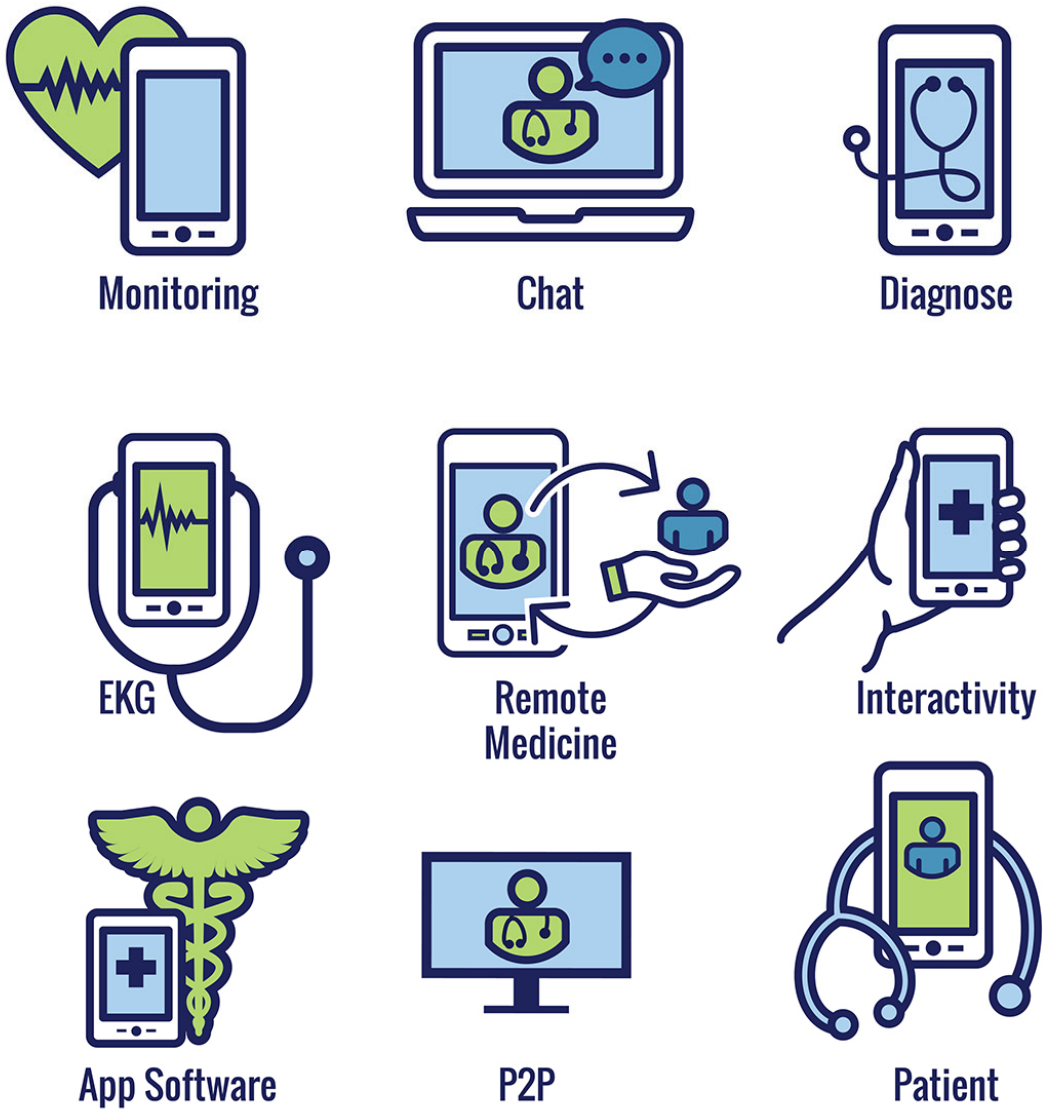
TELEHEALTH USE AMONG RURAL INDIVIDUALS WITH DISABILITIES



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Telehealth Use Among Rural Individuals with Disabilities

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SUMMARY

Telehealth systems facilitate the delivery of health-related information and services, and encompass a large range of applications. Advocates of telehealth services assert that these services expand access to care, increase convenience to patients, improve quality, and reduce costs relative to in-person care, among other benefits. This is particularly true in rural areas where access to care is limited, and telehealth services are currently being used for a range of services in rural communities. However, for individuals with disabilities living in rural areas, access to care is even more challenging. At present, less is known about the use of telehealth services among individuals with disabilities residing in rural areas to address their barriers to healthcare. Therefore, **the purpose of this scoping study is to systematically identify how the disability community is using telehealth in rural areas.**

This scoping study, focused on 'how' the disability community is 'using' telehealth in rural areas, relies on systematic searches of both published literature and anecdotal information. The results identified a few studies conducted on telehealth for people with disabilities residing in rural areas. There is little else reported regarding how the disability community is using telehealth in rural areas. What is reported is self-care management using telehealth mechanisms. The findings suggest that telehealth is emerging as a tool with the potential to improve access to care, potentially reduce costs, and enhance patient satisfaction. There is less support for telehealth's potential to improve health outcomes. Clinicians recognize the potential benefits of telehealth for individuals with disabilities, but their knowledge and confidence prescribing treatment via telehealth is a significant barrier to its use.

Individuals with disabilities residing in rural areas are increasingly using telehealth services as an effective approach to self-manage their chronic health conditions. Individuals with disabilities residing in rural areas are also using telehealth-based mental health services. Self-care management telehealth applications, with a few exceptions, are in the early stage of development and adoption by individuals with disabilities residing in rural areas. There is, however, great potential for telehealth services to have an increasingly positive impact on the quality of rural individuals with disabilities' lives.

INTRODUCTION

Telehealth refers to the use of telecommunication systems to facilitate the delivery of "health-related information and services" (Scott et al., 2007). Telehealth encompass a large range of services and modalities enabling remote health care in a variety of clinical applications. Telehealth applications and modalities continue to evolve as providers, payers, and technology firms develop new telehealth services. However, there are five general types of telehealth services: Direct-to-Consumer (DTC), Provider-to-Provider (PTP), Remote Patient Monitoring (RPM), Store and Forward (S&F), and mobile health applications (mHealth).

1. DTC services are patient-initiated synchronous two-way voice or video virtual visits with clinicians in another location using devices such as smartphones, tablets, and computers. DTC services can include routine physician visits, mental health visits, dermatology visits, and other types of services.
2. PTP services involve a clinician at an originating site, in the presence of a patient, initiating synchronous communication with another clinician (often a specialist) at another site.
3. RPM involves a patient at home being monitored by a clinician from a remote location using two-way video or an electronic device (MedPAC, 2018).
4. S&F is collecting clinical information and sending it electronically to another site for asynchronous evaluation.
5. mHealth refers to the use of mobile and wireless technologies to support the achievement of health objectives, typically self-care such as a mobile app for delivering exercise programs (Lai et al., 2019).

Advocates of telehealth services assert that these services can expand access to care, increase convenience to patients, improve quality, and reduce costs relative to in-person care. Others caution that telehealth services in their many forms may not succeed in accomplishing these aims in all cases and instead may act as a supplement to in-person services rather than a substitute (MedPAC, 2018).

While rural areas represent 97 percent of the U.S. land area, they also only represent approximately 19 percent of the population (about 60 million people), as defined by the U.S. Census Bureau (US Census Bureau, 2016). While there is significant diversity across rural

areas, rural residents on average experience higher rates of poverty and worse health outcomes than urban residents (CMS, 2018). Rural areas have higher rates of cigarette smoking, hypertension, obesity, and physical inactivity during leisure time than urban areas (Moy et al., 2017). Access to care is also limited in rural communities, primarily because of travel distances and healthcare costs (CMS, 2018). Limited access is exacerbated by health workforce shortages in many rural areas (RHIH, 2017). The shortage of healthcare providers is most prevalent for specialty physicians. As of 2010, there were 263 specialists per 100,000 population in the most urban counties and 30 specialists per 100,000 population in the most rural counties (CMS, 2018).

While rural residents account for a relatively small percentage of the total U.S. population, they represent a higher proportion of people with a disability: 17.1% of rural Americans report a disabling condition compared with 11.7% of urban-dwelling Americans (RTC, 2017). The higher rates of disability persist across gender, race, impairment type, and all age groups. Rural living can pose unique challenges for people with disabilities (NACCHO, 2018). Due to their decreased likelihood of being insured, lack of access to transportation, and need for more frequent medical attention, rural residents with disabilities may be doubly disadvantaged by the limited healthcare services available in their communities (Gallagher et al., 2011; Krahn et al., 2014). Additionally, while accessing general healthcare services in rural areas is challenging, it is even more so for people with disabilities to access specialty care (Zhou & Paramanto, 2019). As a result, adults with disabilities living in rural areas typically rely on services that are more informal and less specialized (NACCHO, 2018). They must travel farther and pay more for those services, and they tend to receive lower quality care than their urban counterparts (Weber et al., 2001). Barriers to health care for individuals with disabilities are often structural in nature and include less access to transportation making it difficult physically and requiring significant time to get to a healthcare provider's office or clinic (CMS, 2018).

Telehealth services are currently being used for a range of services in rural communities (CMS, 2018). Telehealth allows patients in rural areas to connect directly with health care providers, specialty care (e.g., psychiatry and dermatology), real-time consultation between providers, and is also used to support rural health care providers with clinical decision-making and remote diagnosis. Telehealth has been used to provide assistive technology assessment, diagnostic evaluations, assessment and therapy services, and consultation opportunities for people with disabilities in rural communities (Zhou & Paramanto, 2019). Telehealth shows positive results

for patient satisfaction in rural areas, including reducing travel times, increasing access to and interactions with physicians, and ensuring that the patient is adhering to treatment (CMS, 2018). Telehealth services are seen as an opportunity to increase access to care for rural beneficiaries by reducing the need to travel for healthcare services and supporting the healthcare workforce through provider-to-provider consultations (CMS, 2018).

At present, less is known about the use of telehealth services among individuals with disabilities residing in rural areas to address their barriers to healthcare. Therefore, **the purpose of this scoping study is to systematically identify how the disability community is using telehealth in rural areas.**

METHODS

This research was approached as a scoping study, where the evidence for how rural disability communities are using telehealth is not readily apparent. Therefore, this scoping study takes two approaches. First, a systematic search to identify a comprehensive list of published records from electronic databases was used. Second, internet searches using Google were carried out to identify anecdotal records. These approaches identified published scientific studies, grey literature, and advocacy or position publications. It is important to note that rather than focusing on research of trial applications of telehealth methods, both approaches focused on 'how' the disability community is 'using' telehealth in rural areas. This was the significant limiting factor of the available evidence.

The Google and Google Scholar internet searches were conducted using the following words and phrases in the title or abstract; (disab* OR handicap* OR impair*) AND (telehealth OR telemedicine OR telerehabilitation OR mobile health) AND (rural OR medically underserved). The order of operations was 'disability', then 'telehealth', and finally 'rural'. The searches generated mostly pilot studies, some case studies and cost-effectiveness studies. Ancestral searches were conducted of the returns to generate additional returns, although few. The identified materials were considered for inclusion when they contributed in some way to understand 'how' rural disability communities are 'using' telehealth, and are reported in the following *Relevant Common Practices* and *Barriers* sections.

The systematic search of published records was begun but not completed as one of the records first identified represented a very recently published systematic literature review conducted during June 2018 by Zhou & Paramanto (2019) that was closely aligned with this effort. The objective of this study was to evaluate the current status of digital interventions for people with disabilities in remote and underserved areas. The keywords used in the study were (Telehealth OR mHealth OR telerehabilitation OR eHealth OR telemedicine) AND (disability or impairment) AND underserved OR rural). A full description of the study methods may be found in the published article. The general results of this systematic search are reported in the following section, *Evidence-Based Practices.* However, the identified studies were typically conducted to determine the efficacy of telehealth strategies in achieving positive outcomes among rural populations of individuals with disabilities. As such, these studies do not necessarily represent telehealth practices currently being used by individuals with disabilities, but do identify effective strategies for doing so.

FINDINGS

Evidence-Based Practices

A small number of small-scale studies have been conducted on telehealth for people with disabilities residing in rural areas. Zhou and Paramanto (2019) identified 10 studies conducted between 2003 and 2018 specific to telehealth use among rural populations with disabilities, the results for which are shown in Table 1. This systematic review showed that most participants with disabilities had a positive opinion regarding the digital interventions delivered via telehealth. Most of them had reasonable levels of satisfaction, and some of them had functional improvement in motor performance, language ability, and self-care skills. Their mental status and quality of life showed improvement in other studies. In addition, telehealth made it possible for them to access desired interventions and saved them time and money. The digital intervention technology generally used was videoconferencing.

Table 1. Results of the identified studies (Zhou & Parmanto, 2019).

Reference	Duration of intervention	Interventions	Outcome measures	Results
Clark et al, 2002 [40]	17 months	PT[a], OT[b], SLT[c], vocational rehabilitation, and psychological services	Mobility, self-care ability, emotion, language ability, and cost and travel savings	Patient was functionally independent in household walking and self-care; functional use of affected lower extremity for support and balance; patient could express basic needs independently, communicate complex ideas; caregiver's mood was more positive; and cost and travel savings
Forducey et al, 2003 [41]	24 weeks	PT, OT, SLT, neuro-psychological services, and telementoring	Physical and cognitive function of patients and nursing home staff's perception and satisfaction	Improvements in neuropsychological status and physical functioning and the telementoring program was very beneficial
Barlow et al, 2009 [42]	2 years	Wheelchair seating assessment and intervention	Patient and therapists' satisfaction, intervention goal attainment, travel expense, therapists' time spent in providing service, and wait time and completion time	Clients had similar satisfaction ratings to those seen F2F[d]; clients had their goals met as often as clients seen F2F; travel cost savings; rural therapists spent more time in preparation and follow-up; and clients had shorter wait times for assessment than rural F2F clients
Kelso et al, 2009 [43]	1 month for 2 families, 3 months for the other 2 families	EI[e] (SLT, OT, and PT)	Parental satisfaction, usability of the system, interventionists' feedback, and cost and travel savings	Videoconferencing-based tele-EI system is both usable and satisfactory to most participants; parents and therapists experienced technical problems; and cost savings for delivering EI via telehealth
Schein et al, 2010 [44]	88 min on average	Assessment and prescription of wheelchair and seating	Users' satisfaction, comfort and time and cost savings	A high level of patient satisfaction and saved money and time
Olsen et al, 2012 [45]	1 year	EI, home visits, and coaching model	Cost savings, participants' rating, and provider and family satisfaction	Cost savings and increased availability of services from specialists; parents' comfort with technical skills was high; provider's ratings of comfort with the telehealth experience were high; parents were satisfied with each visit modality; most providers (79%) were satisfied with the telehealth experience; and telehealth removed time and travel barriers and increased availability of qualified personnel
Levy et al, 2015 [47]	On average 99 days	PT	Functional level, quality of life, and satisfaction	Significant improvement in most outcome measures; 96% of patients were satisfied with the telehealth experience; and avoided travel miles, driving time, and travel reimbursement
Langkamp et al, 2015 [48]	1 year	Connection to primary doctor	Parents' satisfaction, school staff's satisfaction and comfort with the program, and participating practice members' experience with the program	Most parents had a high level of satisfaction with the program; parents were satisfied with the care their child received; school staff noticed benefits of telehealth; and participating providers agreed to continue the participation
Sangelaji et al, 2017 [49]	24 weeks	12 weeks Web-based physiotherapy followed by 12 weeks behavioral change intervention	Participants' feedback, physical activity, body function and composition; quality of life, fatigue, and mental status	Intervention was not effective for the participants; accepted telehealth practice; overall dissatisfaction with using the activity monitors; and both positive and negative aspects of website use
Portaro et al, 2018 [50]	6 months	Telemonitoring, psychological consultation, neurological, and pneumological assessment	Number of hospital admissions, patients' satisfaction, the clinical impact, and quality of life	Reduced hospital admissions; patients had a mild improvement in emotional and mood status; body mass index remained stable; patients developed better skills to solve problems; no change on caregiver burden; and reasonable level of satisfaction

As reported by Zhou and Paramanto (2019);

> A few studies included in this review provided services and evaluated the situations of family caregivers (Clark et al., 2002; Portaro et al., 2018). The results indicated that these caregivers were helped by the digital intervention (such as psychotherapy and communication skills) and that caregivers were satisfied with the intervention delivered to patients via telehealth.
>
> Some studies also assessed the local and remote care providers' experience with participating in the telehealth-based intervention (Langkamp et al., 2015). Overall, these care providers were generally satisfied with this digital intervention delivery approach as it provided intervention results comparable with face-to-face visits, increased patient contact time, and reduced travel time and costs.
>
> For some specific interventions, such as EI [early intervention], it is known that for children it is beneficial to be delivered within the child's natural environment and to use daily activities with familiar people. In this case, digital intervention via telehealth might be the only plausible approach for delivering EI to children in underserved areas at a specific time and frequency.
>
> In most of these studies, the telehealth technology was VC for synchronized intervention, in which all parties (patients, caregivers, local care providers, and the remote care team) could interact in real time. This is desired in most cases. In some circumstances, asynchronous telehealth may be superior to synchronized communication or traditional in-office visits (Langkamp et al., 2015), as children with DD may not cooperate when a doctor is observing. In a store-and-forward mode, children may not have the stress, and they are more likely to cooperate when having a medical exam done by a school staff they know.

Zhou and Paramanto (2019) also suggest that research studies in telehealth use among individuals with disabilities have not significantly improved in the past two decades. Each of the studies found in the literature review were conducted to determine the efficacy of telehealth strategies in achieving positive outcomes among rural populations of individuals with

disabilities. Although relevant to the purpose of this scoping study, these studies do not necessarily represent telehealth practices currently being used by individuals with disabilities.

Relevant Common Practices

Currently, there is very little reported concerning how the disability community is using telehealth in rural areas. Much of what is reported describes remotely facilitating self-care management in the home setting via telehealth. Of the five general types of telehealth services, synchronous Direct-to-Consumer (DTC), Provider-to-Provider (PTP), and mobile health applications (mHealth) are those reported being used. Store and Forward (S&F) and Remote Patient Monitoring (RPM) were less reported.

In addition to indicating that rural residents are less likely than their urban counterparts to use telehealth, and that individuals with disabilities are less likely to use telehealth than individuals without disabilities, Stenberg (2018) reported three findings. First, individuals with a disability were more likely to conduct online health research than those without a disability, and rural residents with disabilities had lower rates than urban residents with disabilities (Stenberg, 2018). Second, individuals with disabilities were less likely to conduct online health maintenance than those who were not disabled, despite potentially being more involved with medical practices than those without disabilities (Stenberg, 2018). Third, individuals with disabilities were less likely to have their health monitored than those who were not disabled, despite having a potentially greater need or greater involvement with medical personnel than individuals without disabilities (Stenberg, 2018).

The consensus is that telehealth is emerging as a tool with the potential to improve access to care, potentially reduce costs, and enhance patient satisfaction. In addition, the evidence supporting telehealth is strongest for the care of patients with certain chronic conditions, although lacking for other types of conditions (CMS, 2018). Clinicians recognize the potential benefits of telehealth for individuals with disabilities, but their knowledge and confidence prescribing treatment via telehealth is a significant barrier to its use (Morris et al., 2019).

Two recent commissioned reports to Congress on Medicare/Medicaid and telehealth use did report its use by individuals with disabilities, albeit the report is limited (CMS, 2018; MedPAC, 2018). These reports to Congress found that telehealth services were most used for basic healthcare and mental health services (MedPAC, 2018). Although insurance plans cover

telehealth in rural areas, only half cover telehealth to the patient's residence (MedPAC, 2018), typically DTC services, as an alternative to telehealth originating between two healthcare facilities such as PTP services that require the beneficiary to go to a local healthcare facility.

According to the Centers for Medicare & Medicaid Services (CMS, 2018), beneficiaries using telehealth services in 2016 tended to be under age 65, eligible for Medicare through disability, and dually eligible for Medicare and Medicaid. In 2016, beneficiaries under age 65 accounted for 56 percent of telehealth services, although representing just 17 percent of all Medicare beneficiaries. In 2016, 53 percent of telehealth users were eligible for Medicare through disability and 62 percent were dually eligible for Medicare and Medicaid. Although dually eligible beneficiaries account for roughly 20 percent of the Medicare population, these dual-eligible beneficiaries accounted for 71 percent of telehealth claims. In 2016, persons with disabilities accounted for 65% (58,406) of beneficiaries using telehealth. These beneficiaries used over 66% (182,858) of all telehealth services. And among all telehealth users in 2016, 57 percent resided in rural locations and 43 percent in urban locations.

CMS's findings suggest individuals with disabilities residing in rural areas are using telehealth, although likely PTP services. Between 2014 and 2016, there was a 37.7% increase in the number of beneficiaries with disabilities using telehealth, and a 53.7% increase in the total services these beneficiaries used (CMS, 2018).

The Medicare Payment Advisory Commission, in their 2018 report to Congress, found that most Medicare's telehealth users (92 percent) were categorized in at least 1 of CMS's 20 chronic condition categories, compared with 79 percent of non-telehealth users. Telehealth users most commonly had hypertension (44 percent) and depression (37 percent), compared with 43 percent and 12 percent of nonusers, respectively. A disproportionate share of telehealth users were classified in the schizophrenia (19 percent) and bipolar disorder (18 percent) categories, compared with non–telehealth users (MedPAC, 2018). These findings, and those of CMS, support telehealth use by people with disabilities to be most commonly for basic healthcare and mental health services (MedPAC, 2018).

Telehealth methods have been shown to be an effective approach in empowering persons with severe disabilities and their family caregivers to `self-manage' their own chronic health conditions, showing improvements in psychosocial functioning and self-management skills

(Forducey et al., 2012). Additional research suggests that training family caregivers via telehealth methods is effective (Myers et al., 2018). Home-based telehealth technologies can be used to optimize coping and community integration skills for adults with severe functional disabilities (Dorstyn, Mathias, & Denson, 2011). For example, videoconferencing counseling on psychosocial functioning of rural teenagers with epilepsy has been shown to be effective in meeting outcomes (Glueckauf et al., 2002). For other chronic conditions and populations, such as depression among women with physical disabilities in rural areas, telehealth may be an effective response to barriers to accessing mental health services. However, little has been examined regarding the application of telehealth services among women with disabilities (Khubchandani & Threw, 2016).

Similarly, little has been examined regarding the different telehealth service modes, such as mHealth or mobile healthcare applications for people with disabilities. Jones et al. (2018) examined mobile healthcare, and particularly the proliferation of mobile health software applications (mHealth apps), and found that people with disabilities are not well represented (Jones et al., 2018). With a few notable exceptions (autism, mental health, stroke), people with disabilities have not been a primary target for mHealth app development (Jones et al., 2018b). Concerns have been raised that the proliferation of mHealth could increase health disparities if the apps disproportionately benefit advantaged populations and leave vulnerable populations behind, including people with disabilities. Early evidence suggests that disparities may already exist between populations with disabilities and those without disabilities in adoption of mHealth apps. While smartphone ownership is about equal among adults with and without disabilities (71% vs. 68%), the rate of adoption of mHealth apps is lower by half – 17% of adults with disabilities vs. 34% of adults without disabilities report downloading at least one app that is meant to support their health (Jones et al., 2018; Jones et al., 2018b).

Jones et al. (2018b) conducted a systematic review of the literature and identified 8 studies concerning the current state of mobile healthcare for people with disabilities. The findings indicate that mHealth development and application for people with disabilities is in its early stages with virtually no evidence of effectiveness on health outcomes of people with disabilities (Jones et al., 2018b). However, users with disabilities of mobile apps indicated a high adoption rate (40%) of mHealth apps, but also pointed to difficulties in locating suitable apps for users with disabilities (with disability-focused apps accounting for about 2% of all mHealth apps

(Jones et al., 2018b)), problems with accessibility of apps, and concerns about the accuracy or relevance of content in "mainstream" mHealth apps (Jones et al., 2018). The findings suggest three types of mHealth apps are needed; (1) mainstream health and wellness apps and those for managing chronic health conditions and risk factors, (2) those that target health conditions or risks unique to people with disabilities, and (3) accessibility interfaces or add-ons that work with mHealth apps may be needed for some users with disabilities (Jones et al., 2018).

The same 2018 study (Jones et al., 2018b) identified numerous web resources that provide information about mobile apps for people with disabilities, as provided in Table 2.

Other individual studies have generally found that patient satisfaction is high for those who receive telehealth services. A study comparing outcomes of wheelchair seating and positioning intervention using telehealth and face to face visits in rural areas found that telehealth clients had similar satisfaction ratings and were as likely to have goals met. Telehealth saved travel costs. Rural therapists using telehealth spent more time in preparation and follow up than the other groups (Barlow et al., 2009). Another study suggests that pediatric subspecialty telemedicine consultations can be provided to children with special health care needs living in a rural communities with high satisfaction among local providers and parents/guardians for being more accessible, family-centered, and coordinated among patients and their health care providers (Marcin et al., 2004). This study supports the findings of an earlier study examining the use of telehealth to provide subspecialty care for children with special health care needs residing in rural areas, which found it to be an acceptable means of delivering care when part of an integrated health services delivery (Karp et al., 2000). In another study conducted with rural children with special needs participants reported that telehealth-based consultations were at least as effective as those delivered on-site, with significant cost savings (Harper, 2006), and telehealth was used successfully to improve metabolic control and reduce cardiovascular risk in an ethnically diverse and rural population of individuals with diabetes in another study (Davis et al., 2010).

Table 2. mHealth apps available on websites for people with disabilities (Jones et al., 2018b).

Website Name	Disability Category	# of Apps on Site	# of mHealth Apps on Site	Names of Apps
FCC's Accessibility Clearing House (www.ach.fcc.gov)	Blind/Visually Impaired	88	0	
FCC's Accessibility Clearing House	Cognitive	56	6	Behavior Status, In Case of Emergency (ICE) personal health information; PE (Prolonged Exposure) Coach; PTSD Coach; Seizure Log; Small Talk Pain Scale
FCC's Accessibility Clearing House	Mobility	40	3	ICE; RxMindMePerscription; Seizure Log
GARI App Database (https://www.gari.info/findapps-results.cfm)	All	117	3	Tetra Alarm; Hear and Tinitus; MIMI MearingTest
Apps for the Deaf and Hearing Impaired (www.appadvice.com)	Deaf/HoH	14	0	
iOS Apps Developed Specifically for Blind or Low Vision Users (www.applevis.com)	Blind/Low Vision	112	1	CrowdViz
Orion ISO (www.orioniso.com)	All	21	1	My Emergency Info
Friendship Circle (www.friendshipcircle.org)	Autism/Learning Disabilities	7	1	Behavior Tracker Pro
AFB's Collection of Accessible Apps for Android (www.afb.org/afbpress/pub.asp?DocID=aw140303)	Blind	10	0	
Assist Ireland (www.assistireland.ie)	All	103	5	Pill Reminder; Med Coach; iFall; Fall Alert; Fall Detection
Choice (www.choice.com.au)	All	8	0	
Living Well with a Disability (www.livingwellwithadisability.org)	All	5	0	
Disabled-World (www.disabled-world.com)	All	106	1	WebMD Webscape (for healthcare providers)
Bridging Apps (www.search.bridgingapps.org/apps)	All	3245	35	ICE; Emergency: Alerts notifications, and preparation; Depression and mood management; Anxiety management (relaxation, mindfulness, deep breathing); CareZone (disease management app for caregivers); Bipolar Disorder, ADHD, PTSD, OCD management; Track-It seizure log; Exercise Buddy for Autism and children with DD; Bowel Mover Pro for IBS; Birdhouse for Autism (behavior, health and daily living manager for parents); Moving Forward problem-solving app for chronic disease management; PumpPartner for managing baclofen pump; SlowControl vibrating fork app to slow rate of eating; Grey Matters for caregivers managing dementia; Feeding Tube Kids for managing tube feedings; Connections information and referral app for caregivers of special needs children
		3932	56	

Barriers

However, there are barriers to telehealth's adoption by individuals with disabilities in rural area. Of course, broadband infrastructure is less likely to be in place in rural areas, particularly for lower income populations that include many individuals with disabilities. People with disabilities have less access to the internet, and those that do tend to have slower connections (APA, 2019), although smartphone ownership is about equal among adults with and without disabilities (Jones et al., 2018b; Morris et al., 2016). Regulatory barriers also exist as consumers pay for telehealth services through reimbursement models such as Medicare, Medicaid, or private health insurance programs (described as follows).

Current Relevant National and State Policies on Telehealth by Payer (Alonso et al., 2019)

This section is taken verbatim (with citation revisions to coordinate with this report) from Alonso et al.'s (2019) policy brief concerning *Telehealth in Rural America*:

Medicare: For individuals 65 years of age and older, or under 65 with specific disabilities, Medicare reimburses for established telehealth services under certain conditions (CMS, 2018). Medicare does not cover remote patient monitoring or store and forward delivery services, except in Alaska or Hawaii. Services covered are described by Current Procedural Terminology (CPT) or Healthcare Common Procedure Coding System (HCPCS) codes. In 2018, code 99091 allowed providers to get reimbursed for remote monitoring of data collection and interpretation (CMS, 2018). In November of 2018, CMS approved a new rule that allows reimbursement for virtual check-ins to determine if a patient issue warrants an office visit or seeking emergency care. CMS will reimburse for the check-in only if it does not result in a face-to-face encounter. In addition, the rule will allow reimbursement for "store and forward" services of images or other pre-recorded patient information that could not substitute for an in-person appointment. Lastly, the rule includes reimbursement for technology-facilitated interprofessional consultation. CMS also added a new interim rule that would allow exemptions to the requirements for originating sites. These exceptions would allow a patient's home to become an originating site when being treated for substance abuse disorders and allow mobile stroke units to be considered a reimbursable originating site.

New reimbursable service are categories that include services like those already approved for telehealth delivery such as consultations or office visits, and services not similar to Medicare

approved services, but services where technology may prove beneficial. Medicare Advantage plans may reimburse for telehealth but charge higher premiums or copays. Providers who can deliver telehealth services include physicians, nurse practitioners, physician assistants, nurse midwives, clinical nurse specialists, clinical psychologists and clinical services workers, and registered dietitians or nurse professionals (CMS, 2018).

The originating site for telehealth is the patient's location at the time of service, which must be in a health professional shortage area (HPSA) or county outside of a Metropolitan Statistical Area (MSA) (CMS, 2018). Rural HPSAs, defined by the federal office of rural health policy (FORHP), are facilities located within an MSA but in rural census tract which can be made an eligible telehealth site. Eligible telehealth sites are provider offices, hospitals (including critical access hospitals), rural health clinics, federally qualified health centers, skilled nursing facilities, community mental health centers, and hospital based or critical access hospital based renal dialysis centers. In addition to those identified above, exceptions to the Medicare telehealth reimbursement include programs such as the Next Generation ACO, Shared Savings Programs, Episode Payment Models, and Comprehensive Care for Joint Replacement Models (CMS, 2018).

Medicaid: Telehealth reimbursement via Medicaid is allowed if service delivery meets federal requirements for efficiency, economy, and quality care. There are wide parameters given to each site on how to both assemble and manage their state telehealth policy. If services are reimbursed for the same amount as when delivered face to face, there is no need for states to submit a state plan amendment to Medicaid (Medicaid, 2018).

No states have the exact same definition and regulation of telehealth. Forty-nine states reimburse for live video Medicaid services, with only fifteen states providing reimbursement for store and forward. Twenty states reimburse for remote patient monitoring and twenty-three states restrict what constitutes as an originating site. Thirty-two states offer either a transmission or facility fee when using telehealth (Medicaid, 2018).

Private Payer Telehealth: Most states (thirty-eight and DC) legislate policies on private payer reimbursement for telehealth, with no federal legislation for private payers to provide coverage for telehealth services. The state laws are mixed, with some states requiring the same level of reimbursement for face to face and some requiring a minimum level of reimbursement. The most

restrictive state policies involve health professional licensing across states, with state professional boards providing differing telehealth standards for their providers.

Enforcement

Because there is little or no jurisprudence on how disability rights laws apply to telemedicine, case law is paramount. In this regard, the existing case law for website accessibility may be viewed as indicative of requirements under the ADA. They may also signal how the courts will interpret the ADA when it is applied in cases involving telemedicine. In an environment where Congress has not acted expeditiously to clarify legislative intent as it relates to the ADA and telemedicine, rulemaking and enforcement agencies and courts will be left to ensure that people with disabilities are both not segregated and enjoy the same access as those without disabilities (Powers et al., 2017).

CONCLUSION

Little is known about the use of telehealth services among individuals with disabilities residing in rural areas to address their barriers to healthcare. Therefore, the purpose of this scoping study is to systematically identify how the disability community is using telehealth in rural areas. The findings are focused on 'how' the disability community is 'using' telehealth in rural areas.

A small number of small-scale studies have been conducted on telehealth for people with disabilities residing in rural areas. This systematic review indicates that most individuals with disabilities receiving care using telehealth had a positive opinion regarding the experience, some experienced functional improvement in motor performance, language ability, self-care skills, mental status, and quality of life. In addition, telehealth made it possible for them to access desired interventions and saved them time and money.

There is little else reported regarding how the disability community is using telehealth in rural areas. What is reported is self-care management using DTC, PTP, and mHealth mechanisms. The consensus is that telehealth is emerging as a tool with the potential to improve access to care, potentially reduce costs, and enhance patient satisfaction. There is less support for telehealth's potential to improve health outcomes. Clinicians recognize the potential benefits of telehealth for individuals with disabilities, but their knowledge and confidence prescribing treatment via telehealth is a significant barrier to its use (Morris et al., 2019).

Individuals with disabilities residing in rural areas are increasingly using telehealth services as an effective approach to self-manage their chronic health conditions. Individuals with disabilities residing in rural areas are also using telehealth-based mental health services. The mHealth telehealth applications, with a few exceptions, are in the early stage of development and adoption by individuals with disabilities residing in rural areas. There is, however, great potential for mHealth and other telehealth services to have an increasingly positive impact on the quality of rural individuals with disabilities' lives.

Since technology literacy and preferences tend to vary, it is crucial that telehealth providers collaborate with people with disabilities and caregivers to ensure that the telehealth technologies are tailored to their specific needs (Scherer, Sax, & Glueckauf, 2005).

BIBLIOGRAPHY

Alonso, W., Crouch, E., & Thorell, N. (2019). Telehealth in Rural America. National Rural Health Association Policy Brief. Retrieved from https://www.ruralhealthweb.org/NRHA/media/Emerge_NRHA/Advocacy/Policy%20documents/2019-NRHA-Policy-Paper-Telehealth-in-Rural-America.pdf

American Psychological Association. (2019). Telehealth and Persons with Disabilities: What Psychologists Should Know. Retrieved from https://www.apa.org/pi/disability/resources/publications/newsletter/2013/05/telehealth-psychologists

Barlow, I. G., Liu, L., & Sekulic, A. (2009). Wheelchair seating assessment and intervention: A comparison between telerehabilitation and face-to-face service. *International Journal of Telerehabilitation, 1*(1), 17.

CMS. (2018). *Report to Congress on Telehealth Utilization and Future Opportunities.* Retrieved from https://www.cms.gov/About-CMS/Agency-Information/OMH/Downloads/Information-on-Medicare-Telehealth-Report.pdf

Davis, R. M., Hitch, A. D., Salaam, M. M., Herman, W. H., Zimmer-Galler, I. E., & Mayer-Davis, E. J. (2010). TeleHealth improves diabetes self-management in an underserved community: diabetes TeleCare. *Diabetes Care, 33*(8), 1712-1717.

Dorstyn DS, Mathias JL, Denson LA. (2011). Psychosocial outcomes of telephone-based counseling for adults with an acquired physical disability: A meta-analysis. *Rehabilitation Psychology,* 56:1–14.

Forducey, P. G., Glueckauf, R. L., Bergquist, T. F., Maheu, M. M., & Yutsis, M. (2012). Telehealth for persons with severe functional disabilities and their caregivers: Facilitating self-care management in the home setting. *Psychological services, 9*(2), 144.

Gallagher, B. A., Hart, P. M., O'Brien, C., Stevenson, M. R., & Jackson, A. J. (2011). Mobility and access to transport issues as experienced by people with vision impairment living in urban and rural Ireland. *Disability and Rehabilitation, 33*(12), 979-988.

Glueckauf, RL.; Noel, LT. (2011). Telehealth and family caregiving: Developments in research, education, and health care policy. In: Toseland, RW.; Haigler, DH.; Monahan, DJ., editors. *Education and support programs for caregivers: Research, practice, policy*. Springer; New York: 85-105.

Glueckauf, R. L., Fritz, S. P., Ecklund-Johnson, E. P., Liss, H. J., Dages, P., & Carney, P. (2002). Videoconferencing-based family counseling for rural teenagers with Epilepsy: Phase 1 Findings. *Rehabilitation Psychology*, *47*(1), 49.

Harper, D. C. (2006). Telemedicine for children with disabilities. *Children's Health Care*, *35*(1), 11-27.

Jones, M. L., Morris, J., & DeRuyter, F. (2018). Mobile healthcare and people with disabilities: Results from a preliminary survey. In *International Conference on Computers Helping People with Special Needs* (pp. 457-463). Springer.

Jones, M., Morris, J., & Deruyter, F. (2018b). Mobile healthcare and people with disabilities: current state and future needs. *International journal of environmental research and public health, 15*(3), 515.

Krahn, G. L., Walker, D. K., & Correa-De-Araujo, R. (2015). Persons with disabilities as an unrecognized health disparity population. *American Journal of Public Health, 105*(S2), S198-S206.

Karp, W. B., Grigsby, R. K., McSwiggan-Hardin, M., Pursley-Crotteau, S., Adams, L. N., Bell, W., ... & Kanto, W. P. (2000). Use of telemedicine for children with special health care needs. *Pediatrics, 105*(4), 843-847.

Khubchandani, A., & Thew, D. (2016). Achieving equity in the health of women with disabilities through telehealth: Challenges and benefits. In S. E. Miles-Cohen & C. Signore (Eds.), *Eliminating inequities for women with disabilities: An agenda for health and wellness* (p. 83–91). American Psychological Association.

Lai, B., Wilroy, J., Young, H. J., Howell, J., Rimmer, J. H., Mehta, T., & Thirumalai, M. (2019). A Mobile App to Promote Adapted Exercise and Social Networking for People With Physical Disabilities: Usability Study. *JMIR Formative Research, 3*(1), e11689.

Marcin, J. P., Ellis, J., Mawis, R., Nagrampa, E., Nesbitt, T. S., & Dimand, R. J. (2004). Using telemedicine to provide pediatric subspecialty care to children with special health care needs in an underserved rural community. *Pediatrics, 113*(1), 1-6.

Medicaid. (2018). Telemedicine. Retrieved from https://www.medicaid.gov/medicaid/benefits/telemed/index.html

MedPAC (2019). *Mandated report: Telehealth services and the Medicare program.* Retrieved from http://www.medpac.gov/docs/default-source/reports/mar18_medpac_ch16_sec.pdf?sfvrsn=0

Morris, J. T., Jones, M. L., & Sweatman, W. M. (2016). Wireless technology use by people with disabilities: A national survey. *The Journal on Technology and Persons with Disabilities,* 4: 101-113.

Morris, J., Jones, M., Thompson, N., Wallace, T., & DeRuyter, F. (2019). Clinician Perspectives on mRehab Interventions and Technologies for People with Disabilities in the United States: A National Survey. *International journal of environmental research and public health, 16*(21), 4220.

Moy, E., Garcia, M. C., Bastian, B., Rossen, L. M., Ingram, D. D., Faul, M., & Iademarco, M. F. (2017). Leading causes of death in nonmetropolitan and metropolitan areas—United States, 1999–2014. *MMWR Surveillance Summaries, 66*(1), 1.

Myers, R. E., Karazsia, B. T., Kim, E., Jackman, M. M., McPherson, C. L., & Singh, N. N. (2018). A telehealth parent-mediated mindfulness-based health wellness intervention for adolescents and young adults with intellectual and developmental disabilities. *Advances in Neurodevelopmental Disorders, 2*(3), 241-252.

National Association of County & City Health Officials. (2018). Engaging People with Disabilities: Strategies for Rural Health Departments. Retrieved from https://www.naccho.org/uploads/downloadable-resources/Rural-Health-Disability-Fact-Sheet.pdf

Powers, G. M., Frieden, L., & Nguyen, V. (2017). Telemedicine: Access to Health Care for People with Disabilities. *Houston Journal of Health Law & Policy*, 17: 7-20.

Rural Health Information Hub. (2017). Healthcare Access in Rural Communities. Retrieved from https://www.ruralhealthinfo.org/topics/healthcare-access

RTC: Rural, Research and Training Center on Disability in Rural Communities. (2017). Research that Leads to Solutions for Rural Americans with Disabilities, Executive Summary. Retrieved from http://rtc.ruralinstitute.umt.edu/www/wp-content/uploads/RTCRural_ResearchSummary_2017.pdf

Scherer M, Sax C, Glueckauf R. (2005). Activities and participation: The need to include assistive technology in rehabilitation counselor education. *Rehabilitation Education,* 19:177–190.

Scott, R. E., McCarthy, F. G., Jennett, P. A., Perverseff, T., Lorenzetti, D., Saeed, A., ... & Yeo, M. (2007). Telehealth outcomes: a synthesis of the literature and recommendations for outcome indicators. *Journal of Telemedicine and Telecare, 13*, 1-38.

Stenberg, P. L. (2018). Rural Individuals' Telehealth Practices: An Overview.

U.S. Census Bureau. (2016). New Census Data Show Differences Between Urban and Rural Populations. United States Census Bureau. Retrieved from https://www.census.gov/newsroom/press-releases/2016/cb16-210.html

Weber, B. A., Duncan, G. J., & Whitener, L. A. (2001). Welfare reform in rural America: What have we learned? *American Journal of Agricultural Economics, 83*(5), 1282-1292.

Zhou, L., & Parmanto, B. (2019). Reaching People With Disabilities in Underserved Areas Through Digital Interventions: Systematic Review. *Journal of medical Internet research, 21*(10), e12981.