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Satisfaction of Patients and Physicians with Telehealth Services during the COVID-19 Pandemic: A Systematic Review and Meta-Analysis

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Objectives: The rapid spread of coronavirus disease 2019 (COVID-19) posed significant challenges to healthcare systems, prompting the widespread adoption of telehealth to provide medical services while minimizing the risk of virus transmission. This study aimed to assess the satisfaction rates of both patients and physicians with telehealth during the COVID-19 pandemic. **Methods:** Searches were conducted in the Web of Science, PubMed, and Scopus databases from January 1, 2020, to January 1, 2023. We included studies that utilized telehealth during the COVID-19 pandemic and reported satisfaction data for both patients and physicians. Data extraction was performed using a form designed by the researchers. A meta-analysis was carried out using random-effects models with the OpenMeta-Analyst software. A subgroup analysis was conducted based on the type of telehealth services used: telephone, video, and a combination of both. **Results:** From an initial pool of 1,454 articles, 62 met the inclusion criteria for this study. The most commonly used methods were video and telephone calls. The overall satisfaction rate with telehealth during the COVID-19 pandemic was 81%. Satisfaction rates were higher among patients at 83%, compared to 74% among physicians. Specifically, telephone consultations had a satisfaction rate of 77%, video consultations 86%, and a mix of both methods yielded a 77% satisfaction rate. **Conclusions:** Overall, satisfaction with telehealth during the COVID-19 pandemic was considered satisfactory, with both patients and physicians reporting high levels of satisfaction. Telehealth has proven to be an effective alternative for delivering healthcare services during pandemics.

Keywords: Personal Satisfaction, Telemedicine, Patients, Physicians, COVID-19

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I. Introduction

With the emergence of coronavirus disease 2019 (COVID-19) in late 2019 and its swift spread worldwide, healthcare systems faced significant challenges [1,A1]. Non-urgent medical visits led to hospital overcrowding and dramatically increased the workload for hospital staff, thereby heightening the risk of infection transmission. Additionally, this situation jeopardized the lives and health of individuals, while also causing mental stress and anxiety [A2]. This issue was particularly acute for patients with certain chronic conditions who required ongoing medical, follow-up, and rehabil-

itation services, as they faced a heightened risk of contracting COVID-19 [A2-A5]. As a result, social distancing and staying at home were advocated to curb virus transmission and prevent further spread, which in turn imposed severe restrictions on the availability of healthcare services [A1,A6].

In this context, telehealth emerged as a solution for maintaining safe distances, reducing non-essential travel, and alleviating the burden on healthcare facilities during the widespread outbreak of this disease [2,A6,A7]. This method of delivering healthcare services has transformed care provision into a critical clinical function throughout the pandemic. It utilizes electronic systems and remote communication technologies to provide cost-effective care, regardless of the location of the healthcare provider and the patient, while ensuring safety [3,4,A8,A9]. It is also noteworthy that governments swiftly addressed barriers to telehealth during this period, such as reimbursements and communication infrastructure [A10].

Therefore, during the COVID-19 pandemic, telehealth was utilized across a wide range of medical specialties, including psychiatric care [A11], epilepsy management [A5], diabetes management [A12], rheumatology [A13], urology [A14], physical therapy and spinal rehabilitation [A15], pre-chemotherapy assessments [A16], ophthalmology [A17], treatment of spinal disorders [A18], and post-joint replacement follow-ups for hips and knees [A19]. Various telehealth platforms and modalities were employed, including telephone counseling [A20], video counseling [A21], web-based video sessions [A6], and interactive virtual education sessions [A12].

Since patient satisfaction is a key indicator of healthcare quality, research has underscored the importance of evaluating patient satisfaction with telehealth to enhance its technologies [A9]. Additionally, satisfaction with healthcare services is linked to greater patient engagement and adherence to treatment [A22]. With the increasing use of digital technologies and telehealth in healthcare, it is crucial to study patient satisfaction, a determinant of healthcare system quality [A9]. Indeed, evaluating patient satisfaction with the implementation of telehealth is vital for service providers in the continuum of patient care [A23]. Therefore, this study aimed to investigate the satisfaction rates of both patients and physicians with telehealth services during the COVID-19 pandemic.

II. Methods

This systematic review and meta-analysis was conducted and reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses [5].

1. Eligibility Criteria

The inclusion criteria for this study encompassed a range of research that investigated the use of telehealth services to deliver care during the COVID-19 pandemic, while also assessing the satisfaction of both patients and physicians. We included only studies published in English. Studies for which the full text was not available or that reported insufficient data were excluded.

The proposed PICOTS-SD (participants, interventions, comparisons, outcomes, timing of outcome measurement, setting, study design) framework was as follows [6]:

- Participants: All patients and physicians who received or were prescribed care using telehealth services during the COVID-19 pandemic;
- Intervention: Telehealth services;
- Comparator: Not applicable;
- Outcome: Satisfaction rate;
- Timing of outcome measurement: During the COVID-19 pandemic;
- Setting: Hospitals and other centers that deliver such services to patients; and
- Study design: Observational studies, including those with cross-sectional, cohort, and case-control designs.

2. Information Sources and Search Strategy

Three main databases—Web of Science, PubMed, and Scopus—were searched from January 1, 2020, to January 1, 2023. The investigation began by developing a search strategy, which involved identifying relevant keywords. These keywords included “telemedicine,” “telehealth,” “mHealth,” “teleconsultation,” “eHealth,” “mobile health,” “televisit,” “virtual visit,” “satisfaction,” “COVID-19,” “coronavirus,” “2019-nCoV,” and “coronavirus.” The search keywords were combined using both “OR” and “AND” operators.

3. Selection Process

After the search was completed, all records were imported into EndNote software version 18, and duplicates were removed. The studies were then subjected to a three-step screening process according to the eligibility criteria, which included evaluations of the title, abstract, and full text. Two independent reviewers screened the records based on the title, abstract, and full text. Any discrepancies at this stage were resolved by consensus with a third reviewer.

4. Data Collection Process and Data Items

Upon finalizing the selection of relevant articles, we designed a structured data extraction form to facilitate the collection of pertinent information. This form captured essential data points including the author's name, year of publication, study design, geographical location of the study, healthcare domain, types of telehealth platforms used, sample size, duration of data collection, the average age of the intervention group, the proportion of female participants in the study, and levels of satisfaction. In our study, satisfaction was defined as "a measure of how happy a patient or physician is with the healthcare delivered via telehealth" [7]. Two independent reviewers extracted the data. Any discrepancies at this stage were resolved by consensus with a third reviewer.

5. Quality Appraisal

We employed the Joanna Briggs Institute critical appraisal checklist to assess the quality of the included studies [8]. This institute has developed various checklists tailored to different types of studies. We applied these checklists according to the study design, utilizing specific ones for cross-sectional, cohort, and case-control studies.

6. Synthesis of Results

The meta-analysis was performed using OpenMeta-Analyst software [9]. Due to potential heterogeneity among the studies, the meta-analysis was conducted using a random-effects model with the DerSimonian-Laird method, which accounts for a 95% confidence interval [10]. We used the rate of satisfaction for meta-analysis, which reported either a percentage or a number of people from the original studies. Additionally, we utilized I^2 statistics to assess the heterogeneity of the included studies. I^2 test results below 25%, between 50%–75%, and above 75% were considered to indicate low, moderate, and high statistical heterogeneity, respectively [11]. The main sources of heterogeneity were attributed to differences in populations, contexts/settings, geographical areas, methods used to measure satisfaction rates, services provided, and the modes of service delivery. Our results are presented based on two main subgroup categorizations: (1) patients and physicians; and (2) telephone, video, or a combination of both. Studies that reported satisfaction as a percentage were considered for inclusion in the meta-analysis.

III. Results

1. Study Selection

The initial search identified 1,454 articles across various databases. After duplicates were removed, 986 articles remained for further review. The titles of these articles were then evaluated, narrowing the selection to 439. Further scrutiny of their abstracts reduced the number to 62 studies deemed suitable for research purposes (Figure 1).

2. Study Characteristics

Among the 62 studies included in the research, 25 were conducted in 2020 and 37 in 2021. These studies spanned 17 different countries, with the majority originating from the United States (n = 29; 47%), followed by the United Kingdom (n = 7; 11%), Saudi Arabia (n = 4; 6%), and France (n = 3; 5%). A diverse range of research methodologies was employed, with surveys being the most common (n = 26, 42%), followed by cross-sectional studies (n = 11; 18%) and cohort studies (n = 7; 11%). Additionally, the primary focus of most studies was on teleconsultation (19 studies, 30%), while the remaining studies explored other aspects of telehealth care services. Specifically, 10 studies (16%) involved telehealth care via telephone calls, 8 studies (13%) through video consultations, and 8 studies (13%) through a combination of video and telephone calls (Table 1, Appendix 1).

3. Results of Syntheses

The high heterogeneity among the studies, due to varying study designs, diverse populations, different types of services

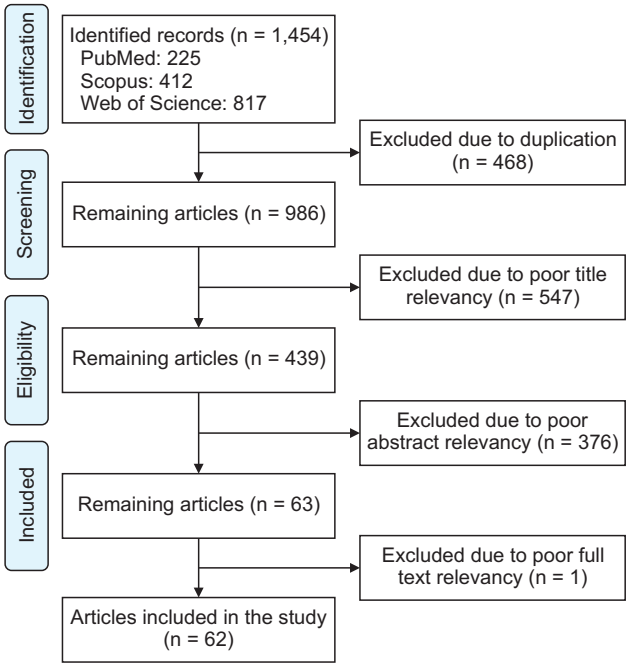

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow chart.

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Table 1. Summary of the studies

Ref.[a)]	Study, year	Design	Country	Service/ Practice/Care	Type of telemedicine system	Sample size	Data collection period	Mean age (yr)	Sex, female (%)
[A1]	Liu et al., 2020	Retrospective cohort study	China	Coronavirus disease (COVID-19)	Remote diagnosis and treatment	985 patients	Jan 24–Feb 17, 2020	-	57.7
[A2]	Sharawat et al., 2020	Prospective follow-up study	India	Children and adolescents with migraine	Telephone consultations (teleconsultation)	51 caregivers	Mar 25–Jun 4, 2020	Average 9.42 ± 3.19	52
[A3]	Ambrosini et al., 2020	Follow-up	Italy	Uro-oncology	E-mail accompanied by a telephone call from the urologist	60 patients	From Mar 9, 2020	-	-
[A4]	Chesnel et al., 2021	Experience of the COVID-19 pandemic	France	Neuro-urology	Teleconsultations by telephone	221 patients	Mar 16–Jun 30, 2020	55.4 ± 14.2	58.9
[A5]	Dias et al., 2021	Observational	Portugal	Tension-type headache: migraine, trigeminal autonomic cephalalgia, or other primary headache disorders	Headache teleconsultation	254 patients	May 21–Jul 8, 2020	40.9 ± 11.8	88.0
[A6]	Berlin et al., 2021	Cohort study	Canada	Cancer	Virtual care management system (video and telephone)	3,507 patients and 284 practitioners	Mar 23–May 22, 2020	-	-
[A7]	Bhuva et al., 2020	Prospective cohort study	Texas, USA	Spine physical medicine and rehabilitation patients	Telemedicine visits	172 patients	Mar and Jun 2020	64.47 ± 12.42	53.3
[A8]	Akama-Garren et al., 2021	Retrospective cohort study	USA	Patients with acute respiratory symptoms	Telemedicine phone calls	1,286 patients	Apr 18–Nov 18, 2020	45	66
[A9]	Mustafa et al., 2021	Single-center, prospective study	USA	Allergy/immunology	Video and telephone	Video: 66 patients Telephone: 28 patients	Jun 26–Jul 31, 2020	Video: 57 (58.1%)	Video: 58.1 Telephone: 71.7
[A10]	Capusan et al., 2021	Survey	USA	Pediatric pulmonary patients	Video or audio telehealth	50 patients	Mar–Apr 2020	-	-

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Table 1. Continued

Ref.[a)]	Study, year	Design	Country	Service/ Practice/Care	Type of telemedicine system	Sample size	Data collection period	Mean age (yr)	Sex, female (%)
[A11]	Sathiyaraj et al.,2020	Survey, cross-sectional study	USA	patients undergoing prechemotherapy evaluation	video visit	70 patients	Apr 1–Jul 14, 2020	40 and 60 (60%)	67.6
[A12]	Hasson et al., 2021	Survey	Israel	Adult patients with cancer	Telemedicine meeting via telephone	172 patients	Mar–May 2020	Median: 63 (21–88)	7
[A13]	Kenney et al., 2021	Survey	USA	Childhood cancer survivors (CCS)	Virtual visits using video-conferencing	81 providers 38 patients	Apr–Jun 2020	Provider: 18–29 Patient: 18–29	Provider: 42 Patient: 63
[A14]	Erlank et al., 2020	Reported outcome measures	UK	Early medical abortion (EMA)	Follow-up call	1,220 patients	Apr 6–Aug 31, 2020	-	98.1
[A15]	Ashmawy et al., 2020	Retrospective study	UK	Total hip and knee arthroplasties	Virtual joint replacement clinic	1,749 patients	Jan 2017–Dec 2018	71 (25–98)	58.72
[A16]	Kumar et al., 2020	Cross-sectional observational study	India	Orthopedic patients	Telemedicine consultation	450 patients	Apr 1–Apr 30, 2020	38.03 ± 16.23	49
[A17]	Ong et al., 2020	Survey	Singapore	Ureteric colic patients	Teleconsultation	1,006 patients	2016–2019	42.3 ± 12.5	31.2
[A18]	Byrne and Watkinson, 2021	Descriptive cross-sectional	UK	Orthodontic	Video consultations	59 patients 62 clinicians	-	-	Patient: 63 Clinician: -
[A19]	Hentati et al., 2021	Survey	USA	Rhinology-Otolaryngology	Telehealth visits (audio-video visits)	45 patients	Mar 15–Jun 1, 2020	51.2 ± 16.0	68.9
[A20]	Gomes et al., 2021	Transversal study	Portugal	Patients with diabetes, hypertension	Teleconsultation	253 individuals	Apr 1–May 1, 2020	-	-
[A21]	Kaunitz et al., 2021	Retrospective survey	USA	Dermatology	Live interactive teledermatology	602 patients	Mar–Jun 2020	18–75	70.8
[A22]	Koziatek et al., 2020	Retrospective cohort study	USA	Assessed for emergency department referrals	Virtual urgent care platform	2,668 patients	Mar 8–Apr 7, 2020	-	61.8

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Table 1. Continued

Ref.[a)]	Study, year	Design	Country	Service/ Practice/Care	Type of telemedicine system	Sample size	Data collection period	Mean age (yr)	Sex, female (%)
[A23]	Volcy et al., 2021	Survey	USA	Internal medicine (IM) and family medicine (FM)	Televisits	94 patients	Apr 16–Apr 30, 2020	Average: 57.7	IM patients: 77.5 FM patients: 79.8
[A24]	Gentry et al., 2021	Cross-sectional descriptive survey	USA	Mental health clinicians	Video telehealth	193 clinicians	Mar–Jun 2020	-	59.8
[A25]	Polunina et al., 2020	Survey	Russia	COVID-19 patients	Video/audio conferencing	216 COVID-19 patients	Apr 30–May 10, 2020	Average: 40.3 ± 0.72 (men) 44.2 ± 0.97 (women)	-
[A26]	Lapadula et al., 2021	Cross-sectional study	USA	Neonatology prenatal visits for pregnant women	Teleconsultations (video-consult)	50 patients	May to mid-Nov 2020	-	-
[A27]	Bate et al., 2021	Survey	Australia	Pre-COVID-19 or COVID-19 subgroups, in both patients and clinicians	Web-based video, using web real-time communication technology	1,757 stakeholders (875 patients; 632 parents; 62 adult-based clinicians; and 188 pediatric-based clinicians)	Mar 16–Apr 15, 2020	-	
[A28]	Shaverdian et al., 2021	Survey	USA	Radiation oncology clinics	Telemedicine consultation	114 patients	Apr 2–Jun 10, 2020	Median: 65 (19–91)	43
[A29]	Alwabiliy et al., 2021	Cross-sectional descriptive study	Saudi Arabia	Facilitate healthcare services	Virtual clinics	123 patients	May 5–Jul 9, 2020	33 ± 12	61
[A30]	Nasser et al., 2021	Cross-sectional survey study	Saudi Arabia	Patients treated through telemedicine programs in Saudi Arabia	Telehealth visits	425 patients	Feb–Aug 2020	-	63.1
[A31]	Bizot et al., 2021	Survey	France and Italy	Anticancer therapy for metastatic and localized cancers	Teleconsultations	1,299 patients	Apr 6–May 25, 2020	-	-

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Table 1. Continued

Ref.[a)]	Study, year	Design	Country	Service/ Practice/Care	Type of telemedicine system	Sample size	Data collection period	Mean age (yr)	Sex, female (%)
[A32]	Knaus et al., 2021	Retrospective review of patients	USA	Anorectal malformation, Hirschsprung's disease, functional constipation, myelomeningocele, and spinal injury	Telemedicine bowel management programs consisted of video and/or phone call visits (remote)	67 patients	May-Oct 2020	Average: 8.6 (3–18), SD 3.9	44.8
[A33]	Chang et al., 2021	Prospective survey study	USA	Cancer rehabilitation	Telerehabilitation stratified by contact method (phone or video)	169 patients	Mar 25–May 31, 2020	57.6	65.2
[A34]	Adams et al., 2021	Prospective observation study	Australia	Rheumatology	Telehealth consultations by telephone	128 patients	Mar 26–Apr 27, 2020 Apr 7–Apr 17, 2020	-	69.5
[A35]	Orrange et al., 2021	Retrospective observational study	USA	Internal medicine patients	Video and telephone consultations	368 patients	Fall of 2020	55.8 ± 16.0	66
[A36]	Kaur et al., 2020	Survey	UK	hyperthyroidism	Telemedicine	65 patients	Jan–May 2020	Average: 53	-
[A37]	Haxhihamza et al., 2020	Survey	Macedonia	Psychiatry	Telepsychiatry	28 patients	-	40.25–19	-
[A38]	Teng et al., 2021	Prospective monocentric study	France	Outpatient epilepsy	Remote encounters	204 physicians	Mar 20–Apr 23, 2020	8.7 (4.5–12.8)	-
[A39]	Al-Sofiani et al., 2021	Survey	Saudi Arabia	Young adults with type 1 diabetes	Interactive virtual educational sessions	210 patients	Mar 24–Apr 24, 2020	Median: 21 (IQR, 11)	68
[A40]	Mortezavi et al., 2021	Retrospectively collected patient encounter data	USA	Rheumatology	Telephone and video visits	359 patients	May 1–May 29, 2020	Median: 59 (21–93)	81.9
[A41]	Palandri et al., 2020	Survey	Italy	Negative myeloproliferative neoplasms	Telephone or video consultations in patients	87 patients	Mar 9–May 4, 2020	-	-

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Table 1. Continued

Ref.[a]	Study, year	Design	Country	Service/ Practice/Care	Type of telemedicine system	Sample size	Data collection period	Mean age (yr)	Sex, female (%)
[A42]	Gerbutavicius et al., 2020	Survey	Germany	Ophthalmology practice	Teleophthalmology (video consultation)	29 patients	-	59.3	55.17
[A43]	Clark and Bradley, 2021	Cross-sectional	USA	Urogynecology	Telemedicine visits	94 patients	Apr 1–May 31, 2020	56.2 ± 16.1	-
[A44]	Mohanty et al., 2020	Survey	Texas	Neurosurgery	Telemedicine consultations	122 patients	Mar 22–May 8, 2020	-	-
[A45]	Efthymiadis et al., 2021	Survey	UK	Urological service	Teleconsultation	194 patients	Mar 23, 2020	Median: 72 (27–91)	13
[A46]	Itamura et al., 2020	Survey	USA	Otolaryngology clinic visit	Virtual visits	221 patients	Mar 1–May 1, 2020	-	-
[A47]	Zhu et al., 2020	Retrospective single-site cohort study	USA	Surgical patients and providers (general surgery, otolaryngology, plastic surgery, urology, and vascular surgery)	Video telemedicine appointment	26 providers	Mar 27–Apr 23, 2020	18–100	51.9
[A48]	Horgan et al., 2020	Retrospective survey	UK	Oral and maxillofacial surgical	Teleconsultation	109 patients	Apr 1–Jun 8, 2020	64.5 ± 13.3	45
[A49]	Marianayagam et al., 2021	Retrospective chart review	USA	Craniofacial	Virtual craniofacial clinic	90 patients	-	-	-
[A50]	Riley et al., 2021	Telephone-based survey	USA	Otolaryngology practices	Routine clinical care for telemedicine consultation	325 patients 25 providers	Apr–Jul 2020	40–59 (45.5%)	49.8
[A51]	Porche et al., 2021	Retrospective, single-institution, review	USA	Clinic visits in neurosurgery	Telemedicine outpatient clinic visits in neurosurgery	97 patients	Mar 1, 2019–Sep 15, 2020	-	-
[A52]	Yoon et al., 2020	Prospectively studied consecutive	USA	Neurosurgery outpatient clinic for either brain or spine disease	Via real-time video conferencing using Google Meet	310 patients	May 15–Jun 8, 2020	60.9 ± 13.6	59

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Table 1. Continued

Ref.[a)]	Study, year	Design	Country	Service/ Practice/Care	Type of telemedicine system	Sample size	Data collection period	Mean age (yr)	Sex, female (%)
[A53]	Richards et al., 2021	Survey	USA	Neurosurgical outpatient practices	Telemedicine (phone or video) visits	179 patients	Jun 1–Aug 15, 2020	63.1 ± 14.6 (range 18.0–91.0)	49.7
[A54]	Shiff et al., 2020	Survey	Canada	Andrology-focused urology practice	Telephone	96 patients	Mar–Jun 2020	48.5 (37.3–62.8)	-
[A55]	Pinar et al., 2020	Prospective, bi-centric study	France	Consultation for follow-up or oncological urology	Urological teleconsultation	105 patients 5 urologists	Mar 30–Apr 13, 2020	Median: 66 (IQR 55–71)	9.5
[A56]	Gan et al., 2021	Survey	USA	Pediatric urology clinic	Video visits	631 patients	May 2018–Apr 2020	Median: 7	28
[A57]	Melian et al., 2021	Prospective observational cohort study	USA	Orthopedic and spinal conditions	Teleconsultation (telephone)	388 patients	Mar 25–Apr 27, 2020	(range 10–94)	56.1
[A58]	Greenfield et al., 2021	Survey	USA	Orthopedic care	Telemedicine visits	346 patients	Mar 23–Apr 24, 2020	Average: 52.4 ± 17.3 (range: 18–88)	52.9
[A59]	Fieux et al., 2020	Prospective study	Saudi Arabia	ENT consultation	ENT telemedicine consultation (telemedicine consultation used the "SARA" platform)	125 patients	Apr 6–Apr 10, 2020	51 (range 18–78)	60.0
[A60]	Layfield et al., 2020	Retrospective chart reviews	USA	Otolaryngology patient (head and neck ambulatory visits)	Video-based telemedicine visits	100 patients	Mar 18–Apr 24, 2020	62.6 ± 13.9	41
[A61]	Shahid et al., 2021	Retrospective survey	UK	Vitrectomy for retinal detachment	Teleconsultation	53 patients	Mar 23, 2020	-	51
[A62]	Shafi et al., 2020	Cross-sectional	USA	Treatment of spinal disorders	Telehealth visits as a platform for delivering care for the treatment of spinal pathology	110 patients	Mar 25–May 15, 2020	>60	53.6

COVID-19: coronavirus disease 2019, ENT: ear, nose, and throat, IQR: interquartile range.

[a)]The lists refer to Appendix 1.

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provided, and varied methods of delivering telehealth care, necessitated the use of a random-effects model.

The results revealed an overall satisfaction rate of 81% with telehealth services (95% confidence interval [CI], 78%–85%; standard error [SE] = 0.02; $p < 0.01$). The I^2 statistic suggested a high level of heterogeneity among the studies, at 98.27%. The forest plot for this analysis is presented in Figure 2.

In the studies, patients reported an overall satisfaction rate of 83% (95% CI, 79%–87%; SE = 0.02, $p < 0.01$). Heterogeneity among the studies, as measured by the I^2 statistic, was 98.29%. Figure 3 depicts the forest plot for this analysis.

The overall satisfaction rate among physicians was 74% (95% CI, 57%–91%; SE = 0.09; $p < 0.01$). The heterogeneity

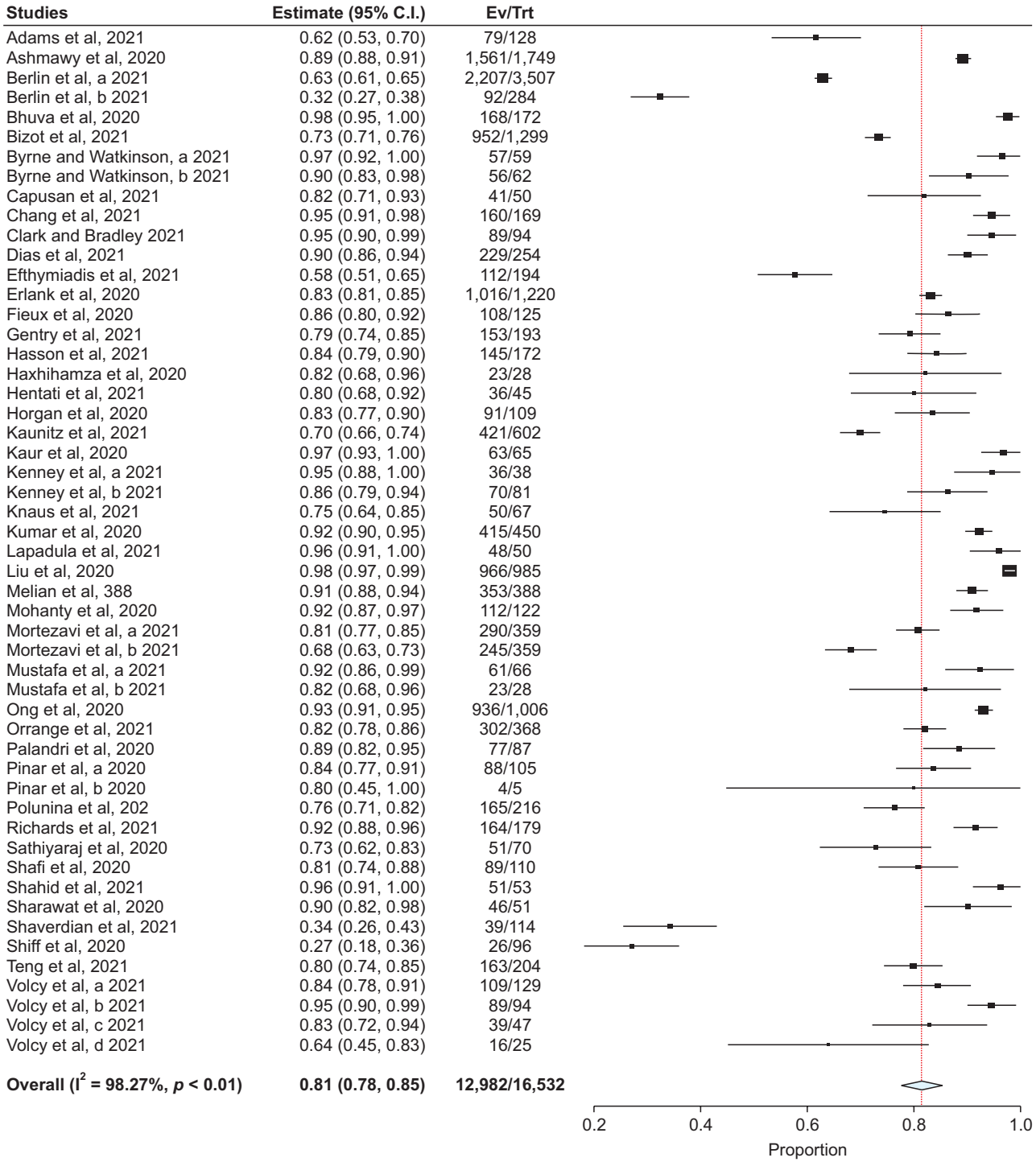

Figure 2. Forest plot of the overall satisfaction with telehealth for all participants.

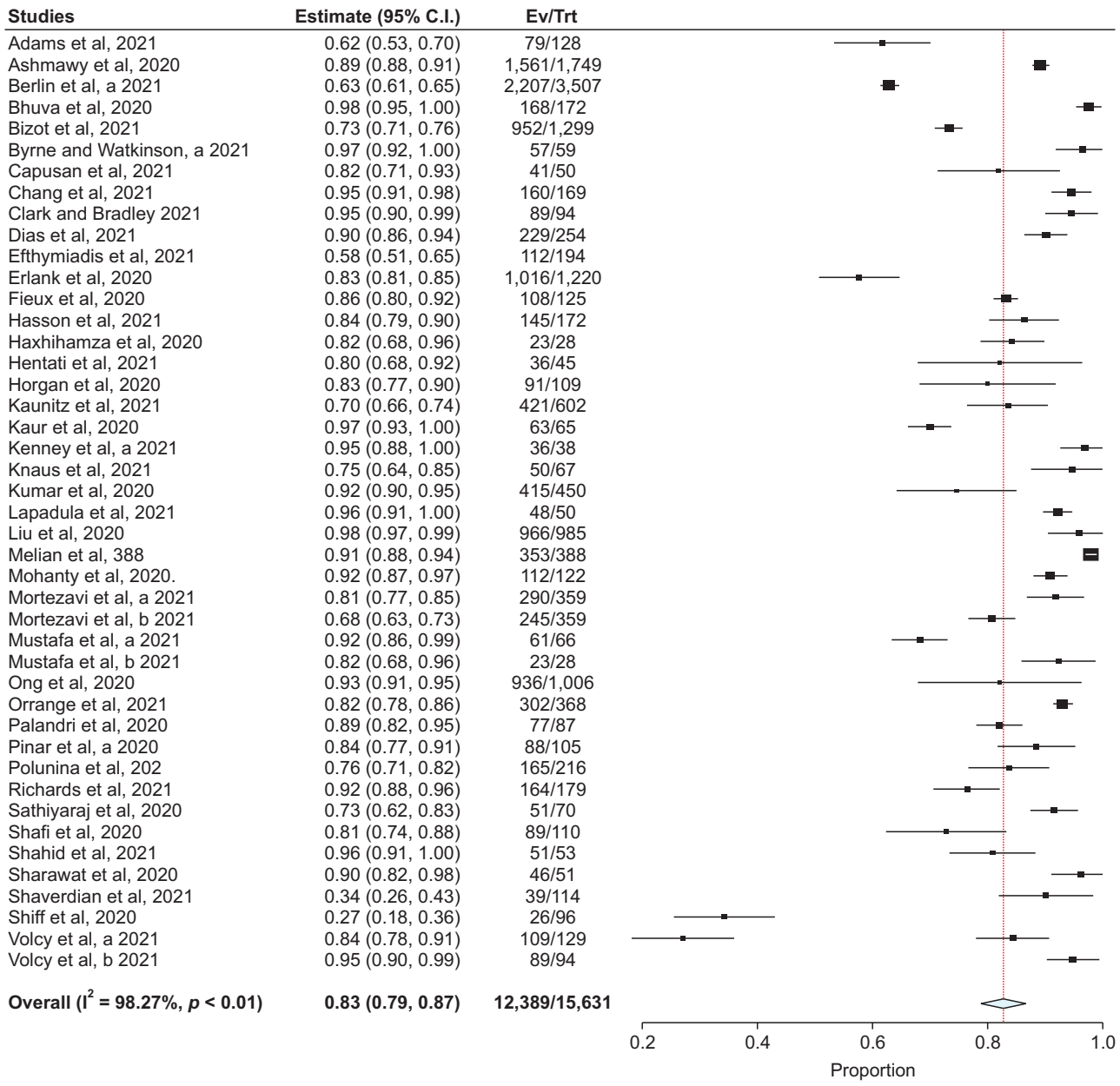

Figure 3. Forest plot of the overall satisfaction with telehealth for patients.

of the studies on physicians, as indicated by the I^2 statistic, was 97.31%. The forest plot for this analysis is illustrated in Figure 4.

A meta-analysis was conducted to evaluate the types of telehealth technology and the associated satisfaction rates. This analysis categorized studies into three subgroups based on the use of telehealth services via telephone, video, or a combination of both.

The overall satisfaction rate for studies utilizing telehealth services via telephone was 77% (95% CI, 70%–85%; SE = 0.04, p < 0.01). There was significant heterogeneity among studies involving telephone-based services, as indicated by an I^2 statistic of 97.55%. The corresponding forest plot for this analysis is presented in Figure 5.

The overall satisfaction rate for studies using telehealth services via video was 86% (95% CI, 80%–92%; SE = 0.03; p < 0.01). The heterogeneity among studies involving video-based services, as indicated by an I^2 statistic of 85.45%, suggests substantial variability. The corresponding Forest plot for this analysis can be found in Figure 6.

The overall satisfaction rate for studies that provided telehealth services via video and telephone was 77% (95% CI, 67%–88%; SE = 0.05; p < 0.01). The heterogeneity among studies that combined video and telephone-based services,

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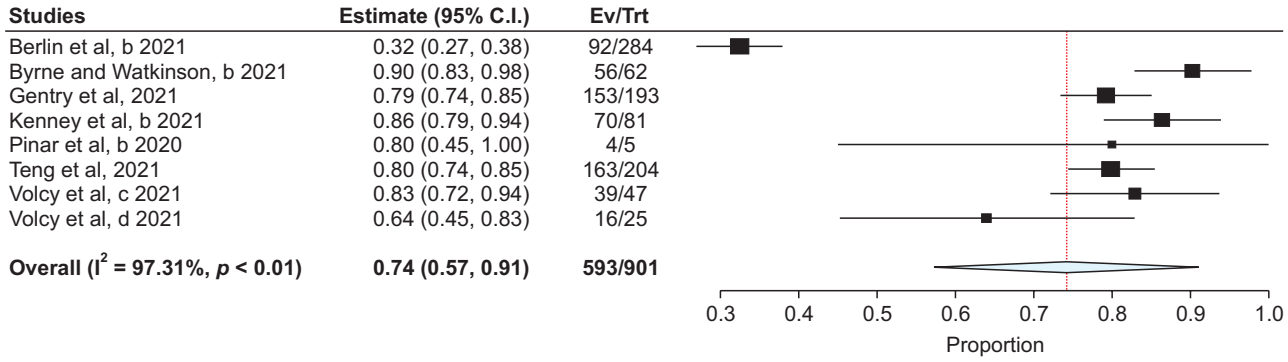

Figure 4. Forest plot of the overall satisfaction with telehealth for physicians.

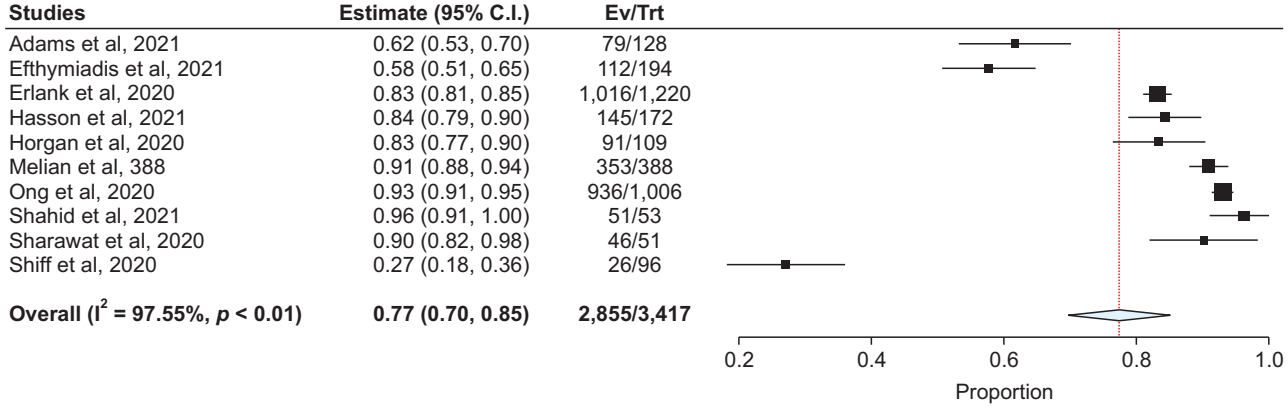

Figure 5. Forest plot of the overall satisfaction with telehealth using telephones.

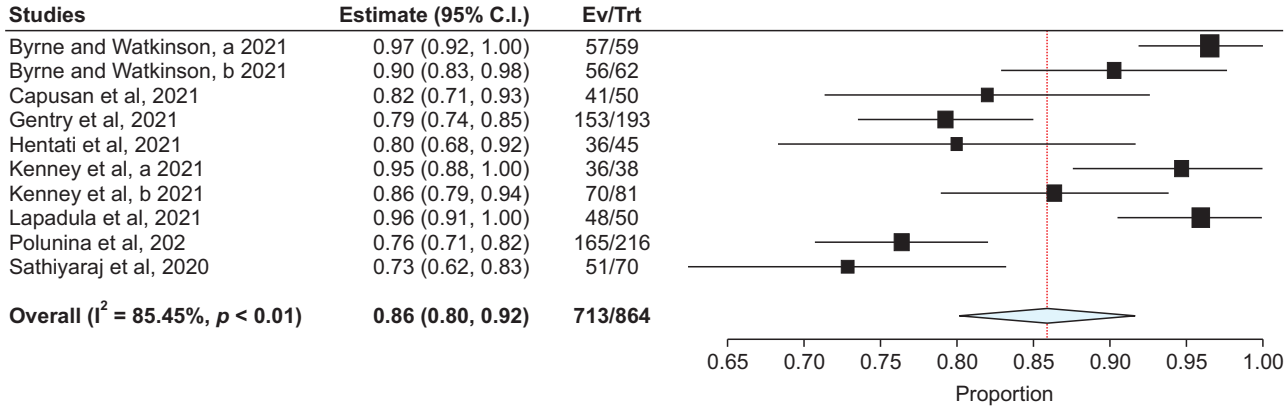

Figure 6. Forest plot of the overall satisfaction with telehealth using videos.

as indicated by an I^2 statistic of 98.57%, was substantial. The forest plot for this analysis is presented in Figure 7.

4. Quality Appraisal

The overall quality score for the included studies was 7, indicating moderate quality. The quality scores of these studies varied from 3 to 10. Among them, the cohort study demonstrated superior quality compared to the cross-sectional and case-control studies.

IV. Discussion

A systematic review examined satisfaction with telehealth care during the COVID-19 pandemic. The results indicated that both patients and healthcare professionals were generally satisfied with telehealth services. Overall, it seems that patient satisfaction with telehealth care exceeds that of physicians.

The findings of this study are consistent with the systematic review by Pogorzelska and Chlabicz [12], which showed

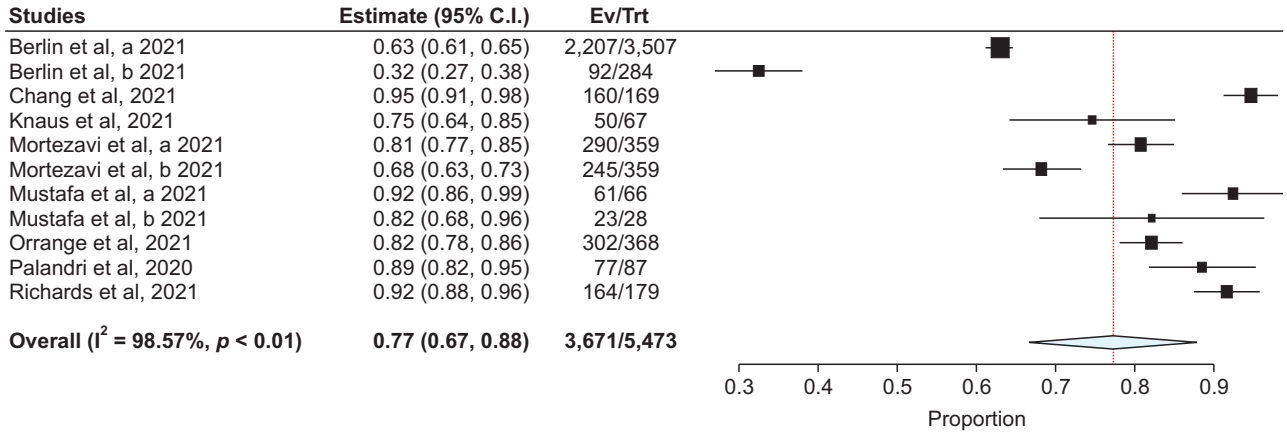

Figure 7. Forest plot of the overall satisfaction with telehealth using telephone and video.

high patient satisfaction with telehealth care across various medical specialties. Moreover, patients regarded telehealth as a valuable resource for consulting with providers during the COVID-19 pandemic. In terms of physician satisfaction, our results align with those reported by Hoff and Lee [13], indicating that physicians from diverse specialties, geographic and practice locations, as well as care situations, are generally satisfied with using telehealth for patient care and consultations with other physicians. Additionally, our findings concur with those of Aashima et al. [14], demonstrating that both physicians and patients favor the ongoing use of telehealth.

Moreover, the results of this study indicated that participants' overall satisfaction with telehealth was higher when using video-based technology. These findings align with those of Saiyed et al. [15] and Gentry et al. [2], which demonstrated a preference among physicians for video-based telehealth. Additionally, physicians reported high levels of acceptability, feasibility, appropriateness, and satisfaction with this modality.

The findings are consistent with those of Monaghesh and Hajizadeh [16], who reported that video conferencing can reduce physical contact. This reduction in contact decreases the risk of exposure to contaminated respiratory secretions and helps prevent the transmission of infections to healthcare providers, all while maintaining patient satisfaction.

Satisfaction was assessed using various techniques across different studies; there was no uniform approach applied consistently. Additionally, it is important to recognize that satisfaction is a multidimensional concept, representing various aspects that can differ from one individual to another and may be influenced by cultural factors specific to each country.

Unsurprisingly, satisfaction with telehealth was consistently high across various healthcare domains, as it provided a viable alternative for enhancing longevity and offering protection against COVID-19 infection. While patients widely embraced telehealth and expressed satisfaction, this heightened satisfaction may not accurately reflect their true sentiments and attitudes toward telehealth. Instead, it could be influenced by the psychological atmosphere and fear prevalent during the COVID-19 pandemic. Therefore, caution should be exercised when generalizing these findings to periods not affected by COVID-19. Consequently, caution is also advised when extending these telehealth satisfaction findings to times unrelated to the pandemic.

Telehealth appears to be a viable alternative for delivering healthcare services during widespread disease outbreaks, particularly through the use of video technology. The ability to engage visually and interactively with healthcare providers and patients likely enhances the appeal of this technology over other methods.

Our study has several limitations. First, there was significant heterogeneity among the studies, which varied by type of study, participant demographics, tools used, context, type of service, etc. This heterogeneity necessitates further investigation in future research. We recommend that other researchers conduct studies focusing on the specific items mentioned here. Additionally, this study confirms the legitimacy of non-face-to-face treatments and services during the pandemic. However, it is a limitation that studies conducted across various countries and environments, involving subjects ranging from children to the elderly and those with diseases, demonstrated satisfaction despite high heterogeneity.

Furthermore, it is advisable to examine patient satisfaction outcomes, particularly in the aftermath of the COVID-19 pandemic. This period has seen a reduced willingness among patients to attend in-person appointments. As a result, there

https://doi.org/10.4258/hir.2024.30.3.206

may be an increase in patient satisfaction with telehealth services due to these changes. Furthermore, telehealth should be considered a standard method for delivering healthcare services, not only during pandemics but also in the post-pandemic era. Such foresight facilitates the preparation and implementation of the necessary infrastructure, ensuring that telehealth can be utilized more effectively during crises.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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References

1. Gilbert AW, Billany JC, Adam R, Martin L, Tobin R, Bagdai S, et al. Rapid implementation of virtual clinics due to COVID-19: report and early evaluation of a quality improvement initiative. BMJ Open Qual 2020;9(2):e000985. https://doi.org/10.1136/bmjoq-2020-000985
2. Gentry MT, Puspitasari AJ, McKean AJ, Williams MD, Breitinger S, Geske JR, et al. Clinician satisfaction with rapid adoption and implementation of telehealth services during the COVID-19 pandemic. Telemed J E Health 2021;27(12):1385-92. https://doi.org/10.1089/tmj.2020.0575
3. Andrews E, Berghofer K, Long J, Prescott A, Caboral-Stevens M. Satisfaction with the use of telehealth during COVID-19: an integrative review. Int J Nurs Stud Adv 2020;2:100008. https://doi.org/10.1016/j.ijnsa.2020.100008
4. Harkey LC, Jung SM, Newton ER, Patterson A. Patient satisfaction with telehealth in rural settings: a systematic review. Int J Telerehabil 2020;12(2):53-64. https://doi.org/10.5195/ijt.2020.6303
5. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Syst Rev 2015;4(1):1. https://doi.org/10.1186/2046-4053-4-1
6. Jung AR, Kim D, Park EA. Cognitive intervention using information and communication technology for older adults with mild cognitive impairment: a systematic review and meta-analysis. Int J Environ Res Public Health 2021;18(21):11535. https://doi.org/10.3390/ijerph182111535
7. Hadeler E, Gitlow H, Nouri K. Definitions, survey methods, and findings of patient satisfaction studies in teledermatology: a systematic review. Arch Dermatol Res 2021;313(4):205-15. https://doi.org/10.1007/s00403-020-02110-0
8. Barker TH, Stone JC, Sears K, Klugar M, Leonardi-Bee J, Tufanaru C, et al. Revising the JBI quantitative critical appraisal tools to improve their applicability: an overview of methods and the development process. JBI Evid Synth 2023;21(3):478-93. https://doi.org/10.11124/JBIES-22-00125
9. Wallace BC, Schmid CH, Lau J, Trikalinos TA. Meta-Analyst: software for meta-analysis of binary, continuous and diagnostic data. BMC Med Res Methodol 2009;9:80. https://doi.org/10.1186/1471-2288-9-80
10. Jackson D, White IR, Thompson SG. Extending DerSimonian and Laird's methodology to perform multivariate random effects meta-analyses. Stat Med 2010;29(12):1282-97. https://doi.org/10.1002/sim.3602
11. Lin L. Comparison of four heterogeneity measures for meta-analysis. J Eval Clin Pract 2020;26(1):376-84. https://doi.org/10.1111/jep.13159
12. Pogorzelska K, Chlabicz S. Patient satisfaction with telemedicine during the COVID-19 pandemic-a systematic review. Int J Environ Res Public Health 2022;19(10):6113. https://doi.org/10.3390/ijerph19106113
13. Hoff T, Lee DR. Physician satisfaction with telehealth: a systematic review and agenda for future research. Qual Manag Health Care 2022;31(3):160-9. https://doi.org/10.1097/QMH.0000000000000359
14. Aashima, Nanda M, Sharma R. A review of patient satisfaction and experience with telemedicine: a virtual solution during and beyond COVID-19 pandemic. Telemed J E Health 2021;27(12):1325-31. https://doi.org/10.1089/tmj.2020.0570
15. Saiyed S, Nguyen A, Singh R. Physician perspective and key satisfaction indicators with rapid telehealth adoption during the coronavirus disease 2019 pandemic. Telemed J E Health 2021;27(11):1225-34. https://doi.org/10.1089/tmj.2020.0492
16. Monaghesh E, Hajizadeh A. The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence. BMC Public Health 2020;20(1):1193. https://doi.org/10.1186/s12889-020-09301-4

Appendix 1. List of studies included in a systematic review

[A1] Liu L, Gu J, Shao F, Liang X, Yue L, Cheng Q, et al. Application and preliminary outcomes of remote diagnosis and treatment during the COVID-19 outbreak: retrospective cohort study. JMIR Mhealth Uhealth 2020;8(7):e19417. https://doi.org/10.2196/19417

[A2] Sharawat IK, Panda PK. Caregiver satisfaction and effectiveness of teleconsultation in children and adolescents with migraine during the ongoing COVID-19 pandemic. J Child Neurol 2021;36(4):296-303. https://doi.org/10.1177/0883073820968653

[A3] Ambrosini F, Di Stasio A, Mantica G, Cavallone B, Serao A. COVID-19 pandemic and uro-oncology follow-up: a "virtual" multidisciplinary team strategy and patients' satisfaction assessment. Arch Ital Urol Androl 2020;92(2). https://doi.org/10.4081/aiua.2020.2.78

[A4] Chesnel C, Hentzen C, Le Breton F, Turmel N, Tan E, Haddad R, et al. Efficiency and satisfaction with telephone consultation of follow-up patients in neuro-urology: experience of the COVID-19 pandemic. Neurourol Urodyn 2021;40(3):929-37. https://doi.org/10.1002/nau.24651

[A5] Dias L, Martins B, Pinto MJ, Rocha AL, Pinto M, Costa A. Headache teleconsultation in the era of COVID-19: patients' evaluation and future directions. Eur J Neurol 2021;28(11):3798-804. https://doi.org/10.1111/ene.14915

[A6] Berlin A, Lovas M, Truong T, Melwani S, Liu J, Liu ZA, et al. Implementation and outcomes of virtual care across a tertiary cancer center during COVID-19. JAMA Oncol 2021;7(4):597-602. https://doi.org/10.1001/jamaoncol.2020.6982

[A7] Bhuva S, Lankford C, Patel N, Haddas R. Implementation and patient satisfaction of telemedicine in spine physical medicine and rehabilitation patients during the COVID-19 shutdown. Am J Phys Med Rehabil 2020;99(12):1079-85. https://doi.org/10.1097/PHM.0000000000001600

[A8] Akama-Garren EH, Shah SA, Zinzuwadia AN, Bartuska A, Hashimoto M, Chu JT, et al. Outcomes of a student-led telemedicine clinic in response to COVID-19. J Ambul Care Manage 2021;44(3):197-206. https://doi.org/10.1097/JAC.0000000000000380

[A9] Mustafa SS, Vadamalai K, Ramsey A. Patient satisfaction with in-person, video, and telephone allergy/immunology evaluations during the COVID-19 pandemic. J Allergy Clin Immunol Pract 2021;9(5):1858-63. https://doi.org/10.1016/j.jaip.2021.01.036

[A10] Capusan KY, Fenster T. Patient satisfaction with telehealth during the COVID-19 pandemic in a pediatric pulmonary clinic. J Pediatr Health Care 2021;35(6):587-91. https://doi.org/10.1016/j.pedhc.2021.07.014

[A11] Sathiyaraj A, Lopez H, Surapaneni R. Patient satisfaction with telemedicine for prechemotherapy evaluation during the COVID-19 pandemic. Future Oncol 2021;17(13):1593-600. https://doi.org/10.2217/fon-2020-0855

[A12] Hasson SP, Waissengrin B, Shachar E, Hodruj M, Fayngor R, Brezis M, et al. Rapid implementation of telemedicine during the COVID-19 pandemic: perspectives and preferences of patients with cancer. Oncologist 2021;26(4):e679-85. https://doi.org/10.1002/onco.13676

[A13] Kenney LB, Vrooman LM, Lind ED, Brace-O'Neill J, Mulder JE, Nekhlyudov L, et al. Virtual visits as long-term follow-up care for childhood cancer survivors: patient and provider satisfaction during the COVID-19 pandemic. Pediatr Blood Cancer 2021;68(6):e28927. https://doi.org/10.1002/pbc.28927

[A14] Porter Erlank C, Lord J, Church K. Acceptability of no-test medical abortion provided via telemedicine during Covid-19: analysis of patient-reported outcomes. BMJ Sex Reprod Health 2021;47(4):261-8. https://doi.org/10.1136/bmjsrh-2020-200954

[A15] El Ashmawy AH, Dowson K, El-Bakoury A, Hosny HA, Yarlagadda R, Keenan J. Effectiveness, patient satisfaction, and cost reduction of virtual joint replacement clinic follow-up of hip and knee arthroplasty. J Arthroplasty 2021;36(3):816-22. https://doi.org/10.1016/j.arth.2020.08.019

[A16] Kumar S, Kumar A, Kumar M, Kumar A, Arora R, Sehrawat R. Feasibility of telemedicine in maintaining follow-up of orthopaedic patients and their satisfaction: a preliminary study. J Clin Orthop Trauma 2020;11(Suppl 5):S704-10. https://doi.org/10.1016/j.jcot.2020.07.026

[A17] Ong CS, Lu J, Tan YQ, Tan LG, Tiong HY. Implementation of a ureteric colic telemedicine service: a mixed methods quality improvement study. Urology 2021;147:14-20. https://doi.org/10.1016/j.urology.2020.10.010

[A18] Byrne E, Watkinson S. Patient and clinician satisfaction with video consultations during the COVID-19 pandemic: an

opportunity for a new way of working. J Orthod 2021;48(1):64-73. https://doi.org/10.1177/1465312520973677
[A19] Hentati F, Cabrera CI, D'Anza B, Rodriguez K. Patient satisfaction with telemedicine in rhinology during the COVID-19 pandemic. Am J Otolaryngol 2021;42(3):102921. https://doi.org/10.1016/j.amjoto.2021.102921
[A20] Gomes-de Almeida S, Marabujo T, do Carmo-Goncalves M. Telemedicine satisfaction of primary care patients during COVID-19 pandemics. Semergen 2021;47(4):248-55. https://doi.org/10.1016/j.semerg.2021.01.005
[A21] Kaunitz G, Yin L, Nagler AR, Sicco KL, Kim RH. Assessing patient satisfaction with live-interactive teledermatology visits during the COVID-19 pandemic: a survey study. Telemed J E Health 2022;28(4):591-6. https://doi.org/10.1089/tmj.2021.0200
[A22] Koziatek CA, Rubin A, Lakdawala V, Lee DC, Swartz J, Auld E, et al. Assessing the impact of a rapidly scaled virtual urgent care in New York city during the COVID-19 pandemic. J Emerg Med 2020;59(4):610-8. https://doi.org/10.1016/j.jemermed.2020.06.041
[A23] Volcy J, Smith W, Mills K, Peterson A, Kene-Ewulu I, McNair M, et al. Assessment of patient and provider satisfaction with the change to telehealth from in-person visits at an academic safety net institution during the COVID-19 pandemic. J Am Board Fam Med 2021;34(Suppl):S71-6. https://doi.org/10.3122/jabfm.2021.S1.200393
[A24] Gentry MT, Puspitasari AJ, McKean AJ, Williams MD, Breitinger S, Geske JR, et al. Clinician satisfaction with rapid adoption and implementation of telehealth services during the COVID-19 pandemic. Telemed J E Health 2021;27(12):1385-92. https://doi.org/10.1089/tmj.2020.0575
[A25] Polunina NV, Tyazhelnikov AA, Pogonin AV, Kostenko EV. COVID-19 patients' satisfaction with quality of medical care provided in the form of telemedicine consultations. Bull Russ State Med Univ 2020(6):135-40. https://doi.org/10.24075/brsmu.2020.084
[A26] Lapadula MC, Rolfs S, Szyld EG, Hallford G, Clark T, McCoy M, et al. Evaluating patients' and neonatologists' satisfaction with the use of telemedicine for neonatology prenatal consultations during the COVID-19 pandemic. Front Pediatr 2021;9:642369. https://doi.org/10.3389/fped.2021.642369
[A27] Bate NJ, Xu SC, Pacilli M, Roberts LJ, Kimber C, Nataraja RM. Effect of the COVID-19 induced phase of massive telehealth uptake on end-user satisfaction. Intern Med J 2021;51(2):206-14. https://doi.org/10.1111/imj.15222
[A28] Shaverdian N, Gillespie EF, Cha E, Kim SY, Benvengo S, Chino F, et al. Impact of telemedicine on patient satisfaction and perceptions of care quality in radiation oncology. J Natl Compr Canc Netw 2021;19(10):1174-80. https://doi.org/10.6004/jnccn.2020.7687
[A29] Alwabili AA, Alotaibi EA, AlE'ed AA, Alqunibut I, Alotaibi OA. Measurement of patient satisfaction with the trend of virtual clinics during the COVID-19 pandemic. Cureus 2021;13(6):e16016. https://doi.org/10.7759/cureus.16016
[A30] Abdel Nasser A, Mohammed Alzahrani R, Aziz Fellah C, Muwafak Jreash D, Talea A Almuwallad N, Salem A Bakulka D, et al. Measuring the patients' satisfaction about telemedicine used in Saudi Arabia during COVID-19 pandemic. Cureus 2021;13(2):e13382. https://doi.org/10.7759/cureus.13382
[A31] Bizot A, Karimi M, Rassy E, Heudel PE, Levy C, Vanlemmens L, et al. Multicenter evaluation of breast cancer patients' satisfaction and experience with oncology telemedicine visits during the COVID-19 pandemic. Br J Cancer 2021;125(11):1486-93. https://doi.org/10.1038/s41416-021-01555-y
[A32] Knaus ME, Ahmad H, Metzger GA, Beyene TJ, Thomas JL, Weaver LJ, et al. Outcomes of a telemedicine bowel management program during COVID-19. J Pediatr Surg 2022;57(1):80-5. https://doi.org/10.1016/j.jpedsurg.2021.09.012
[A33] Chang PJ, Jay GM, Kalpakjian C, Andrews C, Smith S. Patient and provider-reported satisfaction of cancer rehabilitation telemedicine visits during the COVID-19 pandemic. PM R 2021;13(12):1362-8. https://doi.org/10.1002/pmrj.12552
[A34] Adams L, Lester S, Hoon E, van der Haak H, Proudman C, Hall C, et al. Patient satisfaction and acceptability with telehealth at specialist medical outpatient clinics during the COVID-19 pandemic in Australia. Intern Med J 2021;51(7):1028-37. https://doi.org/10.1111/imj.15205
[A35] Orrange S, Patel A, Mack WJ, Cassetta J. Patient satisfaction and trust in telemedicine during the COVID-19 pandemic: retrospective observational study. JMIR Hum Factors 2021;8(2):e28589. https://doi.org/10.2196/28589
[A36] Kaur D, Galloway GK, Oyibo SO. Patient satisfaction with the use of telemedicine in the management of hyperthyroidism. Cureus 2020;12(8):e9859. https://doi.org/10.7759/cureus.9859

[A37] Haxhihamza K, Arsova S, Bajraktarov S, Kalpak G, Stefanovski B, Novotni A, et al. Patient satisfaction with use of telemedicine in University Clinic of Psychiatry: Skopje, North Macedonia during COVID-19 pandemic. Telemed J E Health 2021;27(4):464-7. https://doi.org/10.1089/tmj.2020.0256

[A38] Teng T, Sareidaki DE, Chemaly N, Bar C, Coste-Zeitoun D, Kuchenbuch M, et al. Physician and patient satisfaction with the switch to remote outpatient encounters in epilepsy clinics during the COVID-19 pandemic. Seizure 2021;91:60-5. https://doi.org/10.1016/j.seizure.2021.05.013

[A39] Al-Sofiani ME, Alyusuf EY, Alharthi S, Alguwaihes AM, Al-Khalifah R, Alfadda A. Rapid implementation of a diabetes telemedicine clinic during the coronavirus disease 2019 outbreak: our protocol, experience, and satisfaction reports in Saudi Arabia. J Diabetes Sci Technol 2021;15(2):329-38. https://doi.org/10.1177/1932296820947094

[A40] Mortezavi M, Lokineni S, Garg M, Chen YL, Ramsey A. Rheumatology patient satisfaction with telemedicine during the COVID-19 pandemic in the United States. J Patient Exp 2021;8:23743735211008825. https://doi.org/10.1177/23743735211008825

[A41] Palandri F, Bartoletti D, Giaquinta S, D'Ambrosio F, Auteri G, Sutto E, et al. Telemedicine in patients with haematological diseases during the coronavirus disease 2019 (COVID-19) pandemic: selection criteria and patients' satisfaction. Br J Haematol 2021;192(2):e48-51. https://doi.org/10.1111/bjh.17208

[A42] Gerbutavicius R, Brandlhuber U, Gluck S, Kortum GF, Kortum I, Navarrete Orozco R, et al. Evaluation of patient satisfaction with an ophthalmology video consultation during the COVID-19 pandemic. Ophthalmologe 2020;117(7):659-67. https://doi.org/10.1007/s00347-020-01143-0

[A43] Clark SG, Bradley M. 32 Patient satisfaction with urogynecology telemedicine office visits during the COVID-19 pandemic. Am J Obstet Gynecol 2021;224(6 Supplement):S764-5. https://doi.org/10.1016/j.ajog.2021.04.057

[A44] Mohanty A, Srinivasan VM, Burkhardt JK, Johnson J, Patel AJ, Sheth SA, et al. Ambulatory neurosurgery in the COVID-19 era: patient and provider satisfaction with telemedicine. Neurosurg Focus 2020;49(6):E13. https://doi.org/10.3171/2020.9.FOCUS20596

[A45] Efthymiadis A, Hart EJ, Guy AM, Harry R, Mahesan T, Chedid WA, et al. Are telephone consultations the future of the NHS?: the outcomes and experiences of an NHS urological service in moving to telemedicine. Future Healthc J 2021;8(1):e15-20. https://doi.org/10.7861/fhj.2020-0076

[A46] Itamura K, Tang DM, Higgins TS, Rimell FL, Illing EA, Ting JY, et al. Comparison of patient satisfaction between virtual visits during the COVID-19 pandemic and in-person visits pre-pandemic. Ann Otol Rhinol Laryngol 2021;130(7):810-7. https://doi.org/10.1177/0003489420977766

[A47] Zhu C, Williamson J, Lin A, Bush K, Hakim A, Upadhyaya K, et al. Implications for telemedicine for surgery patients after COVID-19: survey of patient and provider experiences. Am Surg 2020;86(8):907-15. https://doi.org/10.1177/0003134820945196

[A48] Horgan TJ, Alsabbagh AY, McGoldrick DM, Bhatia SK, Messahel A. Oral and maxillofacial surgery patient satisfaction with telephone consultations during the COVID-19 pandemic. Br J Oral Maxillofac Surg 2021;59(3):335-40. https://doi.org/10.1016/j.bjoms.2020.08.099

[A49] Marianayagam NJ, Premaratne ID, Buontempo MM, Villamater FN, Souweidane MM, Hoffman CE. Outcomes of a virtual craniofacial clinic for assessing plagiocephaly during the COVID-19 pandemic. J Neurosurg Pediatr 2021;28(5):497-501. https://doi.org/10.3171/2021.4.PEDS20978

[A50] Riley PE, Fischer JL, Nagy RE, Watson NL, McCoul ED, Tolisano AM, et al. Patient and provider satisfaction with telemedicine in otolaryngology. OTO Open 2021;5(1):2473974X20981838. https://doi.org/10.1177/2473974X20981838

[A51] Porche K, Vaziri S, Mehkri Y, Christie C, Laurent D, Wang Y, et al. Patient satisfaction scores with telemedicine in the neurosurgical population. Clin Neurol Neurosurg 2021;205:106605. https://doi.org/10.1016/j.clineuro.2021.106605

[A52] Yoon EJ, Tong D, Anton GM, Jasinski JM, Claus CF, Soo TM, et al. Patient satisfaction with neurosurgery telemedicine visits during the coronavirus disease 2019 pandemic: a prospective cohort study. World Neurosurg 2021;145:e184-91. https://doi.org/10.1016/j.wneu.2020.09.170

[A53] Richards AE, Curley K, Christel L, Zhang N, Kouloumberis P, Kalani MA, et al. Patient satisfaction with telehealth in neurosurgery outpatient clinic during COVID-19 pandemic. Interdiscip Neurosurg 2021;23:101017. https://doi.org/10.1016/j.inat.2020.101017

[A54] Shiff B, Frankel J, Oake J, Blachman-Braun R, Patel P. Patient satisfaction with telemedicine appointments in an academic andrology-focused urology practice during the COVID-19 pandemic. Urology 2021;153:35-41. https://doi.org/10.1016/j.urology.2020.11.065

[A55] Pinar U, Anract J, Perrot O, Tabourin T, Chartier-Kastler E, Parra J, et al. Preliminary assessment of patient and physician satisfaction with the use of teleconsultation in urology during the COVID-19 pandemic. World J Urol 2021;39(6):1991-6. https://doi.org/10.1007/s00345-020-03432-4

[A56] Gan Z, Lee SY, Weiss DA, Van Batavia J, Siu S, Frazier J, eta l. Single institution experience with telemedicine for pediatric urology outpatient visits: Adapting to COVID-19 restrictions, patient satisfaction, and future utilization. J Pediatr Urol 2021;17(4):480. https://doi.org/10.1016/j.jpurol.2021.05.012

[A57] Melian C, Frampton C, Wyatt MC, Kieser D. Teleconsultation in the management of elective orthopedic and spinal conditions during the COVID-19 pandemic: prospective cohort study of patient experiences. JMIR Form Res 2021;5(6):e28140. https://doi.org/10.2196/28140

[A58] Greenfield PT, Manz WJ, DeMaio EL, Duddleston SH, Xerogeanes JW, Scott Maughon T, et al. Telehealth can be implemented across a musculoskeletal service line without compromising patient satisfaction. HSS J 2021;17(1):36-45. https://doi.org/10.1177/1556331620977171

[A59] Fieux M, Duret S, Bawazeer N, Denoix L, Zaouche S, Tringali S. Telemedicine for ENT: effect on quality of care during Covid-19 pandemic. Eur Ann Otorhinolaryngol Head Neck Dis 2020;137(4):257-61. https://doi.org/10.1016/j.anorl.2020.06.014

[A60] Layfield E, Triantafillou V, Prasad A, Deng J, Shanti RM, Newman JG, et al. Telemedicine for head and neck ambulatory visits during COVID-19: evaluating usability and patient satisfaction. Head Neck 2020;42(7):1681-9. https://doi.org/10.1002/hed.26285

[A61] Shahid SM, Anguita R, daCruz L. Telemedicine for postoperative consultations following vitrectomy for retinal detachment repair during the COVID-19 crisis: a patient satisfaction survey. Can J Ophthalmol 2021;56(2):e46-8. https://doi.org/10.1016/j.jcjo.2020.11.011

[A62] Shafi K, Lovecchio F, Forston K, Wyss J, Casey E, Press J, et al. The efficacy of telehealth for the treatment of spinal disorders: patient-reported experiences during the COVID-19 pandemic. HSS J 2020;16(Suppl 1):17-23. https://doi.org/10.1007/s11420-020-09808-x