

The Determinants of Telemedicine Adoption: A Systematic Review

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Abstract: *Telemedicine has shifted from a peripheral service option to an important mode of healthcare delivery, yet adoption remains uneven across settings, professional groups, and patient populations. This systematic review synthesizes the determinants of telemedicine adoption and proposes an integrated multilevel framework. Guided by PRISMA 2020, the review searched PubMed, Scopus, Web of Science, and CINAHL for peer-reviewed English-language studies published between 2016 and 2025. Following screening, eligibility assessment, and quality appraisal, 40 studies were included in the final synthesis. The evidence indicates that adoption is shaped by interacting individual, technological, organizational, and environmental determinants. Perceived usefulness, usability, digital capability, and trust consistently influence acceptance; however, favorable perceptions do not translate into sustained use when connectivity is unreliable, privacy arrangements are ambiguous, workflows are poorly integrated, or reimbursement and regulatory conditions are unclear. Sustained adoption is more likely when organizations provide leadership support, training, technical assistance, interoperability, and implementation-ready workflows. The review also identifies persistent equity challenges, including age-related capability differences, rural connectivity constraints, and socioeconomic disparities in access. An integrative conceptual framework is proposed in which decision confidence and implementation fit mediate the transition from favorable perceptions to sustained adoption outcomes. The review contributes a clearer analytical structure for telemedicine adoption research and offers practical guidance for health systems seeking durable, scalable, and equitable telemedicine delivery.*

Keywords: Telemedicine, telehealth, adoption, determinants, acceptance, digital health, systematic review

1. Introduction

Telemedicine has become a prominent expression of digital transformation in healthcare. The rapid expansion of remote consultations during and after the COVID-19 pandemic demonstrated that clinical encounters can be reconfigured through synchronous and asynchronous technologies, but it also exposed a persistent gap between emergency uptake and durable adoption (Greenhalgh et al., 2020). Telemedicine is now expected to support access, continuity, convenience, and service resilience, especially for geographically dispersed populations and patients requiring ongoing follow-up (Almathami et al., 2020). Despite these advantages, implementation outcomes remain highly variable across specialties, countries, and patient groups. This variability is unsurprising because telemedicine adoption is a sociotechnical process rather than a purely technical decision. Users assess whether the service is clinically valuable, easy to use, trustworthy, and compatible with everyday

routines. Organizations assess whether telemedicine aligns with strategic priorities, infrastructure capacity, regulatory obligations, and reimbursement arrangements. Patients and clinicians also judge whether remote encounters preserve communication quality, confidentiality, and continuity of care. Adoption therefore depends on an interacting bundle of determinants rather than on any single acceptance construct (Rouidi et al., 2022).

Early work often interpreted telemedicine adoption through technology-acceptance lenses such as the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology, with emphasis on perceived usefulness, perceived ease of use, facilitating conditions, and social influence (Shaarani et al., 2023). More recent studies have widened that lens to include implementation constraints such as interoperability problems, workflow disruption, digital inequity, payment arrangements, and legal uncertainty (Venkataraman et al., 2024). That broader perspective is necessary because post-pandemic telemedicine is no longer judged as a novel add-on, but as a service model evaluated against efficiency, patient experience, equity, and long-term sustainability. The literature nevertheless remains fragmented. Some studies privilege patient acceptance, others emphasize clinician readiness, and still others focus on organizational or policy constraints. Many studies are also strongly context-bound, relying on single-discipline or single-country samples. As a result, the field still lacks a concise integrative account of which determinants recur most consistently, how they cluster across analytical levels, and which conditions distinguish initial acceptance from routine, sustained use. A systematic review is therefore needed to consolidate the evidence and move the discussion beyond isolated lists of barriers and facilitators.

This study synthesizes the literature on telemedicine adoption determinants and develops an integrated framework linking individual, technological, organizational, and environmental conditions. The review addresses three questions: (1) which determinants are most frequently associated with telemedicine adoption, (2) how are these determinants distributed across user, technology, organizational, and system levels, and (3) what gaps remain in the current evidence base for explaining sustained telemedicine adoption?

2. Methodology

This review followed PRISMA 2020 to strengthen transparency, methodological rigor, and reporting consistency. The aim was not to estimate a pooled intervention effect, but to identify, compare, and synthesize determinants of telemedicine adoption across heterogeneous settings, user groups, and study designs. The eligibility framework therefore encompassed quantitative, qualitative, mixed-methods, and evidence-synthesis studies in which telemedicine adoption, acceptance, intention to use, willingness, uptake, implementation barriers, or implementation facilitators constituted a central analytic focus. A structured search was undertaken in March 2026 across four major electronic databases: PubMed, Scopus, Web of Science, and CINAHL. These databases were selected because they index telemedicine, medical informatics, primary care, nursing, and health-services research. The search covered peer-reviewed English-language studies published between January 2016 and December 2025. Database-adapted search strings combined core telemedicine terms, including telemedicine and telehealth, with adoption-related terms such as adoption, determinants, acceptance, intention to use, willingness, uptake, barriers, facilitators, and implementation. During search refinement, conceptually related terms such as perceived usefulness, ease of use, trust, infrastructure, organizational readiness, and social influence were used to improve retrieval precision and coverage.

Study selection was structured to retain articles that provided direct and extractable evidence on telemedicine adoption determinants. A total of 256 records were identified across the selected databases. Following title and abstract screening, 136 records were excluded because they fell outside the review scope or lacked sufficient relevance to telemedicine adoption. The remaining 120 full-text articles were assessed for eligibility. Eighty full-text articles were then excluded because telemedicine was not the primary focus, the paper addressed digital health too broadly without telemedicine-specific evidence, or adoption determinants were not reported clearly enough to support systematic extraction and comparison. The final synthesis therefore included 40 studies. Figure 1 summarizes the study-selection process. A structured extraction sheet was used to capture the main characteristics of each included study. Extracted data covered publication details, study setting, participant group, research design, methods, theoretical orientation, and the determinants reported. To maintain analytical comparability across heterogeneous evidence, determinants were coded into 12 domains: perceived usefulness or clinical value; ease of use or usability; digital literacy or training; trust, privacy, and security; infrastructure and connectivity; facilitating conditions or technical support; workflow fit or interoperability; organizational readiness or leadership; cost or reimbursement; social influence or relationship quality; equity, access, or digital divide; and regulation or governance. Coding was conservative: a determinant was recorded only when the source explicitly identified it as an adoption driver, a barrier, or a statistically supported predictor.

Quality appraisal used criteria appropriate to each study design. Quantitative, qualitative, and mixed-methods empirical studies were assessed in line with the Mixed Methods Appraisal Tool, whereas evidence-synthesis studies were evaluated for methodological transparency, clarity of search procedures, and reproducibility. Overall, the body of evidence was adequate for thematic synthesis, but several recurring weaknesses remained evident, including reliance on cross-sectional self-report data, single-site recruitment, convenience sampling, limited longitudinal follow-up, and inconsistent operationalization of adoption outcomes. Given the substantial heterogeneity in settings, methods, populations, and outcomes, meta-analysis was not appropriate; the final synthesis therefore used a thematic and configurational approach.

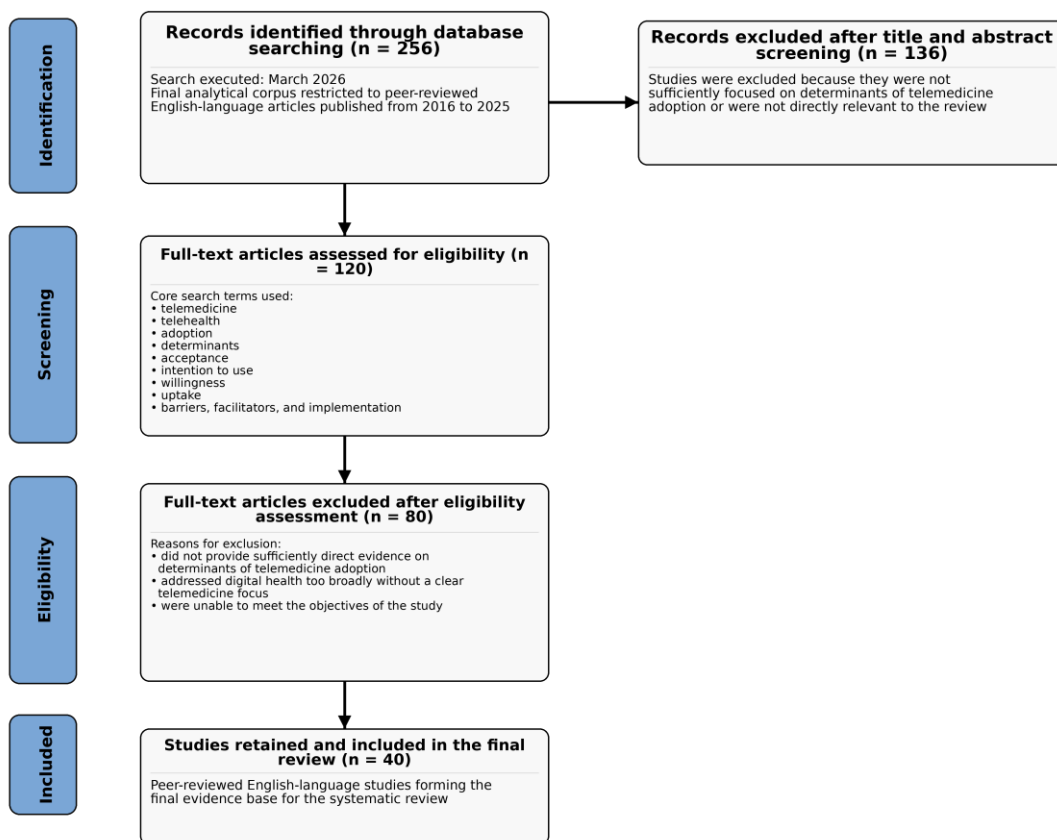


Figure 1 : PRISMA-based study selection process

3. Determinants of Telemedicine Adoption

Across the included studies, telemedicine adoption was not reducible to a simple question of whether users liked the technology. Rather, adoption emerged from the interaction of perceived value, usability, organizational fit, and environmental feasibility. Evidence from primary care, specialist care, mental health, rural services, chronic disease management, and national health systems converged around a multilevel set of determinants.

Table 1 : Matrix of telemedicine adoption determinants

No.	Study	PU	EOU	DL	TR	INF	SUP	WF	ORG	COST	SI	EQ	REG
1	Bradford et al. (2016)	✓				✓	✓		✓			✓	
2	Knight et al. (2016)	✓					✓	✓	✓		✓		
3	Cimperman et al. (2016)	✓	✓	✓							✓		
4	Adenuga et al. (2017)	✓		✓		✓	✓		✓	✓			✓
5	Kruse et al. (2018)	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓
6	Koivunen & Saranto (2018)		✓	✓		✓	✓	✓	✓				
7	Kiberu et al. (2019)					✓	✓		✓				✓
8	Almathami et al. (2020)	✓	✓		✓	✓	✓	✓	✓			✓	✓
9	Peine et al. (2020)	✓	✓					✓	✓				✓
10	Kichloo et al. (2020)	✓				✓	✓			✓			✓
11	Greenhalgh et al. (2020)	✓	✓		✓			✓	✓			✓	✓

No.	Study	PU	EOU	DL	TR	INF	SUP	WF	ORG	COST	SI	EQ	REG
12	Hoffmann et al. (2020)	✓			✓			✓	✓		✓		
13	Chang et al. (2021)					✓			✓	✓		✓	
14	Campos-Castillo & Anthony (2021)				✓	✓					✓	✓	
15	James et al. (2021)	✓		✓			✓	✓	✓				
16	Haleem et al. (2021)	✓			✓	✓	✓			✓			✓
17	Kruse & Heinemann (2022)	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓
18	Beheshti et al. (2022)	✓				✓	✓	✓	✓			✓	
19	Rouidi et al. (2022)	✓	✓	✓	✓		✓				✓		
20	Vosburg & Robinson (2022)	✓	✓		✓						✓		
21	Jones et al. (2023)	✓						✓	✓		✓		
22	Mazouri-Karker et al. (2023)	✓	✓		✓						✓	✓	
23	Ncube et al. (2023)	✓			✓	✓					✓	✓	
24	Shaarani et al. (2023)	✓	✓	✓	✓		✓				✓		
25	Alharbi (2023)			✓	✓	✓	✓						✓
26	Praha et al. (2023)	✓		✓							✓		
27	van Tilburg et al. (2024)	✓	✓			✓	✓	✓	✓			✓	
28	Venkataraman et al. (2024)				✓	✓	✓	✓	✓	✓		✓	✓
29	Bilbiie et al. (2024)	✓	✓		✓		✓				✓		
30	Kung et al. (2024)	✓	✓		✓						✓		
31	Razi et al. (2024)	✓	✓		✓						✓	✓	
32	Oudbier et al. (2024)					✓	✓	✓	✓			✓	✓
33	Wu & Ho (2025)	✓	✓		✓						✓		
34	AlMojaibel et al. (2025)	✓	✓				✓		✓		✓		
35	Phorah & Motsi (2025)	✓	✓			✓	✓		✓	✓			✓
36	Yan et al. (2025)	✓	✓		✓					✓			
37	Kirby et al. (2025)	✓	✓		✓	✓					✓	✓	
38	Cole et al. (2025)					✓	✓		✓	✓		✓	✓
39	Agbeyangi & Lukose (2025)					✓			✓	✓		✓	✓
40	Benjakul et al. (2025)	✓	✓		✓						✓		

PU = perceived usefulness/clinical value; EOU = ease of use/usability; DL = digital literacy/training; TR = trust/privacy/security; INF = infrastructure/connectivity; SUP = technical support/facilitating conditions; WF = workflow fit/interoperability; ORG = organizational readiness/leadership; COST = cost/reimbursement; SI = social influence/relationship quality; EQ = equity/access/digital divide; REG = regulation/governance. Check marks indicate that the determinant was explicitly covered in the source study.

3.1. Core determinants enabling telemedicine adoption

At the individual level, perceived usefulness emerges as the strongest and most consistent determinant. Patients and professionals are more willing to adopt telemedicine when remote care is perceived to save time, reduce travel, improve access, support continuity, or preserve acceptable clinical quality (Kung et al., 2024). When telemedicine is framed only as an emergency substitute rather than as a service model with clear clinical and operational value, sustained adoption weakens. In this literature, usefulness is judged through concrete outcomes such as convenience, shorter waiting times, continuity of follow-up, and communication efficiency. Ease of use, usability, and digital capability form a second recurring determinant cluster. Studies involving both patients and professionals show that complex interfaces, unclear processes, insufficient training, and low digital confidence undermine adoption even when the service is otherwise valued (Benjakul et al., 2025). For clinicians, digital capability is closely tied to workflow confidence; for patients, it is often shaped

by age, health literacy, prior technology experience, and family support. Ease of use should therefore not be treated narrowly as an interface attribute, because it is inseparable from user capability and onboarding quality.

Trust also functions as a foundational determinant. It is shaped by confidence in privacy, security, data handling, professional legitimacy, and the adequacy of remote communication. Telemedicine adoption declines when patients doubt confidentiality or when clinicians question whether remote encounters can preserve diagnostic confidence and relational quality (Wu & Ho, 2025). Trust therefore operates as both a technological and a relational construct: it concerns system integrity, but also the perceived preservation of care quality and accountability. Infrastructure and facilitating conditions determine whether intention can be translated into routine practice. Across rural and lower-resource settings, bandwidth limitations, unstable connectivity, device scarcity, and weak technical support remain recurrent barriers (Cole et al., 2025). Conversely, training, help-desk support, implementation guidance, and reliable platforms increase confidence and reduce abandonment. The synthesis suggests that many telemedicine programs do not fail because users reject the idea of remote care, but because the surrounding organizational environment does not adequately support its delivery.

3.2. Multilevel contexts shaping telemedicine adoption

Organizational determinants repeatedly distinguish short-term implementation from routinized use. Workflow fit is especially important. Telemedicine is more readily adopted when appointment triage, documentation, scheduling, consent, prescribing, and referral pathways are redesigned to accommodate remote care rather than requiring users to work around legacy processes (van Tilburg et al., 2024). Interoperability with existing information systems is part of the same problem. When telemedicine platforms remain disconnected from clinical records, billing routines, or internal communication systems, adoption becomes more labor-intensive and more vulnerable to resistance. Readiness and implementation climate also matter. Evidence from multiple settings shows that clinician uptake is stronger when management endorses telemedicine strategically, allocates resources, clarifies expectations, and legitimizes telemedicine as routine work rather than as an optional experiment (AlMojaibel et al., 2025). Organizational readiness is therefore not limited to hardware or software availability; it also includes managerial commitment, governance arrangements, protected time, and coherent implementation signals.

Environmental determinants operate as boundary conditions. Cost and reimbursement uncertainty remain central barriers in both high-income and middle-income settings. Even when telemedicine is technically feasible and clinically acceptable, weak payment models or ambiguous compensation rules suppress adoption incentives (Venkataraman et al., 2024). Legal and regulatory clarity are equally important because clinicians are reluctant to routinize telemedicine when liability, licensure, consent, and data-governance arrangements remain unclear. Equity considerations cut across all levels. The literature does not support the simplistic assumption that telemedicine automatically increases access for everyone. Instead, age, disability, digital poverty, rural connectivity gaps, language barriers, and trust disparities can reproduce or intensify exclusion unless programs are deliberately designed for inclusiveness (Agbeyangi & Lukose, 2025). Equity is therefore not an incidental concern; it is itself a determinant of adoption because marginalized users cannot adopt services they cannot reliably access or meaningfully use.

Table 2 : Summary of determinant domains influencing telemedicine adoption

Category	Factors identified in the literature
Individual-level determinants	Perceived usefulness, ease of use, digital capability, prior experience, trust, perceived communication quality, willingness, and satisfaction.
Technological determinants	Platform reliability, connectivity, device availability, privacy and security safeguards, interoperability, and technical support.
Organizational determinants	Workflow fit, clinician workload, leadership support, readiness, training provision, implementation climate, and normalization of remote care.
Environmental and policy determinants	Cost, reimbursement, regulation, licensure, liability, policy clarity, rural access constraints, socioeconomic disparities, and digital divide.

4. Discussion

This review indicates that telemedicine adoption is best understood as a layered sociotechnical process. Technology-acceptance variables remain indispensable, but they do not provide a complete explanation. Perceived usefulness and ease of use function as first-order conditions shaping willingness or intention. Adoption becomes durable only when those perceptions are supported by reliable infrastructure, workflow integration, organizational legitimacy, and enabling policy conditions. This helps explain why many services that expanded rapidly under crisis conditions have proved difficult to stabilize afterward. A useful interpretation of the evidence is that telemedicine adoption unfolds across three linked stages. The first is appraisal, in which users assess value, usability, and trust. The second is translation, in which intention is converted into operational practice through training, technical support, workflow redesign, and managerial endorsement. The third is routinization, in which telemedicine becomes normalized through reimbursement, governance, interoperability, and repeated successful use. The literature is strongest on the first stage and comparatively weaker on the latter two. That imbalance matters methodologically because the field often conflates stated willingness with genuine implementation success.

The findings also clarify why telemedicine adoption research benefits from combining acceptance and implementation perspectives. Acceptance models explain why users may intend to use a system, but they under-specify organizational and institutional constraints. Implementation-oriented studies, by contrast, capture infrastructure, work design, regulation, and sustainability more effectively. A more credible explanation of telemedicine adoption therefore lies in integrating user beliefs with contextual feasibility. Figure 2 reflects that integration by positioning decision confidence and implementation fit between determinant domains and adoption outcomes. The practical implication is straightforward. Health systems seeking durable telemedicine adoption should not treat technology procurement as the main intervention. The evidence instead supports a bundled strategy: demonstrate clinical value, simplify interfaces, provide training, secure technical support, integrate telemedicine into standard workflows, protect privacy, align reimbursement, and monitor equity effects. Programs that neglect any of these areas may still achieve initial uptake, but sustained normalization becomes much less likely.

5. Research Gaps

Several important gaps remain in the literature. First, most empirical studies are cross-sectional and rely on self-reported intention or perception, which limits causal inference and reveals little about long-term routinization. Longitudinal evidence tracking telemedicine use after initial implementation remains scarce. Second, adoption outcomes are defined inconsistently. Some studies treat satisfaction

as adoption, whereas others use willingness, frequency of use, or mere exposure. This weakens cross-study comparability and creates conceptual slippage between acceptance and sustained utilization. The evidence base also remains geographically and institutionally uneven. High-income settings are overrepresented, whereas robust adoption research from lower-resource systems remains comparatively limited, even though infrastructure and governance challenges are often most acute in those contexts. Many studies also isolate either patient determinants or clinician determinants without examining their interaction. Yet telemedicine is inherently relational: adoption depends on both sides of the encounter and on the organizational system that surrounds them.

Equity is frequently acknowledged but remains under-theorized. Many studies describe digital divides, but far fewer explain how service design, reimbursement policy, language support, caregiver involvement, and hybrid care pathways can reduce exclusion. Relatively little work also explains how telemedicine moves from crisis-enabled implementation to stable institutional practice. More longitudinal, comparative, and implementation-focused research is needed to examine how policy clarity, reimbursement, interoperability, and leadership shape sustainability across specialties and care levels. These gaps justify the conceptual model proposed in this review. Future research should test multilevel models that distinguish among intention, enactment, and routinization; compare specialties, institutions, and countries; and incorporate equity-sensitive measures of access, digital capability, and service quality. Without that shift, the field will continue to overstate adoption on the basis of short-term willingness data.

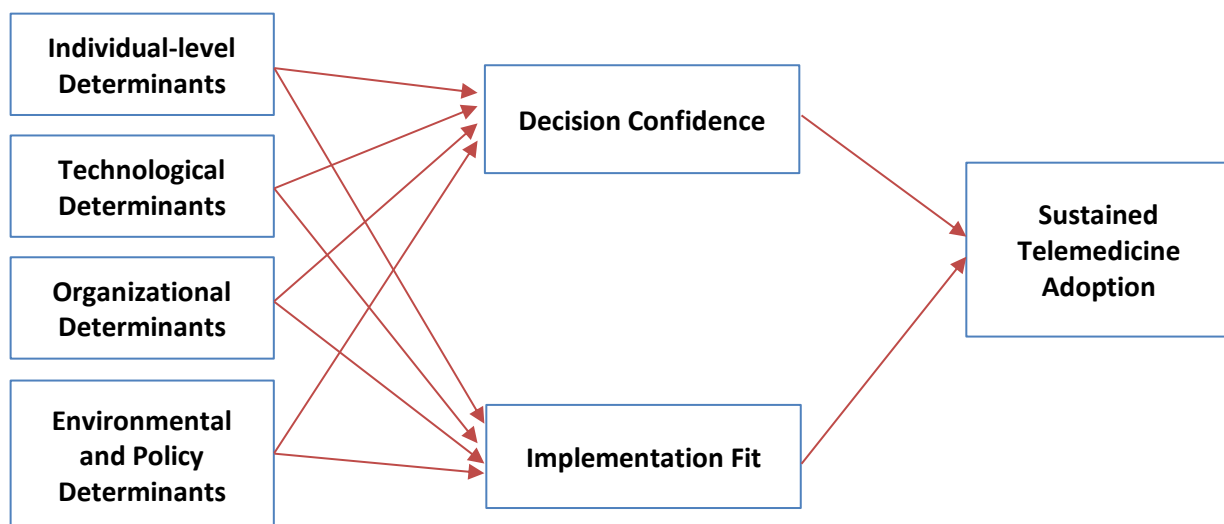


Figure 2 : Integrated conceptual framework of telemedicine adoption determinants

6. Conclusion

This systematic review shows that telemedicine adoption is shaped by a coherent but multilevel configuration of determinants. Perceived usefulness, usability, digital literacy, and trust influence whether users regard telemedicine as acceptable. Infrastructure, technical support, and workflow integration determine whether use is practical. Leadership, organizational readiness, reimbursement, regulation, and equity conditions determine whether telemedicine becomes sustainable rather than episodic. The central implication is that telemedicine adoption is not merely a technology procurement issue. It is an implementation and governance challenge built on a technology platform. Health systems seeking enduring adoption must align clinical value, user capability, organizational design, and external policy conditions. The framework developed in this review provides a basis for

future empirical testing and a more realistic roadmap for moving telemedicine from exceptional use to normalized care delivery.

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