

The Impact of Telemedicine on Patient Satisfaction Levels in Several Developed and Developing Countries: A Systematic Review

Dampak Telemedisin terhadap Tingkat Kepuasan Pasien di Beberapa Negara Maju dan Berkembang: Tinjauan Sistematis

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Abstract

Telemedicine is a telecommunication technology in healthcare that has expanded rapidly, especially during COVID-19. Its implementation varies between developed and developing countries, raising questions about its impact on patient satisfaction and the factors influencing it. This study aims to evaluate the impact of telemedicine on patient satisfaction across developed and developing countries and to identify key factors influencing satisfaction to inform improvements in telemedicine delivery models. The systematic review was conducted using PubMed, Scopus, and Web of Science databases. The search utilized keywords related to telemedicine and patient satisfaction. The inclusion criteria focused on peer-reviewed articles published between 2020 and 2025, resulting in 14 studies (seven from developed countries and seven from developing countries) being analyzed. Data were extracted and synthesized following the PRISMA guidelines. The analysis identified 14 eligible studies. The findings indicate that telemedicine generally has a positive impact on patient satisfaction, with high satisfaction levels reported across various settings. For example, studies from Sweden and India reported that approximately 78-93% of patients expressed satisfaction or willingness to reuse the telemedicine service. However, several challenges were identified, particularly in developing countries such as Indonesia and the Philippines, including service costs, limited digital infrastructure, and low technological literacy.

Keywords: Patient experience, Patient outcomes, Patient satisfaction, Telemedicine.

Abstrak

Telemedisin adalah teknologi telekomunikasi dalam perawatan kesehatan yang telah berkembang pesat, terutama selama pandemi COVID-19. Implementasinya bervariasi antara negara maju dan negara berkembang, sehingga menimbulkan pertanyaan tentang dampaknya terhadap kepuasan pasien dan faktor-faktor yang memengaruhinya. Studi ini bertujuan untuk mengevaluasi dampak telemedisin terhadap kepuasan pasien di negara maju dan negara berkembang serta untuk mengidentifikasi faktor-faktor kunci yang memengaruhi kepuasan guna memberikan informasi untuk perbaikan model penyampaian telemedisin. Tinjauan sistematis dilakukan menggunakan basis data PubMed, Scopus, dan Web of Science. Pencarian menggunakan kata kunci yang terkait dengan telemedisin dan kepuasan pasien. Kriteria inklusi berfokus pada artikel yang ditinjau sejawat yang diterbitkan antara tahun 2020 dan 2025, menghasilkan 14 studi (tujuh dari negara maju dan tujuh dari negara berkembang) yang dianalisis. Data diekstrak dan disintesis mengikuti pedoman PRISMA. Analisis mengidentifikasi 14 studi yang memenuhi syarat. Temuan menunjukkan bahwa telemedisin umumnya memiliki dampak positif pada kepuasan pasien, dengan tingkat kepuasan tinggi yang dilaporkan di berbagai lingkungan. Misalnya, studi dari Swedia dan India melaporkan bahwa sekitar 78-93% pasien menyatakan puas atau bersedia menggunakan kembali layanan telemedisin. Namun, beberapa tantangan telah diidentifikasi, khususnya di negara-negara berkembang seperti Indonesia dan Filipina, termasuk biaya layanan, infrastruktur digital yang terbatas, dan literasi teknologi yang rendah.

Kata kunci: Pengalaman pasien, Hasil pasien, Kepuasan pasien, Telemedisin.



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Introduction

Telemedicine, defined as the remote diagnosis and treatment of patients using telecommunications technology, has grown rapidly in recent years and has become a transformative solution in modern healthcare delivery. The COVID-19 pandemic significantly accelerated its adoption globally, as physical distancing and lockdown measures forced health systems to adopt alternative modes of care delivery [1]. Telemedicine now serves as a temporary replacement and a permanent component in many health systems worldwide. One critical aspect in evaluating the effectiveness and sustainability of telemedicine is patient satisfaction. High satisfaction levels are often associated with improved treatment adherence, continuity of care, and overall perceptions of healthcare quality [2].

Factors such as ease of use, responsiveness of healthcare providers, privacy, and perceived effectiveness of virtual consultations all contribute to shaping patient satisfaction [3] However, the impact of telemedicine on patient satisfaction may vary significantly between developed and developing countries, primarily due to differences in digital infrastructure, access to technology, healthcare financing models, and user readiness [4]. In developed countries, strong digital systems and policy frameworks often support telemedicine. In contrast, challenges such as unstable internet connections, limited device availability, and lower digital literacy in developing regions can hinder optimal implementation [5]. Although several studies have examined patient satisfaction with telemedicine, a gap remains regarding comprehensive comparisons across different country contexts. No previous systematic review has explicitly compared patient satisfaction levels between developed and developing countries, despite the increasing global adoption of telemedicine. Therefore, this systematic review aims to synthesize existing research on patient satisfaction with telemedicine in developed and developing countries, identify key influencing factors, and provide insights for improving telemedicine delivery models globally.

Method

Study Design

The research was conducted as a systematic review, a methodical and comprehensive approach to synthesizing existing literature on a specific topic. This review evaluated the impact of telemedicine on patient in both developed and developing countries. The review aimed to identify key factors influencing patient satisfaction and provide insights for enhancing telemedicine delivery models globally by systematically collecting and analyzing relevant studies.

Search Strategy

The research strategy involved a thorough literature search across three major electronic databases: PubMed, Scopus, and Web of Science. The search utilized a combination of keywords to ensure comprehensive coverage of relevant literature. The keywords included terms related to telemedicine, patient experience, patient satisfaction, and their impacts. The search process was designed to capture a wide range of studies, and the initial research was screened for duplicates using Zotero reference management software. This systematic review ensured that the literature search was exhaustive and efficient. The search process in all databases uses the keywords ("Telemedicine" OR "Telehealth") AND ("Patient Experience" OR "Patient Satisfaction" OR "Patient Outcomes") AND ("Impact" OR "Effect" OR "Influence").

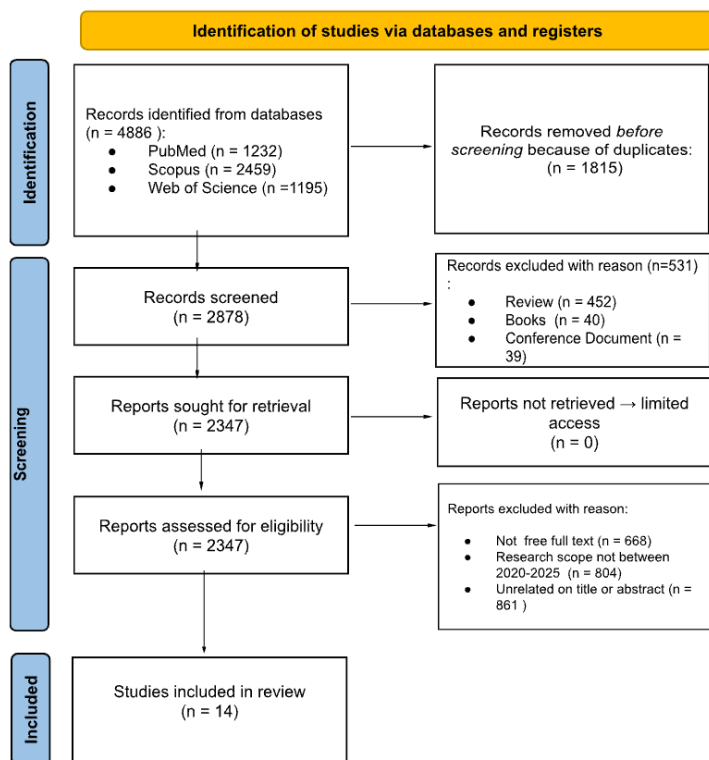


Figure 1. PRISMA diagram flow studies

Eligibility Criteria

Articles categorized as reviews, books, book chapters, conference proceedings, and other non-primary research publications were excluded to ensure that only original peer-reviewed studies were included in the analysis. Screening was subsequently conducted based on accessibility, where articles not available as open access or not accessible in full text through institutional subscriptions were excluded. This restriction represents a limitation of the review and may introduce potential publication bias, as relevant studies that were not accessible could have been omitted. Furthermore, studies published outside the 2020-2025 timeframe were excluded to maintain temporal relevance, particularly in light of the rapid expansion of telemedicine following the COVID-19 pandemic. The final stage involved screening titles and abstracts to assess relevance, excluding studies that did not focus on the impact of telemedicine on patient satisfaction, including those addressing provider satisfaction, technical system aspects, or other outcomes not directly related to patient satisfaction. The entire screening process was conducted independently to minimize potential bias.

Data Extraction

Data extraction involved systematically collecting relevant information from the selected studies. This included study characteristics, sample size, patient demographics, telemedicine modalities used, and key findings related to patient satisfaction. The extraction process was conducted using a standardized form to ensure consistency and accuracy in capturing the necessary data from each study. This structured approach facilitated a comprehensive synthesis of the findings across the included studies.

Data Analysis

In this systematic review, data analysis involved synthesizing the retrieved data to identify patterns, trends, and key factors influencing patient satisfaction with telemedicine. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines aided in the analysis, ensuring that the results were reported clearly and systematically. The entire data analysis method was both qualitative and quantitative. Qualitative analysis was employed to clarify the themes and insights derived from the investigations, focusing on patient experiences, satisfaction levels, and contextual factors influencing telemedicine utilization. This included categorizing the results by location, type of telemedicine service used, and patient demographics. This made it possible to compare the results between developed and developing countries.

Data analysis in this systematic review primarily involved a narrative synthesis of findings across the included studies. Patient satisfaction data, such as reported percentages or scores, were extracted and presented descriptively in tables to facilitate comparison between studies. Due to substantial heterogeneity in study designs and measurement instruments. And outcome reporting, a quantitative synthesis (meta-analysis) was not performed. Instead, the analysis focused on identifying patterns, trends, and key factors influencing patient satisfaction across different contexts.

Result and Discussion

The study identification and selection process in this systematic review followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Relevant literature was identified from three major databases: PubMed (n = 1232), Scopus (n = 2459), and Web of Science (n = 1195), yielding a total of 4886 articles. The initial step was to remove duplicates using Zotero software, which identified and removed 1815 duplicate articles, leaving 2878 unique articles for the initial screening stage. In the first screening stage, articles were excluded based on document type. A total of 531 articles were excluded, consisting of reviews (n=452), books (n=40), and conference papers (n=39). After the initial screening, 2347 articles were further evaluated in the whole document search stage.

These articles were successfully accessed, so no articles were excluded due to restricted access. Next, the fully accessed articles were assessed based on more specific eligibility criteria. Six hundred sixty-eight articles were excluded due to a lack of free full-text availability, 804 articles were excluded because they were not in the 2020 to 2025 period, and 861 other articles were excluded because their titles and abstracts were irrelevant to the research topic. After completing all selection processes, 14 studies met all inclusion criteria and were included in this systematic review. A total of 7 articles were studied in developing countries, and 7 articles were studied in developed countries.

Based on the analysis of 14 studies with articles that passed the inclusion criteria, it was found that telemedicine generally had a positive influence on patient satisfaction levels in various geographic and clinical contexts, both in developed and developing countries. Most patients reported positive experiences regarding accessibility, ease of use, time efficiency, and convenience of remote consultations. However, these satisfaction levels still vary depending on each country's type of service, patient characteristics, and contextual factors. In developed countries such as Sweden, Canada, Ireland, and Japan, patient satisfaction with telemedicine services tends to be high, particularly in primary care and the management of chronic diseases. In Sweden, approximately 78% of patients reported that they would use telemedicine services again for similar complaints, with an average satisfaction score of 79 out of 100. Meanwhile, in Ireland, patients with inflammatory bowel disease reported high satisfaction levels with virtual clinics, with a median score of 18 out of 20. Factors such as patient personality, disease activity, and travel costs contributed significantly to variations in satisfaction levels.

In contrast, in developing countries such as the Philippines, Indonesia, and India, although patient satisfaction with telemedicine is relatively high, several challenges remain. These challenges include the high cost of services, limited technological infrastructure, and inadequate training for service providers. However, a study from India showed that 70.1% of spine patients were delighted with teleconsultation, and 93.4% stated they would use it again. In Indonesia, factors such as ease of use, data security, and the professionalism of doctors were the main determinants of patient satisfaction with teleconsultation applications. Patient satisfaction is also strongly influenced by the type of service provided. In specific services such as telehealth for speech therapy in Saudi Arabia, monitoring of patients with cochlear implants in Italy, and support for APD (automated peritoneal dialysis) patients in Mexico, telemedicine has been shown to increase patient engagement in care, provide a sense of security during the pandemic, and expedite medical follow-up. Some studies have even linked patient satisfaction to better personal health outcomes, as found in a telehealth-based drug information service in Turkey.

While most studies have shown positive impacts, some critical caveats have emerged regarding digital inequalities, limitations in physical interactions, and doubts about the reliability of the technology. For example, some older patients reported lower satisfaction, while others reported feeling less comfortable with virtual consultations than with face-to-face ones. Overall, these findings suggest that telemedicine has excellent potential to improve patient satisfaction. However, tailored approaches to the needs of local populations and to each country's healthcare landscape are still necessary.

Table I. Data Extraction

Author and Year	Study Design	Age (Years)	Sample Size	Country/State	Telemedicine Tools					Outcome Measures	Patient Satisfaction (as reported)
					Video Call (%)	Voice Call (%)	Messaging/email (%)	Telemedicine app (%)	Other (Remote Patient Monitoring Devices, hospital hotlines) (%)		
Bellizzi et al., 2023	Cross-sectional Study	>18	361	California, United States	39,10%	32,07%	-	-	-	5-point Likert scale	78% of patients reported being satisfied
Alyahya., 2025	Cross-sectional Study	<ul style="list-style-type: none"> • <6 months: 13 participants (4.30%) • 7 months – 3 years: 60 participants (19.87%) • 4 – 7 years: 69 participants (22.85%) • 8 – 12 years: 28 participants (9.27%) • 13 – 18 years: 6 participants (1.99%) • 19 – 40 years: 59 participants (19.54%) • 41 – 64 years: 53 participants (17.55%) • 65 years: 14 participants (4.64%) 	302	King Fahad Medical City, Riyadh, Saudi Arabia.	51,3	32,87	-	3,97	-	5-point Likert scale	82,12% of patients reported being satisfied

Rockler Meurling et al., 2023	Cross-sectional Study	<ul style="list-style-type: none"> 0-19 years: 175 respondents (26%) 20-69 years: 470 respondents (70.1%) 70+ years: 25 respondents (3.7%) 	670	Skåne, Sweden	-	-	-	-	-	Binary (yes/no) question and a 0-100 scale	78% of patients reported being satisfied
Storan et al., 2023	Cross-sectional Study	<ul style="list-style-type: none"> Low satisfaction group (n = 68): Average age 46 years (95% Confidence Interval: 43.1 - 49.6) High satisfaction group (n = 73): Average age 44 years (95% Confidence Interval: 40.4 - 47.1) 	141	Dublin, Ireland	-	-	-	-	-	5-point Likert scale.	Median 18/20 (high satisfaction)
Mason et al., 2024	Cross-sectional Study	<ul style="list-style-type: none"> < 6 months: 4.30% 7 months – 3 years: 19.87% 4 – 7 years: 22.85% 8 – 12 years: 9.27% 13 – 18 years: 1.99% 19 – 40 years: 19.54% 41 – 64 years: 17.55% > 65 years: 4.64% 	110	Tokyo, Japan	45	10	-	30	15	5-point Likert scale.	Mean 4.3/5 (high satisfaction)
Wu et al., 2023	Observational Longitudinal Study	\bar{x} 29.61	18,709	China	-	-	-	-	-	Binary (yes/no) question, (0 for no, 1 for yes).	Patients expressed appreciation toward their physician (49)

Alexandra et al., 2021	Cross-Sectional Study	<ul style="list-style-type: none"> • 17 – 25 years: 86.5% • 26 – 35 years: 6.7% • 36 – 45 years: 3.3% • 45 – 55 years: 2.2% • > 55 years: 1.1% 	551	Indonesia	54,7	41,4	66	-	-	5-point Likert scale	High satisfaction reported
Alhassan et al., 2022	Cross-sectional study	<ul style="list-style-type: none"> • 18-30 years: 35.1% • 31-40 years: 31.7% • 41-50 years: 20.2% • 51 years and above: 13.0% 	208	Turkey	42,9	3,8	52,4	-	0,9	5-point Likert scale	86,7% of patients reported being satisfied
Sorrentino et al., 2024	Cross-sectional study	<ul style="list-style-type: none"> • Adults (≥13 years): 35 patients (53%) • Children (6–12 years): 15 patients (23%) • Babies (2–6 years): 16 patients (24%) 	66	Italia	30-40	-	<15	100	-	5-point Likert scale	91% of patients reported being satisfied
Niyyati et al., 2023	Observational Longitudinal Study	<ul style="list-style-type: none"> • Children (<12 years): ~45-53% • Adolescents (13-18 years): ~40-50% • Young adults (>18 years): ~5-10% 	255	Canada	76	24	-	-	-	4-point Likert scale	91% of patients reported being satisfied
Cuevas-Budhart et al., 2023	Qualitative Study	Mean age 45.41 ± 16.93;	29	Mexico	-	-	-	100	-	This study did not use a Likert scale but relied on semi-structured interviews.	The study did not provide specific percentage values for patient satisfaction.
Viswanathan VK et al., 2023	Cross-sectional study	<ul style="list-style-type: none"> • 20-29 years: Approximately 15-20% • 30-39 years: Approximately 25-30% 	288	India	100	-	-	-	-	3-point Likert Scale	93,7% of patients reported being satisfied

		<ul style="list-style-type: none"> • 40-49 years: Approximately 20-25% • 50-59 years: Approximately 15-20% • 60 years and above: Approximately 5-10% 											
Alicia Victoria G. Noceda et al., 2023	Mixed-methods study	<ul style="list-style-type: none"> • 18 to 65 years 	216	Philippines	45,5	31,5	61,5	23	1,5	5-point Likert scale	Median (high satisfaction)	4/5	
White et al., 2022	Mixed-methods study	<ul style="list-style-type: none"> • Not Mentioned 	25 to 35 participants	Australia	70-80	20-30	-	-	-	5-point Likert scale	Specific percentages for patient satisfaction are not mentioned.		

Table II. The Quality of Individual Studies for The Cross-Sectional Studies

JBI Criteria	Relevant to Study (Yes/No/Unclear/NA)									
	[6]	[7]	[8]	[9]	[10]	[5]	[11]	[12]	[13]	[14]
Were the criteria for inclusion in the sample clearly defined?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were the study subjects and the setting described in detail?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Was the exposure measured in a valid and reliable way?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were objective, standard criteria used for measurement of the condition?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear
Were confounding factors identified?	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	No	No	Unclear
Were strategies to deal with confounding factors stated?	No	Yes	Unclear	Yes	Yes	Yes	Yes	No	No	Yes
Were the outcomes measured in a valid and reliable way?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear
Was appropriate statistical analysis used?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This critical appraisal of cross-sectional studies was conducted using the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies, which evaluates eight key methodological domains to assess the validity and reliability of research findings. The nine studies reviewed generally demonstrated strong methodological quality. They most clearly defined their inclusion criteria, adequately described the participants and settings, and employed valid and reliable measures for both exposure and outcomes. However, several studies particularly Sorrentino et al. and Viswanathan et al. did not adequately identify or address potential confounding factors, which may impact the interpretability of their findings. Overall, while the studies are of acceptable quality and offer valuable insights, limitations in the handling of confounders should be considered when interpreting their results.

Observational longitudinal studies follow participants over time to examine the relationship between an exposure and a specific outcome. In the context of JBI methodology, this type of design is best evaluated using the Cohort Studies appraisal tool. This is because both longitudinal and cohort studies share key characteristics: they assess exposure-outcome relationships over a defined time period, allow observational investigation of potential causal links, and can be conducted prospectively or retrospectively. [15] They were assessed using the JBI Cohort Checklist. Strengths included a clear definition of telehealth exposure, validated outcome measures (TUQ), and control for confounders. Key limitations were no control group (limiting causal inference) and 40% response rate (potential attrition bias). Despite some weaknesses in follow-up, the study demonstrates a low overall risk of bias through rigorous methods. Findings are valuable for understanding perceptions of telehealth, although caution is needed regarding generalizability. This study meets the inclusion criteria for systematic reviews, although it has noted limitations.

Table III. Quality Assessment of Cohort Studies Using JBI Checklist

JBI Cohort Study Criteria	Assessment for Niyiyati et al. (2023)
Were the two groups similar and recruited from the same population?	No
Were exposures measured similarly to assign groups?	Yes
Was exposure measured validly and reliably?	Yes
Were confounding factors identified?	Yes
Were strategies to address confounding stated?	Yes
Were participants free of the outcome at baseline?	Yes
Were outcomes measured validly and reliably?	Yes
Was follow-up time sufficient for outcomes?	Yes
Was follow-up complete, with reasons for attrition explored?	No
Were strategies to handle incomplete follow-up used?	No
Was statistical analysis appropriate?	Yes

Table IV. Quality Assessment of Mix Methods Studies Using Mixed Methods Appraisal Tool (MMAT)

MMAT Criteria	White et al. (2022) Yes/No/Can't tell	Comments	Alhassan et al. (2022) Yes/No/Can't tell	Comments
Qualitative approach appropriate?	Yes	Suitable for studying communication	No	No qualitative component described
Adequate qualitative data collection?	Yes	Used interviews and recordings effectively	No	No qualitative method was reported
Findings derived from data?	Yes	Findings grounded in raw interactional data	No	No qualitative findings
Interpretation substantiated by data?	Yes	Supported by conversation data	No	Lacks qualitative interpretation
Coherence in data, collection, analysis?	Yes	High coherence across all stages	No	No coherence shown
Representative participants?	Yes	Sample includes diverse GPs and patients	Yes	Users reflect DIC service demographic
Appropriate measurements?	Yes	CARE & TUQ tools applied	Yes	TUQ and a structured survey were used
Complete outcome data?	Yes	All planned data collected and used	Yes	87% response rate considered complete
Confounders accounted for?	Can't tell	Not clearly addressed	Can't tell	Not reported explicitly
Intervention occurred as intended?	Yes	Procedures followed as designed	Yes	Service delivered consistently
Relevant sampling strategy?	Yes	Purposive and targeted sampling	Yes	Based on actual user access
Representative sample?	Yes	Includes multiple clinics	Yes	Spans professions and continents
Appropriate measurements?	Yes	Well-validated tools and protocols	Yes	Measures were validated and appropriate
Low nonresponse bias?	Can't tell	Not discussed in the protocol	Yes	High response rate minimizes bias
Appropriate statistical analysis?	Yes	Mixed-methods protocol suitable	Yes	Uses regression and correlation appropriately
Rationale for mixed methods?	Yes	Strong justification provided	Yes	Justified by the Donabedian framework
Integration of study components?	Yes	Good linkage between methods	Yes	Data analysis aligns with objectives
Interpretation of integration?	Yes	Triangulated across methods	Yes	Integrated via structured survey
Divergences addressed?	Can't tell	Not explicitly handled	No	Not addressed
Adherence to each method's criteria?	Yes	High rigor across methods	Can't tell	Mainly, quantitative rigor is shown

The MMAT assessment reveals that [16] demonstrates strong methodological quality across qualitative, quantitative, and mixed-methods domains, with clearly justified use of mixed methods, validated measurement tools, coherent integration, and robust data interpretation. In contrast, [11] perform well on

quantitative descriptive criteria, with high response rates and valid tools, but lack a qualitative component, limiting their ability to fully meet mixed-methods standards. Notably, neither study addresses confounders, and only White et al. thoroughly integrates and interprets mixed data sources, highlighting its stronger adherence to MMAT criteria.

Tools for Telemedicine

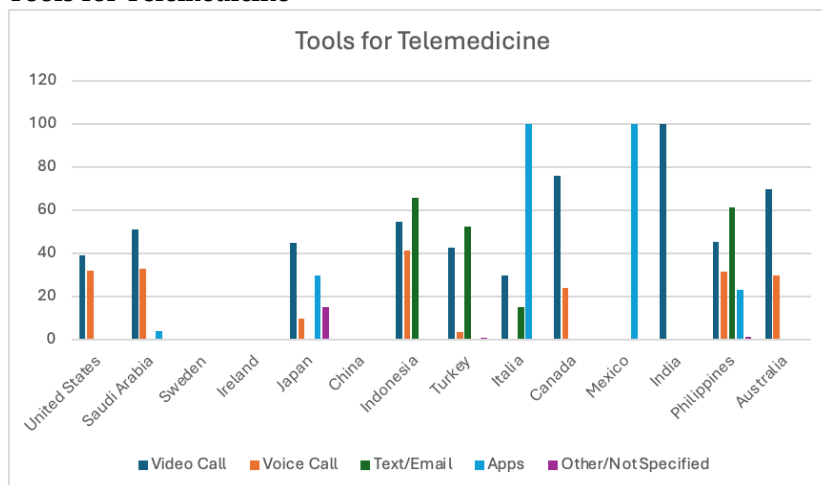


Figure 1. Tool for Telemedicine

Overall, the telemedicine tools used in the analyzed studies showed wide variation across service needs and country contexts. The most used medium was video calling, used in 66.7% of studies (8 of 14 studies), followed by voice calling, recorded in 50% of studies (6 of 14 studies). Text messaging or email was used in 33.3% of studies (4 of 14 studies), while dedicated telemedicine apps were used in 25% of studies (3 of 14 studies). In addition, remote monitoring devices were reported in 16.7% of studies (2 of 14), particularly for chronic health services such as dialysis and hearing-aid rehabilitation. Several studies (16.7%) mentioned online consultations in general without specifying the specific medium used. These data suggest that more interactive telemedicine tools, such as video calling and dedicated apps, are more widely used in countries with robust digital infrastructure. In contrast, simpler media such as telephones and text messaging remain the mainstay in many healthcare settings, especially in developing countries. In general, the combination of these tools contributed to relatively high levels of patient satisfaction in most studies.

Opportunities and Challenges of Telemedicine Across Different Healthcare

Telemedicine offers significant opportunities to improve healthcare delivery, particularly by enhancing access and efficiency across diverse settings. Several studies in this review show that telemedicine enables patients, especially those in remote areas, to access healthcare services without the need for long-distance travel, thereby reducing time and cost burdens [13][17]. It also supports continuity of care and follow-up management, particularly for chronic conditions, contributing to high levels of patient satisfaction [8][10]. However, these benefits are accompanied by notable limitations, including the inability to perform physical examinations and technical challenges such as unstable internet connections and limited access to digital devices [5][17].

Importantly, the balance between these opportunities and challenges varies across healthcare contexts. In developed countries, patient satisfaction is largely driven by efficiency, convenience, and integration within well-established healthcare systems, although challenges remain among older populations with lower digital adaptability [8][10]. In contrast, in developing countries, telemedicine primarily improves access to previously limited healthcare services, but barriers are more structural in nature, including limited access to digital devices, high internet costs, and lower levels of digital literacy [13][5]. This indicates that while age-related adaptation is a key concern in developed settings, fundamental access and affordability issues play a more dominant role in developing contexts, highlighting the need for context-specific implementation strategies.

Comparison of Patient Satisfaction in Developed vs Developing Countries

The analysis reveals that while patient satisfaction remains high across both developed and developing regions, the fundamental drivers of satisfaction differ significantly between these context. In developed

countries, such as Sweden and Japan, satisfaction is primarily driven by efficiency, convenience, and seamless integration with established healthcare systems. Studies indicate that patients in these regions prioritize time-saving and the ability to manage chronic conditions within their existing routines [8] [10]

Conversely, in developing countries such as the Philippines, Indonesia, and India, satisfaction is largely driven by expanded access to medical services that were previously hindered by geographic or distance barriers [13][17]. However, this high level of satisfaction often comes at the cost of persistent infrastructure challenges, including unstable internet connectivity and technical limitations [5]. Thus, while telemedicine serves as a tool for optimization in developed nations, it functions as a critical bridge of healthcare access in developing regions, albeit with significant structural caveats.

Demographic and Social Factors

Age, education, and personality factors are essential in shaping patients' experiences and satisfaction levels with telemedicine. A study from Sweden found that young patients (0–19 years) had the highest satisfaction levels, while older patients (over 70 years) tended to be less satisfied. In addition, an open personality and high travel costs were associated with increased satisfaction, while patients with active disease or an agreeable personality showed lower satisfaction [9].

Telemedicine by Service Type

The type of service greatly influences patient perception and acceptance of telemedicine. Services such as speech therapy [7], cochlear implant monitoring[12], and pediatric diabetes management [15] show very high satisfaction levels. In contrast, services for conditions that require direct physical examination, such as spinal disease, experience limitations in effectiveness and patient satisfaction [8].

Implementation Limitations and Challenges

Despite the benefits of telemedicine, technical and structural challenges remain significant barriers, especially in developing countries. These challenges include digital inequality, inadequate health worker training, and unstable internet connections [5][17]. Some patients also mentioned that the digital interaction experience still lacks "humanity," especially regarding empathy and emotional closeness, usually present in face-to-face encounters [18].

Policy and Practice Recommendations

Based on the findings in this review, strengthening the telemedicine system should focus on three key aspects: ensuring equitable digital infrastructure, providing continuous training for health workers, and developing a patient-centered system. To achieve this, governments and service providers must collaborate to expand access, enhance service quality, and create inclusive, culturally adaptive service models that address the diverse needs of populations [16].

Conclusions and Future Directions

In conclusion, telemedicine improves patient satisfaction across diverse settings, mainly through enhanced access and efficiency. However, the drivers of satisfaction are context dependent. In developed countries, satisfaction is driven by system integration and convenience, whereas in developing countries, it is largely influenced by improved access to previously limited healthcare services. Despite its benefits, challenges such as infrastructure limitations and digital literacy persist, particularly in resource-limited settings. Therefore, successful implementation requires context-specific strategies, focusing on system optimization in developed regions and expanding digital access in developing ones.

Conflict of Interest

The authors received no specific funding for this systematic review. The work was conducted as part of the academic requirements for the Master of Pharmaceutical Management program at the Faculty of Pharmacy, Gadjah Mada University. The co-authors, from the Department of Pharmaceutics, Faculty of Pharmacy, Gadjah Mada University, provided academic supervision and guidance for the methodology and analysis of the systematic review.

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References

- [1] World Health Organization, "WHO-2019-nCoV-essential_health_services-2020.2-eng," *Geneva: World Health Organization*, 2020.
- [2] C. Scott Kruse, P. Karem, K. Shifflett, L. Vegi, K. Ravi, and M. Brooks, "Evaluating barriers to adopting telemedicine worldwide: A systematic review," *Jan. 01, 2018, SAGE Publications Ltd.* doi: 10.1177/1357633X16674087.
- [3] K. B. Shiferaw and E. A. Mehari, "Internet use and ehealth literacy among health-care professionals in a resource limited setting: A cross-sectional survey," *Adv. Med. Educ. Pract.*, vol. 10, pp. 563–570, 2019, doi: 10.2147/AMEP.S205414.
- [4] S. N. Gajarawala and J. N. Pelkowski, "Telehealth Benefits and Barriers," *Journal for Nurse Practitioners*, vol. 17, no. 2, pp. 218–221, Feb. 2021, doi: 10.1016/j.nurpra.2020.09.013.
- [5] S. Alexandra, P. W. Handayani, and F. Azzahro, "Indonesian hospital telemedicine acceptance model: the influence of user behavior and technological dimensions," *Heliyon*, vol. 7, no. 12, Dec. 2021, doi: 10.1016/j.heliyon.2021.e08599.
- [6] K. M. Bellizzi, K. Ligus, E. Fritzson, C. Salafia, T. Sanft, and C. L. Park, "Disruption in Cancer Care During Early Survivorship due to the COVID-19 Pandemic and Patient Satisfaction with Telemedicine," *Supportive Care in Cancer*, vol. 31, no. 5, May 2023, doi: 10.1007/s00520-023-07767-7.
- [7] R. S. W. Alyahya, "The satisfaction of clients and caregivers with telehealth speech-language pathology services," *Digit. Health*, vol. 11, Jan. 2025, doi: 10.1177/20552076241313163.
- [8] C. Rockler Meurling, E. Adell, M. Wolff, S. Calling, V. Milos Nymberg, and B. Borgström Bolmsjö, "Telemedicine in Swedish primary health care - a web-based survey exploring patient satisfaction," *BMC Health Serv. Res.*, vol. 23, no. 1, Dec. 2023, doi: 10.1186/s12913-023-09133-z.
- [9] D. Storan *et al.*, "Satisfaction with telemedicine-delivered inflammatory bowel disease care depends on disease activity, personality and economic factors," *Frontline Gastroenterol.*, vol. 14, no. 2, pp. 132–137, Mar. 2023, doi: 10.1136/flgastro-2022-102198.
- [10] A. N. Mason, T. Naito, S. Fukushima, K. Asano, K. Yamaji, and R. Kuwatsuru, "Multi-Dimensional Analysis of Japanese Telemedicine Patient Satisfaction," *Health Serv. Insights*, vol. 17, Jan. 2024, doi: 10.1177/11786329241280864.
- [11] G. Alhassan, A. Bosnak, and E. Hamurtekin, "Perceived satisfaction and outcomes from drug information center services provided with a telehealth approach," *Niger. J. Clin. Pract.*, vol. 25, no. 12, pp. 2053–2061, Dec. 2022, doi: 10.4103/njcp.njcp_552_22.
- [12] F. Sorrentino *et al.*, "Remote Check as a tele-health instrument for cochlear implant recipients: Analysis of impact and feasibility of application.," *American Journal of Otolaryngology - Head and Neck Medicine and Surgery*, vol. 45, no. 4, Jul. 2024, doi: 10.1016/j.amjoto.2024.104294.
- [13] V. K. Viswanathan, A. P. Shetty, C. Murugan, R. A. Kavishkar, R. M. Kanna, and S. B. Rajasekaran, "The perspectives of patients and spine surgeons on the effectiveness and reliability of telemedicine consultations for spine ailments - A glimpse at the Indian scenario," *Indian Spine Journal*, vol. 6, no. 1, pp. 82–88, Jan. 2023, doi: 10.4103/isj.isj_104_21.
- [14] D. C. Wu, X. Zhao, and J. Wu, "Online Physician-Patient Interaction and Patient Satisfaction: Empirical Study of the Internet Hospital Service," *J. Med. Internet Res.*, vol. 25, 2023, doi: 10.2196/39089.
- [15] S. Niyyati *et al.*, "Patient Perceptions of Telehealth for Pediatric Type 1 Diabetes During the COVID-19 Pandemic: A Follow-up Study," *Can. J. Diabetes*, vol. 47, no. 7, pp. 579–586.e6, Oct. 2023, doi: 10.1016/j.cjcd.2023.05.005.
- [16] S. J. White, A. Nguyen, P. Roger, T. Tse, J. A. Cartmill, and S. M. Willcock, "Experiences of telehealth in general practice in Australia: research protocol for a mixed-methods study," *BJGP Open*, vol. 6, no. 1, pp. 1–6, Mar. 2022, doi: 10.3399/BJGPO.2021.0187.
- [17] A. V. G. Noceda *et al.*, "Patient satisfaction with telemedicine in the Philippines during the COVID-19 pandemic: a mixed methods study," *BMC Health Serv. Res.*, vol. 23, no. 1, Dec. 2023, doi: 10.1186/s12913-023-09127-x.
- [18] M. Á. Cuevas-Budhart *et al.*, "Patient experience in automated peritoneal dialysis with telemedicine monitoring during the COVID-19 pandemic in Mexico: Qualitative study," *Nurs. Open*, vol. 10, no. 2, pp. 1092–1101, Feb. 2023, doi: 10.1002/nop2.1377.