

Telemedicine: Future of the healthcare system and its impact on patient satisfaction: A literature review

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ABSTRACT

Background and Objectives: The utilization of telemedicine has increased dramatically since the onset of the COVID-19 pandemic. In this review, we examined studies published within the past five years that investigated the impact of telemedicine on patient satisfaction. **Methods:** Four investigators utilized PubMed and Google Scholar to find studies published within the past five years that assessed patient satisfaction with telemedicine in the field of adult primary care, using either the Press Ganey or CAHPS surveys. Studies that compared cost and quality of care between telemedicine and in-patient healthcare were also included to address the secondary aims of this study. **Results:** A total of 11 studies out of the 405 that were investigated were selected for this review. Five studies found no significant difference in patient satisfaction between telemedicine and in-person medicine, with one of those showing a patient preference for telemedicine. One study demonstrated significantly higher satisfaction with in-person medicine vs. telemedicine. Another study found that most physicians and patients reported no perceived difference in quality of care between telemedicine and in-person visitation. One study found no difference in patient satisfaction with telemedicine between immigrants and non-immigrants. Another study showed that patients have higher satisfaction when using telemedicine with their PCP vs. an unfamiliar provider. Two studies found telemedicine to be cost-effective. **Conclusions:** Our review concludes that patient satisfaction with telemedicine is not inferior to that with in-person visits. However, further research should be conducted to determine various factors that may affect patient perception and satisfaction.

Keywords: Patient satisfaction, telehealth, telemedicine

Introduction

Since its inception in the 1950s, telemedicine has undergone transformative growth, driven by technological advancements, and accelerated by the COVID-19 pandemic. As telemedicine became the epicenter of the pandemic era and brought about a multitude of changes to the healthcare landscape, it has become imperative to understand its impact on patient satisfaction.

Given the fact that patient satisfaction is a very dynamic and subjective variable, it is additionally imperative that standardized methods are used to measure this so that an accurate impact may be assessed. This review assesses studies conducted over the last five years to explore the relationship between telemedicine and patient satisfaction, gauged via standardized surveys such as Consumer Assessment of Healthcare Providers and Systems (CAHPS) and Press Ganey. The onset of the COVID-19 pandemic led to a seismic shift in healthcare dynamics, compelling the rapid adoption of telemedicine as a primary mode of care.

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Methods

Search strategy

We systematically searched PubMed and Google Scholar for primary studies relevant to the topic of telemedicine and patient satisfaction. We used a combination of the following keywords to search the databases: *telemedicine, telehealth, patient satisfaction, CAHPS, Press Ganey*. Searches were limited to January 2019 onwards. Four reviewers completed their literature search independently, and then compared findings to come to a consensus on which to include in the review.

Eligibility criteria

We considered only primary studies that had been published in peer-reviewed journals. We included studies that examined patient perception of telemedicine or telehealth interventions. Furthermore, to ensure validity, studies must have measured patient satisfaction using either the Consumer Assessment of Healthcare Providers and Systems (CAHPS) or Press Ganey surveys to be included.

We excluded non-English language articles, and studies conducted outside of the United States. We also excluded articles pertaining to pediatric patients, psychiatric intervention, and articles that did not directly pertain to adult primary healthcare (i.e., physical therapy, rehabilitation, counseling, etc.).

Search results

A total of 1825 studies were found using the search criteria. After screening the study titles and abstracts, 405 studies were assessed for eligibility. We conducted full-text screening of the articles and excluded 396 articles that did not meet inclusion and exclusion criteria. Nine studies met all criteria and were selected to be included in this review [Figure 1].

Literature Review and Results

The COVID-19 pandemic undeniably brought telemedicine to the forefront of the healthcare system. In this review, we will go over studies relevant to adult primary care in the past five years that investigated the impact of telemedicine on patient satisfaction, measured using standardized Consumer Assessment of Healthcare Providers and Systems (CAHPS) and Press Ganey surveys.

Based on the uncertainty associated with the COVID-19 pandemic, patients were hesitant to attend in-person appointments, leading to the implementation of telemedicine into the healthcare system as a primary realm of providing quality care to patients. Ramaswamy *et al.* conducted a retrospective study in an adult patient population at an academic center in New York City, looking at non-procedural outpatient visits from April 1, 2019 to March 31, 2020.^[1] They observed that patient satisfaction scores were higher in the telemedicine group of 620 patients as compared to the inpatient group of 37,989 patients (94.9%

vs 92.5%, $P < 0.001$). To rule out the impact of the pandemic on patient satisfaction scores, survey results were compared before and after the pandemic, with the cutoff date for the pre-pandemic set at March 3, 2020, and they found no significant differences in scores (95.0% vs 94.9%, $P = 0.31$).^[1] Similar results were observed by Donelan, *et al.* when comparing patient and provider satisfaction with tele-visitation to in-person visitation before the COVID-19 pandemic showing that 62.9% of patients and 59% of providers found no difference in the quality of care between in-person and virtual visits.^[2] Further, 82.3% of patients responded that they would recommend telemedicine to family and friends, and 68.5% of patients rated the quality of their telemedicine visits 9 out of 10 or 10 out of 10 ultimately highlighting the impact of telemedicine on the healthcare system.^[2]

Maher *et al.* conducted a retrospective study comparing patient satisfaction with in-person visits ($n = 14,430$) in the four months before the onset of the COVID-19 pandemic to patient satisfaction with virtual visits during the first four months of the pandemic ($n = 22,009$). This study aimed to determine if there were any changes in patient satisfaction scores following the introduction of telemedicine services.^[3] Five hospitals and 23 different medical specialties were included in this study, and a positive patient satisfaction score was measured as a top-box response to the likelihood-to-recommend question in the CAHPS survey. They observed results in favor of in-person visits, with patients being more likely to recommend in-person than telemedicine visits (82.32% vs 69.45%, $P = 0.029$).^[3] Within telehealth, different modalities of communication, such as video and audio visitation, can have differing levels of impact on patient satisfaction. Chen *et al.* studied the different levels of satisfaction between in-person, video, and phone visits and found that patients were more likely to recommend video visitation as compared to audio visitation (90.4 vs 86.7, $P = 0.007$).^[4] Patients still maintained higher recommendation scores for video visitation as compared to in-person visitation (90.4 vs 88.6, $P = 0.3$), however, they had lower recommendation scores for audio visits as compared to in-person (86.7 vs 88.6, $P = 0.4$) highlighting the significance of video appointments in the health-care system.^[4] The benefits of video consultation are many folds including time effectiveness and seeing the provider without traveling to their offices in contrast to audio visitation.

In addition to inpatient satisfaction, similar studies have been conducted to observe the impact of telemedicine on patient satisfaction in the outpatient setting. Hays *et al.* showed comparable results with a difference in magnitude of less than 2% in all three settings including audio, video, and in-person visitations, again highlighting the impact of telehealth when compared to in-person visitations.^[5] Similar outcomes were observed when another study by Danila *et al.* was conducted at a specialty clinic to measure disparities in patient satisfaction across telemedicine modalities. Patients were contacted and asked if they would be willing to do a virtual appointment, and they found no significant differences in patient satisfaction scores in

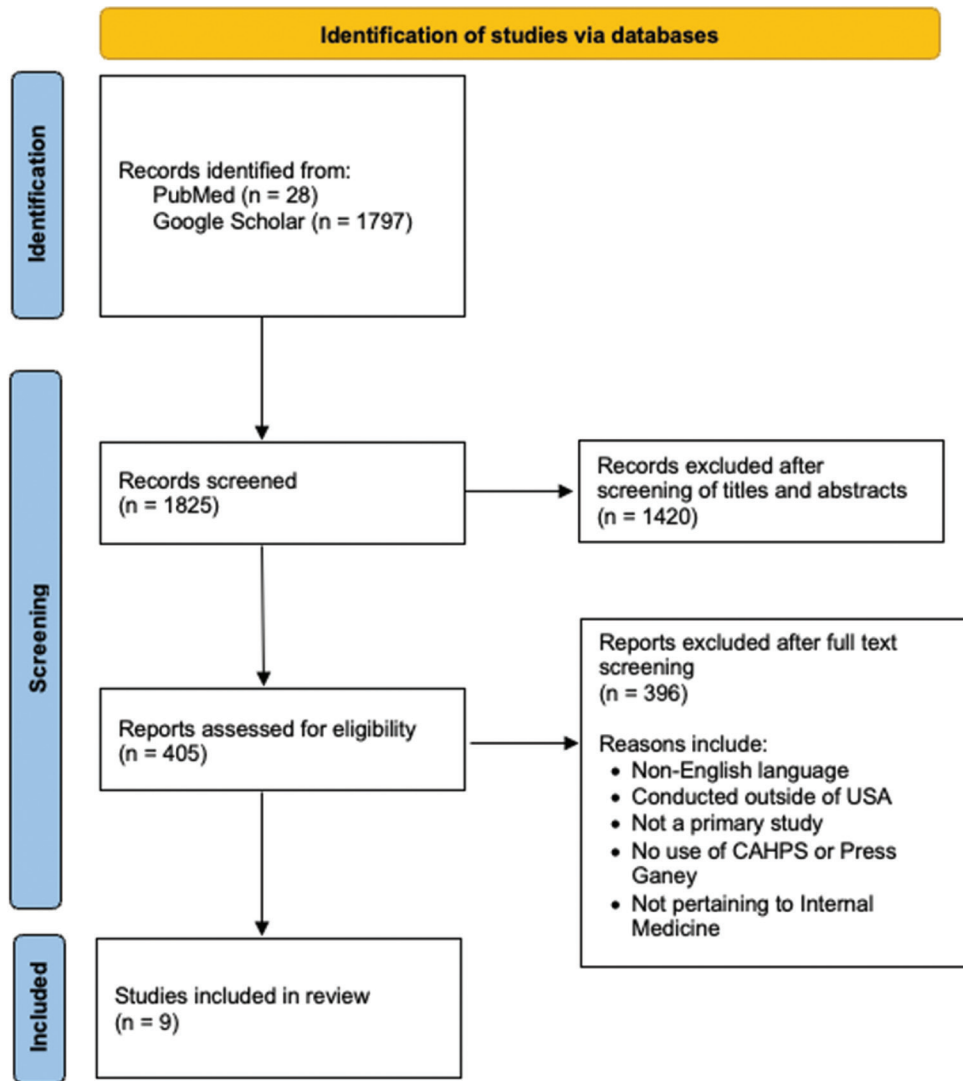


Figure 1: PRISMA flow diagram

both groups (84.6% v/s 78.1%, $P = 0.32$).^[6] A similar concept was reflected by Bruno *et al.* in the setting of prenatal healthcare comparing in-person visitation with telehealth. To confirm the significance of telemedicine in healthcare, a similar study was projected among pregnant women at the Cleveland Clinic when they were interviewed after virtual prenatal visits between October 7, 2019 and March 20, 2020.^[7] Three measures of patient satisfaction were found not to be statistically different between telemedicine and in-person visits: degree of care demonstrated by the provider ($P = 0.16$); likelihood of recommending the provider to others ($P = 0.09$); and likelihood of recommending the practice to others ($P = 0.13$). Further, 114 out of 165 (69%) respondents found their telemedicine visit to be as good as an in-person visit, 42 out of 165 (26%) found telemedicine to be better than in-person, and 148 out of 165 (90%) would recommend telehealth to other patients.^[7]

While telemedicine has proven to be beneficial in providing quality care to patients, some potential barriers impacting the care include socioeconomic factors, such as language,

insurance, and immigration status. To confirm the impact of socioeconomic factors on patient satisfaction scores, Levine *et al.* conducted a study to compare patient satisfaction among 122 immigrant patients and 138 non-immigrant patients proving no differences in the perception of quality of care among immigrants and non-immigrants, with 92% of immigrants and 94% of non-immigrants rating their care as excellent quality.^[8] Additionally, 100% of immigrants who attended a telehealth visit reported that they would prefer a telehealth visit at their next appointment, with 97% of non-immigrants reporting the same ($P = 0.07$) emphasizing the significance of telemedicine in the healthcare system.^[8] Patient familiarity has proven to be impacting patient satisfaction scores with telehealth visits. Rossini *et al.* studied the effect of practice familiarity on patient reception to telemedicine. They found that of 350 patients who had visits with their PCP as compared to 94 who had visits with providers outside of their PCP's practice, patients were more likely to rate their tele-visit higher based on familiarity with the primary care provider.^[9] Patients familiar with the practice had 3.76 higher odds (confidence interval [95% CI]:

1.4 9–9.44) of rating in-person care as indistinguishable from a telehealth visit.^[9]

Telemedicine provides many benefits to the healthcare system. It is more accessible than in-person visitation, which greatly benefits those who live in rural areas far from their providers, with limited access to transportation and little flexibility in their work-life schedule. In addition to being more accessible, telemedicine has proven to be time- and cost-effective. Patel *et al.* looked at 11,688 patients who had telehealth visits at the Moffitt Cancer Center in Florida between April 1, 2020 and June 30, 2021, and estimated the average cost savings per visit using the variables of driving distance, time spent traveling and going to an in-person appointment, and average hourly income of patients in that region. It was estimated that the mean cost savings for patients using telemedicine rather than in-person medicine were between \$147.40 and \$186.10 per visit.^[10] This study did not consider cost savings of caregivers, which was also likely to be significant, as it is common for cancer patients to be accompanied by caregivers at their appointments. Additionally, telemedicine utilization serves as a means for healthcare facilities to reduce expenditure, as Haleem *et al.* observed the decreased cost of video consultations on physicians and facilities.^[11] Of course, none of these benefits of telemedicine would be justified if they came at the expense of patient satisfaction or quality of care. This literature review finds that patient satisfaction with telemedicine is high overall, and not significantly different than with in-person health in most instances.

Discussion

In a world of uncertainty, the management of COVID-19 pneumonia and the impact of telemedicine around the pandemic era has been an important area of research. Quality of patient care has always been a priority regardless of the means of care, and its true measure is best elicited through patient satisfaction scores. This literature review indicates that patient satisfaction scores are comparable for telemedicine *versus* in-patient visitations.

Telemedicine has been utilized by healthcare organizations for decades, but the significance of telemedicine increased exponentially during the COVID-19 era. The concept was introduced in the late 1950s and first utilized by the University of Nebraska Medical Center to relay medical information electronically. Although now widely prevailing, telemedicine was less commonly integrated and utilized in healthcare organizations before March 2020. Concerns about health safety led to increased utilization of telemedicine by healthcare organizations. With the increased demand, there has been a surge in research analyzing patient perception and satisfaction. To measure this dynamic and subjective variable, there are numerous standardized evaluations available to assess patient satisfaction including Press Ganey and Consumer Assessment of Healthcare Providers and Systems (CAHPS) surveys.

Our literature review analyzed multiple aspects of patient satisfaction with telemedicine using the Press Ganey and CAHPS

surveys. This analysis demonstrated that patient satisfaction was comparable between inpatient and telemedicine visits. COVID-19 led to millions of patients dying due to acute respiratory distress syndrome since the beginning of the pandemic, and having an alternative healthcare delivery platform with comparable patient satisfaction that avoids close contact is paramount to improving patient and provider safety. Telemedicine provides patients with access to healthcare without risk of exposure to communicable diseases.

It is important to further consider the time-effectiveness and cost-effectiveness utility of telemedicine. An umbrella review conducted by Eze *et al.* examined a multitude of systematic reviews on the cost-effectiveness of telemedicine. They found that 39% of reviews concluded that telemedicine was unequivocally cost-saving compared to non-telemedicine intervention.^[12] A systematic review by de la Torre-Díez *et al.*^[13] found that of 35 studies examining the cost-utility and cost-effectiveness of telemedicine, only 2 studies did not conclude that telemedicine was a cost-effective intervention. Another study reviewed 5,695 Veterans Affairs appointments in rural Vermont and found that patients saved on average 145 miles of travel and 142 min per telemedicine visit.^[14] Of note, there is a lack of primary studies evaluating the degree to which telemedicine reduces direct costs on patients and healthcare systems alike. Patel *et al.* were able to establish that telemedicine visits provided indirect cost-savings to patients, but no studies have examined the direct cost-savings.^[10] Further high-quality studies need to be conducted to directly analyze the degree to which telehealth improves costs in the healthcare system.

Conclusion

Telemedicine provides patients with safe, cost-effective, and time-saving access to care, without compromising patient satisfaction. While the use of telemedicine is not new to the healthcare system, its utilization has increased in the post-COVID era. Our review analyzed studies that evaluated patient satisfaction with telemedicine using the CAHPS and the Press Ganey surveys and found that patient satisfaction with telemedicine is not inferior to that with in-person visits. Moving forward, there is a need for further studies analyzing the direct degree to which telemedicine improves the quality, outcomes, and cost-effectiveness of patient care. While this literature review establishes that patient satisfaction and perceived quality of care with telemedicine are high, a study should be conducted to look at clinical outcomes in telemedicine compared to in-person care. Additionally, our review found that there is a discrepancy in patient reception to different modalities of telemedicine, such as audio, video, and in-person visitation.

Further studies should be conducted to determine which platforms are directly associated with high levels of patient satisfaction, and these platforms should be implemented across healthcare systems. Moreover, additional research should be conducted comparing the impact of telemedicine on patient

satisfaction in different types of appointments, such as follow-ups, pharmacy visits, laboratory visits, and new visits. User-friendliness plays an important role in patient satisfaction and should be considered when designing these platforms, especially as it pertains to populations with low technological literacy. Healthcare providers should receive training to maximize the benefits of telemedicine, such as education on virtual communication and technical support.

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Conflicts of interest

There are no conflicts of interest.

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