

Sustaining Telehealth in Minority Communities: A Systematic Literature Review of Resilience Approaches Amid Disruptions

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SUSTAINING TELEHEALTH IN MINORITY COMMUNITIES: A SYSTEMATIC LITERATURE REVIEW OF RESILIENCE APPROACHES AMID DISRUPTIONS

ABSTRACT

Telehealth has become a critical mechanism for maintaining healthcare access during periods of disruption, including pandemics, natural disasters, and system-level shocks. However, sustaining telehealth delivery in minority and underserved communities remains a persistent challenge due to structural inequities in broadband access, digital infrastructure, and resource allocation. These barriers restrict the resilience of telehealth systems and risk reinforcing existing disparities in healthcare access and outcomes.

This study reviews how telehealth systems in minority communities have been sustained during periods of disruption with particular attention to resilience strategies, digital equity, and policy contexts. Guided by resilience and digital equity frameworks, the review synthesizes evidence on how social, technological, and regulatory factors shape the continuity and durability of telehealth delivery. Following PRISMA 2020 guidelines, peer-reviewed studies published between 2019 and 2024 were identified from Scopus, PubMed, and ProQuest. Included studies explicitly examined telehealth implementation or outcomes in minority or underserved populations and addressed broadband access, digital equity, sustainability, or policy-related influences on telehealth continuity.

Across 36 included studies, the synthesis reveals that telehealth sustainability is strongly influenced by digital infrastructure, organizational capacity, culturally responsive implementation, and stable reimbursement and regulatory environments. While emergency policy flexibilities supported rapid telehealth expansion during crises, long-term continuity depended on system integration, broadband affordability and reliability, workforce capacity, and equity-oriented design. The findings suggest that telehealth resilience in minority communities may depend less on short-term increases in use and more on broader structural conditions governing access, governance, and digital inclusion.

This study contributes evidence-based insights for policymakers, healthcare organizations, and researchers seeking to strengthen equitable and resilient telehealth systems. Addressing broadband inequities, institutionalizing supportive policy frameworks, and embedding culturally responsive practices are essential to sustaining telehealth as a durable component of healthcare delivery in minority and underserved communities beyond periods of disruption.

Keywords: Telehealth Resilience; Systematic Literature Review; Broadband Access; Digital Equity; Minority Communities; Health Equity

INTRODUCTION

Background

Telehealth has increasingly been recognized as a crucial strategy for improving healthcare access, particularly for underserved and minority communities that face long-standing structural barriers to care. Prior to the COVID-19 pandemic, telehealth adoption in the United States remained limited due to regulatory restrictions, reimbursement challenges, and uneven digital infrastructure [1]. The COVID-19 pandemic significantly changed how telehealth was utilized, accelerating its integration into mainstream healthcare delivery. Emergency policy measures, including expanded

Medicare reimbursement and relaxed licensure requirements, enabled healthcare systems to rapidly deploy telehealth services across primary care, mental health, and chronic disease management settings [2]. Early analyses of Medicare data demonstrated sharp increases in telehealth use during the initial stages of the pandemic, confirming its role in maintaining continuity of care during widespread service disruptions.

Despite these gains, however, the expansion of telehealth also exposed persistent inequities in digital access and healthcare utilization. Studies have shown that racial and ethnic minority populations, older adults, and low-income households were less likely to engage in telehealth services due to limited broadband access, lack of digital devices, and lower levels of digital literacy. These disparities reflect broader social determinants of health, such as income, education, and neighborhood infrastructure, which shape individuals' ability to benefit from digital health innovations [3]. The patterns also reflect what the ECSJ framework characterizes as normalized institutional violence, that is, systemic arrangements in policy, infrastructure, and governance that disproportionately disadvantage marginalized communities while appearing administratively neutral.

Broadband access has emerged as a foundational requirement for effective telehealth delivery. The Federal Communications Commission characterizes broadband as essential infrastructure for participation in modern economic, educational, and healthcare systems [4]. However, FCC data consistently show that communities of color and economically disadvantaged neighborhoods are disproportionately affected by gaps in broadband availability and affordability. These digital inequities constrain telehealth engagement and reinforce existing patterns of healthcare exclusion.

This systematic literature review addresses these gaps by integrating existing evidence on telehealth sustainability in minority communities, with particular emphasis on resilience approaches, broadband access, and policy contexts during periods of disruption. While numerous COVID-era reviews have documented telehealth utilization patterns and identified barriers and facilitators to adoption, fewer have examined the structural conditions that determine whether telehealth systems endure beyond emergency contexts.

By applying a resilience lens, this review moves beyond static classifications of obstacles and supports conceptualizing telehealth as a dynamic system embedded within governance structures, digital infrastructure, and organizational capacity structures. In doing so, the analysis shifts attention from short-term crisis expansion to the long-term institutional, infrastructural, and policy factors that shape telehealth continuity in communities facing persistent structural inequities. By consolidating findings across disciplines and study designs, this review aims to inform more equitable and sustainable telehealth policy and practice.

To assess how telehealth systems are sustained amid disruptions and identify persistent barriers to resilience, this systematic review is guided by the following research questions:

1. What frameworks and strategies have been applied to sustain resilience in telehealth systems during disruptions?
2. What challenges and gaps are reported in maintaining telehealth resilience?

METHODOLOGY

Methodological Framework

This systematic literature review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines [5]. The review aimed to

synthesize empirical evidence on the sustainability of telehealth in minority and underserved communities, with particular emphasis on broadband access, digital equity, resilience strategies, and policy contexts during periods of disruption.

Search Strategy and Data Sources

A comprehensive literature search was conducted across three major academic databases, which are Scopus, ProQuest, and PubMed, to identify peer-reviewed studies published between 2019 and 2024. This timeframe was selected to capture telehealth research emerging before, during, and after the COVID-19 pandemic. The search strategy used a structured approach and employed Boolean operators to combine three core concept areas:

- 1) Telehealth and digital health interventions,
- 2) Broadband access and digital equity, and
- 3) Minority or underserved populations.

Search terms included combinations of keywords such as *telehealth*, *telemedicine*, *virtual care*, *digital health*, *broadband access*, *internet connectivity*, *digital equity*, *minority communities*, and *underserved populations*. Controlled vocabulary and database-specific syntax were applied where appropriate.

Eligibility Criteria

Studies were eligible for inclusion if they met the following criteria:

- 1) were peer-reviewed and published in English between 2019 and 2024;
- 2) examined telehealth or digital health interventions;
- 3) focused on minority or underserved populations; and
- 4) explicitly addressed broadband access, digital equity, resilience, sustainability, or policy-related factors influencing telehealth adoption or continuity.

The excluded studies did not establish a clear connection between telehealth and broadband access, but either focused exclusively on short-term utilization without addressing sustainability, or failed to center minority or underserved populations. Studies were required to focus explicitly on minority or underserved populations rather than merely reference these groups as demographic subcategories. This criterion was adopted to ensure that the review centered analyses designed to examine structural inequities and sustainability challenges specific to marginalized communities, rather than studies in which minority status was incidental to the primary research question.

The review was intentionally limited to studies published between 2019 and 2024 to capture telehealth systems operating within contemporary policy, reimbursement, and infrastructure environments, particularly during and in the aftermath of periods of widespread disruption. Search strategies were adapted to the syntax and indexing structure of each database while maintaining consistent core concepts to optimize sensitivity and relevance.

Database	Search Query Used	Initial Records Identified
SCOPUS	(TITLE-ABS-KEY (telehealth OR telemedicine OR "virtual care")) AND (TITLE-ABS-KEY (resilien* OR sustainab* OR equity OR inequity OR disparit* OR "access to care")) AND (TITLE-ABS-KEY ("minority communit*" OR "racial and ethnic minorities"))	83
PROQUEST	((ti(telehealth OR telemedicine) OR ab(telehealth OR telemedicine OR "e-health")) AND (ti(minority OR racial OR disparities) OR ab(minority OR racial OR ethnic OR underserved OR disparities)) AND (ti(sustain* OR resilience) OR ab(sustain* OR resilience OR continuity)) AND (ti(disrupt* OR COVID-19) OR ab(disrupt* OR "COVID-19" OR pandemic OR crisis)))	85
PUBMED	(telehealth OR telemedicine OR "virtual care") AND (resilien* OR sustainab* OR adapt*) AND ("minority communities" OR "underserved populations" OR "racial and ethnic minorities")	62
Total Records		230

Table 1: Keywords used for search strategies and the number of papers identified

Study Selection and Screening

The initial database search yielded 230 records, including 83 from Scopus, 85 from ProQuest, and 62 from PubMed. One duplicate record was removed prior to screening. Automation tools were used to exclude 166 records based on predefined eligibility criteria, while 3 of the records were removed by hand, resulting in 60 records retained for title and abstract screening.

A total of 60 full-text articles were sought and successfully retrieved for further assessment. Following full-text review, 36 studies met all inclusion criteria and were retained for final synthesis. The study selection process is illustrated in the PRISMA 2020 flow diagram (Figure 1).

Data Extraction and Synthesis

Data were extracted from included studies using a structured approach capturing study design, methodology, geographic location, population characteristics, telehealth modality, broadband or digital equity considerations, and key findings related to resilience and sustainability. Given the heterogeneity of study designs and outcome measures, a narrative synthesis approach was employed. Studies were thematically analyzed to identify recurring patterns across geographic contexts and conceptual domains, forming the basis for the thematic results presented in the following section.

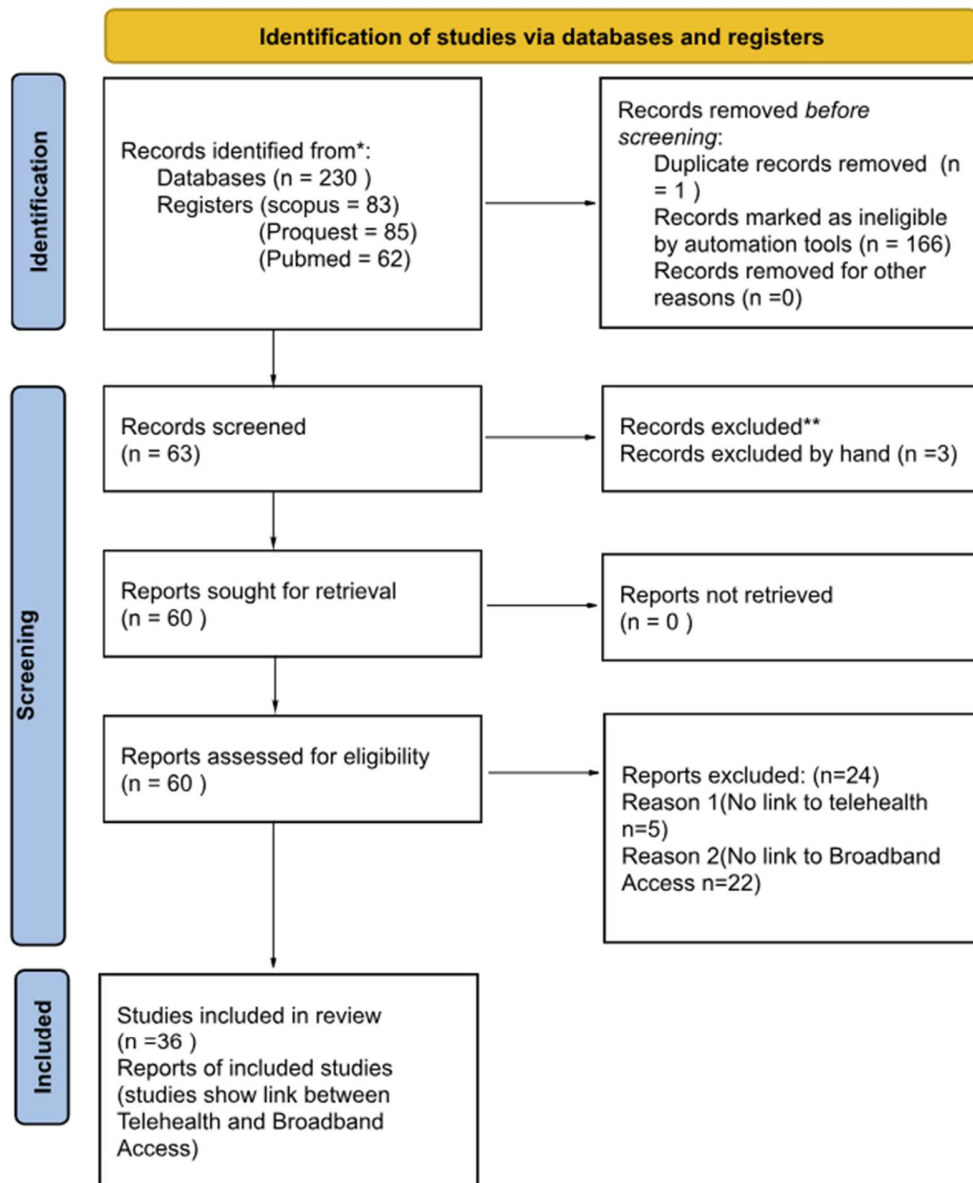


FIGURE 1: PRISMA 2020 flowchart depicting the process for the article

RESULTS

Overview of Included Studies

A total of 36 studies met the inclusion criteria for this systematic literature review. The included studies employed a range of methodological approaches, including quantitative analyses, qualitative designs, mixed-methods studies, and implementation-focused evaluations.

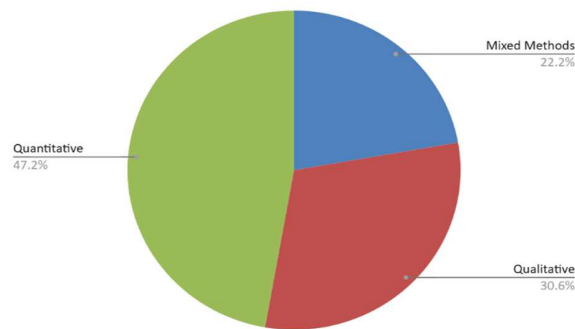


Figure 2a: Included Studies by Study Design

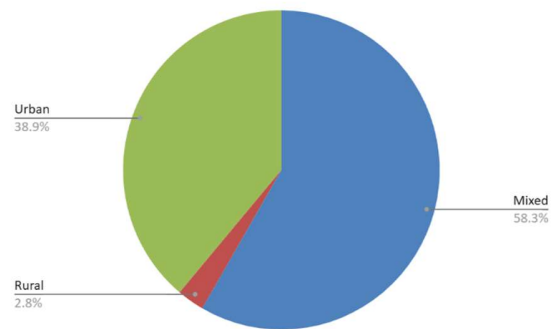


Figure 2b: Included Studies by Study Settings

Telehealth interventions examined across the literature included virtual clinical consultations, remote monitoring, tele-mental health services, and technology-enabled care coordination. Study populations predominantly comprised racial and ethnic minority groups, low-income populations, older adults, and residents of underserved or resource-limited communities.

Thematic synthesis was conducted using structured screening derived from the updated thematic coding table. Five analytic domains guided the synthesis: telehealth sustainability and continuity of care; digital equity, broadband access, and technology barriers; health equity and minority community impact; policy, reimbursement, and regulatory environment; and implementation challenges and system capacity. The following sub-sections examine each analytic domain in detail, synthesizing findings across the included studies:

Geographical Location

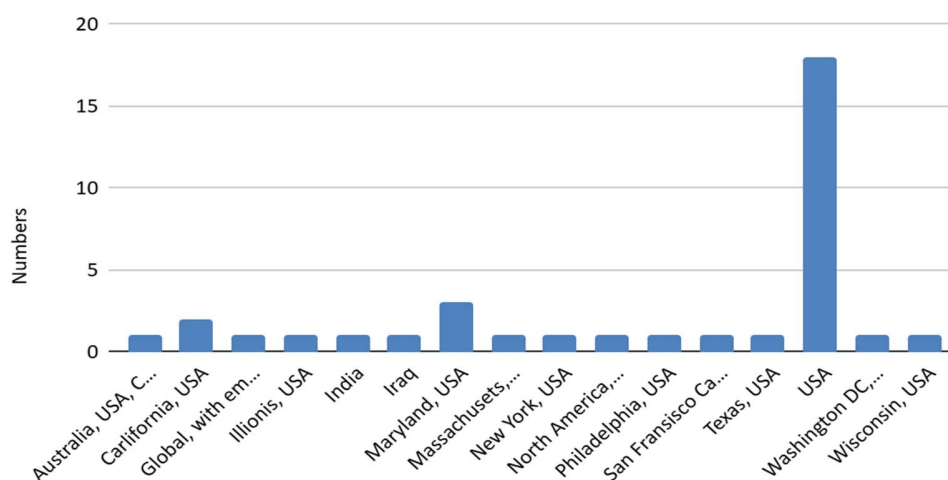


Figure 3: Included Studies by Geographical Location

Telehealth Sustainability & Continuity of Care

Across the reviewed studies, telehealth sustainability was closely associated with the ability of health systems to maintain continuity of care beyond periods of acute disruption [6] [9] [13]. While most studies documented substantial increases in telehealth utilization during the COVID-19 pandemic, sustained use overtime varied considerably [8] [15]. For instance, Crotty et al. [6] found that telehealth completion rates were higher in systems where virtual care was integrated into established clinical workflows and supported by institutional scheduling infrastructure. Similarly, Johnson et al. [9] highlighted that implementation strategies emphasizing workflow redesign and provider training contributed to greater continuity beyond initial crisis deployment.

In contrast, settings that adopted telehealth primarily as an emergency response experienced measurable declines in use once temporary policy flexibilities were rolled back [15] [18]. These patterns illustrate a core resilience principle: systems are more likely to endure external shocks when telehealth is institutionally embedded rather than episodically deployed. From a resilience perspective, sustainability reflects adaptive capacity and structural integration, the degree to which telehealth is incorporated into routine organizational processes rather than treated as an auxiliary service. In minority communities, where health systems often operate under resource constraints, limited infrastructural integration reduces the system's ability to absorb disruption and maintain service continuity [7] [11]. Thus, crisis-driven expansion alone does not ensure long-term resilience.

Digital Equity, Broadband Access & Technology Barriers

Digital equity and broadband access were consistently identified as key factors of telehealth sustainability across the included studies [14] [15]. Multiple studies documented that limited broadband availability, unreliable connectivity, and affordability constraints restricted participation in video-based telehealth services, often resulting in disproportionate reliance on audio-only modalities among low-income and minority populations [8] [11]. Williams and Shang [15] reported that telehealth engagement among low-income racial and ethnic minority populations was strongly mediated by broadband access and device availability, rather than patient preference.

Technology barriers extended beyond connectivity alone. Studies examining older adults and underserved populations identified digital literacy, platform usability, and device access as recurring impediments to sustained telehealth use [10] [16] [17]. From a digital equity framework perspective, broadband functions as essential health infrastructure, a prerequisite for equitable participation in digital care delivery. Within a resilience lens, broadband availability represents infrastructural robustness: without reliable digital infrastructure, telehealth systems lack the foundational capacity required to maintain service delivery during disruption. The persistence of connectivity gaps therefore undermines both equity and resilience, reinforcing structural vulnerabilities in communities already facing health disparities.

Health Equity & Minority Community Impact

Health equity considerations were central across multiple studies, particularly in analyses of differential telehealth uptake and outcomes among minority populations [6] [22] [24]. Several studies demonstrated that racial and ethnic minority patients were less likely to utilize video-based telehealth services, with disparities closely linked to broadband access, insurance status, device availability, and digital literacy rather than cultural resistance or individual preference [16] [17],

identified significant racial disparities in telemedicine uptake within federally qualified health centers, underscoring structural rather than behavioral determinants of engagement.

Cultural and linguistic responsiveness also emerged as key determinants of sustained participation. Studies noted that telehealth interventions incorporating bilingual resources, culturally tailored communication strategies, and community engagement mechanisms demonstrated improved patient satisfaction and continuity of care [9] [12] [23]. Within a digital equity framework, these adaptations address not only access but also meaningful inclusion, ensuring that telehealth systems function effectively across diverse populations. Collectively, these findings suggest that equity-oriented implementation is not peripheral but integral to resilient telehealth systems.

Policy, Reimbursement & Regulatory Environment

Policy and regulatory contexts played a major role in shaping telehealth implementation and sustainability [13] [20]. Across studies, emergency policy measures such as expanded reimbursement, relaxed licensure requirements, and authorization of audio-only services, were associated with increased telehealth access during periods of disruption [14] [20]. However, some studies raised concerns regarding the long-term viability of telehealth models in the absence of permanent policy reforms [13] [15].

Uncertainty surrounding reimbursement policies and regulatory continuity was frequently cited as a barrier to institutional investment in telehealth infrastructure [9] [14]. Several studies indicated that policy instability disproportionately affects minority and underserved populations, as health systems serving these communities often operate with limited financial and administrative flexibility [13] [15]. These findings highlight the importance of stable governance structures in sustaining equitable telehealth delivery.

Implementation Challenges & System Capacity

Implementation challenges and system-level capacity constraints were commonly reported across the reviewed studies [6] [15]. Health systems serving minority communities faced barriers related to workforce limitations, insufficient training, and competing operational demands [9] [18]. Several studies noted that rapid telehealth deployment during crisis periods strained existing systems, limiting the ability to institutionalize digital care models over time [6] [14].

Variability in system capacity influenced the extent to which telehealth services could be scaled and sustained. Settings with greater organizational resources and technical support demonstrated stronger implementation outcomes, while resource-constrained systems experienced fragmented adoption and reduced continuity [9] [13] [15]. These findings underscore the role of structural capacity in determining the sustainability of telehealth interventions in minority and underserved contexts.

DISCUSSION

Summary of Key Findings

Across the included studies, telehealth was effective in maintaining access to care during periods of disruption, but long-term sustainability and continuity were uneven and strongly shaped by structural and system-level conditions. Most studies showed that telehealth was more likely to continue when it was integrated into routine clinical workflows, supported by adequate staffing

and training, and embedded within existing care delivery systems rather than deployed as short-term emergency responses [6] [8]. Conversely, fragmented implementation, workflow strain, and limited system capacity constrained sustained use, particularly in settings serving minority and underserved communities [15] [18]. Digital equity emerged as a foundational prerequisite for equitable telehealth, with broadband availability, affordability, device access, and digital literacy consistently identified as determinants of engagement and modality choice, often pushing marginalized populations toward lower-quality or limited telehealth options when infrastructure was inadequate [7] [11] [14]. Health equity outcomes were further shaped by cultural responsiveness, language access, and trust, as telehealth models that failed to address these factors risked reproducing disparities, while community-engaged and culturally tailored approaches were associated with improved acceptability and participation [8] [12] [21]. Finally, policy and governance contexts played an important role, with expanded reimbursement and regulatory flexibilities supporting telehealth continuity during disruptions, but policy uncertainty and reimbursement instability undermining long-term sustainability and equitable investment, particularly for systems serving minority communities [13] [19] [20].

Comparative Analysis of Findings Across Studies

A comparative examination of the included studies reveals both similarities and differences in how telehealth sustainability and resilience were realized across contexts. While most studies reported rapid expansion of telehealth during periods of disruption, the extent to which these gains were sustained varied substantially by health system capacity, digital infrastructure, and policy environment [6] [14] [15]. Studies conducted in systems with pre-existing telehealth infrastructure and stronger organizational support consistently demonstrated more durable continuity of care compared with those in which telehealth was introduced primarily as an emergency response [8] [13].

Geographic context emerged as a key axis of variation. Studies focused on rural or geographically isolated communities emphasized broadband availability and infrastructure limitations as the primary constraints on telehealth sustainability [7] [11] [14]. In contrast, studies situated in underserved urban settings more frequently identified affordability, device access, and digital literacy as dominant barriers, despite nominal broadband availability [10] [15] [16]. Although the nature of barriers differed, their impact on telehealth continuity was comparable, suggesting that digital inequity manifests differently across settings but produces similar sustainability challenges.

Comparisons across patient populations further highlight differential telehealth outcomes. Studies examining older adults and low-income populations consistently reported lower engagement with video-based telehealth services, often due to compounded challenges related to device access, usability, and digital skills [10] [16] [17]. In contrast, studies involving health systems that implemented targeted supports, such as patient navigation, training, or simplified platforms, reported improved uptake and continuity among these groups [9] [13]. These differences suggest that telehealth sustainability is not solely population-dependent but is mediated by the availability of supportive implementation strategies.

Policy context also differentiated sustainability outcomes across studies. Research conducted during periods of expanded reimbursement and regulatory flexibility consistently reported higher telehealth utilization and continuity [19] [20]. However, studies examining post-emergency phases or anticipating policy rollbacks expressed concerns about the fragility of telehealth models in the absence of stable reimbursement and licensure structures [12] [15]. Health systems serving

minority and underserved populations were particularly sensitive to policy uncertainty, as limited financial margins constrained their ability to absorb regulatory shifts [9] [13].

Across studies, approaches to resilience varied in both formality and scope. While some studies described structured organizational adaptations—such as permanent workflow redesign and institutional investment—others relied on informal or short-term adjustments that were less likely to be sustained [6] [18]. Notably, few studies explicitly compared resilience strategies or evaluated their effectiveness longitudinally, limiting the ability to draw definitive conclusions about which approaches best support sustained telehealth delivery in minority communities.

Taken together, this comparison indicates that telehealth sustainability is shaped by interacting structural, contextual, and policy factors rather than by a single determinant. Differences observed across studies underscore that resilience is unevenly distributed, with health systems serving minority and underserved populations facing compounded challenges related to infrastructure, capacity, and governance. These variations highlight the need for context-sensitive and equity-oriented strategies to support durable telehealth systems.

Implications for Policy, Healthcare Practice, and Research

The findings of this review indicate that telehealth sustainability in minority and underserved communities is highly dependent on stable and supportive policy environments. Across the included studies, temporary regulatory flexibilities and expanded reimbursement policies played significant roles in telehealth continuity during periods of disruption [19] [20]. However, several studies highlighted that policy uncertainty and the temporary nature of these measures undermine long-term investment in telehealth infrastructure and workforce development, particularly in systems serving marginalized populations [9] [12] [15]. These findings suggest that institutionalizing telehealth reimbursement, licensure flexibility, and support for audio-only modalities may be essential for sustaining equitable telehealth access beyond emergency contexts.

The review also highlights the importance of recognizing broadband access as a form of health infrastructure. Studies consistently demonstrated that limited broadband availability and affordability constrained telehealth participation and continuity in minority communities [7] [11] [14]. Aligning healthcare policy with digital infrastructure initiatives may therefore strengthen telehealth resilience and reduce disparities during future disruptions.

From a practice perspective, the findings highlight that telehealth sustainability is contingent on intentional system integration and organizational capacity building. Health systems that embedded telehealth into routine clinical workflows, aligned digital platforms with existing care processes, and invested in provider training were more likely to maintain continuity beyond crisis periods [6] [13]. In contrast, telehealth models introduced as short-term or emergency solutions without corresponding investments in staffing and infrastructure were less likely to be sustained [15] [18].

The review further suggests that culturally responsive and patient-centered implementation strategies are critical to telehealth effectiveness in minority communities. Studies emphasized that language-accessible platforms, culturally competent care delivery, and community engagement enhanced patient trust and sustained telehealth participation [17] [21]. Addressing digital literacy, usability challenges, and patient support needs may therefore be essential components of equitable and sustainable telehealth practice [10] [16].

The findings of this review reveal several priorities for future research. Despite extensive documentation of telehealth expansion during disruptions, relatively few studies examined long-term sustainability or resilience beyond emergency contexts [8] [9]. Future research should

prioritize longitudinal designs that assess telehealth continuity over time and explicitly operationalize resilience constructs to evaluate their effectiveness across diverse settings.

Additionally, the literature suggests a need to move beyond utilization-based outcomes and incorporate equity-sensitive measures such as quality of care, patient experience, and continuity across care settings [14] [15]. Greater empirical attention to community-led telehealth models and comparative analyses of broadband and reimbursement policies may further inform strategies to promote resilient and equitable telehealth systems in minority communities [7] [19].

Limitations

This review was conducted within defined methodological boundaries that shape the interpretation of findings. The search was limited to peer-reviewed studies published in English between 2019 and 2024 and indexed in Scopus, PubMed, and ProQuest. While these databases capture a substantial portion of telehealth research, studies indexed elsewhere or published in grey literature were not included. The defined timeframe centers COVID-era telehealth implementation and its immediate aftermath, which may limit insights into longer-term pre-pandemic models of digital care.

The review also focused specifically on studies that explicitly linked telehealth implementation to broadband access, digital equity, sustainability, or resilience in minority and underserved populations. This targeted focus strengthens the conceptual coherence of the analysis but narrows inclusion to studies that directly engage equity-oriented dimensions of telehealth.

Additionally, the included studies varied considerably in design, setting, and outcome measures, which precluded quantitative meta-analysis and necessitated a narrative synthesis approach. Much of the current literature emphasizes crisis-period expansion, with comparatively fewer longitudinal evaluations of post-emergency sustainability. Accordingly, conclusions regarding resilience reflect the present state of evidence and highlight areas where further longitudinal research is needed.

CONCLUSION

This systematic literature review demonstrates that telehealth has played an important role in maintaining access to care for minority and underserved communities during periods of disruption. However, the evidence synthesized across 36 studies indicates that telehealth resilience cannot be understood through short-term utilization gains alone. Rather, sustained continuity depends on structural conditions, including broadband infrastructure, organizational capacity, culturally responsive implementation, and stable policy environments that shape whether telehealth systems endure beyond crisis periods.

By applying a resilience lens, this review builds on existing COVID-era telehealth scholarship beyond descriptive accounts of barriers and facilitators. Instead of focusing solely on adoption during emergency expansion, the analysis conceptualizes telehealth as a dynamic system embedded within governance frameworks, digital infrastructure, and institutional design. This perspective clarifies that resilience in minority communities is determined not by patient uptake in isolation, but by the degree to which telehealth is structurally integrated, equitably supported, and institutionally stabilized over time.

Looking forward, advancing resilience-oriented and equity-centered telehealth design will require coordinated policy reforms, sustained investment in broadband infrastructure, and deliberate

organizational integration strategies. Sustaining equitable telehealth requires confronting institutional structures that normalize exclusion through infrastructural and policy design, thus future research should operationalize resilience constructs more explicitly, employ longitudinal designs to assess durability beyond emergency contexts, and evaluate how digital equity interventions alter system-level outcomes. Telehealth has the potential to reduce disparities, but only when embedded within systems intentionally designed to address structural inequities and support adaptive capacity in the communities they serve.

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