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Research paper

Patient-Centered Care in The Digital Era: A Systematic Review of Patient Satisfaction Measures in Virtual Healthcare

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Abstract

The rapid integration of virtual healthcare technologies has transformed the delivery of patient-centered care, especially in the wake of global health crises. Patient satisfaction is a critical indicator of care quality in digital environments, influenced by accessibility, communication, digital literacy, system usability, and trust. This systematic review aims to evaluate the key determinants of patient satisfaction in virtual healthcare settings, identifying common themes and gaps to inform the development of patient-centered digital care models. A systematic review of 20 peer-reviewed studies was conducted using databases such as PubMed, Scopus, Web of Science, and Google Scholar. Studies employed diverse methodologies, including cross-sectional surveys, systematic reviews, and cohort studies. Data were synthesized using a narrative approach and coded into significant themes. High levels of patient satisfaction were associated with ease of access, strong digital infrastructure, clear communication, and user-friendly platforms. However, satisfaction declined among populations with limited digital literacy or technological access. Trust in data security and continuity of care also emerged as significant contributors. Despite promising outcomes, the lack of standardized satisfaction measurement tools and variability in study designs presented challenges in comparative evaluation. The review highlights that while virtual healthcare holds great promise for enhancing patient satisfaction, it requires inclusive design, secure systems, and personalized care approaches. Standardized assessment frameworks and further research across diverse populations are needed to advance equitable and effective digital health strategies.

Keywords: *Digital Health Service; Patient-Centered Care; Patient Satisfaction; Telemedicine; Virtual Healthcare.*

1. Introduction

Patient-centered care (PCC) has evolved as a fundamental principle in modern healthcare, maintaining respect for patient values, preferences, and needs during decision-making. (Karajicic, 2021). As digital technologies progressively redefine the delivery of healthcare, virtual health platforms such as Telemedicine, remote consultations, and digital monitoring have become pivotal to maintaining continuity of care, particularly in the case of global health emergencies like the COVID-19 pandemic. (Mbunge et al., 2022). These new models of care necessitate a reframing of patient satisfaction and how it is conceived and quantified in the virtual environment.

Virtual health environments present unique opportunities and challenges impacting patient experiences, like accessibility, communication quality, perceived empathy, and usability. (Wu et al., 2025). Numerous studies have shown that although virtual healthcare increases convenience and coverage, technical difficulty concerns, privacy, and the absence of interpersonal touch can negatively impact patient satisfaction. (AlShareef & AlWabel, 2024). With medical care systems worldwide adopting digital platforms on an unprecedented level, measuring patient satisfaction is now imperative in ascertaining whether the quality of care is negatively impacted in virtual care environments.

Understanding satisfaction measures in virtual healthcare is particularly crucial when healthcare systems face mounting pressures to enhance efficiency, reduce costs, and improve patient engagement. (Vallée & Arutkin, 2024). Insights from patient feedback and satisfaction metrics can inform service design, technology integration, and policy development to better align digital care with patient needs and expectations. (Zhao et al., 2024). Moreover, evaluating satisfaction in virtual care contributes to broader discussions around healthcare equity, digital literacy, and access disparities across diverse populations.

While the literature regarding patient satisfaction in conventional healthcare environments is vast, specifically targeted research regarding virtual care is scattered. Such studies are heterogeneous with regard to methodology, population, and tools for measuring satisfaction, creating inconsistencies and knowledge gaps. Hence, there is a need for a systematic review to synthesize the current evidence and establish consistency in how satisfaction is defined, assessed, and influenced within virtual healthcare contexts.

This systematic review examines the different measures of patient satisfaction in virtual healthcare delivery. It explores what elements of digital care models significantly influence patient satisfaction and determines the common themes and measures across studies. This review hopes to provide evidence-based suggestions for enhancing virtual healthcare delivery while upholding the fundamental principles of patient-centered care in a digital era through synthesizing existing evidence.

2. Literature Review

Several systematic reviews and evidence-based studies have investigated patient satisfaction in virtual care, emphasizing the increasing importance of virtual platforms in providing patient-centered services. Existing evidence, such as studies by Aashima et al. (2021) and Emami et al. (2022), repeatedly suggests that virtual care increases patient satisfaction due to greater convenience, accessibility, and lower burden of travel, especially for underserved or rural patients. (Aashima et al., 2021; Emami et al., 2022). For example, in a study by Nguyen et al. (2020), more than 80% of patients expressed high satisfaction with telemedicine services, especially in terms of timely communication, scheduling convenience, and the sense of feeling heard and respected by the provider. (Nguyen et al., 2020). Likewise, Campbell et al. (2023) highlighted that the levels of patient satisfaction in virtual consultations were equivalent to face-to-face visits if proper digital infrastructure and provider training existed. (Campbell et al., 2023).

Tabaeeian et al. (2024) conducted a systematic review of Telemedicine use facilitators and barriers and observed that ease of technology interfaces, secure websites, and provider empathy significantly impacted patient perceptions of care quality. (Tabaeeian et al., 2024). Conversely, research by Wronikowska et al. (2021) identified difficulties in satisfaction measurement due to variability in assessment tools and the absence of standardized metrics specific to digital care. (Wronikowska et al., 2021). A scoping review conducted by Wu et al. (2025) identified that most virtual care satisfaction surveys do not capture the subtle patient experiences of emotional support, clear communication, and perceived privacy. (Wu et al., 2025), highlighting the need for more detailed evaluation models.

Additionally, some research has determined contextual and demographic variables influencing satisfaction levels in virtual environments. Socioeconomic status, age, and digital literacy are essential variables that may condition how patients interact with and experience digital health care. (Estrela et al., 2023; Kaihlanen et al., 2022; Paccoud et al., 2021). Older people, for example, or those with restricted digital access, might indicate lower satisfaction due to technological issues. In contrast, younger, digitally connected populations tend to present greater acceptance and optimistic experiences.

However, despite these encouraging insights, much of the existing literature remains fragmented, with variations in population focus, study design, and satisfaction measurement approaches. Additionally, many past reviews do not consider the impact of real-time communication technologies, AI-driven interfaces, or cultural perceptions of digital care, which increasingly shape patient experiences in the digital era. (Božić; Sun & Zhou, 2023).

In this systematic review, the researchers aimed to investigate how patient satisfaction is measured in virtual healthcare settings and to identify the key elements of digital care that most significantly influence satisfaction. The study also seeks to evaluate the consistency and reliability of existing satisfaction assessment tools and determine how demographic, technological, and contextual factors impact patient experiences. This review contributes to the broader dialogue on enhancing virtual healthcare delivery and is a foundation for developing standardized, patient-centered satisfaction frameworks tailored to digital care environments.

3. Methodology

3.1. Study design

This research adopted a secondary qualitative study design that uses systematic review methods to review prior studies on the effect of Virtual Healthcare and the digital era on Patient-Centered Care. The research was meticulously designed to systematically identify, analyze, and consolidate the findings from existing scholarly articles. The core rationale for choosing this methodology was to present a strong foundation to understand the patterns of scholarship and the trend of patient satisfaction with virtual healthcare in patient-centered care in digital settings.

3.2. Search strategy, eligibility criteria, and study selection

A comprehensive search strategy was developed to identify relevant studies assessing the impact of Virtual Healthcare on Patient-Centered Care in digital settings. The following databases were searched for peer-reviewed articles: PubMed, Google Scholar, Scopus, Web of Science, Scimago.

The search terms and combinations included: “Patient satisfaction”, “Virtual healthcare”, “Telemedicine”, “Digital health services”, “Remote consultations”, “Tele-health satisfaction”, “Online medical care”, “Digital patient experience”, “Virtual care quality”, “Satisfaction measurement tools in tele-health”, “Patient-centered care in digital settings”, “Technology-based healthcare delivery”.

The search terms were then linked using the Boolean operators of AND and OR to include all studies related to the subject. The articles used in the review must be published in English, and the search was conducted from January 2020 to the present (see Table 1).

Table 1: Criteria for Literature Selection

Criterion Category	Inclusion Criteria	Exclusion Criteria
Relevance to the topic	Studies conducted in virtual healthcare settings (e.g., Telemedicine, Tele-health, and online consultations)	Studies that did not involve virtual or remote healthcare settings
Measured outcome	Patient satisfaction as a primary or secondary outcome	Studies without patient satisfaction as a measured outcome
Publication Type	Quantitative studies (including observational studies, cohort studies, randomized controlled trials, and cross-sectional studies)	Non-peer-reviewed articles (e.g., editorials, conference papers, abstracts, and commentaries)
Timeframe	Primarily published from January 2020 to the present	Outdated articles published before 2020
Language	English	Publications in other languages

Studies with a high risk of selection bias were noted, and their impact on the final analysis was minimized through sensitivity analysis. The study selection process followed a systematic approach. All identified studies were first screened based on their titles and abstracts. Any

study that met the inclusion criteria was fully retrieved for further assessment. Two independent reviewers did the screening and selection, and disagreements were resolved through consensus or consultation with a third reviewer. The PRISMA Flowchart, shown in Fig. 1, illustrates the study selection process, including the number of articles identified, screened, included, and excluded at each stage.
Although snowballing was performed by screening the reference lists of included studies, no additional studies met the eligibility criteria for inclusion. Therefore, all final included studies were sourced from database searches.

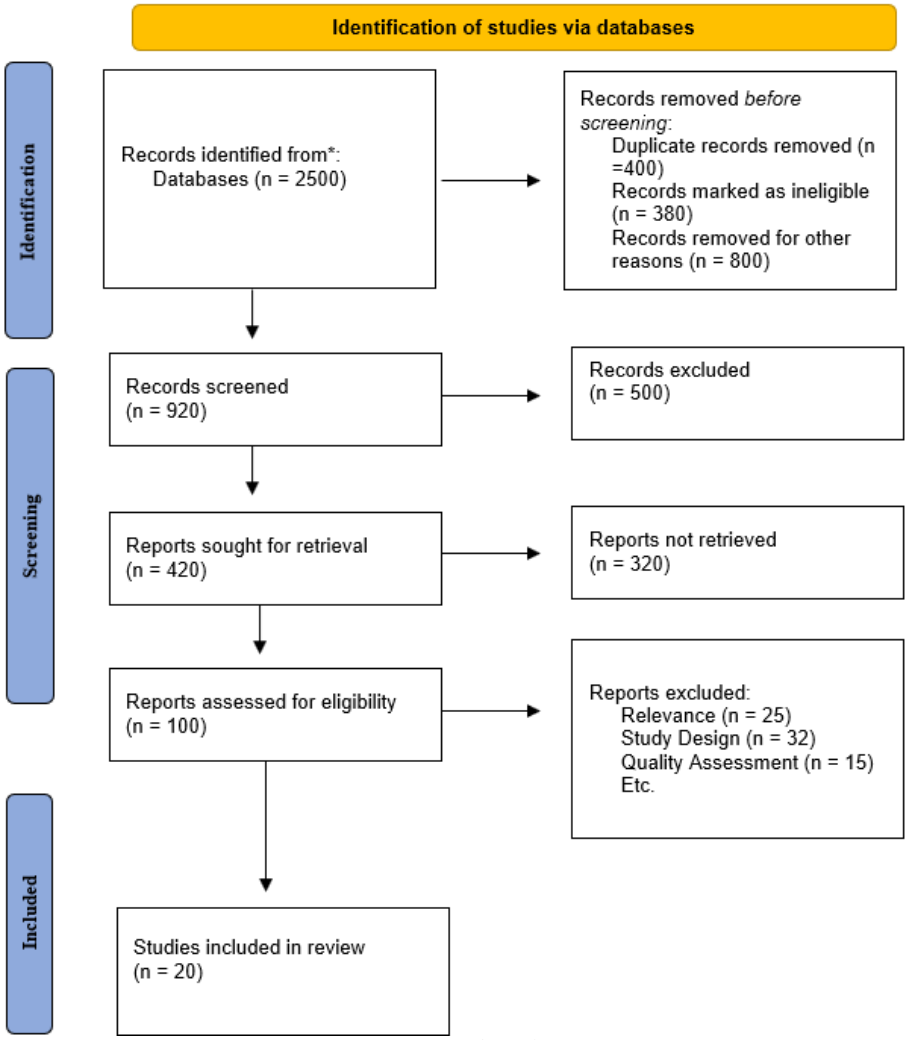

Fig. 1: PRISMA Flow Diagram.

3.3. Quality assessment

The review included articles that underwent rigorous evaluation using the QUADAS-2 tool to ensure alignment with the research design, as shown in Figures 2 and 3. QUADAS-2 is a widely used and highly reliable checklist tool for systematically evaluating the quality and risk of bias in diagnostic accuracy studies and is commonly implemented via platforms such as RevMan (Review Manager), Covidence, Rayyan, or Robvis (Risk of Bias Visualization). Although QUADAS-2 was originally developed for diagnostic accuracy studies (Yang et al., 2021), its guidance explicitly states that review-specific tailoring is required. In this review, the QUADAS-2 tool was used within the Covidence software to facilitate assessment and consensus among reviewers (Yang et al., 2021). Due to the lack of a standardized instrument expressly intended to evaluate the methodological quality of research on patient satisfaction in virtual healthcare, we adapted the QUADAS-2 tool as a practical alternative. Although originally developed to evaluate diagnostic accuracy studies, its structured framework allowed us to systematically examine important aspects of study design, such as participant selection, measurement methods, and overall study flow. However, it is recognized that employing a tool designed for diagnostic studies imposes certain constraints in evaluating subjective notions like patient satisfaction. To address this, we carefully adapted the tool to suit our context and relied on reviewer consensus throughout the assessment process to reduce potential bias and ensure consistent interpretation of the findings. In the context of this review, it was adapted to evaluate the methodological quality of studies exploring patient satisfaction in virtual healthcare settings.
The assessment covered four key domains: patient selection (D1), index test (D2), reference standard (D3), and flow and timing (D4). Most studies demonstrated a low risk of bias across all domains, indicating robust methodological quality. However, a few studies exhibited areas of concern. Specifically, Aytekin et al. (2025) and Sainio (2024) showed high risk in the index test domain, while Hasselgren et al. (2021) and Vats (2024) revealed high risk in the reference standard domain. Additionally, some studies presented moderate concerns in one or more domains, highlighting variability in study design and reporting.
Applicability concerns were minimal, reinforcing the relevance of included studies to the research question. Any discrepancies in the assessment were resolved through consensus among reviewers. Overall, the QUADAS-2 evaluation supports the reliability of the synthesized findings while acknowledging potential methodological limitations in a minority of the included studies.

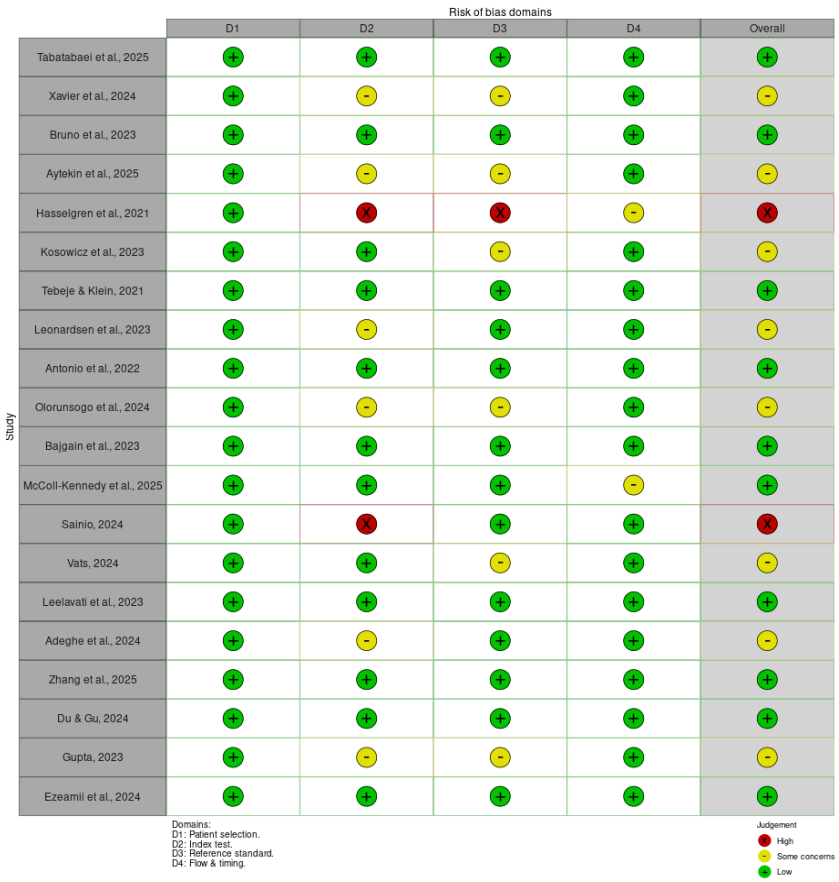

Fig. 2: Risk of Bias Summary of Included Studies Using the QUADAS-2 Tool Across Four Domains in Evaluating Patient Satisfaction Measures in Virtual Healthcare.

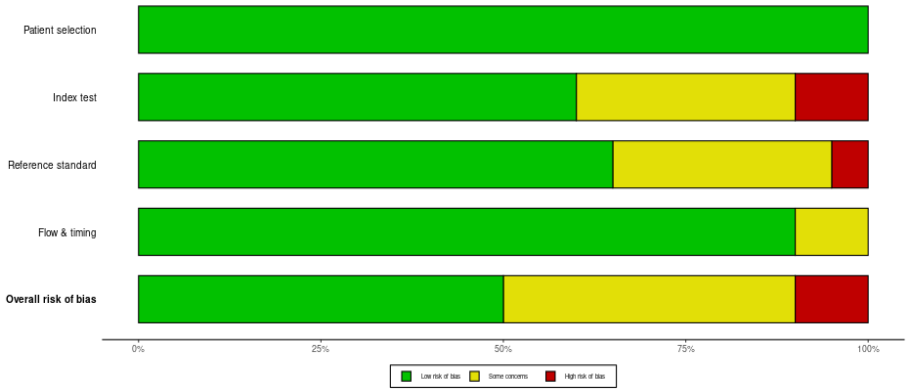

Fig. 3: Proportion of Included Studies with Low, Moderate, and High Risk of Bias Across QUADAS-2 Domains in Evaluating Satisfaction Measures in Virtual Healthcare.

3.4. Data synthesis

The data were synthesized using a narrative synthesis approach. While the included studies primarily utilized quantitative methods, a meta-analysis was not feasible due to heterogeneity. Therefore, the researchers employed a narrative synthesis approach to systematically identify and analyze recurring patterns and trends within the quantitative findings. This involved grouping study results by type of digital healthcare modality (e.g., Telemedicine, mobile health, video consultations) and the instruments used to measure patient satisfaction. This method facilitated the identification of common themes, variations in satisfaction levels, and factors influencing patient perceptions across different virtual care platforms. Ultimately, this approach enabled a comprehensive understanding of how patient-centered care is perceived and measured in digital healthcare settings. NVivo software has been utilized to organize and analyze the data. First, the full text of each study was reviewed, and relevant segments were coded with labels such as “remote access,” “user autonomy,” and “trust in data privacy.” These codes represented key ideas or findings related to patient satisfaction. As the coding progressed, patterns began to emerge. Similar codes were grouped, and broader themes were identified to capture shared concepts across studies.

In total, nine major themes were developed, each reflecting a different aspect of the virtual care experience. For example, Accessibility and Convenience covered ideas such as reduced travel time and flexible appointments, while trust and data security focused on how patients felt about privacy and the safety of their health information. Themes like digital literacy and inclusivity shed light on the challenges faced by patients who may not be tech-savvy or lack access to digital tools. Each theme was supported by multiple studies, which helped strengthen its validity and relevance. Table 3 provides a summary of the themes, the associated codes, the outcomes linked to each theme, and the studies that supported them.

Using NVivo software allowed the researchers to trace how often certain themes appeared across the literature and helped in visually mapping connections between related ideas. This approach provided a clearer picture of what drives or detracts from patient satisfaction in virtual healthcare and highlighted areas where further research and standardization are needed.

4. Results

4.1. Included studies

Using PubMed, Web of Science, Scopus, and Google Scholar search engines, 20 potentially relevant articles were found; however, more articles were also found from the reference lists of other articles. Of the identified 420 records, 320 were used for further analysis after excluding duplicates and non-English articles. Of the articles screened based on keywords and abstracts, many articles that did not match the inclusion criteria were excluded from this analysis. The search was followed by the selection using criteria of relevance, research design, and quality assessment of 20 articles to be considered in this review.

While several studies report a positive correlation between virtual healthcare delivery and improved patient satisfaction, potential confounding variables were not consistently accounted for, including variation in digital literacy, access to technology, and differences in virtual care models. This introduces an inherent bias in some studies, which should be considered when interpreting the findings.

4.2. Study characteristics

This systematic review includes 20 studies that explore various dimensions of patient satisfaction in virtual healthcare settings, as outlined in Table 2. The studies encompass a range of methodologies, including cross-sectional analyses, systematic reviews, prospective cohort studies, scoping reviews, and conceptual frameworks. Geographically, the research spans North America, Europe, Asia, and the Asia-Pacific region, reflecting a diverse global interest in digital health solutions. The study populations range from general and chronic care users to those in primary healthcare and specialized fields such as prenatal care and movement disorders. The primary outcomes focus on factors influencing patient satisfaction, including ease of access, trust, engagement, perceived quality of care, and technological usability. Interventions and digital tools examined include Telemedicine, e-health platforms, patient portals, remote monitoring systems, and blockchain-based trust frameworks. While the findings consistently point toward improved patient satisfaction and accessibility, limitations such as conceptual inconsistencies, lack of generalizability, small sample sizes, and limited real-world application highlight the need for standardized, large-scale evaluations to better assess the long-term impact of virtual healthcare on patient-centered outcomes.

Table 2: Characteristics of Studies

S. No	Reference	Title	Aim	Findings	Limitations
1	(Tabatabaei et al., 2025)	Health Economic Evaluation and Patient Perspectives on a Virtual Clinic: Advancing Digital Remote Care in Health Care	To evaluate virtual remote care systems based on patient satisfaction and sustainability.	High satisfaction (avg. 9.1/10); decreased travel burden and CO2 emissions.	Limited to chronic pain patients; potential bias due to small sample and tech-savvy users.
2	(Xavier et al., 2024)	Patient Satisfaction and Digital Health in Primary Health Care	To map patient satisfaction with digital health strategies in PHC.	Identified cultural values and expectations affecting satisfaction.	Large data volume and extensive manual review are required.
3	(Bruno et al., 2023)	Virtual prenatal visits associated with high measures of patient experience and satisfaction among average-risk patients: a prospective cohort study	To compare satisfaction with virtual vs. in-person prenatal care.	90% willing to repeat virtual visits; similar satisfaction rates.	Lack of diversity; limited generalizability to underserved populations.
4	(Aytekin et al., 2025)	Digital Health Technologies in Patient Experience Literature: A Scoping Review and Future Outlook for Sustainable Digital Health Interventions	To identify key tools and concepts tied to digital health satisfaction.	E-health, Telemedicine, and patient portals positively shaped satisfaction metrics.	Conceptual inconsistency in defining "patient experience."
5	(Hasselgren et al., 2021)	Blockchain for Increased Trust in Virtual Health Care: Proof-of-Concept Study	To propose a blockchain-based system for building trust in virtual care.	Blockchain supports transparency and patient trust.	Conceptual and technical model; not tested in real-world scenarios.
6	(Kosowicz et al., 2023)	Lessons for Vietnam on the Use of Digital Technologies to Support Patient-Centered Care in Low- and Middle-Income Countries in the Asia-Pacific Region: Scoping Review	To explore digital health implementation in Asia-Pacific LMICs.	DHTs improve equity and quality of care when aligned with patient needs.	Excluded non-English/Vietnamese studies may not represent all LMICs.
7	(Tebeje & Klein, 2021)	Applications of e-Health to Support Person-Centered Health Care at the Time of the COVID-19 Pandemic	To examine how e-health supports person-centered care during COVID-19.	Increased access, engagement, and remote monitoring during crises.	Limited generalizability due to early pandemic timing.
8	(Leonardsen et al., 2023)	Person-Centeredness in Digital Primary Healthcare Services—A Scoping Review	To explore existing research on digital PCC in PHC.	Identified four key themes, including accessibility and self-management.	There are only 12 studies, mostly in Western contexts.
9	(Antonio et al., 2022)	Advancing digital patient-centered measurement methods for team-based care	To conceptualize PCM methods in team-based care using digital tools.	Developed 5 PCM integration methods enhancing patient-provider collaboration.	Small, rural clinic sample; limited generalizability.
10	(Olorunsogo et al., 2024)	Reviewing the evolution of U. S. telemedicine post-pandemic by analyzing its growth, acceptability, and challenges in remote healthcare delivery during Global Health Crises.	To analyze the growth and challenges of telemedicine post-COVID.	Telemedicine improved access and outcomes but raised equity concerns.	Lack of long-term data and real-world implementation outcomes.

11	(Bajgain et al., 2023)	Patient-reported experiences and outcomes of virtual care during COVID-19: a systematic review	To review the impact of virtual care using PROMs and PREMs.	Virtual care increased convenience and safety, but tech barriers remained.	Most 2020 studies excluded provider perspectives.
12	(McColl-Kennedy et al., 2025)	Patient-centered care in practice: hospital and online primary care settings	To compare PCC principles in digital vs. in-person care.	Respect and collaboration are valued; video care is preferred over audio.	PCC principles need validation in diverse, real-time settings.
13	(Sainio, 2024)	Bringing people-centered digital health to the next level	To assess patient experience with remote monitoring for movement disorders.	Usability and integration into care boosted satisfaction.	Limited sample from a specific patient association.
14	(Vats, 2024)	Navigating the Digital Landscape: Embracing Innovation, Addressing Challenges, and Prioritizing Patient-Centric Care	To explore the dual impact of digital tools on care and satisfaction.	Digital tools improve operations and satisfaction when trust is established.	Conceptual and policy-focused; lacks quantitative outcome data.
15	(Leelavati et al., 2023)	Revolutionizing Healthcare Delivery: Telemedicine's Influence on Access and Patient Satisfaction	To explore how Telemedicine enhances patient satisfaction and access.	Reduced travel barriers; high satisfaction across quality indicators.	Self-reported data; cross-sectional design.
16	(Adeghe et al., 2024)	A review of emerging trends in Telemedicine: Healthcare delivery transformations	To analyze current telemedicine trends and their impact.	Tele-health improves chronic disease care and satisfaction.	Methodological diversity limits comparison across studies.
17	(Zhang et al., 2025)	Digital Health Innovations to Catalyze the Transition to Value-Based Health Care	To evaluate digital tools supporting patient-centered VBHC.	Enhanced diagnostics, outcomes, and engagement via digital platforms.	Standardization of PROMs remains a challenge.
18	(Du & Gu, 2024)	The development of an evaluation scale of patient satisfaction with Telemedicine: a systematic review	To build a scale for measuring satisfaction with Telemedicine.	Created a 9-dimensional scale with 37 items.	Limited database sources; rapidly evolving field may outdate scale.
19	(Gupta, 2023)	A Systematic Review of the Literature on the Development of New Concepts from the Perspective of Promoting Patient-Centered Care	To assess digital health's role in patient-centered care globally.	Digital tools improve engagement, autonomy, and satisfaction.	Conceptual overlaps and differing satisfaction definitions.
20	(Ezeamii et al., 2024)	Revolutionizing Healthcare: How Telemedicine Is Improving Patient Outcomes and Expanding Access to Care	To design a protocol for assessing satisfaction with digital PHC.	Provides a structured methodology for future research.	Protocol stage only; results pending empirical validation.

4.3. Digital health interventions and patient satisfaction

The selected studies highlight how digital health interventions impact patient satisfaction across different care environments. A universal trend throughout the literature is the favorable view of Telemedicine and e-health platforms to enhance access to care, convenience, and patient engagement. Multiple studies like Tabatabaei et al. (2025), Bruno et al. (2023), and Leelavati et al. (2023) reported high satisfaction with virtual consultations, especially in patients with chronic conditions or those who are getting routine care. (Bruno et al., 2023; Leelavati et al., 2023; Tabatabaei et al., 2025). Patients valued the decreased travel burden, greater scheduling flexibility, and continuity of care.

Additionally, various studies like Xavier et al. (2024), Aytekin et al. (2025), and Gupta (2023) highlighted that elements like easy-to-use platforms, cultural adaptability, and effective communication significantly contributed to the development of patient experience in virtual care. (Aytekin et al., 2025; Gupta, 2023; Xavier et al., 2024). Nonetheless, studies by Bruno et al. (2023) and McColl-Kennedy et al. (2025) highlighted some constraints regarding digital literacy and disparities in access, particularly in underprivileged communities, which influenced general satisfaction outcomes. (Bruno et al., 2023; McColl-Kennedy et al., 2025).

Hasselgren et al. (2021) and Antonio et al. (2022) studied technology infrastructure and trust in systems, discovering that technologies such as blockchain and patient portals that integrate helped increase transparency and foster confidence in electronic care. (Antonio et al., 2022; Hasselgren et al., 2021). Additionally, according to Tebeje & Klein (2021) and Bajgain et al. (2023), during the COVID-19 pandemic, telecare significantly increased and was linked to greater safety and patient control, as supported by systematic reviews and pandemic-related analyses. (Bajgain et al., 2023; Tebeje & Klein, 2021).

Scoping reviews by Leonardsen et al. (2023) and Aytekin et al. (2025) identified key themes such as accessibility, self-management, and person-centeredness as recurring elements of a positive patient experience. (Aytekin et al., 2025; Leonardsen et al., 2023). However, several conceptual studies, such as those by Vats (2024) and Ezeamii et al. (2024), stressed the importance of developing standardized frameworks and outcome measures to effectively evaluate digital health satisfaction. (Ezeamii et al., 2024; Vats, 2024).

Lastly, the studies by Du & Gu (2024) and Ezeamii et al. (2024) offered practical tools for future evaluation, such as the development of a validated satisfaction scale or methodological protocols for digital primary healthcare, signifying a shift toward more structured and evidence-based digital patient experience measurement. (Du & Gu, 2024; Ezeamii et al., 2024).

4.4. Themes and codes

The thematic analysis used NVivo software to identify key themes and codes from the selected studies. Coding entailed systematically sorting the data into themes, each subdivided into coded forms. These codes were then sorted to develop a meaningful framework from which the patterns and connections within the data could be better understood. The extracted themes and codes are presented in Table 3.

Table 3: Themes, Codes, and Supporting Articles

Theme	Codes	Patient Outcomes	Supporting Articles
Accessibility and Convenience	Remote consultations, travel reduction, appointment flexibility, 24/7 access	Increased satisfaction due to convenience and reduced time/travel burden	(Bruno et al., 2023; Leelavati et al., 2023; Tabatabaei et al., 2025)
Patient-Centeredness	Individual preferences, personalization, user autonomy, self-management	Higher satisfaction when care is tailored to individual needs	(Aytekin et al., 2025; Leonardsen et al., 2023; McColl-Kennedy et al., 2025)
Digital Literacy and Inclusivity	Tech access, digital skills, disparities, age/gender/ethnic barriers	Satisfaction varied with tech literacy and socio-demographic inclusion	(Bruno et al., 2023; Gupta, 2023; Xavier et al., 2024)
Trust and Data Security	Blockchain, transparency, confidentiality, and health record access	Increased patient confidence with secure systems	(Antonio et al., 2022; Hasselgren et al., 2021)
Quality of Communication	Clinician-patient interaction, responsiveness, empathy, clarity	Better satisfaction with strong communication, even virtually	(Tebeje & Klein, 2021)
System Usability and Interface Design	Ease of use, interface layout, platform reliability, and technical glitches	Usability issues impacted satisfaction, especially for elderly patients	(Du & Gu, 2024; Ezeamii et al., 2024)
Continuity and Coordination of Care	Follow-ups, integration with in-person services, referrals, and care pathways	Seamless coordination improved satisfaction and trust	(Aytekin et al., 2025; Gupta, 2023; McColl-Kennedy et al., 2025)
Perceived Quality of Care	Accuracy, timeliness, and effectiveness of virtual consultations	Satisfaction is linked to perceived high-quality care delivery	(Bajgain et al., 2023; Leelavati et al., 2023; Tabatabaei et al., 2025)
Empowerment and Engagement	Health literacy, participation in decisions, and patient feedback mechanisms	Engaged patients reported higher satisfaction and compliance	(Leonardsen et al., 2023; Vats, 2024; Xavier et al., 2024)
Future Directions and Research Gaps	Standardized tools, conceptual models, and evaluation frameworks	Need for consistent outcome measurement in digital health	(Du & Gu, 2024; Ezeamii et al., 2024; Vats, 2024)

5. Discussion

With digital health technology transforming healthcare delivery, patient satisfaction in virtual care has become a critical indicator for assessing care quality. (Longyear, 2021). The major themes, obstacles, and drivers of patient-centered outcomes were discussed to systemically consolidate existing evidence around the measurement of satisfaction with virtual care. The results provide an integrated perspective on how digital platforms match patient requirements, uncovering the promise and pitfalls of virtual care in delivering quality care.

5.1. Accessibility and convenience

One of the most frequently mentioned contributors to patient satisfaction on virtual platforms is increased accessibility. Several studies, like Bruno et al. (2023), Leelavati et al. (2023), and Tabatabaei et al. (2025), highlighted the fact that minimized travel burden, flexible scheduling options, and extended hours of operation greatly enhanced patient participation and satisfaction. (Bruno et al., 2023; Leelavati et al., 2023; Tabatabaei et al., 2025). Patients in rural or underprivileged communities cited high satisfaction levels for receiving care from home. Yet, availability did not always translate into satisfaction when digital or internet sources were uneven or lacking, marking the value of infrastructural equity.

5.2. Patient-centeredness and personalization

Personalization and respect for personal choice, hallmarks of patient-centered care, were uniformly associated with increased satisfaction scores. Aytekin et al. (2025) and Leonardsen et al. (2023) observed that patients appreciated systems that permitted self-management, agency, and partnership in health choices. Research also indicated that virtual platforms should adopt malleable interfaces and adaptive content to accommodate patient heterogeneity and varying patient conditions, as this can substantially improve the subjective assessment of care quality and pertinence. (Aytekin et al., 2025; Leonardsen et al., 2023).

5.3. Digital literacy and inclusivity

One of the key challenges identified by Bruno et al. (2023), Gupta (2023), and Xavier et al. (2024) was variability in digital literacy by age, socioeconomic status, and education levels. (Bruno et al., 2023; Gupta, 2023; Xavier et al., 2024). Although younger patients familiar with technology generally had positive experiences, older patients and those not digitally skilled were frustrated, confused, or distrustful of virtual systems. These results highlight the necessity of inclusive design and digital literacy education to facilitate equal virtual access to healthcare.

5.4. Trust and data security

The studies by Antonio et al. (2022) and Hasselgren et al. (2021) revealed that the issue of trust, especially in terms of confidentiality, secure communication, and access to health records, emerged as a significant determinant of satisfaction. (Antonio et al., 2022; Hasselgren et al., 2021). Blockchain technologies and encrypted platforms were considered promising technologies for resolving patient issues related to data misuse. When patients were satisfied that their health data were safe, their trust in the virtual model of care was enhanced, thus positively impacting satisfaction ratings.

5.5. Quality of communication

Good communication continues to be central to patient satisfaction, even in virtual environments. The study by Tebeje & Klein (2021) identified provider empathy, responsiveness, and clarity as key factors during teleconsultations that significantly impacted patients' perceptions of the quality of care. (Tebeje & Klein, 2021). Interestingly, when these human factors were maintained even through digital interfaces, patients expressed satisfaction rates similar to or surpassing those from in-person visits.

5.6. Usability and system design

Several studies, like Du & Gu (2024) and Ezeamii et al. (2024), identified the usability and design of digital platforms as a key driver of patient satisfaction. Easy-to-use, reliable, and visually intuitive platforms improved the user experience. (Du & Gu, 2024; Ezeamii et al., 2024). Technical issues, complex interfaces, and platform unreliability, on the other hand, deterred patient use and impacted engagement. Older adults and disabled patients were especially susceptible to adverse experiences due to system usability issues.

5.7. Continuity and coordination of care

According to Aytekin et al. (2025) and McColl-Kennedy et al. (2025), Virtual platforms that offered seamless integrated services like remote monitoring, simple follow-ups, and smooth referral systems were associated with increased patient satisfaction. (Aytekin et al., 2025; McColl-Kennedy et al., 2025). Disjointed care and disorganized communication among practitioners resulted in confusion and dissatisfaction. The research emphasized the significance of coordination between online and offline services to provide end-to-end and consistent patient support.

5.8. Perceived quality and effectiveness

Throughout the study, perceived care quality, regardless of delivery, was a basic predictor of satisfaction. This finding is consistent with Bajgain et al. (2023) and Leelavati et al. (2023). Patients were satisfied when they believed their diagnosis was correct, the treatment was prompt, and the care administered was effective (Bajgain et al., 2023; Leelavati et al., 2023). The perception depended largely on provider competence and the platform's capacity to accommodate comprehensive assessments and decision-making for treatment.

5.9. Empowerment and engagement

Patient empowerment through education, shared decision-making, and feedback loops emerged as a core element in studies by Leonardsen et al. (2023), Vats (2024), and Xavier et al. (2024). Virtual tools that promoted active participation and health literacy fostered a sense of control and ownership over care processes (Leonardsen et al., 2023; Vats, 2024; Xavier et al., 2024). These factors contributed to improved compliance, better outcomes, and higher satisfaction.

5.10. Standardization and future research

Although there has been advancement, according to Du & Gu (2024) and Ezeamii et al. (2024), a common frustration was the non-uniform nature of the tools used to capture satisfaction in virtual healthcare (Du & Gu, 2024; Ezeamii et al., 2024). Comparability and consistency between studies are undermined without standard metrics and conceptual models. Future studies have to focus on creating and validating satisfaction scales with a focus on virtual environments. Through this, more accurate measurements can be made, and patient-centered virtual care will be optimized.

6. Strengths and Limitations

This systematic review presents an in-depth synthesis of contemporary literature on patient satisfaction with virtual healthcare, providing essential insights into the alignment of digital care delivery with patient-centered care principles. One of the significant strengths of this research is its careful selection process, multiple database use, and thematic coding strategy, which enabled an in-depth exploration of the complex nature of patient experiences in digital settings. By classifying findings into well-defined themes such as accessibility, digital literacy, trust, and perceived quality of care, this review presents an organized understanding that can be used to inform policy and clinical practice. There are some limitations. The diversity in study designs and tools for measuring these factors narrowed the potential for conducting a meta-analysis. Since it is mainly based on quantitative studies, it might have been possible to exclude deep qualitative insights into patient opinions.

7. Relevance to Clinical Practice

The results of this systematic review have important implications for practice, especially as healthcare systems continue to develop virtual models of care. By identifying the most important determinants of patient satisfaction, this research offers practicable findings that clinicians, managers, and policymakers can employ to optimize patient-centered care in digital settings. Knowledge of these factors enables healthcare professionals to align virtual care with various patient needs, thus enhancing engagement, adherence, and overall care outcomes. In addition, the focus on trust, data protection, and customized care stresses the need to uphold ethical and compassionate standards in the provision of tele-health. Placing these findings within clinical protocols, however, has the potential to enhance patient satisfaction and inform improved health outcomes and sustained adoption of digital health services.

8. Conclusion

This systematic review captures the changing dynamics of patient-centered care in virtual healthcare environments, focusing on the broader constructs of patient satisfaction. The review finds that accessibility, personalization, trust, digital competence, communication quality, and system usability are key predictors that shape patient experiences in digital care settings. Although virtual healthcare has enormous benefits of convenience and accessibility, gaps in digital access and literacy must be bridged for equitable care delivery. The research highlights the necessity for standardized measures of satisfaction and customized approaches based on the heterogeneity of patient needs across settings. By matching digital healthcare processes with the underlying values of patient-centered care, stakeholders can boost the effectiveness and quality of virtual care provision in the digital age.

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