The Determinants of Digital Health Implementation: A Systematic Review

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Abstract: *This systematic review identifies and synthesises determinants that shape the implementation of digital health technologies across clinical, organisational, and health-system settings. A PRISMA-informed evidence reconstruction was conducted using a publicly archived corpus derived from documented PubMed/MEDLINE and Scopus searches and supplementary citation tracking. The present review independently re-screened the corpus, restricted inclusion to primary empirical reports published within the 2015-2025 window and included 64 studies for MMAT-informed appraisal and narrative synthesis. Fourteen recurrent determinants were coded: acceptance, digital skills, perceived value, workflow fit, leadership, organisational readiness, training, financing, governance, usability, interoperability, infrastructure, privacy and security, and equity and access. Acceptance was examined in 56 studies, infrastructure in 46, equity and access in 44, digital skills in 43, perceived value in 41, workflow fit and financing in 37 each, governance in 35, training in 30, privacy and security in 27, leadership in 25, usability in 23, organisational readiness in 14, and interoperability in nine. The evidence indicates that implementation is rarely shaped by a single factor. Sustainable integration depends on alignment among user confidence, clinical usefulness, workflow compatibility, leadership, resourcing, regulation, secure and interoperable infrastructure, and equitable access. The synthesis distinguishes frequency of examination from evidential weight and identifies priorities for longitudinal, multilevel, implementation-stage-specific, and comparative research.*

Keywords: digital health; implementation; determinants; telehealth; mobile health; artificial intelligence; health information systems; systematic review.

1. Introduction

Digital health implementation refers to the organisational and system-level work required to move technologies from initial availability or pilot use into reliable, routine, and sustained care. The concept extends beyond individual adoption because implementation also depends on clinical processes, managerial arrangements, technical architecture, financing, regulation, and continuous adaptation. Digital health technologies include electronic health records, telehealth, mobile health applications, artificial intelligence, remote monitoring, patient portals, and data-exchange infrastructures. These technologies can improve access, coordination, information availability, and service efficiency, but technical capability alone does not ensure meaningful integration. Wittich et al. (2026) showed that implementation barriers cluster across human and social dynamics, organisational structure and management, and infrastructure and data security. Implementation failures are consequential because poorly integrated technologies may create duplicate documentation, fragmented workflows, additional cognitive burden, and inequitable access. Technologies that appear effective in controlled settings may be abandoned when users do not trust them, when they are poorly aligned with clinical work, or when infrastructure and governance are insufficient. Borges do Nascimento et al. (2023) found that healthcare professionals encounter recurrent barriers involving workload, technical limitations, organisational support, and digital capability. Sustainable implementation therefore requires a systems perspective that considers the interaction of people, work, technology, and policy rather than treating uptake as a purely behavioural choice.

Implementation science provides several complementary lenses for organising these conditions. The Consolidated Framework for Implementation Research distinguishes intervention, inner-setting, outer-setting, individual, and process influences (Damschroder et al., 2009). The NASSS framework explains why complex technologies may be rejected, abandoned, or fail to scale when difficulties accumulate across the condition, technology, value proposition, adopter system, organisation, wider system, and adaptation over time (Greenhalgh et al., 2017). Diffusion of Innovations theory highlights perceived advantage, compatibility, complexity, trialability, and observability as mechanisms influencing spread (Rogers, 2003). Together, these perspectives indicate that determinants may function as barriers or facilitators according to context and implementation stage. Existing evidence is extensive but fragmented by technology, population, and setting. Telehealth research often emphasises reimbursement, connectivity, professional roles, and access. Mobile health research commonly focuses on acceptance, literacy, usefulness, privacy, and design. Artificial-intelligence implementation adds questions of data quality, explainability, accountability, and clinical integration. Electronic health record and data-infrastructure studies emphasise workflow, interoperability, governance, and organisational change. A cross-technology synthesis is therefore needed to distinguish recurrent determinants from technology-specific conditions and identify domains that remain underexamined.

This review addresses four research questions. First, which determinants of digital health implementation were substantively examined in eligible empirical studies? Second, how can these determinants be organised into a coherent, inductively derived analytical system? Third, which determinants received the greatest research attention, and what patterns of barriers and facilitators were reported? Fourth, what theoretical, methodological, contextual, geographical, and implementation-stage gaps remain? The aim is to provide an evidence-grounded synthesis that can guide researchers, healthcare leaders, technology developers, and policymakers while avoiding causal claims that are not supported by the predominantly observational evidence base.

2. Methodology

A PRISMA-informed systematic review with narrative synthesis was conducted. Reporting followed PRISMA 2020 principles for transparent identification, screening, eligibility assessment, and inclusion (Page et al., 2021). The review is described as PRISMA-informed because it reconstructs and independently re-screens a publicly archived evidence corpus rather than rerunning every original database query. The eligible publication window covered 1 January 2015 to 31 December 2025 and comprised eleven complete calendar years. Only English-language, peer-reviewed, primary empirical studies were eligible. The identification pool comprised 238 publications in the open supplementary dataset of Wittich et al. (2026), derived from documented PubMed/MEDLINE and Scopus searches for digital health implementation barriers and facilitators, supplemented by citation tracking. Archived titles, designs, samples, countries, stakeholder groups, technology categories, and extracted barrier-facilitator text formed the screening and extraction base. This design enabled transparent secondary verification while distinguishing the reconstructed corpus from a de novo search.

Eligible studies examined implementation, integration, scale-up, routinisation, sustained use, or operational adoption of a digital health technology and substantively analysed at least one determinant rather than merely mentioning it in background text. Studies had to report a recognisable empirical design, an identifiable healthcare population or organisational setting, and sufficient methodological and results information for responsible coding. Qualitative, quantitative, and mixed-methods designs were accepted. Systematic reviews, scoping reviews, narrative reviews, editorials, protocols, commentaries, white papers without primary data, and conference abstracts without adequate methods were excluded. Studies limited to attitudes toward hypothetical technologies were excluded when they lacked a defensible connection to implementation processes. Duplicate or overlapping reports were retained only when they contributed distinct empirical findings. Re-screening proceeded in two stages. The 238 records were first screened using titles, abstract-level descriptions, and publication types. One hundred were excluded because they were reviews, clearly non-empirical, or outside scope. Detailed evidence fields were then assessed for 138 empirical candidates. Seventy-four were excluded: 26 lacked sufficient focus on implementation determinants, 18 were narrowly condition- or prototype-specific without transferable evidence, 14 lacked adequate methodological reporting or extractable detail, nine were conceptual or non-empirical despite initial classification, and seven overlapped with another report. The remaining 64 studies formed the final evidence base.

Data extraction captured author, publication year, title, design, sample, country, stakeholder group, technology category, barriers, facilitators, and quality-appraisal information. Determinant categories were developed inductively and consolidated only when concepts were substantively equivalent. Fourteen determinants were retained: acceptance, digital skills, perceived value, workflow fit, leadership, organisational readiness, training, financing, governance, usability, interoperability, infrastructure, privacy and security, and equity and access. A check mark was assigned only when a study substantively examined a determinant in its methods or findings. Methodological quality was appraised using design-appropriate questions from the 2018 Mixed Methods Appraisal Tool (Hong et al., 2018), covering research-question clarity, sampling and data collection, completeness of reporting, coherence between data and interpretation, and mixed-methods integration. Appraisal was summarised qualitatively: 39 studies met most design-relevant criteria, 16 had moderate limitations, and nine had substantial methodological or reporting limitations. No single numerical MMAT score was calculated. Appraisal findings informed interpretive weight rather than exclusion or aggregation into a single quality score. Meta-analysis was inappropriate because of substantial heterogeneity in technologies, populations, outcomes, implementation stages, designs, and measures. Narrative synthesis compared recurrent barriers and facilitators across determinants, technologies, stakeholder groups, and settings; frequency counts represented evidence coverage rather than effect magnitude.

Figure 1 summarises the reconciled identification, screening, eligibility, and inclusion pathway for the present review.

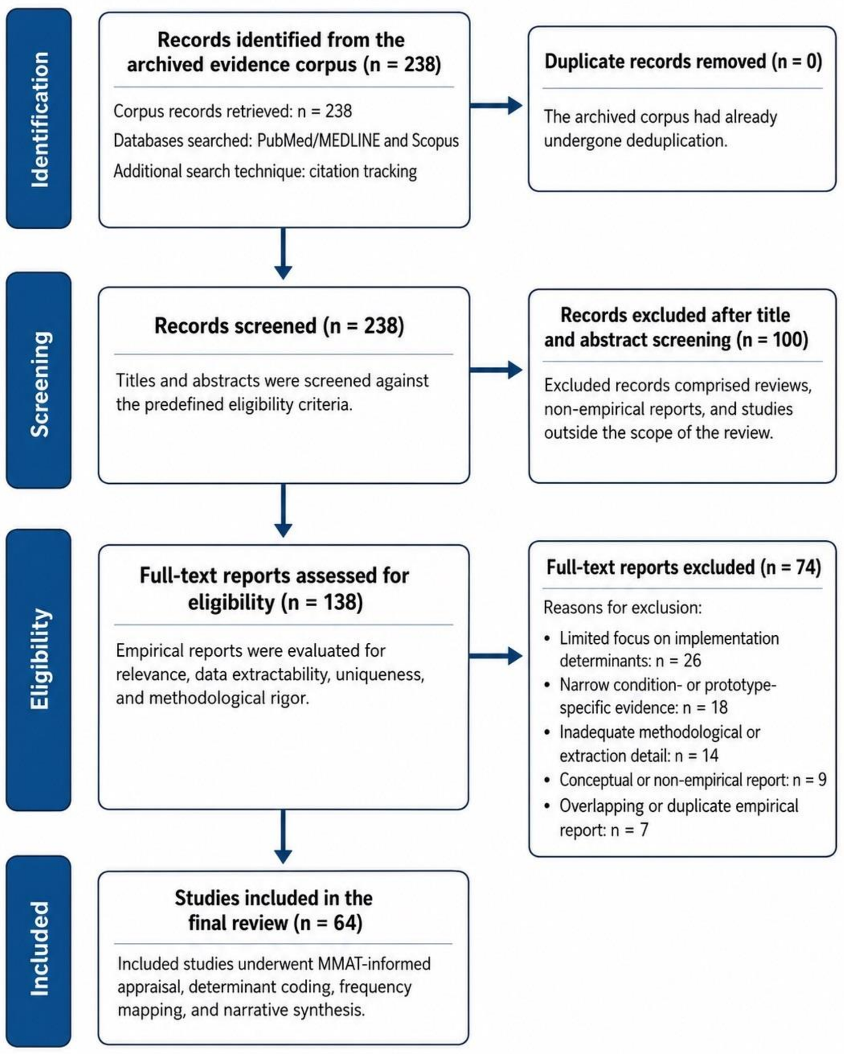

Figure 1: The Systematic Review Process

3. Conceptual and Analytical Innovation

The first analytical contribution is a determinant system that separates implementation conditions without treating them as independent. Acceptance captures willingness, trust, resistance, engagement, and behavioural commitment. Digital skills cover literacy, knowledge, confidence, and technical competence. Perceived value reflects usefulness, effectiveness, relative advantage, and clinical relevance. Workflow fit concerns compatibility with routines, workload, time, documentation, and service processes. Leadership captures strategic direction, implementation champions, communication, collaboration, and managerial support. Organisational readiness represents culture, capacity, preparedness, and change-management capability. Training captures structured education and ongoing technical or peer support. The remaining determinants connect implementation to wider organisational and technical systems. Financing includes costs, investment, reimbursement, budgets, and incentives. Governance covers policy, regulation, legal responsibility, standards, approval, and accountability. Usability concerns interface quality, ease of use, functionality, and user-centred design. Interoperability addresses data exchange, system integration, and standards. Infrastructure covers hardware, software, devices, networks, internet access, and technical capacity. Privacy and security include confidentiality, cybersecurity, data ownership, consent, and liability concerns. Equity and access capture geographic, socioeconomic, linguistic, age-related, disability-related, and service-access conditions.

The frequency map describes research attention rather than causal magnitude. Acceptance was examined in 56 of 64 studies (87.5%), infrastructure in 46 (71.9%), equity and access in 44 (68.8%), digital skills in 43 (67.2%), and perceived value in 41 (64.1%). Workflow fit and financing each appeared in 37 studies (57.8%), governance in 35 (54.7%), training in 30 (46.9%), privacy and security in 27 (42.2%), leadership in 25 (39.1%), usability in 23 (35.9%), organisational readiness in 14 (21.9%), and interoperability in nine (14.1%). These counts indicate concentrated research attention to user-facing and resource conditions while also revealing limited direct examination of readiness and interoperability.

Table 1 maps the 64 included studies against the fourteen determinants and the focal implementation outcome.

Table 1: Literature Review Matrix

No.	Author(s) and Year	Acceptance	Digital Skills	Perceived Value	Workflow Fit	Leadership	Readiness	Training	Financing	Governance	Usability	Interoperability	Infrastructure	Privacy/Security	Equity/Access	Implementation
1	Serrano et al. (2018)	✓			✓	✓	✓	✓	✓		✓	✓			✓	✓
2	Aljohani et al. (2019)	✓					✓			✓						✓
3	Byambasuren et al. (2019)	✓	✓	✓	✓			✓	✓				✓		✓	✓
4	Cole et al. (2019)	✓	✓	✓	✓			✓					✓	✓	✓	✓
5	Natsiavas et al. (2019)	✓			✓					✓		✓	✓			✓
6	Prendergast et al. (2019)	✓		✓	✓	✓	✓	✓					✓	✓		✓
7	Seto et al. (2019)	✓		✓					✓				✓			✓
8	Weichelt et al. (2019)	✓	✓		✓	✓	✓			✓	✓		✓		✓	✓
9	Ye et al. (2019)	✓	✓												✓	✓
10	Zachrison et al. (2019)	✓			✓				✓	✓					✓	✓
11	Zhou et al. (2019)	✓			✓				✓	✓	✓		✓	✓	✓	✓
12	Abd Razak et al. (2020)	✓	✓						✓				✓			✓
13	Aloyuni et al. (2020)	✓	✓						✓	✓						✓
14	Bally et al. (2020)	✓	✓	✓	✓	✓		✓	✓	✓	✓			✓	✓	✓
15	Curtis et al. (2020)	✓	✓	✓	✓	✓		✓						✓	✓	✓
16	Fortuna et al. (2020)	✓	✓					✓	✓		✓		✓		✓	✓
17	Haneef et al. (2020)		✓			✓			✓	✓			✓	✓	✓	✓
18	Hulter et al. (2020)	✓	✓	✓	✓								✓	✓	✓	✓
19	Kosari et al. (2020)				✓			✓						✓	✓	✓

No.	Author(s) and Year	Acceptance	Digital Skills	Perceived Value	Workflow Fit	Leadership	Readiness	Training	Financing	Governance	Usability	Interoperability	Infrastructure	Privacy/Security	Equity/Access	Implementation
20	Lavallee et al. (2020)			✓	✓			✓	✓	✓	✓	✓	✓		✓	✓
21	Ramdani et al. (2020)	✓		✓		✓	✓			✓	✓		✓	✓		✓
22	Waschkau et al. (2020)	✓							✓		✓		✓			✓
23	Alkureishi et al. (2021)	✓	✓	✓									✓		✓	✓
24	Carlqvist et al. (2021)	✓	✓	✓	✓	✓					✓	✓	✓		✓	✓
25	Clark et al. (2021)	✓	✓	✓	✓			✓	✓	✓	✓				✓	✓
26	Dahlhausen et al. (2021)	✓	✓						✓	✓						✓
27	Depuccio et al. (2021)		✓			✓		✓								✓
28	Ezezika et al. (2021)		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓
29	Frank et al. (2021)	✓	✓	✓						✓						✓
30	Kalicki et al. (2021)	✓		✓									✓		✓	✓
31	Khodadad-Saryazdi et al. (2021)	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓		✓
32	Pan et al. (2021)	✓		✓						✓			✓	✓	✓	✓
33	Rauwerdink et al. (2021)	✓		✓		✓							✓			✓
34	Taboada et al. (2021)	✓	✓	✓	✓	✓	✓				✓		✓		✓	✓
35	Aggarwal et al. (2022)	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓		✓	✓
36	Al Badi et al. (2022)	✓		✓									✓	✓		✓
37	Alsobhi et al. (2022)	✓	✓	✓			✓	✓	✓	✓	✓		✓	✓		✓
38	Cannavacciuolo et al. (2022)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓
39	DeHart et al. (2022)	✓		✓					✓	✓			✓		✓	✓
40	Fernández Coves et al. (2022)	✓	✓	✓		✓		✓	✓	✓			✓		✓	✓
41	Frey et al. (2022)	✓	✓	✓				✓		✓			✓			✓
42	Kaihlanen et al. (2022)	✓	✓	✓	✓	✓		✓	✓		✓		✓	✓	✓	✓
43	Ma et al. (2022)	✓			✓				✓	✓	✓		✓		✓	✓
44	Mosch et al. (2022)	✓		✓	✓	✓		✓			✓	✓	✓			✓
45	Ng et al. (2022)	✓	✓	✓	✓	✓		✓	✓				✓	✓	✓	✓
46	Payán et al. (2022)		✓				✓		✓	✓			✓	✓	✓	✓
47	Schouten et al. (2022)	✓	✓	✓	✓										✓	✓
48	Terry et al. (2022)		✓							✓					✓	✓
49	Weinert et al. (2022)	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓		✓
50	Ab Hamid et al. (2023)	✓						✓			✓		✓		✓	✓
51	Alanazi et al. (2023)	✓		✓					✓		✓			✓	✓	✓

No.	Author(s) and Year	Acceptance	Digital Skills	Perceived Value	Workflow Fit	Leadership	Readiness	Training	Financing	Governance	Usability	Interoperability	Infrastructure	Privacy/Security	Equity/Access	Implementation
52	Alzghaibi et al. (2023)	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓
53	Antonacci et al. (2023)	✓	✓	✓	✓			✓	✓	✓		✓	✓	✓	✓	✓
54	Darcel et al. (2023)	✓	✓	✓	✓		✓		✓	✓		✓			✓	✓
55	Fazakarley et al. (2023)	✓	✓		✓		✓			✓			✓	✓	✓	✓
56	Heeres et al. (2023)	✓	✓	✓	✓	✓			✓	✓			✓	✓		✓
57	Horwood et al. (2023)		✓		✓			✓							✓	✓
58	Lew et al. (2023)	✓	✓	✓	✓	✓		✓		✓			✓		✓	✓
59	Liljeroos et al. (2023)	✓	✓	✓	✓			✓	✓	✓			✓	✓	✓	✓
60	Blondino et al. (2024)	✓	✓						✓				✓			✓
61	Hosseini et al. (2024)	✓	✓	✓		✓		✓	✓	✓			✓	✓	✓	✓
62	Marco-Ruiz et al. (2024)	✓	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓	✓
63	Schroeder et al. (2024)	✓		✓	✓				✓						✓	✓
64	Weik et al. (2024)	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 1 shows that implementation studies usually examined clusters of determinants rather than isolated factors. Acceptance, infrastructure, equity and access, digital skills, and perceived value were most frequently represented, indicating sustained attention to user engagement and practical access. Workflow fit, financing, and governance form a second cluster that links local use to organisational and policy conditions. Training, privacy and security, leadership, and usability were moderately represented. Organisational readiness and interoperability were least frequently examined even though they are important to scale-up and cross-system integration. Every row is marked in the implementation column because each study contributed eligible evidence on the focal phenomenon. The matrix should not be interpreted as an effect-size ranking; a frequently examined determinant may have mixed or context-dependent findings.

4. Discussion

Acceptance emerged as the most frequently examined determinant, but it should not be interpreted as a fixed personal trait. It may change with experience, perceived usefulness, trust, risk, peer influence, and the credibility of implementation processes. Byambasuren et al. (2019) found that general practitioners wanted more knowledge, evidence, and authoritative guidance before recommending mobile health applications. Alkureishi et al. (2021) showed that clinician perspectives on telemedicine reflected both perceived benefits and concerns about the quality of interaction. Schroeder et al. (2024) similarly identified practical conditions associated with improving uptake among older adults. These findings suggest that engagement strategies should demonstrate clinical value, create opportunities for hands-on learning, and respond to concerns rather than treating resistance as an individual deficit. Digital skills and training were related but not interchangeable. Skills describe existing capability, whereas training is an implementation strategy intended to build capability and maintain competent use. Abd Razak et al. (2020) identified human skills, expertise, support, and technological resources as central to health-information-system implementation. Alsobhi et al. (2022) reported that knowledge, experience, costs, and available resources shaped rehabilitation professionals' use of artificial intelligence. Aggarwal et al. (2022) found that large-scale mobile implementation required dedicated personnel, communication, governance, and iterative support. Training is therefore unlikely to succeed when it is delivered once, detached from workflow, or unsupported by protected time and technical assistance.

Perceived value and workflow fit explain why technically functioning tools may not become routine. Users are more likely to integrate a technology when it improves access, decision-making, coordination, efficiency, or continuity without creating disproportionate documentation or interruption. Bally et al. (2020) found that stakeholders considered the fit between mobile health and primary-care work when judging integration. Depuccio et al. (2021) described how physicians adapted operations during the rapid transition to telemedicine. Cannavacciuolo et al. (2022) showed that telemedicine implementation required organisational change rather than simple technical deployment. The combined evidence supports early workflow mapping, staged implementation, iterative redesign, and explicit assessment of who benefits and who absorbs additional work. Leadership and organisational readiness were less frequently coded than acceptance, but they were especially salient when implementation crossed professional or organisational boundaries. Serrano et al. (2018) identified stakeholder-specific barriers involving incentives, regulation, communication, and organisational responsibilities. Ezezika et al. (2021) showed that scaling a maternal mobile-health project required coordination beyond the technology itself. Alzghaibi et al. (2023) highlighted the organisational complexity of large-scale electronic health record implementation in primary care. The evidence therefore characterises credible leadership as aligning strategy, roles, resources, accountability, and local participation rather than relying on symbolic endorsement.

Financing and governance frequently operated as outer-setting conditions. High acquisition and maintenance costs, uncertain reimbursement, inadequate staffing, and short-term project funding may undermine continuation after pilot phases. Zachrison et al. (2019) identified barriers to telemedicine implementation in rural emergency departments that extended beyond clinician attitudes. Hosseini et al. (2024) reported that policymakers viewed regulation, infrastructure, financing, and coordination as interconnected telemedicine challenges. Al Badi et al. (2022) identified ethical, security, accuracy, and control concerns in artificial-intelligence adoption. These findings support lifecycle financing, clear reimbursement rules, proportionate regulation, transparent accountability, and procurement criteria that include integration and maintenance costs. Technical determinants were multidimensional. Infrastructure concerned the availability and reliability of devices, networks, software, and support. Usability concerned whether the technology could be used efficiently and safely, whereas interoperability concerned whether information could move between systems while retaining meaning. Privacy and security concerned whether data practices were trustworthy, lawful, and resilient. Natsiavas et al. (2019) highlighted the importance of citizen perspectives and system arrangements in cross-border health-data exchange. Zhou et al. (2019) found that security considerations could simultaneously inhibit and enable mobile-health use. Marco-Ruiz et al. (2024) demonstrated that artificial-intelligence implementers faced clinical, technical, organisational, and governance issues across countries. Implementation plans should therefore avoid treating technical readiness as a single checklist item.

Equity and access were examined in 44 studies, reflecting the dual potential of digital health to reduce and reproduce disadvantage. Telehealth can reduce travel and extend specialist access, but poor connectivity, device costs, limited language support, inaccessible interfaces, and low digital literacy can exclude the same populations expected to benefit. Kalicki et al. (2021) identified barriers to telehealth access among homebound older adults. Kaihlanen et al. (2022) documented challenges experienced by vulnerable groups using digital health services. Blondino et al. (2024) reported the use and potential impact of digital health tools at the community level across multiple countries. Equity assessment should therefore be embedded in design, procurement, deployment, and monitoring rather than added after implementation. The theoretical synthesis indicates that implementation depends on cumulative alignment. Diffusion theory helps explain perceived advantage and compatibility, but individual adoption constructs do not fully capture organisational capacity. CFIR draws attention to inner-setting, outer-setting, individual, intervention, and process domains. NASSS accounts for complexity that can evolve over time and impede scale, spread, or sustainability. The evidence suggests that a technology may be accepted yet remain unsustainable if financing, governance, workflow, infrastructure, or interoperability are weak. Conversely, technically mature systems may remain underused when value is unclear, training is inadequate, or users lack influence over design.

Quality appraisal tempers the conclusions. Most studies were qualitative, cross-sectional, or mixed-methods investigations that were well suited to identifying context and plausible mechanisms but could not establish causal effects. Among the included studies, 39 met most design-relevant appraisal criteria and generally demonstrated clearer sampling, data collection, and analytic coherence. Sixteen studies had moderate limitations, including small samples or restricted settings, while nine had substantial limitations because of incomplete reporting or weak linkage between data and conclusions. Accordingly, the evidence supports claims about contextual associations and plausible mechanisms, not universal causal estimates or a single implementation formula.

5. Research Gaps and Future Research Directions

The first gap concerns implementation stage. Many studies conflate initial acceptance, early adoption, operational implementation, scale-up, and sustainability even though determinants may change across these phases. Future research should define the stage explicitly and use longitudinal designs that follow technologies from preparation through routinisation and adaptation. Repeated measurement would clarify whether early enthusiasm persists, whether workload effects decline after learning, and when financing or governance constraints become decisive. The second gap is the limited direct examination of organisational readiness and interoperability. Readiness appeared in only 14 studies and interoperability in nine, despite their importance for complex, multi-site, and data-intensive technologies. Future studies should operationalise readiness through measurable leadership, staffing, governance, change capacity, and learning-system indicators. Interoperability research should examine semantic, technical, organisational, and legal dimensions rather than treating data exchange as a binary technical property.

The third gap concerns causal and comparative evidence. Many determinant-outcome relationships were examined using cross-sectional surveys, making directionality uncertain. Hybrid effectiveness-implementation trials, stepped-wedge evaluations, natural experiments, interrupted time-series studies, and comparative case studies could test specific strategies while preserving contextual explanation. Evaluations should report implementation outcomes such as adoption, fidelity, penetration, acceptability, feasibility, cost, and sustainability using validated measures. The fourth gap is geographical and distributional. Although the evidence spans several regions, high-income settings and digitally mature organisations remain overrepresented. Future research should include low-resource health systems, rural services, community organisations, disability groups, linguistic minorities, and people with limited digital access. Equity analyses should report who is reached, who is excluded, what accommodations are provided, and whether digital delivery changes disparities in access or outcomes.

The fifth gap concerns emerging artificial-intelligence implementation. Studies increasingly describe trust, explainability, data quality, liability, bias, and professional roles, but few follow systems through routine deployment at scale. Future research should distinguish model performance from implementation performance and examine monitoring, human oversight, workflow integration, responsibility for error, model updating, and post-deployment drift. Comparative studies should test whether governance and training requirements differ among predictive tools, generative systems, decision support, and administrative automation. Finally, determinant interactions require stronger modelling. The matrix shows co-occurrence, but it does not establish which combinations are necessary, sufficient, or compensatory. Multilevel studies should test whether leadership strengthens the effects of training, whether usability matters more when digital skills are limited, whether reimbursement conditions moderate adoption within clinical workflows, and whether privacy safeguards increase trust without creating prohibitive burden. Configurational methods and realist evaluation may be particularly useful for identifying which combinations work, for whom, under what conditions, and at which implementation stage.

6. Conclusion

This systematic review synthesised 64 empirical studies and identified fourteen determinants of digital health implementation. The evidence shows that implementation is a multilevel alignment problem rather than a simple technology-acceptance problem. Acceptance, infrastructure, equity and access, digital skills, and perceived value received the greatest research attention, while organisational readiness and interoperability were comparatively underexamined. Sustainable implementation requires technologies that are useful and usable, users who are engaged and supported, workflows that can absorb change, leaders who coordinate strategy and resources, financing that extends beyond pilots, governance that clarifies responsibility, and infrastructure that is secure, interoperable, and accessible. Because the evidence base is heterogeneous and predominantly observational, determinant frequencies should not be interpreted as causal rankings. Future research should employ longitudinal, comparative, multilevel, and implementation-stage-specific designs to assess how determinants interact and which strategies produce durable, equitable integration across diverse health systems.

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