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Patient Satisfaction with Telehealth Services Compared to In-Office Visits: A Systematic Literature Review

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Abstract

Telehealth is changing the current paradigm of healthcare. As an emerging mode of healthcare delivery, telehealth stands to help alleviate the shortage of primary care and specialty care providers especially patients in rural areas. In addition to increasing access of healthcare, this service allows for flexibility, convenience and has the potential to decrease healthcare costs while improving patient outcomes. The objective of this literature review was to examine patient satisfaction with telehealth compared to in-office visits. A systematic search was conducted and a total of 17 articles that met inclusion criteria were examined. Data and factors evolving around patient satisfaction with telehealth were extracted and descriptively synthesized from the inclusion articles. Multiple factors were identified that impacted patient satisfaction with telehealth including travel time/convenience, access to healthcare, cost savings, clinical outcomes, provider relationship, and inhibiting influences of telehealth. The overall findings are in consensus that patients are equally, if not more, satisfied with telehealth when compared to in-office visits. Despite this, there is a paucity of high-quality research related to this topic. Telehealth is a growing role for advanced practice registered nurses, therefore adding to the importance of prioritizing the understanding of the identified themes within this literature review and how they impact patient satisfaction with telehealth.

Keywords: telehealth, systematic review, rural healthcare, patient satisfaction, in-office visits, patient outcomes, convenience, travel, cost savings

Patient Satisfaction with Telemedicine Services Compared to In-Office Visits: A Systematic Literature Review

According to the Health Resources and Services Administration (HRSA, 2019) of the U.S. Department of Health and Human Services, telemedicine is defined as "the use of electronic information and telecommunications technologies to support and promote long-distance clinical health care, patient and professional health-related education, public health and health administration" (para 3). There are a variety of different types of telehealth technologies, including video conferencing, the internet, streaming media, terrestrial and wireless communications, along with store-and-forward imaging (HRSA, 2019). For the purposes of this literature review, telehealth and telemedicine are used interchangeably.

Telehealth evolved in the 1870's with the use of a telephone to reduce unnecessary doctor visits, but fully evolved in the 1960's with the initiation of the Space Technology Applied to Rural Papago Advanced Health Care (STARPAHC) project (Dinesen et al., 2016; Nesbitt, 2012). This pilot project allowed a public health service hospital to provide remote health care through a home monitoring system to the Papago Indian Reservation and U.S. astronauts in space (Nesbitt, 2012). Although telehealth was originally developed for rural and underserved patients, telehealth has now emerged in a wide array of healthcare specialties in both the rural and urban setting (Orlando et al., 2019).

Telemedicine is a care delivery model that focuses on Healthy People 2020 goals of improving patient outcomes and access to healthcare and eliminating healthcare disparities (Office of Disease Prevention and Health Promotion, 2018). Telehealth has the potential to increase access and make healthcare services more convenient for certain types of patient groups, especially rural healthcare (Dorsey & Topol, 2016). Telehealth also has disadvantages, including

technology problems, the quality of the patient-provider relationship, the quality of the examination, quality of care, and decreased patient satisfaction (Dorsey & Topol, 2016). The increase in telehealth use, makes it is imperative to maintain patient satisfaction regardless of the modality of delivery and patient satisfaction is a key indicator of how well changes in practice and modality meet patient expectations (Kruse et al., 2017). (*The introduction should conclude with the intent of the review. This is repetitive with the abstract but the abstract has to stand alone in how it summarizes the paper therefore it will be repeated)*

Background

With the growing prevalence of chronic disease, shortages in healthcare providers, quest for improved patient outcomes, and increased demands on available providers, telehealth is an alternative mode of delivery that has the potential to increase access for all (Piga et al., 2017). Telehealth also has the capability to reduce travel and expense for patients, increase patient convenience, and potentially provide financial advantages for healthcare facilities and payers (Piga et al., 2017). As with traditional modalities of healthcare delivery, telehealth relies strongly on the reports of patient satisfaction, for quality measure and optimal federal reimbursement. Patients and families are the most reliable source of information that can report how they were treated and if the care received met their expectations (Kruse et al., 2017, p. 2). Patient satisfaction in healthcare has been shown to be closely associated to improved patient engagement and treatment compliance for multiple different chronic and acute healthcare conditions (Orlando et al., 2019). Patient satisfaction and feedback is strongly taken into consideration for future development of telehealth technology equipment, to ensure patient and provider relationships needs are met (Kruse et al., 2017).

Clinical Question

Based on the above phenomena of interest, this literature review aims to synthesize, evaluate, and conclude with a response to the following clinical question *In adult patients how does telemedicine/telehealth visits compared to in-person office visits affect patient satisfaction.* The purpose is to advance understanding of how patient satisfaction is positively or negatively affected by telehealth in order to further guide evidence-based interventions.

Clinical Significance for Advanced Practice

Advanced practice registered nurses (APRN) endeavor to provide access to cost-effective quality care to patients across the healthcare spectrum. As healthcare systems struggle with increased chronic disease patients, provider shortages, and mandatory decrease in healthcare costs, telehealth technologies are emerging to address these challenges and improve patient outcomes (Rutledge et. al., 2017). In a 2013 survey, 52% of hospitals reported they were using telehealth, with over 22 million telehealth visits and that number is growing rapidly (Balestra, 2018). APRN's should anticipate a growing role for telehealth and will need to develop the knowledge, skills, and attituded needed to provide a positive patient experience (Rutledge, et al., 2017). Working in the office and telehealth setting, APRN's will need to understand factors that affect patient satisfaction with telehealth.

With COVID-19 there has been a ten-fold increase in the telehealth use in the last month, which is one of the biggest transformations that have been seen in U.S. healthcare (Webster, 2020). The significant increase of telehealth has prompted the Centers for Medicare & Medicaid Services to issue "unprecedented array of temporary regulatory waivers and new rules to equip the American healthcare system with maximum flexibility to respond to the 2019 Novel Coronavirus (COVID-19) pandemic" (Webster, 2020, p. 1180).

Methods

A systematic literature review was performed to explore the current literature as it pertains to the clinical question. Databases searched include Academic Search Premier, CINAHL Plus, Cochrane, Medline (PubMed), and Nursing and Allied Health. Specific databases, including general subjects covered, specific date range, and search restrictions are included in Table 1 of the attached appendix. Search limits applied to database searches included results from the years 2009-2019, full text available, peer reviewed, references available, and English language. Search terms used included "telehealth," "telemedicine," "patient satisfaction," "patient satisfaction AND telemedicine OR telehealth," and "patient satisfaction with telemedicine OR telehealth versus office visits in rural areas" (see Table 2 in Appendix for specific keyword combination searches). Bibliographic review was also utilized for additional relevant articles. The number of article hits obtained for every keyword search in each of the databases were recorded, and searches with 25 or fewer hits were chosen for a brief review of titles and abstracts an appear asterisked and in bold in Table 2 of the Appendix.

Inclusion and Exclusion Criteria

Article titles and abstracts were reviewed and duplicates were eliminated. A total of 28 studies were further assessed for inclusion or exclusion in this literature review (Table 3). Those articles whose title and/or abstract suggested its relevance to the phenomenon of interest and identified clinical question were marked for further review. The exclusion of articles was based on predetermined criteria. Articles were excluded if the patient population was not adult, the telehealth/telemedicine was and intervention performed by a nurse only and still required in-office visits with provider, were inpatient style telehealth/telemedicine interventions, or the telehealth/telemedicine intervention was a device for monitoring patient status and not used for

provider visits. Refer to Table 3 for all reviewed articles and specific inclusion and exclusion rationale for each citation. Each of the 28 articles were read in entirety and 17 articles met inclusion criteria.

The articles included in the literature review were analyzed to identify the level of evidence, key findings, and implications for practice. The highest level of evidence per Melnyk and Fineout-Overholt (2015) among this body of evidence was four level II RCTs. There were two level IV studies, eight level V studies and three level VI studies. Most of the studies were systematic review of descriptive or qualitative studies or systematic review of mix method studies (see Table 4 in Appendix for further detail on level of evidence and data abstraction of included articles).

Methodical Assessment

Study Characteristics

Despite the growing number of studies related to the clinical question, telehealth research continues to lack high quality research. In this systematic review, numerous articles gathered information on patient satisfaction related to telehealth, however, there was a lack of randomized control trials (RCT), as well as systematic reviews of meta-analyses. Design and quality of the included literature was varying, with only four of the 17 selected articles being RCTs. Although there were sufficient systematic reviews included, none included evidence from RCTs.

Synthesis of Research

After an in-depth review of the 17 articles that met inclusion criteria, the following summary of the literature was formulated. All of the articles that met inclusion criteria included scholarly publications specifically addressed to factors that affected patient satisfaction with telehealth in the adult population. Although the factors affecting patient satisfaction with

telehealth were compared to in-office visits, there were themes present in the literature that contributed only to patient's satisfaction with telehealth. The themes that were identified in the literature review affecting patient satisfaction were categorized as overall patient satisfaction, travel time/convenience, access to healthcare, cost of care, clinical outcomes, provider relationship, and influences of telehealth.

Overall Patient Satisfaction

An estimated 81% of providers describe themselves as being overextended or at full capacity, with no time to take on additional patients or travel to tertiary healthcare sites to provide outreach care (Polinski et al., 2015). Emerging technologies in healthcare have introduced telehealth as an option to increase access of healthcare for patients and allow providers to further extend their patient population without the additional travel time.

A systematic review of 20 articles regarding telehealth technology use in digestive diseases, found patient satisfaction to range from 74-100%. Additionally, the researchers noted that of the study participants who reported 74% patient satisfaction also stated they would recommend telehealth to other patients (Helsel et al., 2017). Another study by Xu et al., had impressive results, with 100% of the study respondents agreeing or strongly agreeing that they were satisfied with telehealth services, with 90% of the respondents agreeing or strongly agreeing that they would recommend telehealth to other veterans (2018). In a different systematic review of patient and caregiver satisfaction with telehealth by Orlando et al., they discussed that of the 36 articles reviewed only one study found that face-to-face appointments were preferred, which was hypothesized due to older demographic age and low travel distance required for in-office visit (2019). In a large cross-sectional survey study with 1734 patients, 95% were very satisfied with telehealth quality and found telehealth to be comparable, if not

better than in-office visits with healthcare providers (Polinksi, et al., 2015). An interesting finding in that study, was that of the 5% of the participants who preferred in-office visits, they contributed it to a strong bond between the assisting nurse and or provider and were impressed with their capabilities during the physical examination, ultimately outweighing telehealth services (Poliniski et al., 2015).

Lastly, one of the three high level evidence studies, a RCT, showed significant positive findings within patient satisfaction regarding convenience for telehealth (Agha et al., 2009). Telehealth patient satisfaction scores were found to be significantly increased at 4.41, compared to 2.37 with in-office visits; with a t-test ($p < 0.001$) on a 1-5 Likert scale assessment with 1= "not at all" to 5= "very much" (Agha et al., 2009).

Decrease Travel Time/Convenience:

There is a consensus across the literature that decreased travel time and convenience are the biggest factors that positively influence patient satisfaction with telehealth. Cox et al. (2016), found in their systematic review of cancer survivors, that patients felt their lives had been disrupted by the cancer diagnosis and telehealth interventions allowed the patients to manage their care remotely which minimized the disruption in their life. Convenience was reflected in different ways throughout the literature, when telehealth replaced in-office visits, patients did not have to travel, thereby saving time, money, resulting in decreased stress related to the burden of travel (Cox et al., 2016). Patients found that telehealth interventions not only decreased travel time but also reported that the remote communication increased anonymity by allowing them to focus on their concerns in the familiarity of their own environment and away from the hospital setting which was highly associated with their cancer diagnosis (Cox et al., 2016).

In a retrospective study by Xu et al., 90.9% of study respondents agreed or strongly agreed that they would rather use telehealth instead of travelling the 156 mile round trip travel to a Veterans Affair Medical Center (VAMC) endocrinologist every three to 12 months, depending on the type of visit (2018). Orlando et al. (2019), found that patients with chronic disease, parents with young children, and caregivers of elderly patients ranked highest in study participants who found that the convenience of attending a telehealth appointment in a patient's own community trumped traveling long distance to meet a provider in person.

Convenience was cited as the biggest contributing factor to patient satisfaction in a qualitative study of patient utilizing telehealth for primary care visits (Powell et al., 2017). These patients recognized decreased wait times, the ability to incorporate family into the visit, not having to miss time from work, and not having to change attire were all positive, convenient features (Powell et al., 2017). Although, 32% of participants in this study connected to telehealth while at their workplace, reporting that even though it was to their advantage to not miss work, privacy was a concern, as there was the potential of coworkers overhearing the visit and having the inability to perform a proper physical examination due to location (Powell et al., 2017).

In a dual arm RCT there were significantly higher satisfaction rates for telehealth compared to in-office visits in the categories of convenience and distance (Wilkinson et al., 2016). For example, the 12 month telehealth convenience mean score was 4.9 as compared to in-office 3.6 (five-item Likert scale with 1= "much less", 2= "slightly less", 3= "same", 4= "slightly more", and 5= "much more") ($p=0.002$) and the 12 month travel distance mean telehealth satisfaction score was 4.5 compared to 3.5 ($p=0.03$) for in-office visits (Wilkinson et al., 2016). Furthermore, the average distance saved was 171 miles per patient visit for telehealth patients (Wilkinson et al., 2016).

Access to Healthcare

"In the United States, an estimated 25% of patients do not have a primary care provider or do not have complete access to one, particularly in rural areas" (Polinski et al., 2015, p. 269). To put this into perspective, some estimation that over 51 million Americans (one-sixth of the population of the US) live in rural areas (Douthit et al., 2015). Thus, the existence of disparities in rural health when compared to urban areas has brought attention to the healthcare industry, as rural Americans suffer disproportionately from chronic illnesses such as, increased mortality and morbidity, cancer, and have poorer health related quality of life (Pedro & Schmiege, 2014). Patients in population areas of approximately 2500 residents within 100 miles of an urban area were found to have poorer social functioning, worse symptoms related to post cancer treatment, and greater financial difficulties (Pedro & Schmiege, 2014). Whereas, survivors in the most remote areas reported better social functioning, fewer symptoms, and fewer financial difficulties when compare to other rural areas (Pedro & Schmiege, 2014). One explanation for this is these patients have chosen to live in the most remote rural areas and have an inherent independence and self-sufficiency (Pedro & Schmiege, 2014, p. 216). This is an important consideration when implementing and practicing telehealth in these rural areas. With poorer health conditions for rural patients, along with the shortage of rural primary care and specialty providers, telehealth has the potential to extend the boundaries and surmount the barriers and challenges of proximity related to rural primary and specialty healthcare (Kruse et al., 2017).

Cost Savings

Due to the increase in healthcare costs, healthcare provider shortages, and mandates to decrease expenditures, cost savings is critical for healthcare institutions. The use of telehealth interventions has provided solutions for many healthcare obstacles, one being cost savings

(Rutledge et al., 2017). The Centers for Medicare and Medicaid Services (CMS) has expanded the geographic location coverage for telehealth and in addition have added new areas of services including primary care, wellness visits, psychotherapy, and other specialty care, with uptake occurring most rapidly in areas where reimbursement is advantageous (Polinski et al., 2015; Powell et al., 2017). In addition to increase in CMS coverage for telehealth, there has been a substantial, across the board increase in third party payer and reimbursement for telehealth services (Polinski et al., 2015). In a 2017 systematic review, cost savings was a common theme that positively influenced patient satisfaction and telehealth use throughout the literature (Kruse et al., 2017). Cost savings were analyzed in a variety of areas. One study found a $63,821 in cost savings as a results of decreased hospital readmissions, while another study found an approximate $234 saved in travel expense per visit for migraine treatment (Kruse et al., 2017). In consensus, a RCT comparing telehealth genetic counseling and in-office genetic counseling found the total cost per patient to provide telehealth genetic counseling to be $106.19 compared to in-office genetic counseling $244.33, with patient satisfaction not differing for telehealth compared to in-office visits with Cronbach's alpha for telehealth 0.88 and in-office 0.82 (Buchanan et al., 2015, p. 965).

VAMC facility in rural Central Alabama, which serves more than 134,000 veterans in 43 counties, lacked an endocrinologist, so theses veterans were required to travel long distances for their services. In 2014 telehealth was implemented to expand endocrinology access, improve veterans' clinical outcomes, and decrease costs related to travel, as the VAMC provides travel reimbursement and bus services for patients required to travel for healthcare (Xu et al., 2018). In a retrospective study of this telehealth service, they found that the VAMC saved $72.94 in travel reimbursement per patient for each telehealth endocrinology visit, with a total savings of

$9,336.32 per year in reimbursements for the 32 patients in the study (Xu et al., 2018). Telehealth not only is a cost savings for healthcare facilities but for patients also. Patients who did not have health insurance had 20% greater odds of preferring telehealth over in-office visits due to cost savings (Polinski et al., 2015).

Clinical Outcomes

Measuring, reporting, and understanding patient outcomes is fundamental in providing quality healthcare and represents an opportunity for redefining patient care, fostering improvement and provides opportunities for a better practice. Through a systematic review, Kruse et al. (2017), identified that telehealth is pivotal in decreasing hospital admissions, improves medication adherence, and improves patient outcomes. Additionally, one telehealth program within this systematic review found a 56% reduction in ambulance transports by implementing telehealth services, while another program reduced readmissions from 12 to 4 over a 12 month period (Kruse et al., 2017). Another study in that systematic review found patients in the study group receiving telehealth management of their diabetes significantly reached their optimal insulin levels when compared to control group who did not participate in telehealth (Kruse et al., 2017). A large chronic disease self-management telehealth study found 77% of participants improved their diet, 80% improved symptom management, and 80% improved medication adherence (Kruse et al., 2017). Patients with opioid use disorder predominantly treated with telehealth were more likely to be retained on methadone when compared to those treated in-person (Lin et al., 2019). Last of all, a retrospective study of VAMC patients utilizing telehealth for endocrine services, measured hemoglobin A1c levels at baseline, 6 months, and 12 months, discovering that levels dropped from 8.7% baseline to 8.1% at 12 months through the telehealth monitoring (Xu et al., 2018).

Provider Relationship

Provider behaviors that facilitate patient satisfaction and patient-centered communication include open-ended questions, professionalism, cultural competence, rapport with patient, strong communication, empathy, emotional support, partnership building, shared-decision making, and ability to actively listen (Agha et al., 2009; Orlando et al., 2019). The quality of patient and provider communication is a critical factor in patient outcomes, compliance, and patient satisfaction (Agha et al., 2009). Effective telehealth patient-centered communications include proper camera positioning, elimination of office or clinic noise, removal of objects that obstruct the camera view, avoiding clothing that is bright or busy on providers, eye contact into camera and not on the computer screen, avoiding distraction by looking down, looking at computer or taking notes, and the careful choice of appropriate words that project empathy (Rutledge et al., 2017).

There has been in-depth research on effective in-office patient centered communication quality and techniques, however, there is lack of research involving telehealth patient centered communication (Agha et al., 2009). Telehealth has the potential to affect patient and provider communication due to lack of physical presence, potential third-party participation, provider dominance during encounter, and decreased nonverbal communication (Agha et al., 2009). In a 2009 RCT of patient satisfaction with provider communication during telehealth, there was similar patient satisfaction with provider communication when compared to in-office visits (Agha, et al., 2009). This study found that communication with a provider via telehealth scored 3.76, while in-office visits scored 3.61 ($p= 0.002$) with no statistically significant difference between telehealth and in-office (p=0.41) (Agha et al., 2009). Similarly, findings with provider competence during telehealth scored 4.79, compared to in-office visit score of 4.74, with a t-test

p=0.006 and p=0.04 respectively (Agha et al., 2009). Furthermore, the study concluded that despite the physical separation, provider communication during telehealth was not inferior to in-office visits, and it was noted that the provider was more attentive, less distracted, was less likely to interrupt the patient (Agha et al., 2009). The presence of a second healthcare worker, whether a provider or nurse, promoted patient confidence and improved patient satisfaction (Agha et al., 2009). There were analogous findings in a 2019 systematic review of 36 articles pertaining to patient and caregiver satisfaction with telehealth services, remarking that communication between the provider and patient positively influenced satisfaction with telehealth (Orlando et al., 2019). The participants in the study felt that they were listened to, had their concerns addressed, had time to ask questions, and participated in the decision making (Orlando et al., 2019). Patients in these 36 articles of the literature review were most satisfied with the privacy and confidentiality features during the telehealth, noting that it was easier to talk about certain personal items through the telehealth compared to face-to-face visit, especially if the provider was actively listening (Orlando et al., 2019). Another positive feature of telehealth communication is that it was shown to positively shift the focus of care away from the provider and towards the patients' preferences and needs (Cox et al., 2017).

In contrast, Mair and Whitten (2000), performed a systematic review of 32 studies that involved telehealth throughout a wide range of specialty services, concluding that the study participants were overall satisfied with the interpersonal provider communication during telehealth. However, there were patient reports of the provider being less present during the telehealth and felt they had a difficult time sharing personal or sensitive information through telehealth. Although it should be noted that even with these concerns patients reported they would continue to use telehealth and recommend it to others (Mair & Whitten, 2000).

Another consideration regarding telehealth is the delivery of bad news or abnormal test results. Patients preferences on receiving abnormal test results, was only addressed in one of the 17 studies. The qualitative study by Powell et al. (2017), reported mixed findings regarding patients preferences for receiving test results, with some patients preferring to use telehealth to receive abnormal test results, as this could be done in the comfort of their home or community. They also acknowledged that knowing they would have to travel a far distance would make the anticipation of the news worse (Powell et al., 2017). While others preferred in-office visits, regardless of travel distance, stating they preferred to hear the news in person (Powell et al., 2017). This is an area for future research.

Inhibiting Influences of Telehealth

There are a number of challenges that influence the success and sustainability of telehealth use even despite advances in technology. Factors that negatively impact patient satisfaction appeared salient throughout the literature in a contrast to convenience (Cox et al., 2016; Orlando et al., 2019). Nine of the 22 studies in Cox et al. (2016), systematic review found that telehealth patients perceived the experience as impersonal and lacking in physical contact, suggesting the need to meet the provider in person at least once prior to initiating telehealth interventions.

Technology issues resulted in jeopardized communication due to visual or audio concerns, with lower satisfaction scores displayed for auditory clarity, image freezing, image absence, sub-optimal sound qualities, and internet drop-outs in a mixed method study of heart failure patients utilizing telehealth (Hwang et al., 2017). It should be noted though that despite technology issues, participants perceived the health outcomes and convenience outweighed the technical issues (Hwang et al., 2017). Another interesting finding is that while technology

challenges are present among most of the studies, computer experience did not seem to inhibit telehealth patient satisfaction, with some participants reporting that no computer experience was a positive challenge (Hwang et al., 2017).

On the other hand, the RCT by Buchanan et al., mentioned above, had significant negative findings for telehealth that were influenced by technology use (2015). In-office visit patients were significantly more likely to adhere to appointment times (89%) compared to telehealth patient's (79%) $p = 0.03$; the biggest factor being technology comfort and knowledge (Buchanan et al., 2015). It was also noted that 15% of the telehealth patients in the study required assistance with technology devices and 7% of the counseling sessions could not be completed due to connectivity and hard drive crash (Buchanan et al., 2015). Although, a majority of the patients in the study (64%) required no assistance with the telehealth technology devices (Buchanan et al., 2015).

Very few of the studies reviewed discussed accuracy of diagnosis during telehealth visits, with the exception of the Piga et al., (2017), who conducted a systematic review that found one of the 23 studies had a disappointing finding related to accuracy of telehealth visits. The disappointing findings showed a 40% accuracy rate for diagnosis, which was determined by first having patients see a junior doctor via telehealth for provisional diagnosis, which was followed by a face to face consultant for provisional diagnosis, followed by the final diagnosis made by an independent consultant rheumatologist (Piga et al., 2017). Recommended enhanced provider training and improved technology devices that have diagnostic features such as a camera, stethoscope, and otoscope focus to improve diagnosis accuracy (Piga et al., 2017).

The last inhibiting factor discussed is providers concerns for litigation related to various situations including, the provider being obliged to rely on remote providers for management of

patients, lack of accuracy of diagnosing with poor technology equipment, license and credentialing, privacy and confidentiality, fraud, and reimbursement for providers (Sabesan & Simcox, 2011).

Discussion

Telehealth has become one of the most rapidly expanding components of the health care system, with an extensive history of research on various aspects of telehealth. Patient satisfaction is a priority when analyzing telehealth, because, if this mode of health care delivery is unsatisfactory, the technology can become redundant and expensive (Kruse et al., 20117). This review narrowed the focused by comparing and contrasting patient satisfaction scores for telehealth compared to in-office visits. From this literature synthesis there were distinctive analytical themes that emerged as factors influencing patient satisfaction with telehealth when compared to in-office visits. These were categorized as overall patient satisfaction, decrease travel time/convenience, access to healthcare, cost savings, clinical outcomes, provider relationship, and inhibiting influences of telehealth. The overall findings are in consensus that patients are equally if not more satisfied with telehealth when compared to in-office visits, however, there is a consistent lack of high-quality research related to this topic. As telehealth symbolizes the feasibility and practicality of an alternative mode of healthcare, patient satisfaction needs to be taken into consideration, as this mode of healthcare is compared to the standard in-office visit. Patient satisfaction is defined per the U.S. Center for Medicare and Medicaid Services as “the patient’s perspective of care which can be objective and meaningful to create comparisons of hospitals and other healthcare organizations” (Kruse et al., 2017, p. 11). It is important to recognize that telehealth must align with a patient’s values and expectations to have positive overall satisfaction and improved clinical outcomes (Orlando et al., 2019).

The literature reviewed demonstrated that telehealth can support patients in all different specialties and at any point in their acute and chronic healthcare journey. With the wide variety of specialties that telehealth can encompass, travel time to see a provider can be a burden and inconvenience, making decrease travel time and convenience to be the most commonly cited and highest overall positive factor influencing patient satisfaction (Agha et al., 2009; Cox et al., 2017; Hwang et al., 2017; Kruse et al., 2017; Orlando et al., 2019; Sabesan & Simcox, 2011; Wilkinson et al., 2016).

When telehealth is implemented as an alternative to in-office visits, studies show that participants report saving time, money, and reducing stress and burden related to travel (Cox et al., 2017). Long distance travel for healthcare can cause an absenteeism from work and family, dependence on caregivers for transport and childcare, increased cost, and lack of access to healthcare (Orlando et al., 2019).

Telehealth not only has been shown to alleviate burden related to travel and convenience, it also extends services to rural areas where providers are not available. Rural healthcare providers strive to keep abreast of the scientific research and evidence-based practice that is rapidly changing. With the healthcare changes evolving, the need to provide patients access to specialty care for chronic disease is a necessity, however many patients do not have access to this level of care, especially in rural areas (Kruse et al., 2017). This signifies the importance of utilizing telehealth to improve patient outcomes, overcome the barrier of proximity, and in turn benefit healthcare systems at large (Kruse et al., 2017; Wilkinson et al., 2016). To improve quality of life and equity of healthcare access, treatment and clinical support should ideally be available for patients closer to home, eliminating long travel times and overall inconveniences

related to rural healthcare, which is where the literature supports the role of telehealth (Sabesan & Simcox, 2011).

As discussed in the literature review, cost savings were displayed with telehealth services in areas of decrease travel expense for both the provider and patient, reduction in hospital readmissions, reduction in facility reimbursement to patients, decrease in patient cancellations/no-shows, and overall decrease cost per visit with telehealth (Kruse et al., 2017; Powell et al., 2017). Cost issues have important implications for healthcare systems incorporating telehealth into care models as they are likely to impact patient satisfaction and affect uptake of telehealth services (Powell et al., 2017, p. 228).

When implementing a new mode of health care delivery, it is important to validate that patients are not only satisfied and the cost is feasible, but also ensuring they are displaying improved clinical health outcomes, as this in turn affects overall patient satisfaction. While it is evident there is a need for more research related to how telehealth impacts patient outcomes, how clinical outcomes were influenced by telehealth was covered in few studies (Kruse et al.,2017; Lin et al., 2019; Piga et al., 2017). These studies found there was overall improvement in various clinical outcome measures and some having a lasting effect (Kruse et al., 2017; Piga et al., 2017).

The technology base of telehealth significantly changes the mode of delivery, emphasizing the needs for a strong patient provider relationship independent of the modality (Kruse et al., 2017). Patient provider communication during telehealth has mixed findings throughout the studies indicating that providers need to be cognitive of their communication etiquette during telehealth. Having a second healthcare provider present in the room during certain types telehealth services was found to be an overall positive feature of telehealth and was

a contributing factor of patient satisfaction, with patients finding telehealth to be safer and more thorough with additional healthcare workers presents compared to in-office visits (Sabesan & Simcox, 2011).

Since the ultimate goal of this literature review was to determine how patient satisfaction with telehealth compares to in-office visits, health care providers, especially APRN's should recognize the inhibiting influences that decrease patient satisfaction with telehealth and strive to improve in these areas. Inhibiting factors of telehealth included: difficulty accessing program with passwords, connectivity issues, lack of broadband strength, visual and audio clarity issues, lack of training prior to starting, image freezing, lack of overall privacy, lack of privacy when telehealth accessed at work, poor etiquette, lack of eye contact, lack of capability to perform physical examination. However, despite the inhibiting influences of telehealth, the overall consensus was that participants had high satisfaction with telehealth and would recommend telehealth for their own personal use in the future and recommend to others.

Limitations

Only studies conducted since 2009 (with the exception of two studies from 2006 and 2000) were included in this literature review to capture the exponential increase in telehealth interventions over the past 10 years, therefore the findings from this literature review may not reflect patient satisfaction of earlier telehealth interventions. The literature review also only contained experiences of adult patients who participated in telehealth.

There appeared to be a discrepancy in the methodologies used to define and assess patient satisfaction throughout many of the studies, even though many had a similar objective to measure whether patients were satisfied, for accuracy a standardized assessment tool is needed to effectively compare data. A systematic review of heart failure patients and telemedicine

confirmed this finding, reporting that the concept and definition of patient satisfaction was poorly defined and there was a lack of standardized validated instruments to measure patient satisfaction (Kraai et al., 2011). Mair and Whitten (2000) also discussed that very few studies in their systematic review of specialty telehealth services defined what patient satisfaction meant, therefore not allowing the researchers to discern whether the participants in the studies said they were satisfied with telehealth because it "didn't kill them" or that is was "OK," or that it was a wonderful experience (p. 1519). Patient satisfaction research has a well-known occurrence of questionable design value due to methodologically poorly developed questionnaires, response bias, and in the case of telehealth research, bias of patient population (Kraai et al., 2011).

Implications for Future

Recommendations for Improving Patient Satisfaction with Telehealth

Recognizing the inhibiting influences that decrease patient satisfaction with telehealth will significantly improve the overall patient satisfaction, while technology advancement and needs-based interventions should aim to promote patient satisfaction for patients utilizing telehealth services. Technical improvements recommend improved auditory clarity through the use of improved speakers or wireless headphones, improved visual clarity through wider screens, enhanced connectivity through broadband internets, and computer training for those with limited computer experience (Hwang et al., 2017). It is also essential to ensure the facility has current technology equipment as advances in equipment include devices that have an array of equipment and examining capabilities including stethoscope, otoscope, ophthalmoscope, dermascope, and camera.

Recommendations for Future Research

This literature review identifies key areas for further research. Research supports the use of telehealth and patient satisfaction was found to be overall positive. Among the 17 articles, there was a consensus that the studies lacked adequate sample size and recommended larger case-controlled studies. For example, Xu., et al. (2018), recommends larger, more representative samples sizes to fully interpret telemedicine's efficacy in providing healthcare to broader patient populations. In addition, Buchanan, et al. (2015), recommends future research in methods to reduce technical difficulties with telehealth equipment, cost comparison of computers versus dedicated videoconferencing systems, and methods for increasing attendance for telehealth visits. With the many different types of telehealth equipment, a comparison study would be beneficial on the top products.

Research to determine how to best involve patients and their families in telehealth care is also needed. This review focused on the adult population only, therefore a recommendation for future research is to consider the patient satisfaction scores of children and young adults. Research reporting the experiences of individuals who choose not to participate in telehealth could also be explored furthered to enhance the understanding of the barriers and burden with telehealth (Cox et al., 2016).

The tendency throughout the literature to not fully define patient satisfaction and address it only on a superficial level has created more questions for future research (Mair & Whitten, 2000). In addition, Piga et al. (2017) recommended more rigorous research on the effectiveness and accuracy of diagnosing via telehealth before it could replace in-office visits, as accuracy of diagnosis lacked acknowledgement in the research. Lastly, more information is needed regarding what kinds of devices people want to use and how can we manage the data flowing in from all these devices and transform it into information that is actionable by a clinician (Nesbitt, 2012).

Education Recommendations for Health Care Providers

With telehealth being relatively new and rising in clinical practice many of the health care education programs do not include formal training related to telehealth within their curricula, requiring many providers to obtain the necessary training for telehealth on the job (Rutledge et al., 2017). Most of the telehealth training tends to occur in the clinical setting but there are post professional certification programs that provide extensive telehealth training (Rutledge et al., 2017). To fully prepare APRN's and other provider's for their role as advocates in optimizing health care outcomes through an extended service, especially in areas where access is limited, training in the use of telehealth is critical and should be mandatory for best overall results (Rutledge et al., 2017). To remove barriers associated with telehealth, especially provider communications, the current recommendation for on-site training or post professional certification programs is opportunities such as simulation, clinical rotations, and projects as well as didactic sessions (Rutledge et al., 2017). Technology is constantly changing in telehealth equipment so this area of healthcare services will must emphasize the need for routine equipment competencies to ensure fluency in their use. Didactic programs must also address the rising field of telehealth by providing hands-on opportunities in clinical experience and training labs, with a focus on telehealth communication etiquette including completing competencies to provide students with access to hands-on opportunities (Rutledge et al., 2017).

Health Policy Recommendations

"Despite decades of research that highlights the positive impact that telehealth can have on patient outcomes and patient satisfaction, providers still face many obstacles when attempting to integrate telehealth into their practice" (Rutledge et al., 2017, p. 402). It is a necessity that healthcare providers and facilities fully understand the local and federal regulations that pertain

to their specific practice bylaws, as state and federal laws and regulations that govern provider practice along with health insurance reimbursement for telehealth services can differ and lack standardization (Rutledge et al., 2017). It is also recommended that APRN's protect themselves by securing their own professional liability insurance, with the appropriate telehealth coverage, to protect their careers (Balestra, 2018; Rutledge et al., 2017).

In 2016, the American Medical Association adopted ethical guidance on telehealth (Balestra, 2018). In 2015, the American Academy of Pediatrics issued recommendations of telehealth in pediatric health care (Balestra, 2018). However, the rules and regulations addressing APRN practice requirements differ from state to state, and this variability creates confusion for APRN's involved in the practice of telehealth (Balestra, 2018, p. 34). Depending on the type of telehealth services, state boundary issues may exist due to unique state regulations, which may be a liability to an APRN's state licensing. Healthcare system mergers and acquisitions make it likely that healthcare systems may have facilities in multiple states, which adds to the complexity, making it important to be aware of the specific state license regulations for APRN's (Balestra, 2018; Nesbitt, 2012).

Conclusion

With increasing healthcare costs, shortage of providers, and increase patient expectations, technological advances have made telehealth an exceptional alternative mode of healthcare delivery (Mair & Whitten, 2000). The infusion of telehealth technology into all aspects of health care creates a growing role for nurse practitioners to integrate and utilize telehealth in practice. This synthesis of findings from quantitative and qualitative research consistently shows findings that telehealth has a positive impact on patient's satisfaction with the capability to empower patients to manage their overall health by providing a better connection to healthcare

(Orlando et al., 2019). While the findings suggest that telehealth interventions have the capacity to facilitate a positive experience of personalized healthcare, it is important to take personal factors and consumer focus into account to maximize the benefit and minimize the burden of telehealth (Cox et al.., 2016; Orlando et al., 2019). Further higher quality research with standardized methodologies to assess patient satisfaction will aid the development of future telehealth interventions and guide developers to avoid factors that constrain positive user experience, thereby improving telehealth participation and engagement.

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Appendix

Table 1

Database Search Description

Database	Restrictions Added to Search	Dates Included in Database	General Subjects Covered by Database
Academic Search Premier	Full Text; Scholarly (Peer Reviewed); English Language, References available	2014 through 2019	Academic subjects
CINAHL Plus	Full Text; References Available; English Language; Abstract Available; Peer Reviewed	2009 through 2019	Nursing and allied health
Cochrane	Full Text, Reviews with comments and criticism	2009 through 2019	Systematic reviews of primary research in human health care and policy
MEDLINE (PubMed)	Full Text	2009 through 2019	Nursing and medical topics, as well as dentistry, veterinary science, the health care system and preclinical sciences
Nursing and Allied Health Database	Full Text; Peer Reviewed; English Language	2009 through 2019	Nursing and allied health

Table 2

Data Abstraction Process

Date of Search	Key Words	Academic Search Premier	CINAHL Plus	Cochrane	Medline (PubMed	Nursing & Allied Health
10.02.19	"Telehealth" Or "Telemedicine"	2378	218	10	394	3067

10.02.2019	"Patient Satisfaction"	10246	2326	***21**	13204	53,366
10.02.2019	"Access to healthcare in rural areas"	946	100	2	1271	13201
10.07.2019	"Patient satisfaction and Telemedicine" subject terms	178	34	***2**	459	1538
10.07.2019	"Patient satisfaction and Telehealth" -subject terms	176	42	0	328	1051
10.25.2019	"Patient Satisfaction AND Telemedicine OR telehealth"	191	***11**	***2**	224	165
10.25.2019	"Patient satisfaction with telemedicine OR telehealth versus office visits in rural areas"	***5**	***1**	0	***3**	***12**

***BOLD** = articles reviewed for match with systematic review inclusion criteria

Table 3

Characteristics of Literature Included and Excluded

Reference (Include the full reference here)	**Included or Excluded and Document**	**Rationale**
Abrams, D., & Geier, M. (2006). A Comparison of Patient Satisfaction with Telehealth and On-Site Consultations: A Pilot Study for Prenatal Genetic Counseling. *Journal of Genetic Counseling*, *15*(3), 199–205. https://doi.org/10.1007/s10897-006-9020-0	Included	RCT comparing patient satisfaction with telehealth versus in-office genetics counseling.
Agha, Z., Schapira, R., Laud, P., Mcnutt, G., & Roter, D. (2009). Patient satisfaction with physician-patient communication during telemedicine. *Telemedicine Journal and e-Health : the Official Journal of the American Telemedicine Association*, *15*(9), 830–839. https://doi.org/10.1089/tmj.2009.0030	Included	High level of evidence RCT study that analyzes patient-provider communication, patient satisfaction, and patient rapport with telehealth versus in-person visits.
Buchanan, A. H., Datta, S. K., Skinner, C. S., Hollowell, G. P., Beresford, H. F., Freeland, T., Rogers, B., Boling, J., Marcom, P. K., & Adams, M. B. (2015). Randomized trial of telegenetics vs. in-person cancer genetic counseling: Cost, patient satisfaction and attendance. *Journal of Genetic Counseling, 24*(6), 961-970.	Included	RCT comparing a form of telemedicine for genetic cancer counseling compare to in person genetic cancer counseling
Cox, A., Lucas, G., Marcu, A., Piano, M., Grosvenor, W., Mold, F., Maguires, R., & Ream, E. (2017). Cancer survivors' experience with telehealth: A systematic review and thematic synthesis. *Journal of Medical Internet Research, 19*(1), e11.	Included	Systematic review of 22 studies pertaining to cancer survivors using telehealth specifically identifying patient experience
Fitzsimmons, D., Thompson, J., Bentley, C., & Mountain, G. (2016). Comparison of patient perceptions of Telehealth-supported and specialist nursing interventions for early stage COPD: a qualitative study.(Report). *BMC Health Services Research*, *16*(1), 420. https://doi.org/10.1186/s12913-016-1623-z	Excluded	Small study only comparing in home nursing visits to telehealth visits
Goldzweig, C. L., Orshanksy, G., Paige, N. M., Towfigh, A. A., Haggstrom, D. A., Miake-Lye, I., Beroes, J. M., & Shekelle, P. G. (2013). Electronic patient portals: evidence on health outcomes, satisfaction, efficiency, and attitudes: a systematic review. *Annals of Internal Medicine*, *159*(10), 677–687. https://doi.org/10.7326/0003-4819-159-10-201311190-00006	Excluded	A systematic review of patient portal experience. Excluded since this was an actual telehealth visit but rather patient portal
Gorst, S., Armitage, C., Hawley, M., & Coates, E. (2013). Exploring patient	Excluded	Study analyzing blood glucose monitoring devices not telehealth visits

Reference (Include the full reference here)	**Included or Excluded and Document**	**Rationale**
beliefs and perceptions about sustained use of telehealth. *International Journal of Integrated Care*, *13*(7).https://doi.org/10.5334/ijic.1393		
Helsel, B., Williams, J., Lawson, K., Liang, J., & Markowitz, J. (2018). Telemedicine and Mobile Health Technology Are Effective in the Management of Digestive Diseases: A Systematic Review. *Digestive Diseases and Sciences*, *63*(6), 1392–1408. https://doi.org/10.1007/s10620-018-5054-	Included	A systematic review of patient compliance, patient experience, disease activity, and disease quality of life in digestive diseases
Hwang, R., Mandrusiak, A., Morris, N., Peters, R., Korczyk, D., Bruning, J., & Russell, T. (2017). Exploring patient experiences and perspectives of a heart failure telerehabilitation program: A mixed methods approach. *Heart & Lung - The Journal of Acute and Critical Care*, *46*(4), 320–327. https://doi.org/10.1016/j.hrtlng.2017.03.004	Included	randomized mixed method design of self - report surveys patient experiences with heart failure telehealth
Kraai, I., Luttik, M., de Jong, R., Jaarsma, T., & Hillege, H. (2011). Heart Failure Patients Monitored With Telemedicine: Patient Satisfaction, a Review of the Literature. *Journal of Cardiac Failure*, *17*(8), 684–690. https://doi.org/10.1016/j.cardfail.2011.03.009	Included	Systematic review of 12 studies of heart failure patients patient satisfaction with telemedicine
Kruse, C., Krowski, N., Rodriguez, B., Tran, L., Vela, J., & Brooks, M. (2017). Telehealth and patient satisfaction: a systematic review and narrative analysis. *BMJ Open*, *7*(8), e016242. https://doi.org/10.1136/bmjopen-2017-016242	Included	Large systematic review of 2193 articles on patient satisfaction with telehealth.
Lin, L., Casteel, D., Shigekawa, E., Weyrich, M., Roby, D., & Mcmenamin, S. (2019). Telemedicine-delivered treatment interventions for substance use disorders: A systematic review. *Journal of Substance Abuse Treatment*, *101*, 38–49. https://doi.org/10.1016/j.jsat.2019.03.007	Included	Systematic review of 12 studies that analyze telemedicine use in substance use disorders, focusing on retention, efficacy, and patient satisfaction
Magnus, M., Sikka, N., Cherian, T., Lew, S., & Magnus, M. (2017). Satisfaction and Improvements in Peritoneal Dialysis Outcomes Associated with Telehealth. *Applied Clinical Informatics*, *8*(1), 214–225.	Excluded	Patient satisfaction survey study pertained more to peritoneal dialysis equipment versus telehealth equipment

Reference (Include the full reference here)	**Included or Excluded and Document**	**Rationale**
https://doi.org/10.4338/ACI-2016-09-RA-0154		
Mair, F., & Whitten, P. (2000). Systematic review of studies of patient satisfaction with telemedicine. *BMJ, 320*(7248), 1517-1520	Included	Was beyond the 10 year search criteria but felt it was a thorough systematic review identifying areas for improvement in telehealth research and implementation.
Marzorati, C., Renzi, C., Russell-Edu, S., Pravettoni, G., & Marzorati, C. (2018). Telemedicine Use Among Caregivers of Cancer Patients: Systematic Review. *Journal of Medical Internet Research*, *20*(6), e223–e223. https://doi.org/10.2196/jmir.9812	Excluded	Systematic review of telehealth experience for caregivers. Excluded since the population did not pertain to the patient
Morgan, D. G., Kosteniuk, J., Stewart, N., O'Connell, M. E., Karunanayake, C., & Beever, R. (2014). The telehealth satisfaction scale: reliability, validity, and satisfaction with telehealth in a rural memory clinic population. *Telemedicine journal and e-health : the official journal of the American Telemedicine Association*, *20*(11), 997–1003. doi:10.1089/tmj.2014.0002	Excluded	The study was directed more at evaluating the tool used to assess patient satisfaction: telehealth satisfaction scale (TeSS) and not patient satisfaction with telehealth compared to in-person visits.
Orlando, J., Beard, M., Kumar, S., & Orlando, J. (2019). Systematic review of patient and caregivers' satisfaction with telehealth videoconferencing as a mode of service delivery in managing patients' health. *PloS One*, *14*(8), e0221848–e0221848. https://doi.org/10.1371/journal.pone.0221848	Included	Systematic review of quantitative and qualitative research pertaining to patient satisfaction with telehealth
Piga, M., Cangemi, I., Mathieu, A., & Cauli, A. (2017). Telemedicine for patients with rheumatic diseases: Systematic review and proposal for research agenda. *Seminars in Arthritis and Rheumatism*, *47*(1), 121–128. https://doi.org/10.1016/j.semarthrit.2017.03.0	Included	Systematic review of feasibility, effectiveness, and patient satisfaction with telemedicine for rheumatology patients
Polinski, J., Barker, T., Gagliano, N., Sussman, A., Brennan, T., & Shrank, W. (2016). Patients' Satisfaction with and Preference for Telehealth Visits. *Journal of General Internal Medicine*, *31*(3), 269–275. https://doi.org/10.1007/s11606-015-3489-x	Included	1734 adult participants in a cross sectional patient satisfaction survey
Potter, A. J., Mueller, K. J., & Mackinney, M. M. (2014). Effect of tele-emergency services on recruitment and retention of	Excluded	pertains to telehealth implementation and physician recruitment

Reference (Include the full reference here)	**Included or Excluded and Document**	**Rationale**
US rural physicians. *Rural and Remote Health, 14* (2787), 1-17.		
Powell, R., Henstenburg, J., Cooper, G., Hollander, J., Rising, K., & Powell, R. (2017). Patient Perceptions of Telehealth Primary Care Video Visits. *Annals of Family Medicine*, *15*(3), 225–229. https://doi.org/10.1370/afm.2095	Included	Qualitative study with small sample size that identified patient perceptions of telehealth including satisfaction and concerns.
Sabesan, S., Simcox, K., & Marr, I. (2012). Medical oncology clinics through videoconferencing: an acceptable telehealth model for rural patients and health workers. *Internal Medicine Journal*,*42*(7), 780–785. https://doi.org/10.1111/j.1445-5994.2011.02537.x	Included	50 participants in a study on satisfaction with telehealth versus actual presence of provider in rural health clinic.
Shivji, S., Metcalfe, P., Khan, A., & Bratu, I. (2011). Pediatric surgery telehealth: patient and clinician satisfaction. *Pediatric Surgery International, 27(5), 523-526*. https://doi.org/10.1007/s00383-010-2823-y	Excluded	Pediatric population only-does not meet PICO requirements
Tan, K., Lai, N., & Tan, K. (2012). Telemedicine for the support of parents of high-risk newborn infants. *The Cochrane Database of Systematic Reviews*, (6), CD006818–CD006818. https://doi.org/10.1002/14651858.CD006818.pub2	Excluded	Systematic review of telemedicine use for parents of high-risk newborns. Excluded due to patient population age.
Vinson, M., Mccallum, R., Thornlow, D., Champagne, M., & Vinson, M. (2011). Design, implementation, and evaluation of population-specific telehealth nursing services. *Nursing Economic$*, *29*(5), 265–272.	Excluded	The telehealth was for nursing services only and patients had to see providers in clinic
Wilkinson, R., Spindler, M., Wood, C., Marcus, F., Weintraub, G., Morley, E., … Duda, E. (2016). High patient satisfaction with telehealth in Parkinson disease: A randomized controlled study. *Neurology: Clinical Practice*, *6*(3), 241–251. https://doi.org/10.1212/CPJ.0000000000000252	Included	Dual-arm randomized controlled trial patient satisfaction, patient travel burden, health care utilization, and clinical outcomes in a RD clinic.
Xu, T., Pujara, S., Sutton, S., & Rhee, M. (2018). Telemedicine in the Management of Type 1 Diabetes. *Preventing Chronic Disease*, *15*(1), E13. https://doi.org/10.5888/pcd15.170168	Included	Retrospective chart review of patients in an Endocrinology Telehealth Clinic evaluating hemoglobin A1c levels, changes in glycemic control, time savings for patients, cost savings for the US Veterans Health Administration, appointment adherence rates, and patient satisfaction with telehealth.

Reference (Include the full reference here)	**Included or Excluded and Document**	**Rationale**
Young, L., Foster, L., Silander, A., & Wakefield, B. (2011). Home Telehealth: Patient Satisfaction, Program Functions, and Challenges for the Care Coordinator. *Journal of Gerontological Nursing*, *37*(11), 38–46. https://doi.org/10.3928/00989134-20110706-02	Excluded	The program is a telehealth care coordination with an RN and not a provider. They continue to have to see their provider in clinic.

Table 4

Literature Review Table of All Studies Included

Citation	**Study Purpose**	**Pop (N), Sample Size (n) /Setting(s)**	**Design/ Level of Evidence**	**Variables/ Instruments**	**Intervention TM= Telehealth IP= In Person**	**Findings**	**Implications**
Abrams & Geier (2006)	To compare patient satisfaction with telehealth prenatal genetic counseling versus on-site prenatal genetic counseling	165 patients	Level VI Single pilot study	Questionnaire with a combination of 5 point Likert scale questions and YES/NO questions	TM IP	-There was a high level of patient satisfaction when video conferencing was used to conduct genetic counseling consultations performed by telehealth	-The use of telehealth in clinical genetics is an acceptable mode of communication for prenatal genetic counseling for underserved populations. -Studies with a larger sample size, controlled studies, as well as utilization of pre-consultation and post-consultation surveys may help to reduce response bias and make results nongeneralizable

Citation	Study Purpose	Pop (N), Sample Size (n) /Setting(s)	Design/ Level of Evidence	Variables/ Instruments	Intervention TM= Telehealth IP= In Person	Findings	Implications
Agha, et al, (2009)	Random control trial to evaluate patient satisfaction with TM versus IP consultations in categories of physician patient-centered communication, physician clinical competence, physician's interpersonal skills, and satisfaction with convenience of care	221 patients	Level II RCT	Patient Assessment of Communication during Telemedicine (PACT), a patient self-report questionnaire using a 5 point Likert scale	TM IP	-Patients did not perceive telemedicine to have a negative effect on physician-patient communication. -Patients reported a higher satisfaction with physician interpersonal and clinical skills and use of patient-centered communication during telemedicine compared to in-person visits. -Patients also reported telemedicine to be more convenient than in-person visits.	-Further research is under way to determine what factors are predictors of patient-centered communication and patient satisfaction during telemedicine visits. -The presence of a second provider during telemedicine visits may also promote patient confidence and result in improved satisfaction. -Provider factors that may explain high satisfaction with telemedicine include better visual and verbal attention during telemedicine to compensate for physical separation and audio lag.
Buchanan, et al., (2015)	Evaluate Per-patient costs, patient satisfaction, and attendance between telegenetics versus in-person counseling among individuals referred to CGC in four rural oncology clinics	162 patients	Level II RCT	6-item Genetic Counseling Satisfaction Scale, using a 5-point Likert-type response questions	TM IP	-Patient satisfaction was high among those who did attend a telegenetics session, even among individuals who might not be expected to be comfortable with computers. -In the randomized trial comparing telegenetics with in person cancer genetic counseling, they found the cost of cancer telegenetics was less than half that of in-person counseling.	Offers hope for oncology patients that want access to cancer genetic counseling at an affordable rate compared to in-person counseling. The education capabilities of telegenetics may be similar to those of in-person counseling. Recommend development of randomized trials that test the equivalence of multiple service delivery models on important longer-term behavioral and psychosocial outcomes
Cox, et al., (2017)	To systematically identify,	22 studies	Level V Systematic Review	n/a	TM	-In the systematic review 3 analytical themes emerged:	Telehealth can potentially minimize treatment burden

Citation	Study Purpose	Pop (N), Sample Size (n) /Setting(s)	Design/ Level of Evidence	Variables/ Instruments	Intervention TM= Telehealth IP= In Person	Findings	Implications
	appraise, and synthesize qualitative research on the experiences of adult cancer survivors participating in telehealth interventions, to characterize the patient experience of telehealth interventions for this group		of single descriptive or qualitative studies			(1) influence of telehealth on the disrupted lives of cancer survivors (convenience, independence, and burden); (2) personalized care across physical distance (time, space, and the human factor); and (3) remote reassurance—a safety net of health care professional connection (active connection, passive connection, and slipping through the net). -These three themes indicate telehealth interventions represent a convenient approach.	and disruption to cancer survivors lives. Telehealth interventions can facilitate an experience of personalized care and reassurance for those living with and beyond cancer. Telehealth interventions can provide cancer survivors with independence and reassurance. Future telehealth interventions need to be developed iteratively in collaboration with a broad range of cancer survivors to maximize engagement and benefit. It is important to consider individual factors when tailoring interventions to ensure engagement promotes benefit rather than burden.
Helsel, et al., (2018)	Explore digestive disease studies that use telemedicine to effectively manage disease activity, help monitor symptoms, improve compliance to the treatment protocol, increase patient satisfaction, and enhance patient-to-provider communication	20 research articles	Level V Systematic Review of single descriptive or qualitative studies	PRISMA guidelines for systematic review search	TM	Patient compliance and patient satisfaction ranged between 25.7%-100% and 74-100% respectively. -Disease activity improved following telemedicine interventions in several studies.	Telemedicine may be effective in managing disease activity and improving quality of life in digestive diseases. Further studies should explore both gastrointestinal and gastroesophageal disease using same interventions
Hwang, et al., (2017)	To describe patient experiences and perspectives of	17 patients with heart	Level II RCT	Mixed method with quantitative 10-cm visual analogue	TM IP	-29% preferred telehealth and 47% preferred a combined face-to	-Telehealth for heart failure rehabilitation is recommended in combination with face-to-face visits for local and rural patients, indicating improved

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	a group-based hear failure telerehabilitation program delivered to the homes via telehealth	failure		scale survey and a qualitative semi-structured interview face-to-face using a standardized protocol		face and telehealth approach. -Key motivating influence for telehealth was reduced transportation/travel time, no parking costs, which resulted in less family and caregiver burden. -Participants reported health outcomes such as increased strength, improved mood and balance, reduced symptoms of heart failure, return to daily activities, and fewer hospital admissions.	health outcomes, decreased travel times, increased social support, safe exercise environment, and enhanced heart failure knowledge. -Need for technical improvement in areas of auditory clarity, improved visual clarity (wide screens), improved connectivity through broadband internet, and initial computer training.
Kraai, et al., (2011)	To describe the current state of the literature on patient satisfaction with noninvasive telemedicine, regarding definition, measurement, and overall level of patient satisfaction	14 studies	Level V Systematic Review of single descriptive or qualitative studies	Literature search	TM	-Systematic review with 4 RCT, 7 pilot studies, and 3 observational studies with patients being very satisfied with telehealth. -The definition of patient satisfaction was poorly defined and measured in different ways with poorly constructed instruments.	-Patient-reported satisfaction with non-invasive telemedicine for heart failure patients is underexposed -The FDA recommends patient satisfaction be measured in telemedicine research with well designed, validated, and standardized instruments with theoretic foundation.
Kruse, et al., (2017)	To explore the association of telehealth and patient satisfaction in regard to effectiveness and efficiency	44 studies	Level V Systematic Review of single descriptive or qualitative studies	Literature review using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis method	TM	-Overall patient satisfaction can be associated with the modality of telehealth, but factors of effectiveness and efficiency are mixed. Patients expectations were met with TM. -the factors listed most often in the review were	-Telehealth is a feasible option for providers who want to expand their practices to remote areas without having to relocate or expand their footprint. -The review identified a variety of positive factors associated between telehealth and patient satisfaction, recommending healthcare facilities be knowledgeable of the factors when implementing telehealth.

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						improved outcomes (20%), preferred modality (10%), ease of use (8%), low cost (8%), and decreased travel time (7%). -The published studies did not clearly set out reasons for starting telehealth as an intervention, so it is not clear whether patient satisfaction is congruent with the change.	- Special care should be given to incorporate features that enable acceptance and reimbursement of TM.
Lin, et al., (2019)	To review identified and summarized studies examining the effectiveness of telemedicine interventions to deliver treatment for patients with substance use disorders.	13 studies	Level V Systematic Review of single descriptive or qualitative studies	Literature review	TM IP	-Studies examining interventions for nicotine use disorder resulted in telehealth interventions not being significantly better than in-person visits, however satisfaction was quite high with telehealth and participants reported increased convenience to be very important -Studies examining alcohol use interventions found the dropout rate was lower for telemedicine, however the outcomes compared to usual treatment. -Studies examining interventions for opioid use found the telehealth group had higher retention rates than in-person group, however the	-Telemedicine has been shown to be a promising approach to expanding reach and access to substance use disorder patients, especially in areas where treatments are less available. -Patient satisfaction was found to be high among the studies reviewed, but technical challenges were a frequent noted challenge and needs to be addressed. -The systematic review found substantial methodological limitations to the research conducted, indicating further research needed in large scale RCT.

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						outcomes for abstinence from opioids compared to in-person group.	
Mair & Whitten, (2000)	To review research into patient satisfaction with telehealth, specifically clinical consultations between healthcare providers and patients involving real time interactive video	32 studies	Level V Systematic Review of single descriptive or qualitative studies	Systematic literature review	TM	- All studies reported good levels of patient satisfaction. -Qualitative analysis revealed methodological problems with all the published work. -There is a paucity of data examining patients' perceptions or the effects of this mode of healthcare delivery on the interaction between providers and clients.	-Methodological deficiencies (low sample sizes, context, and study designs) of the published research limit the findings. -The studies suggest that teleconsultation is acceptable to patients in a variety of circumstances, but issues relating to patient satisfaction require further exploration from the perspective of both clients and providers.
Orlando, Beard, Kumar, & Orlando, (2019)	To examine whether patients and their caregivers living in rural and remote areas are satisfied with telehealth as a mode of service delivery in managing their health.	36 studies	Level V Systematic Review of single descriptive or qualitative studies	Systematic literature review using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRIMSA).	TM	-System experience with telehealth was the most common measure dimension found in the studies (81%) with high levels of satisfaction across all domains, especially service accessibility. -Communication between the patient and the health care provider had a positive influence. -Anonymity of telehealth was found to be helpful for patients as they reported it was easier to relay stuff compared to in person. -Overall satisfaction was measured in a number of ways with	-Telehealth was found to have high patient satisfaction especially if the appointment in-person required long distance travel. -Given the patient and caregivers high satisfaction, telehealth pays a crucial role in addressing barriers to health care access in rural and remote areas. -The findings of this review reinforce the need for health care providers to actively engage and partner with patients when face-to-face appointments have been substituted for telehealth -Future research is needed to improve methodological concerns.

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						questionnaires scoring greater than 80% in overall satisfaction.	
Piga, et al, (2017)	To systematically review the scientific literature regarding tele-rheumatology and draw conclusions about feasibility, effectiveness, and patient satisfaction	23 studies	Level V Systematic Review of single descriptive or qualitative studies	Systematic literature review	TM	-Systematic review found that rheumatology telemedicine is very well accepted by patients and have been found to bridge the gap in rheumatology provider shortage and decrease travel times for patients. -Found to have high feasibility, high patient satisfaction rates, and there is evidence for a superior or equal effectiveness compared to in-office visits -There was methodological biases and wide heterogeneity of interventions preventing definitive conclusions if telemedicine is equal or superior to in-office visits with rheumatology.	-Telemedicine may provide a well- accepted way to remotely deliver consultation, treatment, and monitoring disease activity in rheumatology patients however there is need for higher quality RCTs demonstrating effectiveness of different telemedicine rheumatology interventions are needed.
Polinski, et al., (2016)	To assess patient's satisfaction with and preference for telehealth visits in a telehealth program at CVS minute clinic	1734 patients	Level IV Cross sectional case control study	12 Item survey with a 5 point Likert scale design	TM IP	-32% expressed a preference for receiving care via telehealth. -An additional 57% rated telehealth visit as "just as good as a traditional visit". -1% of patients rated the telehealth as "worse than a traditional visit".	Patients reported high satisfaction with their telehealth experience suggesting that telehealth may facilitate access to care.

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						-94%-99% reported being "very satisfied" with all attributes of telehealth. -95% appreciated convenience of the service. -99% would "definitely" or "probably" use telehealth again or would recommend telehealth to someone else.	
Powell, et al., (2017)	To describe patient experience with video visits performed with their established primary care clinicians.	19 patients	Level VI Qualitative Study	Telephone interview with semi-structured format	TM	-Participants expressed cost and transportation as the main considerations for preferring telehealth. -Other barriers that telehealth minimized include dealing with traffic, being late to appointments, finding offices, scheduling a convenient appointment, childcare, and physical limitations. -Barriers to telehealth included not having privacy if they did their telehealth exam at their workplace. -Patients reported they preferred in-office visits as a supplement to telehealth if they were getting new of a fatal disease, needed immediate care, or if a physical exam would affect decision making	-Telehealth visits are acceptable in a variety of situations with the study showing patients prefer telehealth over in-office visits. -Future studies should explore which patients and conditions are best suited for telehealth visits

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Sabesan, et al, (2012)	To describe satisfaction of patients and rural health workers with this model of teleoncology.	50 patients	Level VI Single Descriptive Study	16 item survey with 5-point Likert scale.	TM	-Main themes were ease of communication, ability to form rapport through telehealth, ability to save time and money, reduced travel, opportunity to received specialized oncology care close to home -In the initial stage of study 22% of patients would rather travel to the main campus of Townsville instead of telehealth at home clinic and only two patients preferred to travel to Townsville in later cohort of study.	Based on the favorable patient satisfaction and positive responses from healthcare workers, this study further strengthens the argument for implementing videoconferencing as part of routine medical oncology clinics, especially in rural and remote areas of healthcare.
Wilkinson, et al., (2016)	To assess patient satisfaction, clinical outcomes, travel burden, and healthcare utilization in Parkinson's Disease using telehealth for follow-up care with specialty providers.	86 patients	Level II RCT	Dual arm control group quantitative Patient Assessment of communication of Telehealth (PACT) questionnaire	TM IP	-The PACT questionnaire showed significantly higher satisfaction for both telehealth interventions compared to usual in-office treatment at 6 months and 12 months. -Convenience related to distance to travel, satisfaction was significantly higher in both telehealth groups at 6 and 12 months -There was equal or improved overall communication, addressing of clinical concerns, and overall quality of visit compared	-This study suggests that using telehealth to treat patients with Parkinson's Disease results in high patient satisfaction, reduced travel burden, equal clinical outcomes, and perhaps improved health care utilization especially in areas where Parkinson's neurological specialists are not available.

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						with in-person visits -Overall patients satisfaction for telehealth was equal to in-person care. -Clinical outcomes were similar in both arms	
Xu, et al., (2018).	Evaluation of telemedicine's Evaluation of effectiveness in delivering endocrinology care from Atlanta-based endocrinologist	32 patients	Level VI Systematic Review of single descriptive or qualitative studies	Retrospective chart review	TM	-Patients saved 78 minutes of travel time (one way). -The VA saved $72.94 in travel reimbursement per patient visit. Totaling $9,336.32 per year for the 32 patients -100% of the respondents agreed or strongly agreed with the statement that they would recommend telehealth to other veterans -90.9% respondents agreed or strongly agreed that they would rather use telehealth than travel long distances to see their endocrinologists. -Two patients preferred in-person care over telehealth	-The findings of the study support growing evidence that telemedicine is an effective method of health care delivery and is associated with cost savings, time savings for patients, high appointment adherence, and high patient satisfaction. -Further studies with larger, more representative samples of patients with type I diabetes are needed to elucidate telemedicine's effectiveness in providing health care to broader patient populations.