Journal of Rural and Community Development

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Citation:
Nikolic-Khatatbeh, J., Crowe, J., & Li, R. (2024). Navigating telehealth challenges: Rural perspectives on technology access and trust. *Journal of Rural and Community Development*, *19*(2), 167–180.

Publisher:
Rural Development Institute, Brandon University.

Editor:
Dr. Doug Ramsey

ISSN: 1712-8277 © Authors
www.jrcd.ca

Navigating Telehealth Challenges: Rural Perspectives on Technology Access and Trust

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Abstract

This study delves into the adoption and challenges of telehealth services in rural settings, examining racial and locational influences on usage. Employing qualitative methods, it draws on 30 detailed interviews with both healthcare providers and patients in two racially diverse, economically disadvantaged towns in Southern Illinois from fall 2021 to spring 2023. Our findings indicate that insufficient internet access and lack of necessary devices are significant factors in the reluctance of rural residents to embrace telehealth services. Additionally, this study reveals a major barrier: a deep-seated mistrust in the telehealth infrastructure's ability to safeguard private medical information. Notably, our results show that Black participants have heightened concerns regarding the health care industry's capacity to maintain the confidentiality of their medical data.

Keywords: telehealth, broadband, rural, inequalities, trust, race

Relever les défis de la télésanté : perspectives rurales sur l'accès et la confiance à la technologie

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Résumé

Cette étude se penche sur l'adoption et les défis des services de télésanté en milieu rural, en examinant les influences raciales et géographiques sur l'utilisation. Utilisant des méthodes qualitatives, l'étude s'appuie sur 30 entretiens détaillés avec des prestataires de soins de santé et des patients dans deux villes de diversité raciale et économiquement défavorisées du sud de l'Illinois, de l'automne 2021 au printemps 2023. Nos résultats indiquent qu'un accès insuffisant à Internet et le manque d'appareils nécessaires sont des facteurs importants dans la réticence des résidents ruraux à adopter les services de télésanté. De plus, cette étude révèle un obstacle majeur : une méfiance profondément ancrée dans la capacité de l'infrastructure de télésanté à protéger les informations médicales privées. Nos résultats montrent notamment que les participants noirs ont des inquiétudes accrues concernant la capacité du secteur des soins de santé à maintenir la confidentialité de leurs données médicales.

Mots clés : télésanté, haut débit, rural, inégalités, confiance, race

1.0 Introduction

Access to healthcare is crucial in rural areas, given the aging population, prevalence of chronic diseases, and high-risk jobs in sectors like mining and agriculture, compounded by unemployment-related issues such as stress and depression (Biedny & Whitacre, 2022). The ongoing closure of rural hospitals further complicates the situation, endangering rural residents' access to healthcare services (Topchik et al., 2020). Between 2017 and 2021, rural hospitals, defined as hospitals located outside of metropolitan areas, declined by 75—from 1,875 to 1,800. This decline accounted for 71% of the total decline of U.S. hospitals in that period (American Hospital Association, 2024). Since 2005, 192 hospitals in rural parts of the United States have closed, according to the Cecil G. Sheps Center for Health Services Research (2023).

In light of these challenges, telehealth emerges as a potentially transformative solution, offering an alternative way to provide healthcare services to these underserved communities**.**

Telehealth refers to healthcare services virtually delivered by audio and video technologies (Gajarawala & Pelkowski, 2021). While the terms 'telehealth' and 'telemedicine' are frequently used interchangeably, telehealth is a broader term that includes telemedicine and other health-related services utilizing information and communities technology for medical data exchange, professional counseling, and remote patient monitoring (Marcin et al., 2016). Telehealth offers a convenient method for individuals to receive medical services privately at their own residence. A recent study (Kruse et al., 2020) examined how telehealth impacts patient satisfaction in terms of efficiency and effectiveness and identified benefits such as (a) reduced travel time for patients, (b) enhanced communication with healthcare providers, (c) expanded access to healthcare services, (d) increased patient self-awareness, and (e) empowering patients in managing chronic conditions.

The growth of telehealth has been driven by advancements in healthcare information technology and improved access to healthcare services, resulting in unprecedented connections between healthcare workers and patients (Cascella, 2018). Originally, telehealth aimed to deliver vital care to patients in rural and underserved regions (Rutledge et al., 2017). However, as hospitals and healthcare providers increasingly strive to provide high-quality patient care while minimizing costs, telehealth has expanded its acceptance and popularity across more diverse medical specialties and settings (Cascella, 2018).

Beyond access to healthcare, trust in the healthcare system is a key factor influencing healthcare decisions. In the United States there are significant and enduring racial disparities in trust towards the healthcare system. Historically, Black Americans have long faced discrimination and oppression within the U.S. medical system. This legacy has deeply embedded itself in the collective consciousness of the community (Ryan et al., 2008). Historical and contemporary racial discrimination profoundly influences the expectations and beliefs of Black people, subsequently affecting their health and behaviors related to healthcare (Wells & Gowda, 2020; Williams & Mohammed, 2009)

Through the interview responses from Black participants, we investigated more nuanced contexts and issues related to the trust in the telehealth even when the necessary technological infrastructure for telehealth is present, such as *do patients decide against using it because they don't trust the system*, and *is this related to their race*?

In this study, our primary objective is to investigate the infrastructural and social factors driving the adoption of telehealth services. Because the study features two rural towns with differing racial compositions and urban–rural classifications, we investigated whether the attitudes toward telehealth may be influenced by the patient's racial background and geographical location.

2.0 Methods

This study employed a qualitative methodology to understand how rural residents perceive telehealth technologies and the factors influencing these perceptions and potential adoptions. The data was collected through in-depth interviews conducted between fall 2021 and spring 2023. Participants were recruited using flyers displayed in public spaces throughout the community. Volunteers for the interviews

underwent a screening process to confirm their fit into one of the predefined major categories which included healthcare professionals and potential or actual telehealth patients. We made a concerted effort to incorporate a racially diverse participant pool in our recruitment efforts. This study is a component of a wider research project that aims to understand how rural communities may perceive and adopt smart technologies such as telehealth and online education, as well as how the user experiences may intersect with the availability, affordability, speed, and reliability of broadband connections (Chen et al., 2023; Crowe et al., 2024).

2.1 Study Locations

The communities of Carbondale and Cairo in the rural region of Illinois were selected for this study due to their unique demographic and socioeconomic characteristics (United States Census Bureau, 2023):

- *Prevalence of Poverty***.** Both Carbondale and Cairo experience extreme levels of poverty. From 2015 to 2019, one census tract in Cairo and two of Carbondale's seven census tracts were categorized as areas of extreme poverty, defined as having a poverty rate of at least 40%. Additionally, three more tracts in Carbondale are considered to have high poverty, with rates of at least 20%.
- *Racial and Ethnic Diversity*. Both communities are racially and ethnically diverse. In 2020, Cairo's population of 1,733 comprised 69.0% Black, 25.3% White, 4.7% of two or more races, 1.2% Hispanic, and 0.4% American Indian and Alaska Native. Carbondale, with a 2020 population of 21,857, was 54.3% White, 25.7% Black, 7.9% Asian, 7.6% of two or more races, 7.5% Hispanic, and 0.5% American Indian and Alaska Native.
- *Urban vs. Rural Division*. The two communities differ in their rural–urban status. Carbondale qualifies as a 2020 Census urban area, having at least 2,000 housing units or a population of at least 5,000. In contrast, Cairo does not meet these criteria and is thus classified as rural by the U.S. Census Bureau.

2.2 Data Collection

In this study, we conducted interviews with 30 participants, comprising 13 from Cairo and 17 from Carbondale. The participant group included both telehealth users and non-users, along with healthcare providers. Specifically, our respondents consisted of 15 patients with telehealth experience, nine patients without telehealth experience, and six healthcare workers. Among the patients, six were men and 18 were women, while all six healthcare providers were men. Racially, the patient group included 14 White and 10 Black individuals, and all six healthcare providers were white. The participants, as listed in Table 1, reflect the diversity of households in these communities, covering different races and key informants from healthcare institutions. This diverse sample provides a comprehensive overview of telehealth usage during the pandemic, offering insights into how the interplay of urban-rural residency and race affects telehealth service utilization.

Table 1. *List of Respondents*

Pseudoname	**Stakeholder Group**	**Community**	**Race**	**Gender**
Thomas	Healthcare provider	Carbondale	White	Male
John	Healthcare provider	Carbondale	White	Male
Michael	Healthcare provider	Carbondale	White	Male
William	Healthcare provider	Carbondale	White	Male
James	Healthcare provider	Cairo	White	Male
David	Healthcare provider	Cairo	White	Male
Andrew	Patient	Carbondale	White	Male
Joanna	Patient	Carbondale	White	Female
Deidra	Patient	Carbondale	Black	Female
Charles	Patient	Carbondale	Black	Male
Mathew	Patient	Carbondale	Black	Male
Jack	Patient	Carbondale	White	Male
Mary	Patient	Carbondale	White	Female
Emma	Patient	Carbondale	White	Female
Olivia	Patient	Carbondale	White	Female
Patricia	Patient	Carbondale	White	Female
Susan	Patient	Carbondale	White	Female
Ashley	Patient	Carbondale	White	Female
Mark	Patient	Carbondale	White	Male
Sienna	Patient	Cairo	Black	Female
Rebecca	Patient	Cairo	Black	Female
Dorothy	Patient	Cairo	White	Female
Amy	Patient	Cairo	Black	Female
Eric	Patient	Cairo	Black	Female
Brenda	Patient	Cairo	White	Female
Samantha	Patient	Cairo	Black	Female
Barbara	Patient	Cairo	White	Female
Margaret	Patient	Cairo	Black	Female
Lisa	Patient	Cairo	Black	Female
Carrol	Patient	Cairo	Black	Female

Participants meeting the study criteria were contacted via phone, informed about the study's purpose and format, and assured of the confidentiality of their responses. During the COVID-19 pandemic, from November 2021 to April 2023, researchers conducted both phone and in-person interviews, with the latter taking place at the interviewee's home or office. These interviews, which were audio-recorded, varied in length from thirty to ninety minutes. The interview initially comprised 18 questions, but this study focuses on findings from five specific questions directed to patients and another five to healthcare professionals. Given that the broader study includes other questions related to online education and internet reliability, which were not directed toward telehealth, we only retained those questions most relevant to telehealth in this paper. Patients were specifically asked the following:

- Have you ever used telemedicine (e.g., visited with a doctor or health care professional online)?
- If you had adequate and affordable access to broadband, would you choose to see your doctor via virtual visits?
- Can you share any stories that illustrate a virtual visit being better than an in-person visit?
- Can you share any stories that illustrate an in-person visit being better than a virtual visit?
- Are there any aspects of telemedicine that you would like to continue using—even after the pandemic ends?

Healthcare providers were asked:

- How have your patients transitioned to telemedicine—or virtual medicine?
- What advantages does telemedicine have over in-person visits? Can you share any stories that illustrate a virtual visit being better than an in-person visit?
- What disadvantages does telemedicine have over in-person visits? Can you share any stories that illustrate a virtual visit being worse than an in-person visit?
- Are there any aspects of telemedicine that you would like to continue using—even after the pandemic ends?
- Can you describe any instances of inequity of telemedicine among your patients? For instance, were there certain types of patients who did better with telemedicine than others?

As a token of appreciation for their participation, each respondent was given a $20 Wal-Mart gift card.

2.3 Data Analysis

Each interview was transcribed and then coded for themes. First, we constructed a coding matrix based on themes presented during the interviews. Next, we broke down each overarching theme into several components. Two of the authors worked together to transcribe and summarize themes, providing quotes for clarification and support. After hand-coding the interviews, the authors used NVivo 14 software to organize, reassess, and further analyze the interview transcripts. This analysis with NVivo, which involved linking key phrases and uncovering underlying

commonalities among participants, validated our initial hand-coding approach and reinforced our findings.

3.0 Results

Healthcare professionals told several stories of how telehealth saved lives. John (physician) recalled the occasion when:

> a patient's pacemaker was going off, so he called me on the video call and I saw that he was going on this weird rhythm and rushed him to the hospital. If he did not have access to telehealth, he would wait until Monday, and it would be too late.

William (physician) had a similar situation when his patient showed him the results of his Apple Watch during an online session, and he "immediately knew the patient had life threatening condition and a couple hours later he was on operating table." Given the potential for telehealth to improve patient health, including saving one's life, what obstacles exist toward adoption? Furthermore, how do these obstacles vary based on geographic residence and race?

Four themes regarding telehealth emerged from our analysis: (a) unavailability of the necessary infrastructure for implementing telehealth, (b) attitudes toward telehealth, (c) reasons to use, and (d) lack of trust. The following content is presented below, accompanied by illustrative quotes.

3.1 Unavailability of the Necessary Infrastructure for Implementing Telehealth.

Effective use of telehealth services requires access to a suitable device, such as a smartphone, tablet, or computer, and a reliable internet connection. The absence of either can pose a significant barrier to utilizing these services. Healthcare providers interviewed in our study reported that a considerable portion of their patients lacked either computers or internet access. While every patient interviewed from Carbondale had access to a computer or similar device, a few participants from Cairo did not. For instance, Amy (patient) said:

> I don't have any laptop or device. The only device I use is thanks to my job, which (supplies) all employees with one. I use it when I'm there, but at home, I don't have anything.

Residents of Carbondale, on average, owned five computer-like devices, while those in Cairo had about two. Participants from Carbondale typically used devices that were, on average, purchased five years ago, whereas Cairo residents reported using older devices. For example, a patient named Dorothy mentioned using a computer over a decade old that 'barely works.' In terms of internet access, Carbondale residents had a choice of four main providers, offering more and faster home internet options. In contrast, Cairo had limited internet service options, with only one wireless broadband provider available. Additionally, some Cairo residents faced further constraints, as they were ineligible for this service due to their specific locations within the town. Amy (patient) said, "I don't have any internet access at home, since there is a tree that [they told me] blocks the internet, so I can't get one".

She mentioned that she would walk to her workplace outside of her working hours to use a Chromebook that had Wi-Fi access. Eric, a patient, shared that he did not have an internet connection because he couldn't afford it.

Seven participants reported using telehealth services from their workplaces due to not having adequate devices and internet connections at home. For instance, Samantha (patient) stated, "I've done it from my job, my internet at home is breaking too much."

Similarly, Rebecca (patient) said:

> I would not trust my internet and I end up doing a phone call with my doctor. If I need a video call, I have to do it from my office. I know the connection at home is not stable enough.

To summarize this theme, adopting telehealth services was seriously impeded by the lack of broadband infrastructure. According to our findings, people in rural areas experience difficulties connecting to the internet and using the technology more frequently than people in urban areas.

3.2 Attitude Toward Telehealth

The inclination to use telehealth, along with the necessary infrastructure, plays a crucial role in its adoption. Out of 24 patient interviews, 11 participants from Carbondale and six from Cairo reported having used telehealth services. In Carbondale, four of the 13 patients held negative views towards telehealth. For example, Samantha (patient) expressed skepticism, saying, "No, that's not good. To me that's just a lack of professionalism that does not sit well with me." Carrol (patient) was more critical, referring to online telehealth as "the biggest medical healthcare scam that the government has allowed on the open market."

Conversely, most patients from Carbondale reported positive experiences. Olivia (patient) called telemedicine "a great advantage of our time," highlighting her diverse use of online appointments, from therapy sessions to consultations for minor symptoms. Jack (patient) found telehealth "quite useful for the majority of day-to-day ailments," and Emma (patient) praised its convenience, sharing how it allowed her to consult with doctors in St. Louis from home post-surgery. In contrast, in Cairo, a majority (nine out of 11) of the patients had a negative perception of telehealth. These varying experiences and perceptions underscore the complex relationship between geographic location, socioeconomic factors, race, and attitudes towards telehealth.

In summary for this theme, their views on online patient-provider communication varied significantly based on their geographic location and race. We found that Black participants primarily reported negative attitude toward telehealth, while white participants expressed more positive attitude toward telehealth.

3.3 Reasons to Use

Participants cited various reasons for using telehealth. Black participants primarily mentioned cost savings as their main motivation. For instance, Sienna (patient) noted, "Well, for one thing, you may save some money. It keeps the person from having to get out of the highway to go there and not be as costly." Matthew (patient) echoed this sentiment, and said "I did not have to travel, it is convenient and save money."

In contrast, white participants predominantly highlighted convenience as their primary reason for using telehealth services. For example, Emma (patient), mother of seven children said, "It's not easy to pack all their [children] stuff and travel an hour or two to see the doctor and came back with multiple kids, so it is really helpful to do it online." Ashley (patient) found online appointment "very convenient" since she "could go anywhere and I have great, actually have better care online because I was able to access somebody in Chicago who is a fantastic doctor versus with the limited options that are down here". Mary (patient) stressed convenience and said "the thing is that I didn't have to get up to the cold weather and I could still talk to my doctor", while Andrew (patient) appreciated the accessibility after hours and said "You know when I grab that phone call because of my sharp abdomen pain it was probably at 10 or 11:00 o'clock at night, so I think the accessibility to doctors at different hours of the day is something great."

In summary, we found that the reasons to use telehealth in this theme differed by race among the participants. While white interviewees emphasized convenience as the primary reason for using telehealth, Black participants cited cost savings as their primary motive, suggesting the influence of socioeconomic inequalities on telehealth adoption.

3.4 Lack of Trust in Telehealth

The primary reason for not using telehealth, as cited by both healthcare professionals and patients, was a lack of trust. Healthcare professionals highlighted their patients' concerns about safety and privacy. For instance, Thomas (physician) claimed that "trust, security and privacy is what a lot of my patients worry about". Going one step further, David (physician) explained that "all the horror tv stories about identity theft" caused patients to be suspicious "even about something like healthcare where they have to put personal information online." When he suggested telehealth services to patients, they questioned whether it was safe. Furthermore, healthcare workers noticed racial differences with respect to who used telehealth services, and all reported significantly fewer Black patients using telehealth compared to non-Black patients. Michael (physician) said, "I can't remember the last time I had a Black patient online. My online patients are over 95% white, but it's not like that in-person."

This lack of trust was more pronounced among Black participants. Six out of eight Black patients from Cairo expressed distrust in the safety of online appointments and telehealth services. Carrol (patient) insisted on face-to-face consultations, saying, "I don't trust anything online, that's not right, no ma'am." Margaret (patient) voiced strong reservations about internet security and commented "Don't put me on the internet like that. There's nothing secure about being on the internet. I don't care how many firewalls. I don't care what program you have—I won't talk to my doctor or give my information online." Lisa (patient) shared similar concerns and shared, "I mean, you don't want to expose yourself like that. You don't know who is looking at (your information)."

To summarize the last theme, both patients and healthcare providers agreed that a lack of trust was the primary roadblock to telemedicine use. Our results indicate that distrust is more evident among Black participants.

4.0 Discussion

In this study, our aim is to explore the factors driving the adoption of telehealth services and the obstacles hindering their broader utilization. We also delve into how

these factors and barriers vary based on an individual's race and geographic location. By conducting interviews with residents of two racially diverse towns in Southern Illinois, both located in counties with persistent poverty, we were able to investigate the disparities in telehealth service adoption between these areas.

Our findings align with previous research that has identified disparities in digital access among rural populations and racial minorities (Gajarawala & Pelkowski, 2021; Marcin et al., 2016). In terms of internet access Cairo residents faced limited options, having only one wireless broadband service provider, while Carbondale residents had a choice of four major internet providers within city limits. All participants from Carbondale in our study had access to high-speed internet, but this was not the case for every resident in Cairo. Additionally, while all interviewed patients from Carbondale owned computer-like devices, several from Cairo did not, and those in Carbondale generally reported owning newer devices. Access to telehealth services is contingent upon having the necessary physical infrastructure, such as high-speed internet, and digital devices like computers, tablets, and smartphones. Our study revealed that participants from Carbondale had a distinct advantage in both device ownership and access to stable internet connections compared to those from Cairo. This disparity likely contributes to the greater exposure and more favorable views towards telehealth services among Carbondale residents, as opposed to their Cairo counterparts.

A key finding that sheds light on the use of telehealth is the reasoning behind preferring telemedicine to in-person visits. Across all races, convenience emerged as the primary factor driving the use of telehealth. However, the nature of this convenience differed between Black and non-Black participants. Black participants primarily chose telehealth to save money and to avoid taking time off work. In contrast, non-Black participants appreciated the ability to access physicians from various locations. This distinction raises an interesting question about how the progression of highly contagious diseases, such as COVID-19, might influence people's future choices regarding telehealth services, especially in their efforts to avoid crowded healthcare settings.

Perhaps the most revealing insight from our study pertains to the reasons behind the non-use of telehealth services. It is interesting to note that a lack of physical infrastructure was not the main factor cited by those who did not use telehealth services. The primary reason given by respondents for not utilizing telehealth was their concerns on the security of their privacy data. This finding suggests that even with improved access to broadband technologies (Chen et al., 2023; Li et al., 2020), current non-users may continue to avoid telehealth services. Notably, our research found that Black participants exhibited a greater level of distrust in the healthcare industry's ability to protect their medical information. These insights underscore the significant trust barriers in telehealth adoption, particularly among Black patients, and highlight the importance of addressing privacy and security issues to enhance telehealth usage (Wells & Gowda, 2020). Future studies should investigate the effectiveness of programs aimed at building trust between the medical community and those skeptical about the healthcare sector, focusing especially on telehealth services.

We knowledge a few limitations in this study. First, the key informants who were interviewed are not necessarily representative of the underlying population of Carbondale and Cairo inhabitants because they were not selected at random. However, we ensured that the patients were representative of the communities on key characteristics such as race. Second, the research may rely on subjective and

qualitative responses, which are based on key informants' perceptions and recollections. These responses may be influenced by inaccuracies or biases, as respondents might misreport events or conform to societal expectations. However, the credibility of the findings is bolstered by the consistency of major themes, such as internet issues and mistrust, reported by multiple participants. Third, the findings from this study are not universally applicable to all rural communities. Future research could expand upon this work by exploring similar issues across a wider range of areas and within different contexts along the urban-rural continuum.

5.0 Conclusions

This study shows that inadequate internet access and a lack of suitable devices are significant barriers preventing rural residents from accessing telehealth services. By focusing on impoverished and racially diverse communities, this study provides a qualitative examination of rural communities' perceptions and concerns on the use of telehealth services, including their motivations and the reasons for non-adoption. Our results offer valuable nuanced insights into how factors like broadband access and race affect telehealth utilization, highlighting aspects often overlooked by national surveys, especially in the context of Black patients living in rural areas. In summary, our results suggest that:

- The adoption of telehealth services was seriously hindered by the lack of broadband infrastructure, which is often underperforming in rural areas.
- Perceptions of online patient–provider communication varied significantly based on geographic location and race. Black respondents tended to hold negative attitudes towards telehealth services.
- There is a deep mistrust in telehealth services, particularly regarding the protection of private medical information. This finding points to the need for future investigations into the origins of this mistrust and the development of effective practices, guidelines, and policies for enhancing virtual care accessibility and advancing health equity.

Acknowledgements

We are grateful for the perspectives contributed by our stakeholders at the Greater Egypt Regional Planning and Development Commission, Southern Five Regional Planning District and Development Commission, City of Carbondale, Southern Illinois Healthcare, SIU School of Medicine, and SIU Paul Simon Public Policy Institute. We also extend our thanks to Anthony Cusumano for his assistance in conducting interviews with respondents.

Statement of Funding

This research was funded by the National Science Foundation [grant # 2122092]. It was supported [in part] by the U.S. Department of Agriculture (USDA), Economic Research Service. The findings and conclusions in this publication are those of the author(s) and should not be construed to represent any official USDA or U.S. Government determination or policy.

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