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Digital Health Communication Between Healthcare Providers and Patients During COVID-19: A Narrative Review

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Abstract
The COVID-19 pandemic accelerated the transformation of healthcare communication by shifting interactions between healthcare providers and patients from face-to-face encounters to digitally mediated communication. Digital communication platforms, including telemedicine, remote patient monitoring (RPM), virtual wards, mobile health applications, and messaging services, became essential channels for exchanging health information, monitoring patient conditions, providing consultation, and supporting continuity of care. This narrative review aimed to synthesize the existing evidence on digital health communication between healthcare providers and patients during COVID-19, with a particular focus on communication channels, information exchange, patient engagement, communication quality, and communication barriers. A purposive literature search was conducted using PubMed, Scopus, ScienceDirect, ProQuest, Embase, and other relevant sources. Twenty-six studies were included and analyzed using a narrative thematic approach. The findings indicate that digital health communication enhanced timely information exchange, facilitated continuous interaction between healthcare providers and patients, improved patient engagement in self-management, and strengthened communication throughout home-based care. The review also identified several communication challenges, including disparities in digital literacy, unequal access to communication technologies, privacy concerns, reduced interpersonal interaction, and variations in communication practices across healthcare settings. Overall, digital health communication has become a fundamental component of interdisciplinary healthcare communication by supporting accessible, patient-centered, and continuous communication during public health emergencies. Future implementation should strengthen communication quality, promote

digital inclusion, and develop communication strategies that foster effective patient–provider interaction beyond the COVID-19 pandemic.

Keywords: COVID-19, *Digital Health Communication, Health Communication, Patient Engagement, Telemedicine*.

1. Introduction

In order to preserve continuity of care while lowering in-person visits, infection risk, and strain on healthcare systems, the COVID-19 pandemic hastened the use of digital health interventions, particularly telemedicine and remote patient monitoring (RPM) (Ahmed et al., 2024; Bouabida et al., 2021a; Chatterjee et al., 2023; Jnr, 2020; Khan & Duncan, 2025). These technologies have been used in a variety of contexts, such as home isolation, chronic illness management, outpatient care, and post-discharge monitoring. They have been supported by a number of modalities, including video visits, telephone consultations, mobile applications, and device-based monitoring (Ganjali et al., 2022; Houlding et al., 2021; Reforma et al., 2020; Vartanian et al., 2022). Beyond their contribution during the epidemic, the quick growth of digital health has brought attention to the necessity of creative care models as well as long-term finance and regulatory frameworks to facilitate integration into healthcare systems (Ahmed et al., 2024; Chatterjee et al., 2023; Khan & Duncan, 2025).

Research indicates that digital health interventions can enhance patient outcomes, healthcare efficiency, and accessibility. According to systematic reviews and observational research, telemedicine enhances patient satisfaction rates between 70% and 95%, decreases waiting times by 30–50%, boosts follow-up adherence by 20–40%, and lowers travel-related expenses by 25–60% (Bouabida et al., 2021a; Farooq, 2025; Ganjali et al., 2022; Pogorzelska & Chlabicz, 2022). In a similar vein, improvements in disease indicators, symptom severity, overall health status, and decreases in direct and indirect healthcare costs have all been linked to telemedicine and RPM (Ezeamii et al., 2024; Tan et al., 2024a; Vudathaneni et al., 2024). Nearly 90% of patients in remote areas thought they had better access to specialized treatment, and about 85% of patients expressed high satisfaction due to increased convenience and shorter wait times (Tejesh et al., 2025). During the COVID-19 pandemic, telehealth was also essential for maintaining healthcare delivery and reducing in-person interactions, which may have reduced morbidity and mortality (Jnr, 2020; Monaghesh & Hajizadeh, 2020; Ohannessian et al., 2020).

RPM may also reduce hospital admissions, length of stay, and mortality, particularly in patients with heart failure and chronic diseases,

according to several studies (De Lathauwer et al., 2025; Girerd et al., 2025; Smedslund et al., 2025). Additionally, although their impacts on intensive care consumption are yet unknown, artificial intelligence (AI)-based digital solutions, such as early warning systems, have demonstrated promise in reducing in-hospital and 30-day mortality as well as shortening overall hospital stays (Yuan et al., 2025). However, in rigorous trials, wearable monitoring technologies and traditional automated alert systems have not consistently shown significant reductions in mortality, hospital length of stay, or ICU transfer rates, suggesting that their efficacy may depend on implementation context and design (Areia et al., 2021; Blythe et al., 2022; Herasevich et al., 2022; Mann et al., 2021).

The efficacy and equity of digital health interventions are still constrained by significant obstacles, despite these encouraging results. Ten to thirty percent of low-income populations have restricted access to gadgets and internet connectivity, and fifteen to twenty-five percent of patients struggle with digital literacy (Adeogun & Faezipour, 2025; Badawy & Radovic, 2020; Farooq, 2025; Smith et al., 2020). Connectivity issues remain particularly prominent in rural areas, where around 30% of patients report internet-related difficulties and some perceive a lack of personal interaction with healthcare providers (Tejesh et al., 2025). Additional concerns include data privacy and cybersecurity risks, increased clinician workload and data overload, and the potential erosion of patient–provider relationships due to reduced face-to-face interaction and physical examination (Farooq, 2025; Hailu et al., 2024; Houlding et al., 2021; Jnr, 2020; Tagne et al., 2025; Tejesh et al., 2025; Van Grootven et al., 2023). These challenges disproportionately affect older adults, socioeconomically disadvantaged populations, and individuals living in non-metropolitan areas (Adeogun & Faezipour, 2025).

Despite the fact that telemedicine, RPM, and other digital health initiatives have been the subject of multiple research throughout the COVID-19 pandemic, the data is still quite inconsistent, with significant differences in study design, populations, technologies, and outcome measures (Tan et al., 2024). Furthermore, meta-analyses evaluating health information technologies and automated early warning systems have reported inconsistent effects on mortality and hospital length of stay, and positive findings from pre–post studies should be interpreted cautiously (Blythe et al., 2022; Herasevich et al., 2022; Mann et al., 2021). Consequently, several authors have called for a comprehensive synthesis of evidence across different technologies, settings, and populations to better understand the overall contribution of digital interventions to COVID-19 patient management and to inform equitable, secure, and

sustainable healthcare policiesn (Badawy & Radovic, 2020; Monaghesh & Hajizadeh, 2020; Ohannessian et al., 2020).

Given the diversity of digital health interventions, implementation contexts, and reported outcomes, a narrative review is particularly suitable for integrating evidence from heterogeneous studies that are not readily amenable to quantitative synthesis or meta-analysis. Therefore, this review addresses three questions: (1) What digital interventions have been used in the management of COVID-19 patients? (2) What are their effects on clinical outcomes and patient experience? and (3) What barriers and facilitators influence their implementation? In order to discover implications for more equitable and sustainable digital healthcare delivery in future practice, this narrative review attempts to consolidate research about the role of telemedicine, telemonitoring, and remote patient monitoring in COVID-19 patient management.

2. Method

2.1 Study Design

In order to give a comprehensive picture of the function of digital health interventions in COVID-19 patient management, this study used a narrative review methodology. Narrative reviews are particularly useful for synthesizing evidence from diverse study designs and heterogeneous healthcare contexts, allowing the integration of findings from different types of digital interventions and the identification of emerging themes, challenges, and future directions. The review focused on telemedicine, telemonitoring, remote patient monitoring (RPM), virtual wards, and other technology-based communication systems used in the care of patients with COVID-19.

2.2 Literature Search Strategy

A literature search was conducted to identify relevant publications from major electronic databases, including PubMed, ScienceDirect, Scopus, ProQuest, and Embase, as well as additional sources identified through reference lists and manual searches. The search focused on studies addressing digital health interventions in COVID-19 patient care, including telemedicine, telemonitoring, remote patient monitoring, and virtual wards. Representative keywords included combinations of "COVID-19," "telemedicine," "telehealth," "remote patient monitoring," "telemonitoring," "virtual ward," "digital health," "patient management," and "patient care."

2.3 Study Selection and Eligibility Criteria

Studies were selected purposively based on their relevance to the objectives of the review. Priority was given to articles that discussed:

a. The use of digital health interventions in COVID-19 patient management;
b. Their effects on clinical outcomes and healthcare utilization;
c. Patient experiences and satisfaction; and
d. Implementation challenges and barriers.

A variety of publication types and study designs, including observational studies, experimental studies, qualitative research, mixed-methods studies, and relevant reviews, were considered to obtain a broad understanding of the topic. Only articles published in English or Indonesian and available in full text were included (Rahmadina et al., 2026; Riadi et al., 2025).

2.4 Data Extraction and Analysis

The findings were synthesized narratively through an iterative process of reading, comparison, and thematic grouping. Recurring concepts and patterns across studies were identified and organized into four overarching themes:

a. Digital health interventions in COVID-19 patient management;
b. Effects on clinical outcomes;
c. Patient monitoring and safety; and
d. Patient experiences and implementation challenges.

The aim of the synthesis was to provide an integrative understanding of the current evidence and to identify implications for future digital healthcare practice. The research flow used in this narrative review is presented in Figure 1.

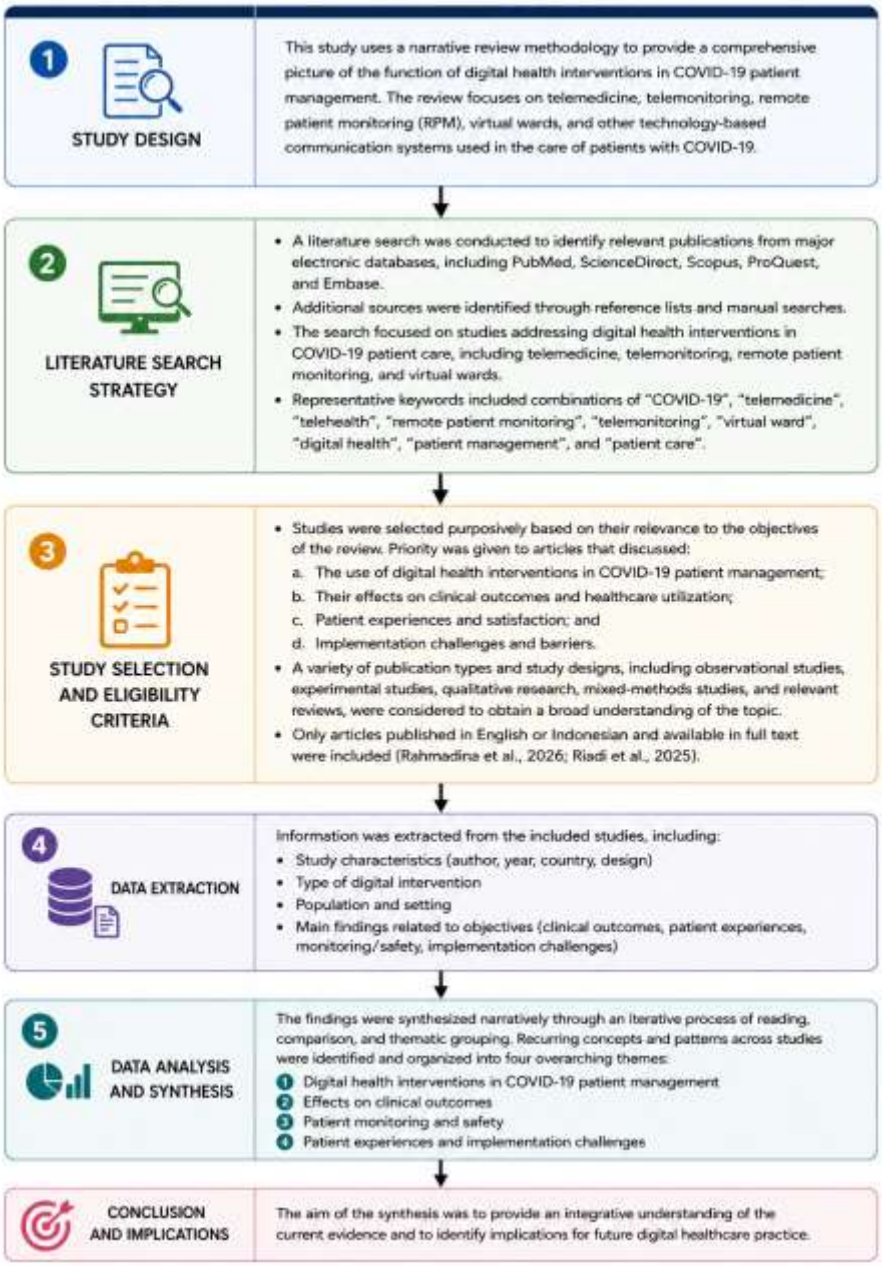

Figure 1. Research Flow

3. Results

3.1 Digital Health Interventions in COVID-19 Patient Management

The included studies demonstrated considerable diversity in the use of digital health interventions for the management of COVID-19 patients. Telemedicine, telemonitoring, remote patient monitoring (RPM), virtual

wards, mobile applications, SMS-based systems, and web-based communication platforms were the most frequently reported interventions (Ferry et al., 2021; Gordon et al., 2020; Sherlaw-Johnson et al., 2022; Suárez-Gil et al., 2022). These interventions were primarily implemented to maintain continuity of care during home isolation and after hospital discharge while minimizing unnecessary in-person visits and reducing the burden on healthcare facilities.

Most programs adopted a structured communication model that enabled bidirectional interaction between patients and healthcare professionals. Communication modalities included telephone consultations, video visits, automated symptom reporting, and digital dashboards that facilitated real-time sharing of clinical information (Martínez-García et al., 2020; Mejia et al., 2022). Several studies also integrated physiological monitoring devices, particularly pulse oximeters, to support remote assessment of patient status and early identification of deterioration (Kodama et al., 2021; Patel et al., 2022; Ward et al., 2022). Despite differences in implementation, the common objective of these interventions was to provide safe and continuous care outside traditional healthcare settings.

Table 1. Digital Health Interventions Used in COVID-19 Patient Management

Intervention	Main Application	Communication Modality	Representative Studies
Telemedicine	Outpatient consultation and follow-up	Telephone, video consultation	Gordon et al., 2020; Suárez-Gil et al., 2022
Telemonitoring	Symptom monitoring and risk assessment	SMS, mobile applications	Martínez-García et al., 2020; Mejia et al., 2022
Remote Patient Monitoring (RPM)	Home monitoring and post-discharge care	Connected devices, dashboards	Kodama et al., 2021; Patel et al., 2022
Virtual wards	Early discharge and home-based care	Teleconsultation and monitoring platforms	Ferry et al., 2021; Sherlaw-Johnson et al., 2022

3.2 Effects on Clinical Outcomes

Overall, digital health interventions were associated with improvements in healthcare utilization and selected clinical outcomes. Several studies reported reductions in hospital readmissions, emergency department visits, and length of hospital stay among patients participating in telemonitoring and RPM programs (Crotty et al., 2022; Haddad et al., 2022; Suárez-Gil et al., 2022). Similarly, virtual ward models facilitated earlier discharge and improved hospital bed availability without increasing mortality or adverse events (Borgen et al., 2021; Georghiou et al., 2022; Kuo et al., 2022).

However, the magnitude of these benefits varied across studies. Some investigations found that digital monitoring enabled earlier detection of deterioration and potentially reduced intensive care unit (ICU) admissions (van den Berg et al., 2022; Ward et al., 2022) . In contrast, other studies reported modest or inconsistent effects, suggesting that the effectiveness of digital interventions depended on patient characteristics, intervention intensity, and healthcare context (Crotty et al., 2022; Georghiou et al., 2022). The heterogeneity of study designs and outcome measures precluded direct comparison across interventions.

Table 2. Effects of Digital Health Interventions on Clinical Outcomes

Outcome	Main Findings	Representative Studies
Hospital readmission	Reduced in several studies	Crotty et al., 2022; Haddad et al., 2022; Suárez-Gil et al., 2022
Emergency department visits	Generally reduced	Crotty et al., 2022; Haddad et al., 2022
Length of hospital stay	Reduced and facilitated earlier discharge	Borgen et al., 2021; Kuo et al., 2022
Mortality	No increase reported in virtual ward models	Georghiou et al., 2022
ICU admission	Potential reduction through earlier intervention	van den Berg et al., 2022; Ward et al., 2022

3.3 Patient Monitoring and Safety

Proactive communication and routine monitoring were central features of most digital health interventions. Daily symptom reporting through mobile applications, SMS, telephone calls, and web-based platforms allowed healthcare providers to remotely assess patient conditions and identify warning signs in a timely manner (Kodama et al., 2021; Loubet et al., 2020; Shaw et al., 2021).

Alert-based systems were commonly used to improve patient safety by facilitating early recognition of clinical deterioration and prompt escalation of care (Martínez-García et al., 2020; Patel et al., 2022; Sherlaw-Johnson et al., 2022). Nevertheless, substantial variation existed regarding monitoring frequency, communication intensity, and escalation protocols. Some programs implemented daily monitoring, whereas others relied on patient-initiated communication or less frequent follow-up (Haddad et al., 2022; Mejia et al., 2022). Such differences may explain the variability in patient safety outcomes reported across studies.

Table 3. Patient Monitoring and Safety Strategies

Monitoring Strategy	Purpose	Potential Benefit	Representative Studies
Daily symptom reporting	Monitor disease progression	Early identification of deterioration	Loubet et al., 2020; Shaw et al., 2021
Pulse oximetry monitoring	Monitor oxygen saturation	Detection of silent hypoxemia	Kodama et al., 2021; Patel et al., 2022
Alert-based communication	Escalation of care	Timely intervention and improved safety	Martínez-García et al., 2020; Sherlaw-Johnson et al., 2022

3.4 Patient Experiences and Implementation Challenges

Overall, patient experiences with digital health interventions were favorable. Many patients reported feeling reassured by continuous communication with healthcare professionals and appreciated the convenience of receiving care at home while maintaining access to healthcare services (Bouabida et al., 2021; Hutchings et al., 2021; Marquez-Algaba et al., 2022). Several studies also reported improved patient engagement and greater adherence to self-monitoring practices (Bouabida et al., 2021; Ferry et al., 2021; Shaw et al., 2021).

Despite these benefits, several implementation challenges were consistently identified. Limited digital literacy, unequal access to technology, and variability in program implementation were among the most frequently reported barriers (Bouabida et al., 2021; Sherlaw-Johnson et al., 2022). Furthermore, some patients perceived a reduction in empathy and interpersonal interaction because of the absence of face-to-face encounters, highlighting concerns regarding the quality of patient-provider relationships in virtual care settings (Bouabida et al., 2021; Sherlaw-Johnson et al., 2022).

Table 4. Patient Experiences and Implementation Challenges

Domain	Main Findings	Representative Studies
Patient satisfaction	Generally high satisfaction and reassurance	Hutchings et al., 2021; Marquez-Algaba et al., 2022
Access to care	Improved convenience and healthcare access	Bouabida et al., 2021; Ferry et al., 2021
Self-management	Improved adherence to self-monitoring	Bouabida et al., 2021; Shaw et al., 2021
Digital literacy	Barrier to technology use	Bouabida et al., 2021
Technology access	Unequal access across populations	Sherlaw-Johnson et al., 2022
Patient-provider relationship	Reduced perceived empathy and personal interaction	Bouabida et al., 2021; Sherlaw-Johnson et al., 2022

Overall, the evidence indicates that digital health interventions can support continuity of care and improve patient experience during COVID-19 management. However, their effectiveness and implementation remain dependent on intervention design, healthcare infrastructure, and patient characteristics, highlighting the need for context-specific implementation strategies.

4. Discussion

By facilitating the shift from hospital-centered care to technology-supported home-based care, this review shows how digital health interventions, in particular, telemedicine, telemonitoring, and remote patient monitoring (RPM), played a crucial role in sustaining healthcare delivery during the COVID-19 pandemic. The widespread implementation of these interventions reflects an accelerated digital transformation in healthcare systems and highlights their potential to support continuity of

care beyond the acute phase of the pandemic (Ferry et al., 2021; Suárez-Gil et al., 2022). Consistent with previous studies, telemedicine and RPM facilitated virtual consultations, reduced the need for in-person visits, and supported ongoing management of patients with acute and chronic conditions (Chukwudi & Paul-Chima, 2024; Khan & Duncan, 2025). However, the rapid adoption of digital technologies also exposed existing inequalities in access to healthcare and underscored the need for stronger integration of digital interventions into routine healthcare delivery (Julesz, 2022; Latulippe et al., 2017; Ramsetty & Adams, 2020; Whitelaw et al., 2020).

The findings suggest that digital health interventions can improve healthcare efficiency by facilitating earlier discharge, increasing hospital bed availability, and reducing unnecessary healthcare utilization, including emergency department visits and hospital readmissions (Borgen et al., 2021; Haddad et al., 2022; Kodama et al., 2021; Kuo et al., 2022). Nevertheless, the evidence regarding their effects on more robust clinical outcomes remains less consistent. Although several studies reported reductions in intensive care admissions and trends toward lower mortality among remotely monitored patients, these findings were not universally observed and, in some cases, did not reach statistical significance (Crotty et al., 2022; van den Berg et al., 2022). Therefore, while digital interventions appear to provide clinically meaningful benefits in supporting continuity of care and healthcare system capacity, their direct effects on mortality and severe disease outcomes remain uncertain and require further investigation.

A notable finding of this review is the importance of proactive communication in enhancing patient monitoring and safety. Daily symptom reporting, automated alerts, and remote physiological monitoring enabled early identification of clinical deterioration and facilitated timely intervention (Loubet et al., 2020; Martínez-García et al., 2020; Patel et al., 2022; Sherlaw-Johnson et al., 2022). These findings support the growing recognition that digital health interventions are not merely communication tools but also clinical decision-support mechanisms that can strengthen community-based care and reduce delays in escalation of treatment. Similar observations have been reported in other healthcare settings, where digital monitoring systems improved coordination among healthcare professionals and enhanced patient outcomes (Wickramasinghe & Schaffer, 2021).

This review also indicates that digital health interventions generally improve patient experiences by increasing convenience, reducing travel requirements, and providing reassurance through continuous communication with healthcare providers (Hutchings et al., 2021;

Marquez-Algaba et al., 2022). Importantly, the positive experiences reported by patients may contribute to greater engagement in self-management and increased adherence to monitoring programs. However, patient satisfaction should not be interpreted as direct evidence of improved clinical effectiveness, as high satisfaction often reflects convenience, accessibility, and perceived usability rather than objective health outcomes (Batbaatar et al., 2017; Black et al., 2014; Doyle et al., 2013).

Despite these benefits, several implementation challenges continue to limit the equitable and sustainable use of digital health interventions. Limited digital literacy, unequal access to devices and internet connectivity, and variability in technological infrastructure remain important barriers, particularly among older adults and socioeconomically disadvantaged populations (Bouabida et al., 2021; Pedretti et al., 2021). Furthermore, reduced face-to-face interaction may negatively influence therapeutic relationships and perceptions of empathy, which remain important components of patient-centered care. These findings suggest that digital healthcare should not necessarily replace conventional services but rather complement them through hybrid models that combine virtual and in-person care according to patient needs and clinical context.

The findings of this review also have important policy implications. Sustainable implementation of digital health interventions requires investment in digital infrastructure, equitable access to communication technologies, and educational initiatives to improve digital literacy among both patients and healthcare professionals. In addition, standardized communication protocols, clear reimbursement mechanisms, and regulatory frameworks addressing data privacy and security are essential to support long-term integration of telemedicine and RPM into routine healthcare services. Without these measures, digital health innovations may inadvertently widen existing healthcare disparities despite their potential benefits.

Several limitations of this review should be addressed. First, there was limited direct comparison between the included studies due to their extreme heterogeneity in terms of study design, patient demographics, intervention features, and outcome measures. Second, because this review employed a narrative approach, no formal risk-of-bias assessment was conducted, and therefore the strength of the available evidence should be interpreted cautiously. Third, only studies published in English and Indonesian were included, which may have introduced language bias and excluded relevant evidence from other settings. Finally, many of the included studies were conducted during the rapidly evolving circumstances

of the COVID-19 pandemic, and the generalizability of their findings to post-pandemic healthcare systems may be limited.

Overall, the evidence suggests that telemedicine, telemonitoring, and remote patient monitoring are promising strategies for supporting continuity of care and improving healthcare system resilience during public health emergencies. However, their long-term effectiveness and sustainability depend on addressing implementation barriers, reducing digital inequities, and generating higher-quality evidence regarding their impact on clinically meaningful outcomes.

5. Conclusion

This narrative review shows that telemedicine, telemonitoring, and remote patient monitoring (RPM) support continuity of care, improve access, and enhance healthcare efficiency during the COVID-19 pandemic, mainly by enabling safe remote patient management and reducing unnecessary healthcare use. However, heterogeneity of evidence and the narrative design limit the strength and generalizability of conclusions, particularly for hard outcomes such as mortality and ICU admission. These findings suggest that digital health interventions are most effective when integrated into hybrid care models supported by adequate infrastructure, standardized protocols, and improved digital literacy and equity. The review contributes by synthesizing diverse evidence on digital health use in COVID-19 care and highlighting that future research should focus on specific interventions with clinically and economically measurable outcomes in diverse and vulnerable populations.

Reference

Adeogun, A., & Faezipour, M. (2025). Assessing the Impact of Telemedicine on Patient Satisfaction Before and During the COVID-19 Pandemic. *Healthcare*, *13*(17), 2095. https://doi.org/10.3390/healthcare13172095

Ahmed, A., Mutahar, M., Daghrery, A. A., Albar, N. H., Alhadidi, I. Q. I., Asiri, A. M., Boreak, N., Alshahrani, A. A. S., Shariff, M., Shubayr, M. A., & Al Moaleem, M. M. (2024). A Systematic Review of Publications on Perceptions and Management of Chronic Medical Conditions Using Telemedicine Remote Consultations by Primary Healthcare Professionals April 2020 to December 2021 During the COVID-19 Pandemic. *Medical Science Monitor*, *30*. https://doi.org/10.12659/MSM.943383

Areia, C., Biggs, C., Santos, M., Thurley, N., Gerry, S., Tarassenko, L., Watkinson, P., & Vollam, S. (2021). The impact of wearable continuous vital sign monitoring on deterioration detection and

clinical outcomes in hospitalised patients: a systematic review and meta-analysis. *Critical Care*, *25*(1), 351. https://doi.org/10.1186/s13054-021-03766-4

Badawy, S. M., & Radovic, A. (2020). Digital Approaches to Remote Pediatric Health Care Delivery During the COVID-19 Pandemic: Existing Evidence and a Call for Further Research. *JMIR Pediatrics and Parenting*, *3*(1), e20049. https://doi.org/10.2196/20049

Batbaatar, E., Dorjdagva, J., Luvsannyam, A., Savino, M. M., & Amenta, P. (2017). Determinants of patient satisfaction: A systematic review. In *Perspectives in Public Health* (Vol. 137, Number 2). https://doi.org/10.1177/1757913916634136

Black, N., Varaganum, M., & Hutchings, A. (2014). Relationship between patient reported experience (PREMs) and patient reported outcomes (PROMs) in elective surgery. *BMJ Quality and Safety*, *23*(7). https://doi.org/10.1136/bmjqs-2013-002707

Blythe, R., Parsons, R., White, N. M., Cook, D., & McPhail, S. (2022). A scoping review of real-time automated clinical deterioration alerts and evidence of impacts on hospitalised patient outcomes. *BMJ Quality & Safety*, *31*(10), 725–734. https://doi.org/10.1136/bmjqs-2021-014527

Jnr, B. A. (2020). Use of Telemedicine and Virtual Care for Remote Treatment in Response to COVID-19 Pandemic. *Journal of Medical Systems*, *44*(7), 132. https://doi.org/10.1007/s10916-020-01596-5

Borgen, I., Romney, M. C., Redwood, N., Delgado, B., Alea, P., George, B. H., Puzziferro, J., & Shihabuddin, L. (2021). From Hospital to Home: An Intensive Transitional Care Management Intervention for Patients with COVID-19. *Population Health Management*, *24*(1). https://doi.org/10.1089/pop.2020.0178

Bouabida, K., Malas, K., Talbot, A., Desrosiers, M. È., Lavoie, F., Lebouché, B., Taguemout, M., Rafie, E., Lessard, D., & Pomey, M. P. (2021). Remote Patient Monitoring Program for COVID-19 Patients Following Hospital Discharge: A Cross-Sectional Study. *Frontiers in Digital Health*, *3*. https://doi.org/10.3389/fdgth.2021.721044

Chatterjee, A., Prinz, A., Riegler, M. A., & Das, J. (2023). A systematic review and knowledge mapping on ICT-based remote and automatic COVID-19 patient monitoring and care. *BMC Health Services Research*, *23*(1), 1047. https://doi.org/10.1186/s12913-023-10047-z

Chukwudi, O. F., & Paul-Chima, U. O. (2024). The Impact of Telemedicine on Healthcare Delivery during and after the COVID-19 Pandemic: Opportunities, Innovations, Challenges, and Policy Implications. *NEWPORT INTERNATIONAL JOURNAL OF PUBLIC*

HEALTH AND PHARMACY, *5*(1). https://doi.org/10.59298/nijpp/2024/51394818

Crotty, B. H., Dong, Y., Laud, P., Hanson, R. J., Gershkowitz, B., Penlesky, A. C., Shah, N., Anderes, M., Green, E., Fickel, K., Singh, S., & Somai, M. M. (2022). Hospitalization Outcomes among Patients with COVID-19 Undergoing Remote Monitoring. *JAMA Network Open*, *5*(7). https://doi.org/10.1001/jamanetworkopen.2022.21050

De Lathauwer, I. L. J., Nieuwenhuys, W. W., Hafkamp, F., Regis, M., Brouwers, R. W. M., Funk, M., & Kemps, H. M. C. (2025). Remote Patient Monitoring in Heart Failure: A Comprehensive Meta-Analysis of Effective Programme Components for Hospitalization and Mortality Reduction. *European Journal of Heart Failure*, *27*(9), 1670–1685. https://doi.org/10.1002/ejhf.3568

Doyle, C., Lennox, L., & Bell, D. (2013). A systematic review of evidence on the links between patient experience and clinical safety and effectiveness. In *BMJ Open* (Vol. 3, Number 1). https://doi.org/10.1136/bmjopen-2012-001570

Ezeamii, V. C., Okobi, O. E., Wambai-Sani, H., Perera, G. S., Zaynieva, S., Okonkwo, C. C., Ohaiba, M. M., William-Enemali, P. C., Obodo, O. R., & Obiefuna, N. G. (2024). Revolutionizing Healthcare: How Telemedicine Is Improving Patient Outcomes and Expanding Access to Care. *Cureus*. https://doi.org/10.7759/cureus.63881

Ferry, O. R., Moloney, E. C., Spratt, O. T., Whiting, G. F. M., & Bennett, C. J. (2021). A virtual ward model of care for patients with COVID-19: Retrospective single-center clinical study. *Journal of Medical Internet Research*, *23*(2). https://doi.org/10.2196/25518

Ganjali, R., Jajroudi, M., Kheirdoust, A., Darroudi, A., & Alnattah, A. (2022). Telemedicine solutions for clinical care delivery during COVID-19 pandemic: A scoping review. *Frontiers in Public Health*, *10*. https://doi.org/10.3389/fpubh.2022.937207

Georghiou, T., Sherlaw-Johnson, C., Massou, E., Morris, S., Crellin, N. E., Herlitz, L., Sidhu, M. S., Tomini, S. M., Vindrola-Padros, C., Walton, H., & Fulop, N. J. (2022). The impact of post-hospital remote monitoring of COVID-19 patients using pulse oximetry: A national observational study using hospital activity data. *EClinicalMedicine*, *48*. https://doi.org/10.1016/j.eclinm.2022.101441

Girerd, N., Barbet, V., Seronde, M.-F., Benchimol, H., Jagu, A., Tartière, J.-M., Hanon, O., Picard, F., Lafitte, S., Lemaitre, M., Pages, N., Nisse-Durgeat, S., & Jourdain, P. (2025). Association of a Remote Monitoring Programme with All-Cause Mortality and Hospitalizations in Patients with Heart Failure: National-Scale, Real-

World Evidence from a 3-Year Propensity Score Analysis of the TELESAT-HF Study. *European Journal of Heart Failure*, *27*(9), 1658–1669. https://doi.org/10.1002/ejhf.3563

Gordon, W. J., Henderson, D., Desharone, A., Fisher, H. N., Judge, J., Levine, D. M., MacLean, L., Sousa, D., Su, M. Y., & Boxer, R. (2020). Remote Patient Monitoring Program for Hospital Discharged COVID-19 Patients. *Applied Clinical Informatics*, *11*(5). https://doi.org/10.1055/s-0040-1721039

Haddad, T. C., Coffey, J. D., Deng, Y., Glasgow, A. E., Christopherson, L. A., Sangaralingham, L. R., Bell, S. J., Shah, V. P., Pritchett, J. C., Orenstein, R., Speicher, L. L., Maniaci, M. J., Ganesh, R., & Borah, B. J. (2022). Impact of a High-Risk, Ambulatory COVID-19 Remote Patient Monitoring Program on Utilization, Cost, and Mortality. *Mayo Clinic Proceedings*, *97*(12). https://doi.org/10.1016/j.mayocp.2022.08.015

Hailu, R., Sousa, J., Tang, M., Mehrotra, A., & Uscher-Pines, L. (2024). Challenges and Facilitators in Implementing Remote Patient Monitoring Programs in Primary Care. *Journal of General Internal Medicine*, *39*(13), 2471–2477. https://doi.org/10.1007/s11606-023-08557-x

Herasevich, S., Lipatov, K., Pinevich, Y., Lindroth, H., Tekin, A., Herasevich, V., Pickering, B. W., & Barwise, A. K. (2022). The Impact of Health Information Technology for Early Detection of Patient Deterioration on Mortality and Length of Stay in the Hospital Acute Care Setting: Systematic Review and Meta-Analysis. *Critical Care Medicine*. https://doi.org/10.1097/CCM.0000000000005554

Houlding, E., Mate, K. K. V, Engler, K., Ortiz-Paredes, D., Pomey, M.-P., Cox, J., Hijal, T., & Lebouché, B. (2021). Barriers to Use of Remote Monitoring Technologies Used to Support Patients With COVID-19: Rapid Review. *JMIR MHealth and UHealth*, *9*(4), e24743. https://doi.org/10.2196/24743

Hutchings, O. R., Dearing, C., Jagers, D., Shaw, M. J., Raffan, F., Jones, A., Taggart, R., Sinclair, T., Anderson, T., & Ritchie, A. G. (2021). Virtual health care for community management of patients with COVID-19 in Australia: Observational cohort study. *Journal of Medical Internet Research*, *23*(3). https://doi.org/10.2196/21064

Julesz, M. (2022). Health equity and health data protection related to telemedicine amid the COVID-19 pandemic. *Informacios Tarsadalom*, *22*(2). https://doi.org/10.22503/inftars.XXII.2022.2.2

Khan, A., & Duncan, D. (2025). Remote Patient Monitoring Applications in Healthcare: Lessons from COVID-19 and Beyond. *Electronics (Switzerland)*, *14*(15). https://doi.org/10.3390/electronics14153084

Kodama, R., Arora, S., Anand, S., Choudhary, A., Weingarten, J., Francesco, N., Chiricolo, G., Silber, S., & Mehta, P. H. (2021). Reengineering the Discharge Transition Process of COVID-19 Patients Using Telemedicine, Remote Patient Monitoring, and Around-the-Clock Remote Patient Monitoring from the Emergency Department and Inpatient Units. *Telemedicine and E-Health*, *27*(10). https://doi.org/10.1089/tmj.2020.0459

Kuo, S., Aledia, A., O'Connell, R., Rudkin, S., Dangodara, A. A., & Amin, A. N. (2022). Implementation and impact on length of stay of a post-discharge remote patient monitoring program for acutely hospitalized COVID-19 pneumonia patients. *JAMIA Open*, *5*(3). https://doi.org/10.1093/jamiaopen/ooac060

Latulippe, K., Hamel, C., & Giroux, D. (2017). Social health inequalities and eHealth: A literature review with qualitative synthesis of theoretical and empirical studies. In *Journal of Medical Internet Research* (Vol. 19, Number 4). https://doi.org/10.2196/jmir.6731

Loubet, P., Czeschan, C., Sintes, M., Sotto, A., & Laureillard, D. (2020). Use of short message service in at-home COVID-19 patient management. *BMC Medicine*, *18*(1). https://doi.org/10.1186/s12916-020-01863-9

Mann, K. D., Good, N. M., Fatehi, F., Khanna, S., Campbell, V., Conway, R., Sullivan, C., Staib, A., Joyce, C., & Cook, D. (2021). Predicting Patient Deterioration: A Review of Tools in the Digital Hospital Setting. *Journal of Medical Internet Research*, *23*(9), e28209. https://doi.org/10.2196/28209

Marquez-Algaba, E., Sanchez, M., Baladas, M., España, C., Dallo, H. S., Requena, M., Torrella, A., Planas, B., Raventos, B., Molina, C., Ribo, M., Almirante, B., & Len, O. (2022). COVID-19 Follow-App. Mobile App-Based Monitoring of COVID-19 Patients after Hospital Discharge: A Single-Center, Open-Label, Randomized Clinical Trial. *Journal of Personalized Medicine*, *12*(1). https://doi.org/10.3390/jpm12010024

Martínez-García, M., Bal-Alvarado, M., Santos Guerra, F., Ares-Rico, R., Suárez-Gil, R., Rodríguez-Álvarez, A., Pérez-López, A., Casariego-Vales, E., Fernández Rial, Á., Rabuñal Rey, R., Rodríguez Álvarez, A., Pérez López, A., Golpe Gómez, R., Gil Mouce, C., Suárez Ramírez, N., Almuiña Simón, C., José Cereijo Quinteiro, M., Daporta Rodríguez, L., Fernández Valdivieso, E., … Conde Freire, J. (2020). Monitoring of COVID-19 patients by telemedicine with telemonitoring. *Revista Clinica Espanola*, *220*(8). https://doi.org/10.1016/j.rce.2020.05.013

Mejia, E., Zalewski, J., & Plummer, S. T. (2022). Adapting Interstage Home Monitoring with the use of Telemedicine During the COVID-19 Pandemic. *Pediatric Cardiology*, *43*(5). https://doi.org/10.1007/s00246-022-02835-x

Monaghesh, E., & Hajizadeh, A. (2020). The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. *BMC Public Health*, *20*(1), 1193. https://doi.org/10.1186/s12889-020-09301-4

Ohannessian, R., Duong, T. A., & Odone, A. (2020). Global Telemedicine Implementation and Integration Within Health Systems to Fight the COVID-19 Pandemic: A Call to Action. *JMIR Public Health and Surveillance*, *6*(2), e18810. https://doi.org/10.2196/18810

Patel, H., Hassell, A., Cyriacks, B., Fisher, B., Tonelli, W., & Davis, C. (2022). Building a Real-Time Remote Patient Monitoring Patient Safety Program for COVID-19 Patients. *American Journal of Medical Quality*, *37*(4). https://doi.org/10.1097/JMQ.0000000000000046

Pedretti, A., Marquez Fosser, S., Pasquinelli, R., Vallone, M., Plazzotta, F., Luna, D., Martinez, B., Rodriguez, P., & Grande Ratti, M. F. (2021). Risk of readmission to the emergency department in mild COVID-19 outpatients with telehealth follow-up. *Revista de La Facultad de Ciencias Médicas de Córdoba*, *78*(3), 249–256. https://doi.org/10.31053/1853.0605.v78.n3.32414

Pogorzelska, K., & Chlabicz, S. (2022). Patient Satisfaction with Telemedicine during the COVID-19 Pandemic, A Systematic Review. *International Journal of Environmental Research and Public Health*, *19*(10), 6113. https://doi.org/10.3390/ijerph19106113

Rahmadina, N., Linawati, S. W., Khairunnisa, S. H. H., Basrowi, R. W., & Riadi, D. (2026). A Systematic Literature Review of Husband's Support for the Incidence of Postpartum Depression in Indonesia. *The Open Public Health Journal*, *19*(1). https://doi.org/10.2174/0118749445424980260202101630

Ramsetty, A., & Adams, C. (2020). Impact of the digital divide in the age of COVID-19. In *Journal of the American Medical Informatics Association* (Vol. 27, Number 7). https://doi.org/10.1093/jamia/ocaa078

Reforma, L. G., Duffy, C., Collier, A. Y., Wylie, B. J., Shainker, S. A., Golen, T. H., Herlihy, M., Lydeard, A., & Zera, C. A. (2020). A multidisciplinary telemedicine model for management of coronavirus disease 2019 (COVID-19) in obstetrical patients. *American Journal of Obstetrics & Gynecology MFM*, *2*(4), 100180. https://doi.org/10.1016/j.ajogmf.2020.100180

Riadi, D., Trihandini, I., & Sari, D. N. (2025). The Effectiveness of Remote Patient Monitoring in Reducing the Risk of

Rehospitalizations in COVID-19 Patients: A Meta-Analysis. *Kesmas Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal)*, *20*(5). https://doi.org/10.7454/kesmas.v20isp1.1715

Shaw, A., Moodley, M., McSporran, K., Thornley, C., Chiles, H., Smith, V., Moore, K., Taylor, L., Patel, P., Adam, T., Beenick, H., Harman, S., Lea, S., Woodward, A., Harris, Z., Patel, N., Ghosh, S., Murphy, A., & Valero-Sanchez, I. (2021). *P18 Safety and effectiveness of an integrated, telehealth-led supported discharge service for Covid-19*. https://doi.org/10.1136/thorax-2021-btsabstracts.128

Sherlaw-Johnson, C., Georghiou, T., Morris, S., Crellin, N. E., Litchfield, I., Massou, E., Sidhu, M. S., Tomini, S. M., Vindrola-Padros, C., Walton, H., & Fulop, N. J. (2022). The impact of remote home monitoring of people with COVID-19 using pulse oximetry: A national population and observational study. *EClinicalMedicine*, *45*. https://doi.org/10.1016/j.eclinm.2022.101318

Smedslund, G., Østerås, N., & Hestevik, C. H. (2025). Effects of Remote Patient Monitoring on Health Care Utilization in Patients With Noncommunicable Diseases: Systematic Review and Meta-Analysis. *JMIR MHealth and UHealth*, *13*, e68464. https://doi.org/10.2196/68464

Smith, A. C., Thomas, E., Snoswell, C. L., Haydon, H., Mehrotra, A., Clemensen, J., & Caffery, L. J. (2020). Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19). *Journal of Telemedicine and Telecare*, *26*(5), 309–313. https://doi.org/10.1177/1357633X20916567

Suárez-Gil, R., Casariego-Vales, E., Blanco-López, R., Santos-Guerra, F., Pedrosa-Fraga, C., Fernández-Rial, Á., Íñiguez-Vázquez, I., Abad-García, M. M., & Bal-Alvaredo, M. (2022). Efficacy of Telemedicine and At-Home Telemonitoring following Hospital Discharge in Patients with COVID-19. *Journal of Personalized Medicine*, *12*(4). https://doi.org/10.3390/jpm12040609

Tagne, J. F., Burns, K., O'Brein, T., Chapman, W., Cornell, P., Huckvale, K., Ameen, I., Bishop, J., Buccheri, A., Reid, J., Shee, A. W., Budge, M., Huggins, C. E., Peeters, A., & Metcalf, O. (2025). Challenges for remote patient monitoring programs in rural and regional areas: a qualitative study. *BMC Health Services Research*, *25*(1), 374. https://doi.org/10.1186/s12913-025-12427-z

Tan, S. Y., Sumner, J., Wang, Y., & Wenjun Yip, A. (2024a). A systematic review of the impacts of remote patient monitoring (RPM) interventions on safety, adherence, quality-of-life and cost-related outcomes. *Npj Digital Medicine*, *7*(1), 192. https://doi.org/10.1038/s41746-024-01182-w

Tan, S. Y., Sumner, J., Wang, Y., & Wenjun Yip, A. (2024b). A systematic review of the impacts of remote patient monitoring (RPM) interventions on safety, adherence, quality-of-life and cost-related outcomes. *Npj Digital Medicine*, *7*(1), 192. https://doi.org/10.1038/s41746-024-01182-w

Tejesh, K., Prasad, D., Zhang, J., Goyal, S., Jayapal, S., & Kulkarni, A. (2025). Telemedicine Effectiveness and Patient Satisfaction in Rural Healthcare Delivery Systems. *International Academic Journal of Innovative Research*, *12*(3), 86–93. https://doi.org/10.71086/IAJIR/V12I3/IAJIR1237

Farooq, U. (2025). Leveraging Telemedicine for Enhanced Healthcare Accessibility: A Narrative Review of Patient Satisfaction, Appointment Adherence, and Cost-Effectiveness. *Journal of Health and Rehabilitation Research*, 1–6. https://doi.org/10.61919/jhrr.v5i1.1757

van den Berg, R., Meccanici, C., de Graaf, N., van Thiel, E., & Schol-Gelok, S. (2022). Starting Home Telemonitoring and Oxygen Therapy Directly after Emergency Department Assessment Appears to Be Safe in COVID-19 Patients. *Journal of Clinical Medicine*, *11*(23). https://doi.org/10.3390/jcm11237236

Van Grootven, B., Irusta, L. A., Christiaens, W., Mistiaen, P., De Meester, C., Cornelis, J., Dierckx de Casterlé, B., Van Durme, T., & van Achterberg, T. (2023). Experiences with the implementation of remote monitoring in patients with <scp>COVID</scp> -19: A qualitative study with patients and healthcare professionals. *Journal of Nursing Scholarship*, *55*(1), 67–78. https://doi.org/10.1111/jnu.12814

Vartanian, K. B., Holtorf, M., Cox, E. J., Diaz, G., Khurana, H., Schlegel, S., Raganit, C., Ong, B., & Czartoski, T. (2022). Patient experience and healthcare utilization for a COVID-19 telemedicine home monitoring program offered in English and Spanish. *PLOS ONE*, *17*(6), e0270754. https://doi.org/10.1371/journal.pone.0270754

Vudathaneni, V. K. P., Lanke, R. B., Mudaliyar, M. C., Movva, K. V., Mounika Kalluri, L., & Boyapati, R. (2024). The Impact of Telemedicine and Remote Patient Monitoring on Healthcare Delivery: A Comprehensive Evaluation. *Cureus*. https://doi.org/10.7759/cureus.55534

Ward, T. J. C., Mavilakandy, A., Danns, J., Tsaknis, G., & Reddy, R. V. (2022). Outcomes from a virtual ward delivering oxygen at home for patients recovering from COVID-19: a real world observational study. *Clinical Medicine, Journal of the Royal College of Physicians of London*, *22*(3). https://doi.org/10.7861/clinmed.2021-0512

Whitelaw, S., Mamas, M. A., Topol, E., & Van Spall, H. G. C. (2020). Applications of digital technology in COVID-19 pandemic planning

and response. In *The Lancet Digital Health* (Vol. 2, Number 8). https://doi.org/10.1016/S2589-7500(20)30142-4

Wickramasinghe, N., & Schaffer, J. L. (2021). Using intelligent tools to support clinical decision making: The case of hip and knee arthroplasty. In *Research Anthology on Decision Support Systems and Decision Management in Healthcare, Business, and Engineering*. https://doi.org/10.4018/978-1-7998-9023-2.ch027

Yuan, S., Yang, Z., Li, J., Wu, C., & Liu, S. (2025). AI-Powered early warning systems for clinical deterioration significantly improve patient outcomes: a meta-analysis. *BMC Medical Informatics and Decision Making*, *25*(1), 203. https://doi.org/10.1186/s12911-025-03048-x