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Review

Patient and family caregiver perceptions of telehealth in oncology in the US: a scoping review

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Abstract

Background With the onset of the COVID pandemic the use of electronic tools, including telehealth, increased out of necessity.
Objectives The goal of this scoping review was to identify perceptions of benefits and limitations of the use of telehealth among cancer patients and their family caregivers. Eligibility-Criteria: This study reviewed articles from PubMed, EBSCO, and Google Scholar using search terms related to oncology and telehealth. Charting Methods: 39 articles were included and categorized as benefits or limitations of telehealth.
Results All studies included patient perceptions while only three studies included caregivers. Benefit themes included (1) Convenience, (2) Savings, (3) Access to Care, (4) Work or Career, (5) Caregiver Inclusion and Perspective, and (6) Other. Limitation themes included (1) Disruption to Care Experience or Patient-Provider Relationship, (2) Need for Physical Examination, (3) Communication Challenges, and (4) Technology-Related Issues. Non-Hispanic White patients were the most prominent racial or ethnic group in the studies while six studies included a high percentage of Black patients.
Conclusions Findings suggest that a hybrid approach might be best depending on the care needed while also benefit from cost-savings and convenience when feasible. Future research must consider the caregiver perspective more intentionally in understanding experiences of telehealth given implications for work. Additional research is also needed to develop strategies to address use differences according to demographics or due to technology barriers.

1 Introduction

Prior to 2020, the U.S. population was slowly engaging more in the digital health, including electronic health records (EHRs) and patient portals. EHRs have been increasingly integrated into the clinical environment and used by patients over the past several years. Nearly 40% of U.S. adults in 2020 reported using their patient portal at least once over the past 12-months [1]. This usage is compared to 28.2% in 2017 and 27% in 2014 [1]. This, pre-COVID, uptake of digital health was due largely to the implementation of policies that incentivized use by health systems or clinics. As summarized by Johnson and colleagues, the 21st Century Cures Act and federal rulemaking sought to increase the access, exchange, and use of electronic health information by patients and their caregivers [2].

COVID-19 then further advanced virtual care and telehealth use broadly [3, 4]. As well known, COVID-19 required the use of telehealth to safeguard patients and health professionals. Now, since the onset of COVID, in which telehealth was a necessity, policies have further advanced to embrace virtual options for patients and families. For example, Medicare now reimburses for select services, particularly behavioral health services, while states have instituted policies (e.g.,

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licensure) that allow for specific rights within a given jurisdiction [5]. Though still not universal in the U.S. population, access to telehealth has increased.

Oncology was no different than most care disciplines in needing to accommodate practice during COVID-19 and in the years since. With over 1.9 million Americans expected to receive a cancer diagnosis in 2023 [6], understanding and addressing the needs of patients and their caregivers with respect to uptake is essential. In recent years, the American Society of Clinical Oncology (ASCO) provided guidance anticipating increasing use [7]. The physical, psychological, and financial impact of cancer on patients is often profound and extends to adversely impact those who are supporting a patient (i.e., caregivers). Caregivers provide patients with logistical, emotional, and nursing-related support [8–11]. Thus, telehealth might provide an opportunity to increase access and better engage caregivers and provide them with better support.

By exploring the oncology literature about use of telehealth, we can better understand how such care might be used to support the care experience for patients and their family caregivers. This analysis might be particularly important given the known areas of strain, especially for populations – patients and caregivers alike – vulnerable to poor physical and emotional deficits and glaring disparities. Indeed, access to care, financial toxicity, and career impact are examples of known strains for patients and caregivers and of which there are significant disparities [12]. To date, literature reviews on telehealth use exist but are not specific to the context of the US, do not focus specifically on perceived benefits and limitations of telehealth for cancer patients and their family caregivers, or lack description of review methodology [13–15].

The goal of this scoping review was to identify studies pertaining to the use of telehealth among persons with cancer (i.e., cancer patients) and their caregivers to synthesize benefits and limitations with use. Interactions with providers is a necessity when diagnosed with cancer and availability through telehealth is increasing and might offer greater access to ongoing care, but only if barriers and limitations among all patients and caregivers—who are regularly part of care communication [8] – are addressed.

2 Methods and procedures

2.1 Study design

This study was a scoping review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The process involved identifying relevant research articles, screening the articles for eligibility, and synthesizing study data and findings from the articles deemed eligible [16].

2.2 Eligibility criteria

Inclusion criteria for articles included: (1) studies involving use of telehealth/telemedicine (herein after used "telehealth"); (2) findings related to use and experiences among a cancer patient and/or their caregiver; (3) studies conducted in the United States; and (4) studies conducted between March 2020 to July 2023. Articles were excluded if they did not involve telehealth use; cancer patient or caregiver perspective of use of telehealth; or were studies not conducted in the United States or between March 2020 and July 2023. The review was limited to the US due to the specifics of the US healthcare system and varied access to telehealth globally. The focus on US studies allowed for all studies to be conducted generally within a similar context or policy ecosystem. The years for the scoping review were also limited to those from the time point of COVID going forward to manuscript development.

2.3 Procedures

The articles for this scoping literature review were identified by searching the PubMed, EBSCO, and Google Scholar databases. Due to the extensive searching mechanism of Google Scholar, the first 200 articles retrieved were included as identified articles, as previously found to be best practice [17]. The search terms included: (patient OR care recipient) AND (caregiver OR family caregiver OR informal caregiver) AND (telehealth OR telemedicine) AND (oncology OR cancer). The date range filter option was used with each database to include articles published between March 2020 and July 2023 (when the search was conducted). The articles identified using the PubMed, EBSCO, and Google Scholar databases were exported to EndNote into separate libraries, and, using the EndNote functionality, removed duplicate articles.

All articles were screened by title, date, and abstract to assess initial eligibility. Articles that seemed to meet eligibility following the initial screening were reviewed in full-text and excluded if found to be ineligible upon in-depth review. The full-text articles were screened independently by two reviewers. Secondary review included confirmation of article eligibility according to inclusion and exclusion criteria in addition to confirmation of findings abstracted from each article.

2.4 Analysis

Data from each article was abstracted into a data table (see Table 1). Abstracted data includes study purpose, cancer type, study design and measurement, sample descriptions including patient and/or caregiver's demographics (e.g., age, gender, race, and ethnicity), and primary outcomes related to telehealth use. Article findings were synthesized according to perceived benefits and limitations of telehealth, which were further categorized into themes as described below.

3 Results

The initial article search identified 1,005 articles for initial review. After removing duplicates and conducting the initial screening and full-text review, 39 articles were identified as eligible for this scoping review. Figure 1 outlines the PRISMA article identification process in detail. Most of the eligible articles involved quantitative analyses, including analysis of patient satisfaction surveys and/or patient and healthcare provider surveys [16, 18–36]. Other studies were qualitative, including only interviews or focus groups [37–46] or involved a mixed-methods approach [27, 47–49]. Varied oncologic specialties are represented in the included articles, including breast [24, 27, 39, 43], gynecologic [31, 36, 42], hematologic/oncologic[38, 45, 46], neuro-oncology[25], liver [47], prostate [18], lung [41], and a combination of breast and gynecologic [35]. Additional characteristics are provided in Table 1, including the age, gender and race or ethnicity of the samples when reported. All studies included patient perceptions while three studies included caregiver perceptions. The participants in most studies were predominantly non-Hispanic White and at a proportion higher than the general United States population (58.9%), while six studies [20, 24, 26, 34, 44, 50] had representation of Black participants at the ratio higher than that in the U.S. population (13.6%) [51]. Table 1 outlines the characteristics of each article and outcomes related to telehealth use or perceptions. The results are categorized below according to the patient and/or caregivers' perceived benefits and limitations of telehealth, along with specific subthemes for benefits and limitations for added detail.

3.1 Benefits of telehealth

Benefits of telehealth as reported in the studies most often related to a (1) Convenience, (2) Savings, (3) Access to Care, (4) Work or Career, (5) Caregiver Inclusion and Perspective, or (6) Other given the array of perceived benefits. These themes are described below per findings.

3.1.1 Convenience

Across several studies, 28–87.4% of patients perceived telehealth to be "convenient" as measured as a yes or no [21, 26, 34, 38, 39, 44, 46, 49, 50, 52, 53]. However, differences were noted according to sociodemographic factors. For example, when reporting on telehealth cancer genetic counseling during COVID-19, patients with lower education levels, older age (> 70 years of age), and male sex were less relieved or grateful for telehealth visits [53]. Moreover, Darcourt and colleagues reported that, though a high percentage of patients were satisfied with telehealth, the patients who declined participation in video telehealth visits for cancer care during the early months of COVID were significantly older, lived in significantly lower-income areas, and were significantly less likely to have commercial insurance than patients who participated [54].

3.1.2 Savings

The specific savings aspects of telehealth included (1) time savings [18, 21, 23, 31, 34, 35, 38, 41, 42], (2) travel savings [18, 20, 23, 25, 29, 31, 39, 41, 43], and (3) cost savings [18, 26, 38, 42, 43, 46]. For example, in three studies the time, travel, and cost savings were transportation-specific, such as reducing and/or eliminating time spent in a vehicle for in-person appointments [42], reducing mileage traveled by participants [39], and saving money on both parking and gas [38, 42].

Table 1 Telehealth Perception Studies

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Aghedo [52]	Cross-sectional Patient and Provider Surveys	Patients with colon, rectal or anal cancer (n = 18) Characteristics: Age: 64.9 (mean) Gender: 33.3% female, 66.6% male Race/Ethnicity: Cancer: Colon (11%), rectal (77.7%), and anal (5.5%)	To transition in-person multidisciplinary clinic (MDC) to a telehealth MDC (tele-MDC) format and to assess early outcomes for patient and physician satisfaction	Patient Survey (5-point Likert scale): • Ease of use • Communication • Quality of audio/visual • Satisfaction	• Virtual technology was easy to use (mean score = 5.00) • Satisfied with the video quality of visit (mean score = 4.93) • Satisfied with the audio quality of visit (mean score = 4.93) • Confident in the privacy and security of personal health information while using virtual clinic (mean score = 4.79) • Compared to in-person clinic, this virtual MDC was time-saving (mean score = 4.86) • Satisfied with time spent with physicians during visit (mean score = 4.86) • Liked the cooperative effort of the healthcare team involved in treatment plan (mean score = 4.93) • Patient was involved in the discussion of care plan (mean score = 4.93) • Health concerns for which the appointment was made were addressed (mean score = 4.93) • Care plan was explained in a clear manner (mean score = 4.93) • Overall satisfied with the quality of care received in visit (mean score = 4.93) • Would like to have another virtual consultation in the future (mean score = 4.93) • Would recommend virtual MDC to other patients (mean score = 4.93)

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Ahmed [18]	Cross-sectional Survey	Patients of an advanced prostate cancer clinic at Mayo Clinic (n = 52) Characteristics: Age: 70.4 (mean) Race/Ethnicity: 94.23% White, 3.85% not Hispanic or Latine, 1.92% Hispanic or Latino	To report patients' telemedicine experience	Telemedicine Satisfaction Survey Assessed: • Ability to clearly hear doctor • If felt privacy and confidentiality were respected • Ability to ask questions clearly and easily • Ability to establish rapport • If felt diagnosis and treatment options were adequately explained • If felt doctor spent adequate amount of time to understand the condition • Likelihood of participation in future teleconsultation	• Patients reported savings on travel (n = 24), time (n = 20), and costs (n = 18) • The median degree of satisfaction was 9 on a 10-point scale • Average cost to travel for an appointment among patients was $250 ($125–350) • 21.15% of telemedicine consultations were conducted over Zoom, whereas 78.85% were over the phone due to greater accessibility by phone services than Zoom-type services • 94% would participate in a future teleconsultation
Alexander [19]	Cross-sectional Patient Satisfaction Survey	Patients of the Cancer and Aging Interdisciplinary Team (CAIT) clinic (n = 50) Characteristics: Age: 83 (mean) Gender: 68% female Race/Ethnicity: 84% White, 6% Black, 2% Asian	To develop and implement a telemedicine clinic for older patients with cancer	Patient demographics and characteristics Electronic Rapid Fitness Assessment CAIT member discipline-specific assessment, which allowed each discipline to provide suggestions and interventions for older patients with cancer	• 50 patients were evaluated in the CAIT clinic between May 2021 and June 2022 • Based on the clinic's multidisciplinary recommendations:36% of patients were recommended to start PT/OT and 62% were given nutritional recommendations • Pharmacists provided 100% of patients recommendations for deprescribing, 16% of patients information for potentially inappropriate mediations, and 3% for significant drug-drug interaction • Based on the clinic's assessment, 52% received chemotherapy, 20% radiation therapy, 12% immunotherapy, and 4% hormonal therapy • 100% of oncologists reported that it was easy to communicate with the geriatricians; 93% reported that the clinical helped define an optical treatment plan • 100% of patients reported that importance of the review on their health and 88% reported understanding the goals of the visit

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Arem [20]	Cross-sectional Provider and Patient Surveys (providers surveys disseminated through the Commission on Cancer network and patient surveys disseminated through the Commission on Cancer network and additional patient advocacy organizations)	Cancer survivors (n = 539) Characteristics: Age (at diagnosis): 51.6 (13.4) Gender: 70.1% female, 23.2% male Race/Ethnicity: 72.2% White, 14.6% Black, 3.3% Asian, 7.4% Hispanic or Latinx	To better understand experiences with the transition to telehealth during COVID	Survey: • Demographics • Concern about COVID-19 • Telehealth experiences • Types of visits deemed appropriate for telehealth	Tasks affirmed as appropriate for telehealth by > 50% of sample: • Survivorship care visits appropriate, including nutrition consultations (78.9%) • Discussion about imaging or laboratory results (58%) • Financial counseling as appropriate (51.7%) • Patient navigation (50.8%) 55.9% endorsed virtual support groups 25.5% indicated improved access to health care services 40.1% indicated saving travel time
Arthur [37]	Cross-sectional Semi-structured Interviews	Older cancer survivors (n = 21) Characteristics: Age: 73.5 (mean) Gender: 57.1% female, 42.9% male Race/Ethnicity: 90.5% non-Hispanic White, 4.8% Asian, 4.8% non-Hispanic Black	To explore the trend of telehealth in cancer survivorship among an older cancer survivor population	Twelve open-ended questions regarding: • Experience and opinions surrounding technology and telehealth use • Supportive cancer care • Health-related mobile applications • Patient portals • Survivorship care plans	Themes: • Telehealth was appropriate for sharing test results, having questions answered by care teams, and participating in support groups • Patient portals reported as valuable for receiving test results, asking provider questions, receiving timely responses, reviewing appointment history, reminder for upcoming appointments, and reminding on preventative services
Bellizzi [21]	Patient satisfaction survey (as part of an ongoing prospective observational study)	Cancer patients (early in survivorship*) eligible for a part of a larger prospective, observational study (n = 361) *Early survivorship defined as patients who recently completed primary cancer treatment and are in the early survivorship phase of care (surveillance/follow-up) Characteristics: Age: 59.9 (mean) Gender: 68.9% female, 31.02% male Race/Ethnicity: 86.43% White, 9.42% non-White; 4.71% Hispanic, 80.33% non-Hispanic	Extent to which cancer patients early in the survivorship report disruption due to the CVOID-19 pandemic in different aspects of care and satisfaction with telemedicine	COVID-10 Supplemental Survey: • Experience with the health care system during the pandemic • Disruption to cancer care delivery • Satisfaction with different components of telemedicine Mixed-Methods: • Telemedicine Satisfaction and Usefulness Questionnaire (TSUQ) • Focus groups	Telemedicine Satisfaction Findings: • Most prevalent areas of early survivorship cancer care disruptions: in-person appointments moved to virtual appointments (55.6%), minimizing face-to-face appointment with providers (39.1%), use of home delivery for medications (24.6%), postponed elective surgeries (related to cancer) (22.8%) and postponed radiology surveillance scanning and screening tests (19.1%) • 35.6% reported being dissatisfied with the lack of physical contact during the telemedicine visit • 77.5% of patients reported telemedicine visits saved them time and 64.0% reported it to be convenient

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Boucher [38]	Cross-sectional, Mixed-Methods: Telemedicine Satisfaction and Usefulness Questionnaire (TSUQ) and focus groups	Adult hematology/oncology patients with prior phone or video visit • Surveys (n = 588) • Focus groups (n = 16) Characteristics (surveys): Gender: 72.1% females, 27.4% males Race/Ethnicity: 93.8% non-Hispanic White, 1.8% Asian, 1.4% non-Hispanic Black, 1.4% American Indian/Alaskan Native Region: 73.5% from the metropolitan area (Twin Cities), 21.8% from rural areas Characteristics (focus groups): Age: 63 (22–81) Gender: 67% females Race: 87.5% non-Hispanic White	To gain insight into patient perspectives and views on the long-term role of telemedicine in hematology/oncology care	Modified 21-Question Telemedicine Satisfaction and Usefulness Questionnaire: • Sub scores for satisfaction and usefulness • Questions amended to include telephones visits in questions • Three questions added to address telemedicine access • Three questions added to ask about the effects of the pandemic on patient care Focus Group: • Based on survey feedback	Survey Findings: • Convenience of telemedicine was appreciated by 87.4% of patients • 92.1% felt telemedicine saved time • 29.9% said the software malfunctioned sometimes • 18.5% of patients reported difficulty using telemedicine modalities • 6.7% of patients said they encountered an issue in accessing video for telemedicine visits Focus Group Findings per Themes: Convenience • Virtual care was well-received, allowed by time off from work among participants, especially those living in rural settings • Reduced parking costs and time Safety • Reduced infectious risk Comfortable setting • Thematic components reported by patients described telemedicine as more relaxed and required less preparation to go out Rapid communication • Providers were vigilant about monitoring inbox; easier scheduling Reduced in-person interactions • Lack of physical care reduced patient morale, feelings of loneliness in journey • Most patients would prefer a hybrid approach, with minor visits being done virtually and prioritizing in-person visits Software accessibility • Thematic components described by patients included difficulty with understanding instruction for accessing telemedicine platform and unstable connections Lab access without context: • Results shared with patients early or inopportune times, without clinician context Telemedicine patient-provider experience: • Some providers were better at developing relationships over telemedicine than others

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Breen [53]	Cross-sectional Patient Survey	Patients seen for a new visit appointment to undergo pretest or post-test genetic counseling at Memorial Sloan Kettering Cancer Center from March to August 2020 (n = 380) Characteristics: Age: 9.2% 18–39 years old, 16.8% 40–49 years old, 29.2% 50–59 years old, 27.9% 60–69 years old, 16.8% 70 years old or greater Gender: 77.6% female, 21.1% male Cancer history: 84.5% current or past cancer diagnosis, 13.4% no known history of cancer	To capture patient experiences with telehealth for cancer genetic counseling clinic throughout the first 6 months of the COVID-19 pandemic	Survey: • Demographics • Device use • Prior experience with video technology • Emotional response to telehealth • Technical experience with telehealth • Satisfaction with appointment (measured via the Genetic Counseling Satisfaction Scare (GCSS) and Visit-Specific Satisfaction Questionnaire (VSQ)) • Preference for future telehealth use • Recommendation of telehealth to family and/or friends	Device use: • 38.9% tablet (n = 148) • 79.7% smartphone (n = 303) • 74.2% laptop or computer (n = 282) Prior use of video technology: • Work and/or personal use (n = 376) • Health care appointment (n = 372) Emotional responses to appointment schedule as telehealth (range 1–5): • Concerned (mean score = 1.94) • Disappointed (mean score = 1.92) • Frustrated (mean score = 1.75) • Comfortable (mean score = 4.06) • Relieved (mean score = 3.66) • Grateful (mean score = 3.68) Technical experience with telehealth (range 1–5): • Concern about technology not working (mean score = 2.55) • Concern about quality of care (mean score = 2.32) • Ease of use of technology during appointment (mean score = 4.07) • Satisfaction with audio or visual quality during appointment (mean score = 4.02) Satisfaction: • GCSS less satisfaction (34.4%, n = 130) • GCSS higher satisfaction (65.6%, n = 248) • VSQ less satisfaction (33.6%, n = 120) • VSQ higher satisfaction (66.4%, n = 237) Preference for future telehealth use: • Prefer in-person (18.8%, n = 70) • Prefer in-person but would consider telehealth (32.0%, n = 119) • No preference (11.8%, n = 44) • Prefer telehealth but would consider in-person (19.4%, n = 72) • Prefer telehealth (18.0%, n = 67) Recommend telehealth to family and/or friends: • Strongly agree (49.7%, n = 186) • Somewhat agree (28.9%, n = 108) • Neither agree nor disagree (15.8%, n = 59) • Somewhat disagree (2.9%, n = 11) • Strongly disagree (2.75, n = 10)

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Buse [39]	Cross-sectional Semi-structured Interviews	Breast cancer patients (n = 15) Characteristics: Age: 73 (mean) Race/Ethnicity: 2 non-Caucasian, 13 Caucasian	To provide a qualitative description of the perspectives of women who have received telemedicine care for early-stage breast cancer	Semi-structured interview guide: • Established a priori • Themes and open-ended questions from research team	• Continuing telemedicine after COVID-19 due to convenience, efficiency, greater healthcare access (disability and rurality) • Distance of commute & multifactorial burden of community (i.e., driving, parking, walking to hospital) were reflected in convenience
Cacciotti [22]	Cross-sectional Patient and Caregiver Surveys	Adult survivors (n = 33) and caregivers (n = 41) Characteristics (patients): Age: 52% 20–29 years old Characteristics (caretaker)): Age: 39% 50 + years old	To assess the telehealth experiences of survivors and caregivers	Survey: • Questions constructed based on previous studies evaluating patient's perceptions of telehealth visits	• 63% of participants agreed that telehealth is an effective way in obtaining medical care • Difficulties with telehealth included the inability to ask questions that are normally asked in-person and difficulties using the system
Chang [23]	Prospective survey study	Cancer patients (n = 155) Characteristics: Age: 57.6 (mean) Gender: 65.2% female, 34.8% male	To evaluate the effectiveness of physician-based telerehabilitation for cancer patients	Survey: • Questions developed through consensus based on what information was useful for rehabilitation providers • Constructed based on prior studies evaluating patients' perceived utility to telemedicine visits	• Satisfaction with the main problem addressed by the visit (69.7% reported "very much"), with satisfaction being consistently higher for video visits (34.8%) as compared to phone visits (26.7%) (reporting "quite a bit") • Patients supported the use of telehealth reporting time saving by avoiding travel • Patients critiqued the use of telehealth reporting technical difficulties in using video visits
Choi [47]	Mixed-Methods: cross-sectional semi-structured interviews and development of pilot intervention	Patients diagnosed with hepatocellular carcinoma (n = 20) Characteristics: Age (at diagnosis): 56.3% 50–65 years old, 43.8% > 65 years old Gender: 100% male Race / Ethnicity: 50% non-Hispanic White, 50% other	To evaluate the patient perspective and pilot test a telemedicine intervention	Semi-structured interview: • Collecting information about MTB process from patient perspective	• Key themes from semi-structured interviews include patient confidence in tumor board recommendations, patient understanding of tumor board recommendations to patients, communication of tumor board recommendations to patients, and patient concerns about receiving healthcare • 94% of patients felt comfortable asking questions during their telemedicine visit • Nearly 70% of patients were "completely satisfied" with the care they received during the telemedicine visit

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Darcourt [54]	Cross-sectional Survey	Cancer patients using the Houston Methodist MyChart video platform across the greater Houston area (n = 1762) Characteristics: Age: 61.4 (mean) Income: 71,450 (mean) Gender: 66.8% female, 33.2% male Race / Ethnicity: 60.8% White, 17.9% Black, 13.0% Hispanic, 5.9% Asian, 2.3% other Insurance type: 59.4% commercial insurance, 36.8% Medicare/Medicaid, 3.8% other (Tricare, VA, self-pay)	To evaluate the use of telemedicine amid the COVID-19 pandemic in patients with cancer and assess barriers to its implementation	2 data sets collected: • Group 1: Patients who preferred not to or could not pursue a MyChart video visit and asked via telephone about reasons for declining (n = 285) • Group 2: Patient post-video survey of patients who agreed to have a MyChart video visit (n = 1477)	Group 1 survey results: • Main reasons for declining video visit included preference for a face-to-face visit (43.5%), technologic problems (28.8%), reschedule for fear of COVID-19 infection (13.0%), preference for rescheduling with no particular reason (3.5%), preference for a telephone call (2.1%), being unsure doing a telehealth visit (2.8%), and other unspecified reasons (6.3%) • Technologic problems included lack of internet or mobile device (18.6%) or technical issues with MyChart application (10.2%) Group 2 Survey Results: • 92.6% were satisfied, 83.4% were very satisfied with overall quality of video visit • 91.7% were satisfied with the ease of use of MyChart video visit with 76.7% of these patients not requiring any technical support • 72% used the help of a Houston Methodist employee, 53% used the help of a family member or friend • 96.7% satisfied with the quality of interaction with their physician • 96.8% satisfied with the ability of physician to address their clinical questions • 97.1% were satisfied with their sense of privacy during the visits • 73.2% indicated the would be highly likely and 17.2% indicated they were somewhat likely to choose another MyChart video in the future

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Du [24]	Cross-sectional survey	Patients who receive routine breast cancer screening, were undergoing diagnostic evaluation for breast cancer, or ever diagnosed with breast cancer (n = 493) Characteristics: Age: 29% 60–69 years old Race / Ethnicity: 56.6% White, 23.3% Black, 5.5% Asian; 5.7% Hispanic or Latinx	To evaluate and quantify potential sociodemographic disparities in breast cancer screening, diagnosis, and treatment, and the use of telemedicine due to COVID-19	Survey: • Developed using question from existing surveys and ASCO COVID19 guidelines • Asked about breast cancer screening, diagnosis, and treatment during COVID-19 pandemic • Extent to which breast cancer screening, diagnosis, or treatment had been changed or delayed because of COVID-19 • Personal protective practices • Extent of worry about financial and health implications of COVID-19 • Use of telemedicine	Telemedicine use: • Over 2/3 participants reported virtual appointment utilization (67.8% cancer patients) and approximately 1/2 reported telephone use (57.7% cancer patients) • Patients who reported higher annual household income had higher odds of telemedicine use compared to those with lower income
Evered [40]	Cross-sectional Semi-structured Interviews	Patients and clinicians over the age of 18 and how engaged in virtual supportive cancer care (patients—n = 18) Characteristics: Age: 9 in 60 s Race / Ethnicity: 19 White, 1 African American, 1 Asian	To integrate the perspectives of clinicians and patients to describe the transition to virtual supportive cancer care during COVID-19	Semi-structured interviews: • Interviews conducted with clinicians and patients • Concurrent analysis meetings helped to identify new interview probes to triangulate patient and clinician experiences through data collection	• Virtual nature of care reduces patient's concerns about using up personal time off work needed for cancer treatment • Fear of the effects of COVID-19 on aspects of cancer care • The feeling of burden in navigating telehealth systems for their supportive cancer care visits • Missing the presence and reassuring physical touch of clinicians • Virtual care enhances access to supportive cancer care that may otherwise be inefficient or inconvenient, such as avoiding long commutes

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Fassas (2021)	Retrospective chart review	Head and neck surgery patients of the University of Kansas Otolaryngology-Head and Neck Department with a scheduled outpatient appointment (n = 64) Patients not interested in telemedicine (n = 43) compared to patients interested in telemedicine (n = 21) Characteristics (not interested): Age: 68.3 (mean) Gender: 39.5% female, 60.5% male Race: 100% White Ethnicity: 100% not Hispanic/Latino Insurance: 39.5% private insurance, 60.5% Medicare Characteristics (interested): Age: 64.5 (mean) Gender: 33.3% female, 66.7% male Race: 95.2% White, 4.8% non-White Ethnicity: 4.8% Hispanic/Latino, 95.2% not Hispanic/Latino Insurance: 42.9% private insurance, 57.1% Medicare	To determine the preferences and barriers for telemedicine among patients with head and neck cancer during the COVID-19 pandemic	Measure collected from initial telemedicine schedule notes: • Interest in telemedicine • Reason for preference for in-person or telemedicine appointments • Access to necessary forms of technology • Comfort with these technologies • Ability to obtain assistance with telemedicine at home if necessary Chart review: • Demographics • History of telemedicine visits • Attendance of scheduled in-person or telemedicine visit Google Maps used to determine driving distance in miles and travel time (minutes)	Patients not interested in telemedicine: • Reported not being interested in telemedicine due to in-person preference (n = 38), uncomfortable with technology (n = 7), no access to technology (n = 5), and other (n = 13) • Comfort in doing telemedicine on their own–75% no (n = 6), 25% yes (n = 1), 25% unsure (n = 1) • Indicated someone could help with a telemedicine visit–66.7% no (n = 4), 0% yes (n = 0), 33.3% unsure (n = 2) • Reported prior KUMC telemedicine visit–83.7% no (n = 36), 16.3% yes (n = 7) Patients interested in telemedicine: • Reported being interested in telemedicine due to avoiding exposure to infection (n = 15), travel distance (n = 3), convenience (n = 12), and other (n = 2) • Reported having access to the following in their home—Comfort in doing telemedicine on their home–smartphone (n = 13), computer with camera and microphone (n = 14), high speed internet (n = 6), telephone (n = 2) • Reported feeling comfortable doing the telemedicine visit on their own–21.2% no (n = 4), 52.6% yes (n = 10), 26.3% unsure (n = 5) • Indicated someone could help with a telemedicine visit –0% no (n = 0), 100% yes (n = 4) • Reported prior KUMC telemedicine visit–85.7% no (n = 18), 14.3% yes (n = 3)
Gardner [25]	Cross-sectional acceptability survey for patients and feasibility survey for providers	Neuro-oncology patients and providers (patients—n = 52) Characteristics: Age: 59 (mean) Gender: 48% male, 52% female	To address the gaps in literature regarding patient acceptance and provider feasibility in a neuro-oncology patient population	Patient Survey: • Inquiring about the DTH-TNP (direct to home – teleneuropsychiatry) experience • Preexisting patient survey was modified for DTH-TNP Patient Satisfaction Survey: • Satisfaction examined using multiple questions & free-test responses	• 98% indicated satisfaction with the DTH-TNP assessment and 92% would recommend the virtual visits to others • 100% felt understood by the examiner • 90% denied technical difficulties, communication challenges (94%), or privacy concerns (98%) • Reported benefits of telemedicine include saved travel time (88%), and a reduced risk of infection (79%)

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Ha [41]	Cross-sectional semi-structured interviews	Stage I-IIIA lung cancer survivors (veterans from VA system) (n = 20) Characteristics: Age: 71.2 (mean) Gender: 90% male Race: 95% non-Hispanic, White Rural living environment: 25%	To gain an in-depth understanding of lung cancer survivors' on tele rehabilitation following curative intent therapy	• Semi-structured interview guide: The authors used the Social Cognitive Theory to gain an understanding of: • Attitudes and perceived self-efficacy towards telemedicine • Outcome expectations of rehabilitation and exercise training • Perceived facilitators towards telerehabilitation • Health goals following curative intent therapy	• 85% had previous experience with telemedicine • None participated in a telerehabilitation program before Themes: Telemedicine is convenient • Less time consuming; ability to overcome distance barriers Telemedicine is impersonal and technologically challenging: • Most participants indicating low self-efficacy towards telemedicine Preference for one–one-one (over group telerehabilitation): • Preference for live rehabilitation, with participants raising concerns about learning the correct training techniques • Survivors unsure of future health goals
Harrington [55]	Retrospective and cross-sectional patient survey	Patients seen the thoracic surgery clinic for cancer care (telemedicine patient survey) (n = 239) Characteristics (new patients in 2019): Age: 67 (mean) Gender: 50% female, 50% male Characteristics (new patients in 2020): Age: 65 (mean) Gender: 51% female, 49% male	To determine how the COVID-19 pandemic affected care for patients undergoing thoracic surgery for cancer	Survey: • 22 Likert Scale questions • 1 free-answer question on improvements to telemedicine	• 77% reported that their telemedicine visits was equivalent to the in-person care they received • 84% of patients disagreed with the statement that telemedicine visits impaired the quality of care they received • 69% reported they felt less stressed during a telemedicine visit than an in-person visit • 96% responded that telemedicine helped them to avoid a possible exposure to COVID-19 • 92% reported it was convenient to speak with a physician in the comfort of their home • 93% felt that telemedicine saved them time, money, and helped avoid transportation logistics • 91% responded that they valued that telemedicine allowed their relatives to be involved in the discussion of their care • 71% felt the loss of human interaction was a disadvantage of telemedicine • 62% thought the absence of a physical exam during the telemedicine visit could increase the likelihood of missed information

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Hassan [26]	National cross-sectional survey	Patients with cancer who had previously reported financial distress who responded to the survey (n = 627) Characteristics: Age: 57.7% between 56–75 Gender: 70% female Race/Ethnicity: 63% White, 20.7% Black, 6.9% Hispanic/Latino Cancer: 33% hematologic, 32.7% breast, 8.8% GU/Gyn, 6.2% GI, 2.1% thoracic Insurance: 51% insured by Medicare, 19% private insurance	Investigate patterns and drivers of telemedicine utilization in financially under-resourced patients with cancer during the COVID-19 pandemic	Patient Advocate Foundation (PAF): • Contained questions that comprehensively addressed the use of telemedicine services during the pandemic • Contained questions that focused on individual experiences with telemedicine adoption, utilization,,preferences perceived advantages, and barriers to utilization	Patient reported advantages of telemedicine: • More affordable (29%) • More convenient (28%) • Allowed them to access care sooner (17%) • Gave them access to expert care outside of their immediate area (8%) • Did not interfere with their ability to work (5%) • Reported no benefits (13%) • Of patients who reported barriers to telemedicine: • Reported poor internet (65%) • Reported a lack of access to devices (19%) • Reported discomfort or embarrassment with being on video (16%) Of patients who expressed concerns about using telemedicine: • Concerned with quality of care (46%) • Concerned that telemedicine was a poor substitute for in-person office visits (25%) • Concerned that they lacked the necessary skill to use technology (18%) Concerned privacy and security (13%)
Johnson [2]	Mixed-Methods: telemedicine usability survey and patient satisfaction	Adult breast cancer patients (n = 78) Characteristics: Age: 63 (mean) Race: 91.9% White, 4.1% Asian, 4.1% other Insurance: 45.8% private, 13.9% Medicare, 34.7% private and Medicare or Medigap	To assess patient satisfaction and usability of telemedicine in the breast cancer patient population to determine the role of telemedicine in future post-pandemic breast cancer care	Patient Satisfaction & Usability of Telemedicine Survey: • Demographics • Health care coverage • Telemedicine visit characteristics • Cancer and treatment characteristics • Prior cancer care delivery statistics	Patient satisfaction with telemedicine: • Median patient satisfaction score was 5.5 Usability of telemedicine: • Median telemedicine usability score was 5.6 • The presence of connection trouble was associated with lower usability scores than the absence of connection trouble

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Kraus [42]	Cross-sectional semi-structured interviews	Patients with gynecologic cancers (n = 15) Wake Forest Comprehensive Cancer Center (NC), serving a largely rural 30-county region of western and central NC, Virginia, and Tennessee Characteristics: Age (mean): 58 Gender: 100% female Race/Ethnicity: 100% non-Hispanic White	To address the gap in data (qualitative investigation of patients' attitudes toward telemedical gynecologic cancer care) to guide future intervention-directed research to expand geographic access (specifically examining patients' perception of the use of telemedicine)	• Semi-structured interviews: Questions designed to elicit views regarding the usefulness and ease-of use of telemedicine for gynecologic cancer care • Patients asked to describe experience with telemedicine for care of any kind • Types of cancer they felt best suited for telemedicine	Advantages of telemedicine for gynecologic cancer care: • Convenience due to decreases in travel time and clinical wait times; increased comfort at home • One participant mentioned being able to step away from work to complete a virtual visit without interruption • Schedule appointments quicker • Quicker communication for cancer risk Travel and associated costs: • Avoidance of travel, especially for those traveling long distances • Saving money on gas, parking, and compensating a driver • Avoiding having to travel to an unfamiliar city Patient-physician communication • Expressed the importance of having their first appointment in-person to build rapport with their doctor • Expressed concern if exams or testing were required
Liu [28]	Cross-sectional Patient Satisfaction Survey	Neuro-oncology patients (telemedicine and in-person) (n = 1,189; 17.4% telemedicine survey, 982 in-person survey) Characteristics: Telemedicine survey: Age: 47.8% < 65, 52.2% > 65% Gender: 61.8% female, 38.2% male Insurance: 33.3% private insurance, 58.5% Medicare, 8.2% Medicaid & other In-person survey: Age: 52.6% < 65, 47.4% > 65 Gender: 54.6% female, 45.4% male Insurance: 38.7% private insurance, 54.1% Medicare, 7.2% Medicaid & other	To evaluate whether the limitations in the use of telemedicine for surgical patients was reflected in patient satisfaction survey results	Press Ganey Patient Satisfaction Survey: • To assess the patient experience Outpatient Oncology Survey: • Used for in-person visits Medical Practice Telemedicine Survey: • Used for telemedicine visit • Question separated into 4 categories – access, care provider, telemedicine technology, overall assessment	Telemedicine Survey: • No statistically significant results In-Person Survey: • Patient age 65 and older reported higher scores for provider and overall assessment • Medicare patients found to have higher overall assessment score

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Ludwigson [49]	Mixed-Methods: cross-sectional questionnaires and semi-structured interviews	Breast cancer patients Characteristics: Age: majority > 45 Race: 89% White, 5.26% Black	To describe patient concerns about COVID-19 and their breast cancer care and qualitatively assess patient perceptions of change in their care	COVID-19 Impact & Healthcare Related Quality of Life Questionnaire: • Assesses COVID-19-specific concerns within the domains: • Distress • Healthcare & daily disruptions • Financial hardship • Perceived benefits • Functional social support • Perceived stress management	Convenience: • "If I was working, could continue working and then just pause for the telehealth visit or, I didn't have to worry about getting the kids dressed, taking them somewhere or. It was just very easy you could do it at your kitchen table you can do it on the couch. It's very simple. I hope that stays." Telehealth experiences: • Advantages include ease of scheduling greater convenience, reduced potential COVID-19 exposure Disadvantages: • Privacy concerns, feeling rushed, feeling impersonal, connectivity problem, communication challenges, lack of physical exam
Mojdehbakhsh [48]	Quality improvement project—converting outpatient gynecologic oncology encounters to telemedicine (including consent) Analyze patient satisfaction (cross-sectional Telehealth Satisfaction Survey)	Gynecologic oncology patients the responded to the Telehealth Satisfaction Survey (n = 113)	To elicit patient feedback regarding this new type of encounter and determine the potential interpersonal impact on patient care	Telemedicine Satisfaction Survey • Voice quality • Comfort in using telehealth • Length of time with provider • Explanation of treatment • Staff characteristics • Privacy concerns • Overall experience	Telehealth satisfaction survey: • Explanation of treatment by the telemedicine staff: 68.1% (n = 77) responded excellent, 25.7% responded good • Thoroughness, carefulness, skillfulness: 75.2% responses excellent, 16.8% responded good • Overall telemedicine treatment experience: 63.7% responded excellent, 24.8% responded good
Mojdehbakhsh [29]	Cross-sectional patient satisfaction survey	Patients at a gynecologic oncology clinic (n = 316)	To evaluate gynecologic cancer patients' satisfaction with telemedicine visits over a one-year period during the COVID-19 pandemic	Telemedicine Satisfaction Survey • Voice quality • Comfort in using telehealth • Length of time with provider • Explanation of treatment • Staff characteristics • Privacy concerns Overall experience	Survey: • 87.0% of patients reported they would use telemedicine again • Common themes: decreased need for travel, appropriateness for uncomplicated follow-up • Concerns raised included: feeling less connected to providers, not being able to have a physical exam, issues with technology, sentiment that telemedicine is a good alternative but should not replace in-person visits

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Nguyen-Grozavu [43]	Cross-sectional semi-structured interviews	Hispanic females with a breast cancer diagnosis (n = 27) Characteristics: Age: 54.4 (mean)	To explore the areas of benefits and challenges related to telehealth use from the perspectives of underserved Hispanic breast cancer patients	Semi-structured interview guide: • How has your experience been of having to interact with your healthcare team via telehealth for your cancer care? • How different is your feeling between receiving telehealth and a face-to-face meeting? • What would be needed to make telehealth work effectively for you?	Advantages: • Simplification of logistical issues: convenience/able to attend appointment from home, increasing comfortableness; overcome transportation barriers • Financial savings: avoiding certain fees, such as copay • Faster access to and longer duration with clinicians: telehealth visits felt less rushed and longer in duration Disadvantages: • Limitations in building rapport and engagement with clinicians • Clinical limitations due to lack of hands-on care • Difficulties with interpreter assistant
Paige [16]	Cross-sectional, satisfaction survey	Cancer patients with at least on video conference visit with a clinician between March 2020 and September 2020 Characteristics: Age: 64.21 (19–88) Gender: 53.16% female, 39.87% male Race: 84.18% White, 5.7% African American	To examine factors associated with cancer patients' satisfaction using telehealth during COVID-19, including video conferencing platforms and secure messaging systems	Survey: • Demographics • Cancer type • Length of time they have lived with cancer • Experience using telemedicine	Survey: • Participants agreed or strongly agreed the technology was easy to use, they were able to overcome technical difficulties with their clinician, they had a comfortable place to sit, and the camera was well-placed to easily see the clinician's face • Patients were 8.88 times more likely to be satisfied with their video appointment if they had a comfortable place to sit • Males were 5.12 times more likely to be satisfied with video
Patel [30]	Cross-sectional patient satisfaction survey	Outpatient oncology patients (n = 5,950 (telemedicine visits); n = 33,318 (in-person visits)) Characteristics: Telemedicine visits: Age: 69.0 (mean) Gender: 50.2% female, 49.8% mal Insurance: 29% private, 65.6% Medicare, 0.94% Medicaid	To assess gynecologic cancer survivors preferences for telehealth cancer care	Press Ganey Outpatient Medical Practice Survey and Telemedicine Survey: • Visit type • Clinic type • Age • Gender • Insurance • Telemedicine experience	Survey: • 45.2% reported not having to drive and 30.3% reported the east of scheduling around other obligations as advantages • 58.8% considered a physical exam critical to detecting recurrence • Concern their provider may miss something during telehealth visits was more common among those who preferred in-person visits only

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Quam [31]	Cross-sectional survey	Gynecologic cancer survivors (already participating in a prospective cohort study) (n = 188) Characteristics: Age: 64.1 (mean) Race/Ethnicity: 98.4% non-Hispanic White, 1.1% Asian, 0.5% Black	To assess gynecologic cancer survivors preferences for telehealth cancer care	Survey: • Telehealth use during the COVID-19 pandemic • Preferences for gynecologic cancer care going forward Telehealth specific questions adopted from the Service User Technology Acceptability Questionnaire	• Among those who used telehealth, 80.3% at least somewhat agreed they were satisfied with their experience • 75.7% agreed it saved time • 61.4% agreed it was easier compared with in-person visits • 29.8% (most cited disadvantage) reported greater difficulty building a relationship with their provider • 45.2% reported not having to drive and 30.3% reported the east of scheduling around other obligations as advantages • 53.7% preferred exclusively in-person visits for their cancer care and surveillance • 58.8% considered a physical exam critical to detecting recurrence • Concern their provider may miss something during telehealth visits was more common among those who preferred in-person visits only
Rodriguez [44]	Cross-sectional semi-structured interviews	Adults with a past or current history of cancer (n = 57) Characteristics: Age: 63 ± 10 Gender: 78.9% female (n = 45) Race: 57.9% White (n = 33), 17.5% Asian (n = 10), 21.1% Black (n = 12) Ethnicity: 10.5% Hispanic/Latino (n = 6)	To understand the experiences and unmet needs of patients with a past or current history of cancer during the pre vaccine phase of the COVID-19 pandemic	Semi-structured interview guide: • Questions designed to explore the extent of the impact of the COVID-19 pandemic on patients with cancer • Informed by patients who provided input on the questions	Themes: • Concern regarding risk of COVID-19 infection • Disruptions in care increased patients' anxiety about poor cancer outcomes • Significant social and economic impact • Increased social insolation and anxiety about the future

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Rodriguez [32]	Cross-sectional online survey	Patients with cancer (n = 312) Characteristics: Age: 57 (mean) Gender: 56.7% female, 16.4% male, 0.3% non-binary Race: 58.7% White, 3.5% Black or African American, 4.5% Asian, 1.3% Alaskan Native/American Indian, 0.3%Native Hawaiian/ Pacific Islander Insurance Status: 70.1% insured, 4.2% uninsured/ cash; 39.4% private insurance, 14.1% public insurance (Medicaid/Medicare), 14.1% multiple plans, 7.4% dual private and public insurance, 3.2% other	To assess patients' perspectives regarding the impact of COVID-10 on their experiences, including their cancer care, emotional and mental health, and social determinants of health (SDOH), and to evaluate whether these outcomes differed by cancer stage	Survey: • 74-item online survey to assess the impact of COVID-19 on patients' experiences, cancer care, and social determinants of health	Experience with Telehealth: • When cancer care was delayed or interrupted, 41% had rescheduled appointments, 27% had appointments that were canceled, 23% received a phone call from their physician, 17% received a video visit with their physician • Of those who received a phone call from physician, the reported a mean satisfaction score of 8 out of 10 • Of those who received a video call from physician, they reported a mean satisfaction score of 5 out of 10
Shaverdian [33]	Cross-sectional patient experience questionnaires	Cancer patients seen in radiation oncology (one pre-pandemic and one intra-pandemic cohort) (telemedicine cohort—n = 351) Characteristics: Age: 65 (mean) Gender: 43% female, 57% male Race/Ethnicity: 83% White, 8% Black, 4% Asian, 7% Hispanic	To optimize oncology practice during the ongoing pandemic and to inform post pandemic use of telemedicine	Survey: • Assess the in-person consultation experience • Evaluated several domains–logistics, patient-physician communication, overall impressions	Survey: Patient satisfaction with telemedicine consultation: no significant difference found between telemedicine and office visit survey respondents
Steinberg [45]	Cross-sectional semi-structured interviews	Parents of children with hematological / oncological conditions (n = 11) Characteristics: Parents: 91% mothers (n = 10) Children: ages 2–18; 72.7% private insurance (n = 8), public insurance (n = 3)	Explore parents' descriptions of their experiences caring for their children with hematological / oncological conditions during the early phases of the pandemic (implications on daily life and healthcare management)	Semi-structured interview guide: • Effect that COVID-19 was having on the daily lives of the parents' children and on their children's healthcare	Interview: • Parents were appreciative of the option for telemedicine as a means of continuing communication & connection while limiting potential COVID-19 exposure • One parent described telemedicine as disconnected, and another concerned with the inability to physically examine their child

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Tam [50]	Semi-structured interviews	Black adults ≥ 21 years old with a prostate, multiple myeloma, or head and neck cancer diagnosis (n = 49) Characteristics: Age: 2% 20–29 years old, 4% 30–39 years old, 6% 40–49 years old, 20% 5–59 years old, 45% 60–69 years old, 22% 70 years old or greater Gender: 45% female, 55% male Cancer: 33% head and neck, 33% prostate, 33% multiple myeloma	To assess perceptions of virtual care usability and acceptability 18–24 months after the onset of the COVID-19 pandemic among Black adults with cancer	Semi-structured interview guide: • To elicit participant's use and perceptions of virtual visits (VVs) • Perceptions of usefulness of VVs • Ease of use • Positive and negative healthcare experiences	Interview: • 59% reported having experienced a VV • When describing positive healthcare experiences, participants focused on relational communication with providers being attentive, accessible, compassionate and caring • When describing negative healthcare experiences, participants focused on physical discomfort associated with cancer care (side effects, symptoms) and communication that was inattentive, disrespectful, and inaccessible Themes: • VVs perceived as acceptable – participants reported willingness to use VVs to interact with oncology team; for those with a prior VV experience, VVs were favored for comfort and convenience (especially with not feeling well); also described staying home, avoiding travel logistics, and decreased time- and travel-related costs compared to in-person visits • Telephone-only visits were critical to overcoming technology-related challenges of VVs – participants expressed anxiety and hesitation about VV technology but could be completed successfully with help from family or clinic staff • In-person visits preferred – regardless of prior VV experience, participants preferred in-person visits as they felt less connected to their provider, missed physical touch, and felt body language cues were missing

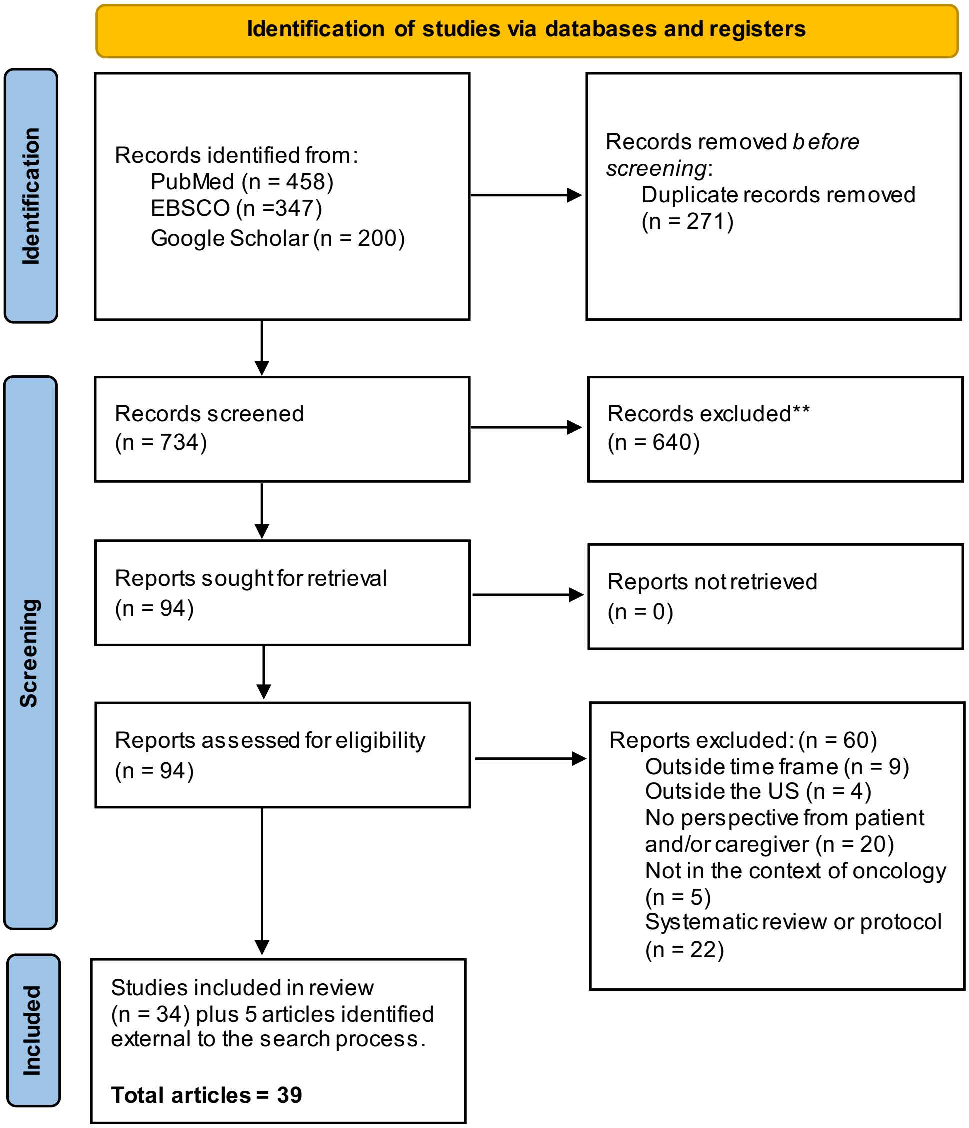
Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Wehrle [34]	Cross-sectional online survey (patient survey* and physician survey) (*n = 374)	Patients with cancer and physicians providing cancer care Characteristics: Age: 61.6 (mean) Race/Ethnicity: 67.2% White or Caucasian, 25.9% Black or African American, 2.1% Asian, 1.3% American Indian or Alaskan Native, 0.3% Hawaiian or Pacific Islander	To determine the attitudes of both oncology patients and physicians toward the implementation of telemedicine early on in the COVID-19 pandemic	Survey: • Service from which patient was receiving care • Interest and comfort level with telemedicine • Future interest in virtual appointments	Survey: • 53.2% were neutral/interested in telehealth visits • Of those who indicated preference for a virtual visit, 52.2% indicated preference was due to convenience or less time consuming; the other 47.8% preferred virtual visits due to concern for infectious disease
Woodard [46]	Cross-section semi-structured interview	Acute myeloid leukemia patients living in North Carolina (n = 6; 5 patients, 1 caregiver) Patient Characteristics: Age: 25–86 Gender: 5 male, 1 female Race: 5 White, 1 Black Caregiver Characteristics: Age: unknown Gender: female Race: White	To understand rural patient perceptions of telehealth while carefully considering patient-identified benefits and barriers for insights into how healthcare professionals could use telehealth to serve the unique needs of this population	Semi-structured interview guide: • Demographics • Experiences with telehealth • Experiences with in-person care	Benefits: • Reduced financial expenses • Increased convenience of care • Other specifics: local support care, reduced travel expenses, increased ease of attending appointments Barriers & Limitations: • Due to knowledge deficit & low telehealth literacy
Wong [36]	Cross-sectional patient satisfaction survey	Patients seen within the gynecologic oncology division (n = 109)	To assess patient experiences with telehealth and its effect on clinical trials	Survey: • Survey tool adapted from a previous telehealth study conducted on radiation oncology patients	• 97.3% agreed that their privacy was respected during telemedicine visits • 92% agreed that their diagnosis and treatment options were adequately explained • Patients agreed that they could easily ask providers questions and establish good rapport with providers via telemedicine visits • 74.1% of patients indicated that they preferred a mixture of telehealth and in-person visits, 12.5% reported preference of only in-person visits, and 13.4% preferred only telehealth visits moving forward

Table 1 (continued)

First author (Year)	Study design	Sample	Purpose	Measurement	Outcomes
Zimmerman [35]	Cross-sectional survey	Outpatient breast and gynecologic cancer clinic patients (n = 215)	To assess the perceptions of the utility of telehealth medicine in their oncologic care during a time of national crisis and its impact on various quality of life measures	Service User Technology Acceptability Questionnaire: • Patient acceptability of telehealth services via measure of: • Accessibility • Comfort • Usability • Privacy & security • Confidentiality • Satisfaction • Convenience • Health benefits with in-home telemonitoring	Survey: • 92% felt telehealth services saved time as they did not have to visit their oncology clinic as often • 73% reported telehealth increased access to care (health or social care professionals) • 65% felt that telehealth services were not suitable as regular face-to-face consultations

Fig. 1 Article identification process



Other savings-related benefits included reduced overall time for appointments due to not having clinic wait times that are commonly associated with in-person appointments [42] and savings on co-pays due to the virtual nature of the telehealth appointment [43].

3.1.3 Access to care

Several studies pertained to improved access to care [20, 26, 30, 35, 39, 40]. For example, one study reporting the perception that one could access care sooner via telehealth compared to an in-person appointment [55], while another study reported the benefit of engaging in an accessable manner among patients with disabilites [39]. Two studies reported that telehealth expanded access to other services, such as supportive cancer care services (that otherwise were inconvenient or inefficient to attend) [40] or to other health professionals, like social care professionals [35].

3.1.4 Work or career

Six of the articles included a theme of convenience of telehealth and work schedule [26, 29, 38, 40, 42, 49]. Studies described in five of the six articles specified that not having to take time away or off from work was an advantage of telehealth appointments [26, 29, 38, 40, 49], two studies specifically identifying the decrease in travel/parking time as a means of saving time as related to work impact [29, 38].

3.1.5 Caregiver inclusion and perspective

Two studies noted the benefit of the ability to include family members [43, 55]. Three articles included caregivers in the samples [22, 45, 46]. Two of these studies included the patient and caregivers' perspective together [22, 46] with one study only having one caregiver included [46], while in the additional, third, study the caregiver perspective was reported upon separately [45]. In this study, the caregivers for pediatric oncology patients reported the impact of the COVID-19 pandemic on their general daily life and children's medical care, with COVID-19 exposure being the main concern. Caregivers identified telemedicine as a means of allowing continued communication with their children's healthcare providers without the potential of COVID-19 exposure associated with in-person appointments [45]. An additional study, including the perspectives of both adult survivors of pediatric cancer and their caregivers, explored difficulties and satisfaction with telehealth. Most participants reported that telehealth is an effective way to obtain medical care. When compared to in-person visits, participants reported telehealth visits were better regarding travel time, convenience, and wait time, whereas in-person visits were better regarding connection with the medical provider and provider's ability to understand the clinical issue [22].

3.1.6 Other

Other reported advantages of telehealth visits include the reduced risk of infection [25, 38, 42, 44, 45, 49, 55], the opportunity to be in a comfortable setting for a visit [43, 50, 55], and a decrease in stress related to amount of distance for in-person visits – especially for rural patients coming from a great distance [39, 46].

3.2 Limitations with telehealth

Several limitations of telehealth were also reported by participants and are categorized as follows: (1) Disruption to Care Experience or Patient-Provider Relationship, (2) Need for Physical Examination, (3) Communication Challenges, and (4) Technology-Related Issues.

3.2.1 Disruption to care experience or patient-provider relationship

Participants noted that the initial transition from in-person to virtual appointments was disruptive to their care and patient-provider relationship due to decreased face-to-face interactions with health professionals [21] and a perceived inability to ask questions that would normally occur during in-person appointments [22]. Some participants agreed that they did not find communicating with a medical provider during a telehealth appointment as satisfactory as compared to in-person [21, 38, 49].

3.2.2 Need for physical examination

Participants also noted the inability of healthcare providers to conduct a physical examination on patients during a telehealth appointment [29, 31, 45, 49, 55]. Specifically for survivors of cancer in one study, 58.8% ($n = 110$) considered a physical examination critical to detecting recurrence [31]. Additionally, participants in three articles reported missing the physical presence and/or touch of a medical provider that is received during an in-person appointment [21, 38, 40]. In the study conducted by Nguyen-Grozavu and colleagues [43] examining the perspectives of Hispanic breast cancer patients, it was noted that participants found telehealth less effective in building trust as compared to in-person visits. Similarly, a common theme among participants of the included articles was the preference for hybrid oncology care, including both in-person and virtual appointments. Participants reported that it was important to have their initial appointment conducted in-person to establish care and build rapport with their provider [36, 38, 55]. As demonstrated by the participants of the study conducted by Harrington et al. (2023) [55], 55% reported they would not use telehealth to establish care. Additionally, patients reported that appointments focusing on imaging or lab results [20, 37], asking their provider questions [21, 36, 37], and participating in support and/or social groups were more appropriate for telehealth appointments [20, 37].

3.2.3 Communication challenges

Primary challenges were a need for an interpreter [43, 49] or issues related to privacy of communication or confidentiality [26, 49]. One study also noted preferring in-person because of the virtual lacking the important non-verbal communication and interaction [50].

3.2.4 Technology-related issues

Various technology-related issues were noted, including those related to systems [29] such as software malfunction [38], difficulty navigating or using a system [22, 40, 41], difficulty understanding instructions on accessing telemedicine platform and unstable connections or poor Internet [23, 27, 38, 49, 56], and lack of access to equipment, devices, or Internet [26]. Related is also the concern of telehealth literacy [46]. In one study, technology problems were reported to be addressed by moving to audio-only calls [50].

4 Discussion

Cancer remains a significant population health concern. It was expected that over 1.9 million individuals in the U.S. in 2023 were to be informed of a cancer diagnosis, while an increasing number of Americans, 26 million by 2040, are expected to be cancer survivors [6, 57]. People are also living longer with cancer and many 5-year survival rates are higher for a greater number of cancers [57]. Interactions with providers when diagnosed with cancer is a necessity, and access to providers through telehealth is increasing and might improve access and sustainability to ongoing care, but only if barriers and limitations among all patients and caregivers—who are regularly part of care communication [8]—are addressed.

Findings suggest that for patients and caregivers there are both benefit and limitations of utilizing telehealth for oncology care. However, most evidence identified was at the patient-level and highlights a major gap in information about family caregiver perceptions and preferences. Our findings (predominantly patient-based) indicate common benefits across oncology settings, including convenience and time, travel, and cost savings. Findings also suggest that an all-virtual approach in oncology is not feasible nor preferred as hands-on examinations are necessary, including for ongoing survivorship care and prevention. Thus, a hybrid approach is likely best going forward. Ongoing research should continue to explore the preferences and needs of patients, caregivers, clinicians and health systems with respect to the use of telehealth in oncology.

Though limited in the number of studies that engaged caregivers, these findings suggest there are perceived benefit of involvement. Patients report that telehealth increases the ability for the caregiver to be involved. Caregivers are well established as vital to patient care; yet career impact and burden is common and is a significant financial challenge to them [8]. Replacing onsite visits with virtual appointments when feasible is a potential option to improve caregiver engagement more broadly and reduce career and related emotional strain. In 2021 Blue Cross Blue Shield reported the direct and indirect impact of caring as $264 billion and encompassing 51 million Americans [58]. This included work impacts such as disruption in hours or retiring early or quitting [58, 59]. Future research must more intentionally consider the caregiver perspective in understanding experiences of telehealth, particularly as related to employment and career maintenance.

Furthermore, findings for studies that had greater racial and ethnic diversity reported generally similar benefits and concerns among participants compared to studies with a less diverse population. However, differences were evident according to technology-based barriers. Addressing differences in access and overcoming barriers to use is vital given that alarming disparities in cancer outcomes continue to exist by race and ethnicity for certain cancers [60, 61]. Indeed, African American or Black individuals have a disproportionate cancer burden, including the highest mortality and the lowest survival of any racial or ethnic group for most cancers. Black patients continue to be less likely to be diagnosed with stage I disease than White patients for most cancers, with some of the largest disparities for female breast (53% vs 68%) and endometrial (59% vs 73%) [60]. An ACS Survivorship report calls upon evidenced-based strategies and equitable access to available resources to mitigate disparities [57]. If barriers are addressed, telehealth might have the potential to improve access to care and outcomes.

Though non-Hispanic White patients were most prominent racial or ethnic group in the studies, six studies included a high percentage of Black patients. The findings were not specific to race or ethnicity or other sociodemographic variables, but findings for each of these studied showed similar benefit and concerns compared to studies with less diverse populations. This included findings about the appropriate type of service for telehealth (e.g., affirming survivorship care), the use of telephone for appointments, greater convenience and affordability (less indirect costs) [20, 24, 26, 34, 50]. However, in one of these studies with greater racial and ethnic diversity of sample, those with higher household income had higher odds of use of telemedicine than those with lower income [24]. Similarly, in another study high barriers included barriers to the Internet or devices or not wanting to be on video [26]. Moreover, these findings mirror research internationally in which, in one study, the proportion of telehealth visits conducted among Black patients was found to be significantly lower compared with White patients and Black participants were more likely to self-report lack of Internet access [62]. These findings suggests the need to ensure equitable access for such services, including policies that promote access to Internet, or the removal of barriers to use or uncertainty.

In addition to differences according to race and ethnicity, additional differences are also noted, including according to age, income, low health digital literacy, and limited English proficiency [63]. An international study by Loree and colleagues found that older adults (≥ 50 years of age) were less likely to be satisfied with virtual oncology appointments [64]. This review also showed that challenges with telehealth in terms of communication were evident, such as the need for interpreter services. Future research should consider additional challenges for patients who might have other communication-related challenges that were not noted in these studies, such as persons with vision, hearing, or cognitive impairments.

5 Limitations

It is possible that not all eligible articles were included. Articles were only included if they were from the U.S., but it is possible that there is well-documented evidence from other countries regarding telehealth use in oncology. Despite these limitations, this scoping review is an important review to begin to establish understanding of preferences of patients and caregivers for further study and benchmarking. This is especially important given the identified gap in caregivers' perceptions.

6 Conclusion

This scoping review identified ways that telehealth is beneficial for patients but might also benefit caregivers. These benefits pertain most often to time and cost savings. Concerns most often pertain to limitations as compared to onsite visits and the ability to fully examine patients or engage with them as well as technology-related issues. Future research must specifically assess perceptions among caregivers and assess use as related to disrupting disparities in access and outcomes in oncology.

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Declarations

Competing interests The authors declare no competing interests.

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