experience by increasing convenience, reducing travel time, and enabling more frequent interaction with healthcare providers. Patients are able to engage more actively in their care, particularly in chronic disease management contexts.

4. Cost-Efficiency and Operational Performance

Digital health contributes to healthcare efficiency primarily through reduction of unnecessary utilization and optimization of resource allocation. Telemedicine reduces the number of in-person visits, thereby decreasing congestion in healthcare facilities and enabling more efficient use of clinical resources.

Operational performance is also improved through streamlined workflows, better scheduling systems, and more effective coordination between service units. These improvements reduce administrative burden and support more efficient service delivery (Kruse & Heinemann, 2022; Rahimi et al., 2024). However, the evidence indicates that efficiency gains are not automatic. They depend on the extent to which digital systems are integrated into workflow processes and supported by organizational structures. Poorly integrated systems may increase complexity rather than reduce it.

5. Health System Sustainability

Digital health plays a critical role in enhancing health system sustainability by enabling flexible and adaptive service delivery models. By reducing reliance on physical infrastructure and enabling remote care, digital health supports long-term cost containment and resource optimization.

Furthermore, digital systems contribute to system resilience, allowing healthcare organizations to respond more effectively to changes in demand, including crisis situations such as pandemics. The ability to scale services, redistribute resources, and monitor performance in real time enhances the overall stability of healthcare systems (WHO, 2021). Nevertheless, sustainability remains conditional on governance and equity considerations. Without appropriate policies and investment, digital health may introduce new costs, increase disparities, and create variability in service quality.

Table 3. Digital Health Outcomes and Conditions

Outcome	Contribution	Critical Condition
Access	Improved reach and responsiveness	Infrastructure & digital literacy
Quality	Better coordination and reduced errors	System integration & usability
Experience	Increased convenience and engagement	Patient acceptance & trust
Efficiency	Reduced utilization and optimized workflows	Workflow alignment
Sustainability	Cost control and system resilience	Governance & policy support

6. Integrated Framework: Digital Health–Service Management Model

The findings support the development of an integrated framework in which digital health operates as a multi-layered system linking technological infrastructure, healthcare service processes, and governance mechanisms. As shown in Table 4, at the foundational level, digital infrastructure includes telemedicine platforms, electronic health records, and data analytics systems that enable continuous information flow and connectivity across healthcare settings. This technological layer forms the basis for service transformation by supporting real-time communication, data-driven decision-making, and system-wide coordination.

At the operational level, this infrastructure is translated into service management processes, including care coordination, workflow integration, and resource allocation, which directly influence healthcare delivery performance. These processes generate measurable outcomes across key domains, namely access to care, quality of care, patient experience, operational efficiency, and system sustainability. The effectiveness of this framework is further determined by governance and contextual factors, including policy and regulation, organizational readiness, equity and digital inclusion, and data governance and security, which collectively ensure that digital health integration is sustainable, accountable, and aligned with health system objectives.

Table 4. Integrated Framework Logic

Layer	Function	Outcome Link
Digital infrastructure	Enables connectivity and data flow	Foundation for all outcomes
Service management	Translates technology into practice	Determines operational impact
Outcome domains	Reflect system performance	Measure value of integration
Governance	Regulates and sustains system	Ensures long-term effectiveness

The integration of digital health and telemedicine into healthcare service management systems influences quality of care and health system sustainability through a combination of access expansion, service coordination, and operational optimization.

However, these effects are mediated by organizational, technological, and governance conditions. Digital health improves access by extending service reach, enhances quality through coordination and data availability, and supports efficiency through optimized workflows.

At the system level, it contributes to sustainability by enabling flexible and resilient service models. At the same time, its effectiveness is contingent upon the alignment of digital technology with service management processes, the presence of supportive governance structures, and the ability of healthcare systems to address equity and infrastructure challenges.

Discussion

The digital health integration represents a systemic transformation rather than a technological enhancement because it reorganizes service delivery structures and decision-making processes at multiple levels of the health system (Shaw et al., 2021; Sheikh et al., 2021). This transformation reflects the evolution of healthcare toward digitally mediated systems where clinical, operational, and informational components are interconnected and interdependent (Hollander & Carr, 2020; Vidal-Alaball et al., 2020). Digital health therefore functions as a socio-technical infrastructure that integrates patient care, information systems, and institutional governance into a cohesive operational model (Topol, 2019; Mesko et al., 2020).

The convergence of clinical and managerial domains is driven by digital platforms that translate patient data into actionable insights for both clinical decision-making and organizational control (Rahimi et al., 2024; Barbieri et al., 2023). This integration enhances system performance by reducing fragmentation and improving coordination across service pathways (Kruse & Heinemann, 2022; Vidal-Alaball et al., 2020). Accordingly, the effectiveness of digital health depends on how well healthcare organizations align technological capabilities with service management processes and operational workflows (Snoswell et al., 2020; Wosik et al., 2020; Choi et al., 2021).

From Access Expansion to Service Transformation

Telemedicine improves access by overcoming spatial and logistical constraints that traditionally limit healthcare utilization (Smith et al., 2020; Contreras et al., 2020). However, its broader significance lies in enabling decentralized care models that redistribute service delivery across multiple settings and locations (Bokolo, 2021; Monaghesh & Hajizadeh, 2020). This transformation shifts healthcare from facility-centered systems toward continuous, patient-centered service ecosystems that emphasize flexibility and responsiveness (Fagherazzi et al., 2020; Doraiswamy et al., 2020).

The expansion of access also changes demand dynamics by increasing patient engagement and facilitating earlier intervention (Ramaswamy et al., 2020; Serper & Volk, 2020). This improves continuity of care and supports long-term management of chronic conditions (Kruse & Heinemann, 2022; Omboni et al., 2020). Nevertheless, access expansion alone does not guarantee improved outcomes without integration into structured care pathways and service management systems (Dorsey & Topol, 2020; Kichloo et al., 2020).

Service Quality and Patient-Centered Care

Digital health improves service quality by enhancing coordination, communication, and timely access to clinical information (Shigekawa et al., 2018; Totten et al., 2020). Real-time data sharing reduces fragmentation and supports consistent and evidence-based clinical decisions (Bashshur et al., 2020; Fatehi & Vidal-Alaball et al., 2020). This establishes digital

health as a mechanism for standardizing care processes and reducing variability across providers (Flodgren et al., 2015; Tuckson et al., 2017).

Patient-centered care is strengthened through digital engagement tools that increase interaction and participation in health management (Gajarawala & Pelkowski, 2021; Orlando et al., 2019). Telemedicine improves treatment adherence and satisfaction by reducing inconvenience and improving communication channels (Powell et al., 2017; Ekeland et al., 2010). However, outcomes depend on usability, digital literacy, and trust in technologies, which influence patient acceptance (Kruse et al., 2023; van Dyk, 2014).

System design also plays a critical role, as poorly integrated digital solutions may increase clinician workload and disrupt workflow efficiency (Carayon et al., 2019; Coiera, 2020). Therefore, alignment between clinical practice and digital systems is required to ensure that quality improvements are realized (Buntin et al., 2011; Jones et al., 2014).

Efficiency and Operational Performance

Digital health improves efficiency by enabling optimized resource allocation and streamlined workflows across healthcare systems (Zanaboni et al., 2018; Wade et al., 2010). Telemedicine reduces unnecessary visits and redistributes workload, which decreases congestion and improves operational performance (Dullet et al., 2017; Uscher-Pines et al., 2020). These improvements allow healthcare systems to manage increasing demand more effectively (Mehrotra et al., 2020; Ashwood et al., 2017).

Efficiency gains depend on integration within organizational processes, as embedded systems produce greater impact than isolated implementations (Glasgow et al., 2012; Adler-Milstein et al., 2014). In contrast, fragmented systems can increase complexity and reduce efficiency (Boonstra et al., 2014; Cresswell et al., 2013). This highlights the importance of system alignment in achieving performance improvements (Jones et al., 2014; Vest & Kash, 2016).

Digital health also supports data-driven decision-making and continuous performance monitoring, improving transparency and adaptability (Evans, 2016; Wang et al., 2018). These capabilities enable healthcare systems to respond dynamically to operational challenges and changing demand (Porter & Lee, 2013; Bates et al., 2014).

Health System Sustainability and Strategic Implications

Digital health contributes to sustainability by enabling cost-efficient, flexible, and resilient healthcare models (Drury et al., 2017; Darkins et al., 2008). Remote care reduces infrastructure dependence and supports scalable service delivery (Totten et al., 2016; Bashshur et al., 2016). These characteristics enhance system resilience and support continuity during disruptions (Smith et al., 2020; Hollander & Carr, 2020).

However, sustainability is constrained by the costs of implementation, maintenance, and workforce training (Kruse et al., 2023; Mair et al., 2012). Without proper governance and planning, these costs may outweigh efficiency benefits (Sheikh et al., 2021; Lennon et al., 2017). Therefore, sustainable digital health implementation requires long-term system alignment and strategic planning (Glasgow et al., 2012; Topol, 2019).

Equity is a central sustainability concern because unequal access to technology may exacerbate disparities in care delivery (Ramsetty & Adams, 2020; Chang et al., 2021). Addressing digital inequality is essential for ensuring that benefits are distributed fairly across populations (Robinson et al., 2015; Viswanath & Kreuter, 2007).

Governance, Policy, and Organizational Readiness

Governance is a fundamental determinant of digital health effectiveness because it ensures alignment between technology, clinical practice, and policy frameworks (WHO, 2021; Kickbusch et al., 2021). Effective governance establishes standards for interoperability, data security, and quality assurance (Vayena et al., 2018; Iyengar et al., 2020). These frameworks enable safe and accountable implementation across healthcare systems (Heathfield et al., 2017; Shaw et al., 2017).

Organizational readiness is equally critical, as successful implementation depends on workforce capability and institutional culture (Gagnon et al., 2016; Ross et al., 2016). Healthcare professionals must be trained to integrate digital tools into practice, and organizations must support innovation environments (Cresswell & Sheikh, 2013; Boonstra & Broekhuis, 2010).

Policy frameworks must evolve to integrate digital health within national health strategies and regulatory systems (Kickbusch et al., 2021; WHO, 2021). This alignment ensures scalability, sustainability, and long-term system performance (Porter & Lee, 2013; Topol, 2019).

IV. CONCLUSION

The findings demonstrate that the integration of digital health, telemedicine, and healthcare service management represents a fundamental transformation in how healthcare systems organize access, deliver services, and sustain performance over time. Across the literature, digital health consistently emerges not as a standalone technological intervention, but as a system-level infrastructure that connects clinical processes, patient interaction, and managerial decision-making into a unified operational framework.

At the level of key outcomes, the evidence indicates that digital health contributes to healthcare improvement through three primary pathways. First, telemedicine expands access to care by reducing geographical, temporal, and organizational barriers, thereby enabling more responsive and continuous service delivery. Second, digital platforms strengthen service quality by improving communication, coordination, and information availability across healthcare providers, which reduces fragmentation and supports more consistent clinical decision-making. Third, digital health enhances operational efficiency and sustainability by optimizing resource utilization, reducing unnecessary hospital visits, and enabling flexible, adaptive service models that increase system resilience.

However, the central conclusion of this review is that these benefits are conditional rather than automatic. The effectiveness of digital health integration depends on how well technological systems are embedded within healthcare service management processes and supported by governance structures, infrastructure readiness, and organizational capacity. Without such integration, digital health may produce limited impact or even introduce new complexities, inefficiencies, and inequities.

Recommendations

For healthcare managers, digital health should be approached as strategic service infrastructure rather than an operational add-on. This requires a shift from technology acquisition toward system integration. Healthcare organizations should:

1. Develop integrated digital service models that align telemedicine with clinical workflows, patient pathways, and operational processes

2. Establish performance monitoring systems (dashboard-based) to track access, quality, patient experience, and efficiency outcomes
3. Strengthen workforce readiness, including training, digital literacy, and clinical ownership of digital tools
4. Implement workflow simulation and pilot testing before full-scale deployment to ensure compatibility with real clinical environments
5. Embed digital health within continuous quality improvement cycles (PDCA) and service evaluation systems

From a managerial standpoint, the key objective is not only to adopt digital tools, but to ensure that these tools reconfigure service delivery in a measurable and sustainable way. At the policy level, digital health integration requires a coordinated governance framework that ensures standardization, equity, and long-term sustainability. Policymakers should:

1. Develop national digital health strategies that integrate telemedicine into broader health system planning
2. Establish regulatory standards for interoperability, data protection, clinical safety, and quality assurance
3. Strengthen infrastructure investment, particularly in underserved and rural areas to reduce the digital divide
4. Ensure equitable access by supporting inclusive digital health programs and addressing technological disparities
5. Introduce accreditation and evaluation mechanisms that assess not only digital adoption, but also integration, performance, and patient outcomes

Digital health policy should therefore evolve from promoting adoption toward ensuring accountable, equitable, and value-based implementation. The long-term sustainability of digital health initiatives depends on the alignment between technological innovation and system-level governance.

Healthcare systems that successfully integrate digital health into service management are more likely to achieve resilience, characterized by the ability to adapt to changing demand, respond to crises, and maintain continuity of care across different contexts. Future research should move beyond examining isolated outcomes of telemedicine or digital health adoption and instead focus on system-level integration and long-term impact. Key research priorities include:

1. **Integration Mechanisms** : Future studies should examine how digital health is embedded within healthcare workflows, governance structures, and organizational processes, including comparative analysis across different health system models.
2. **Outcome Measurement Beyond Utilization**: Research should move beyond measuring telemedicine usage or satisfaction toward evaluating clinical outcomes, quality indicators, efficiency metrics, and sustainability performance.
3. **Equity and Digital Inclusion**: There is a critical need to investigate how digital health affects different population groups and to identify strategies that mitigate disparities related to access, digital literacy, and socioeconomic factors.

4. Long-Term Sustainability and Cost Analysis: Future studies should include longitudinal designs that assess the long-term economic impact of digital health, including cost-effectiveness, return on investment, and system resilience.
5. Governance and Policy Evaluation: Research should explore how regulatory frameworks, national strategies, and institutional governance models influence digital health outcomes across different healthcare systems.
6. Workforce Adaptation and Human Factors: Understanding how healthcare professionals adopt, trust, and interact with digital systems is essential for ensuring that technological integration translates into improved performance.
7. Comparative Health System Studies: Cross-country and cross-system comparisons are needed to identify best practices and contextual factors influencing successful digital health integration.

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