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The Future of Telehealth in Human Immunodeficiency Virus Care: A Qualitative Study of Patient and Provider Perspectives in South Carolina

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Abstract

To ensure care continuity during the COVID-19 pandemic, telehealth has been widely implemented in human immunodeficiency virus (HIV) care. However, participation in and benefits from telehealth were unequal. This study aims to assess the willingness of people living with HIV (PWH) and HIV care providers to use telehealth and perceptions of the future role of telehealth. In-depth interviews with 18 PWH and 10 HIV care providers from South Carolina assessed their willingness to use telehealth, their perspectives on the future of telehealth in HIV care, and recommendations to improve telehealth. Interviews were analyzed using thematic analysis. Most PWH were female (61%), Black/African American (67%), and non-Hispanic (78%). Most PWH (61%) and all providers had used telehealth for HIV care. Most PWH and all providers reported being willing to use or (re-) consider telehealth HIV care services in the future. Providers suggested that telehealth is most suitable for routine HIV care encounters and for established, clinically stable, generally healthy PWH. Attitudes toward telehealth were heterogeneous, with most interviewees valuing telehealth similarly or superior to in-person care, yet >20% perceiving it less valuable. Recommendations to improve telehealth included multilevel strategies to address challenges across four domains: technology, the virtual nature of telehealth, administrative processes, and the sociodemographic profile of PWH. Telehealth in HIV care is here to stay; however, it may not yet be suitable for all PWH and all care encounters. Decision processes related to telehealth versus in-person care need to involve providers and PWH. Existing telehealth options require multilevel adjustments addressing persistent challenges.

Keywords: HIV care services, telehealth, COVID-19, qualitative study, South Carolina

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Introduction

DURING THE COVID-19 pandemic, people living with HIV (PWH) faced human immunodeficiency virus (HIV) care interruptions due to clinic closures and social distancing ordinances. For example, in South Carolina (SC), partial or complete HIV care interruption was reported at more than 80% of Ryan White-funded HIV clinics.¹ Fragmented and interrupted HIV care jeopardizes the benefits of antiretroviral treatment (ART) and could result in increased HIV-related comorbidities, increased transmission risk, and reduced life expectancy.²⁻⁶

To mitigate HIV care interruptions, temporary policy changes facilitated a swift implementation of telehealth for HIV care during the pandemic.⁷⁻¹³

Benefits of telehealth included reduced barriers to HIV care such as transportation or stigma,^{11,13,14} limited COVID-19 exposure,^{11,13} and the increased convenience of receiving care at home.^{9,11,13-15} The Kaiser Family Foundation reported that almost all Ryan White-funded HIV care providers across the United States offered telehealth during the pandemic.¹⁶

Despite the widespread implementation of telehealth HIV care services, not everyone was participating in and benefiting from telehealth equally. PWH who experienced housing instability, belonged to historically marginalized racial and ethnic groups, having a substance use history, living in deprived areas, were older, non-native English speakers, or uninsured engaged in fewer telehealth encounters or experienced more challenges with telehealth.^{8,16-21} To better understand and mitigate these disparities, it is critical to understand telehealth-related decision making, assess providers' and PWHs willingness to use telehealth, and develop strategies to meet their needs.

The implementation of telehealth in HIV care during the pandemic encountered barriers at multiple levels. Individual-level barriers that impacted both PWH and HIV care providers included security concerns, unfamiliarity with virtual visits, difficulties navigating telehealth, and lack of laboratory information or physical exams.^{9,12,14-17,22-28} Patient-specific barriers further comprised the lack of access to technology, a stable and sufficient internet connection, a

private space, digital literacy, and adequate online communication skills.^{9,11,14-17,22-24,27-31} Social context-level factors included "unequal access to or ability to engage in care using technological means" (i.e., digital divide),^{16,23} sociodemographic characteristics of PWH such as income and education, health inequalities experienced by PWH, and social distancing and shelter-in-place ordinances.^{13,15-17,22-24,29,30} Administrative and regulatory barriers included increased administrative burden for HIV care providers, reimbursement issues, and missed appointments.^{12,13,16,22,24}

Literature describing telehealth in HIV care during COVID-19 in the Southern United States^{11-13,17,22,23,32-38} was used to build a telehealth barrier and intervention needs framework (Fig. 1)³⁹ that can be used to guide telehealth research and development. Telehealth barriers were categorized into four domains: technology-related barriers, virtual nature of HIV care visits, policies and regulations, and social determinants of health (SDH). Notably, SDH were reported to amplify other barriers to telehealth HIV care such as limited access to technology, lack of rural connectivity, low digital literacy, and feeling uncomfortable with virtual visits.

To effectively address reported telehealth access and uptake barriers, it is crucial to understand PWH and HIV care provider perspectives on the future of telehealth in HIV care and develop tailored telehealth HIV care strategies.

This study's objective is to assess the willingness of PWH and HIV care providers to use telehealth, their perceptions of the role of telehealth in HIV care in the future, and strategies to address telehealth barriers and intervention needs. This study further assessed the perceived value of and attitudes toward telehealth to inform future telehealth decision making and improvements.

Methods

Ethics statement

The study protocol was determined to be exempt from review by the Institutional Review Board at the HIV care providing institution (#1883275). All interviewees consented verbally to participate in in-depth interviews.

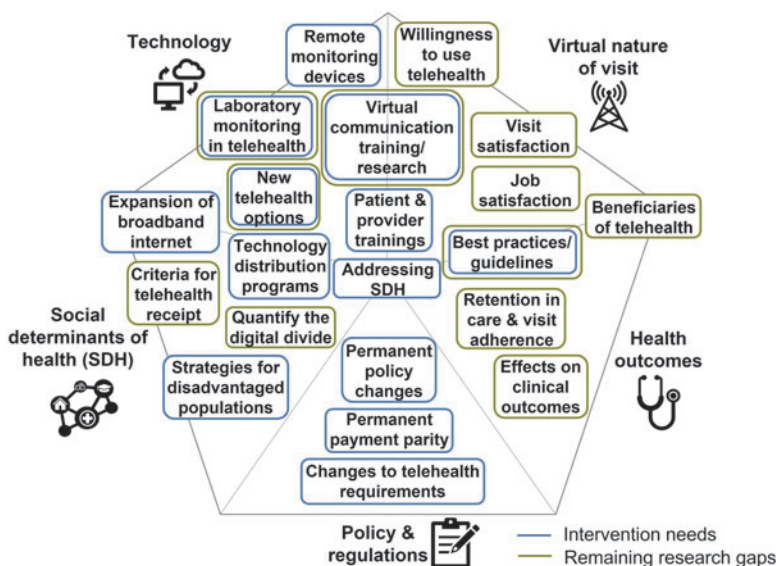


FIG. 1. Barrier and intervention needs framework for telehealth in HIV care. Implementation and access barrier to telehealth domains are: technology, virtual nature of HIV care visit, policies and regulations, and SDH. The health outcomes domain was added to map related research gaps and intervention needs. Intervention needs and remaining research gaps may address multiple barrier domains. HIV, human immunodeficiency virus; SDH, social determinants of health. Reproduced from Yelverton et al.³⁹

Study design and rationale

This study utilized a qualitative study design following a grounded theory approach to assess PWHs and HIV care providers' willingness to use telehealth and their perspectives on the role of telehealth in HIV care in the future. In-depth interviews featuring open-ended question formats were used to collect qualitative data. A quantitative supplemental survey assessed sociodemographic characteristics and measured participants' perceived value of and attitudes toward telehealth. Data analysis and article preparation followed the Standards for Reporting Qualitative Research guidelines.⁴⁰

Context

The South is the epicenter of the HIV epidemic in the United States, and SC is one of the priority jurisdictions for the *End the HIV Epidemic* campaign targeting high HIV transmission areas.⁴¹ SC ranked among the top 10 states with the highest rates of HIV diagnoses in 2019,⁴² with a disproportionate burden of HIV among historically marginalized racial and ethnic groups, and people living in rural areas.^{41,43–47}

Study participants, recruitment, and compensation

The study included PWH receiving care from a large HIV clinic in SC and HIV care providers at the same clinic, which serves ~2400 PWH across 8 counties in SC. PWH were eligible to participate if they were (1) 18 years or older, (2) living with HIV, (3) prescribed ART medication, and (4) received HIV care at the clinic in the year before or during the COVID-19 pandemic. Telehealth use was not an eligibility criterion to capture perspectives on telehealth among people with varying telehealth experiences, including PWH with no telehealth experience. Participants were selected following a stratified purposeful sampling strategy to ensure racial, ethnic, and geographic diversity in PWH participants.⁴⁸ The target sample composition included at least 25% male PWH, at least 25% female PWH, at least 25% non-Hispanic White PWH, at least 25% people of color who are living with HIV, and at least 25% rural PWH. PWH were identified through a combination of provider referrals, snowball sampling, and study flyers, which were posted in waiting areas of the HIV clinic. HIV care providers and clinic staff assisted with recruitment by distributing information and handouts about the study. Patient participants were compensated with a \$30 gift card.

HIV care providers were purposively selected and eligible if they (1) were nontrainee health care providers, and (2) regularly cared for PWH. Providers were recruited in staff meetings and through snowball referrals. In compliance with their institutional policies, providers did not receive compensation for participation.

The sample size was guided by saturation. Interviewers discussed newly introduced themes regularly and determined data saturation once interviews did not introduce any new themes. Prior evidence suggests that data saturation can occur within 12 interviews with primary themes arising as early as 6 interviews in qualitative interviews.⁴⁹

Study instruments

Semistructured interview guides were developed based on the literature^{9,14,15,22} and with input from HIV care providers on the study team. Interview guides explored PWHs and HIV

care providers' willingness to use telehealth and their perspectives on telehealth in HIV care in the future. To ensure appropriate question content and clear language, separate interview guides were used for PWH and provider participants. Both interview guides were reviewed by experienced HIV care providers in the study team. Interviews were guided by questions formulated in the interview guides and allowed for tailored follow-up questions based on interviewee responses. PWH were asked questions such as: "Thinking of the time after the pandemic, would you want to try/continue receiving HIV care services by phone or using video?" and "What could be done to improve HIV care services by phone or using video?." Providers were asked questions such as: "Thinking of the time after the pandemic, what role do you see for telehealth in HIV care?."

The short quantitative supplemental survey assessed basic sociodemographic characteristics, clinical characteristics (patient version only), work history (provider version only), telehealth utilization, and confidence using digital devices.⁵⁰ To assess interviewee's perceived value of telehealth, interviewees were asked to respond to the statement, "I feel HIV care services by phone or video have been just as valuable as in-person HIV care services" (answer options were strongly agree, agree, neutral, disagree, strongly disagree, prefer not to answer). To assess interviewee's attitudes toward telehealth, they were asked "Compared to in-person HIV care, how would you rate HIV care by phone or video regarding the following features?" Features included access to HIV care services, convenience for patients, convenience for providers, communication, patient-provider relationship, and quality of care. Response options included: much better, somewhat better, about the same, somewhat worse, much worse, or prefer not to answer.

Implementation and data processing

Most interviews were conducted in-person in a private room at the HIV clinic (24 out of 28 interviews) and 4 PWH interviews were conducted virtually through teleconferencing software following the interviewee's choice. Interviewers and participants did not have a prior relationship. Interviews lasted about 1 h on average. With consent, all interviews were audio recorded. Recordings were transcribed verbatim using Microsoft's 365 Word online version (Microsoft Corporation, Redmond, WA), reread, and corrected if necessary to ensure data accuracy. Names and other identifying information were removed from the transcripts to protect interviewees' identities.

Provider and PWH interviews were analyzed separately. All transcripts were coded line by line in NVivo (released in March 2020; QSR International, Burlington, MA),⁵¹ using initial codebooks with predeveloped structural coding categories and subcategories based on the interview guide. Initial codebooks were subsequently expanded by adding new codes that emerged during the coding process. Two members of the research team independently coded each interview. Interrater reliability was assessed using Cohen's kappa scores and percentage agreement. Disagreements and differences in coding strategy were resolved in discussion. The final average kappa scores were 0.76 for provider interviews and 0.82 for PWH interview coding, indicating substantial agreement beyond chance.⁵² The percentage of agreement was high (95.1% agreement for provider interviews; 97.4% for interviews with PWH).

Data analysis

To explore and synthesize constructs within the main domains of interest, data analysis followed a thematic analysis approach.⁵³ We identified themes and subthemes by grouping and categorizing the codes. To map recommended telehealth improvements, we used the telehealth barrier framework described in the introduction,³⁹ with four domains of barriers to telehealth: (1) technology, (2) virtual nature of HIV care visits, (3) administrative processes, and (4) SDH. Results are accompanied by selected representative, verbatim quotes to illustrate key findings. Quotes illustrate the essence of the reported findings and not the frequency with which they were mentioned by interviewees. Quotes were edited for clarity, for example, by removing repeated words or nonlexical utterances. Supplemental survey data were analyzed using descriptive statistics in Stata (Version 16; StataCorp, College Station, TX).

Results

Sample characteristics

We conducted 28 interviews with 18 PWH and 10 HIV care providers. Most PWH were female (61.1%), Black or African American (66.7%), and not of Hispanic or Latinx descent (77.8%), with a mean age of 52 years [standard deviation (SD)=9.8; Table 1]. The majority lived in an urban area (77.8%) and had public health insurance (61.1%). PWH had been living with HIV for a mean of 19.4 years (SD=9.8). Most PWH felt very (50%) or somewhat confident (22.2%) in using technology to meet their needs online.

Most HIV care providers were female (70%), White (50%), and not of Hispanic or Latinx descent (90%), with a mean age of 43.3 years (SD=8.9). Provider participants had a mean work experience in HIV care of 14.7 years (SD=10.1). All providers felt very (80%) or somewhat confident (20%) in using technology to meet their needs online.

Use of telehealth in HIV care

Telehealth in HIV care during the COVID-19 pandemic underwent several stages. Providers described that they provided most telehealth HIV care visits between March and September of 2020, when public health measures limited in-person patient care, and that those services reverted to more in-person care after this initial phase of the pandemic. While in-person care never stopped entirely at the HIV clinic, preventative measures were implemented, and nonurgent visits were rescheduled or provided through telehealth. One provider explained,

“The pandemic didn’t stop people from living. And so, it changed the way how they had to do things by wearing a mask and staying separated, however, care continued. Care will not stop because of a pandemic, and so people need to realize with telehealth that care was continued, and patients continued to receive care” (Provider interview #010).

Among our interviewees, most PWH (61.1%) used telehealth for HIV care during the COVID-19 pandemic. Of the remaining PWH, 27.8% reported that telehealth was never offered or discussed and 11.1% reported that they refused to do telehealth. All providers had some experience with telehealth in HIV care; however, the intensity varied. While most providers reported frequent telehealth encounters, some providers reported having fewer than five telehealth encounters.

TABLE 1. SAMPLE CHARACTERISTICS

Characteristic	People living with HIV (N=18), N (%)	HIV care providers (N=10), N (%)
Gender		
Female (vs. male)	11 (61.11)	7 (70)
Age, years		
Mean (SD)	52 (9.82)	43.3 (8.92)
Race		
Black or African American	12 (66.67)	3 (30)
White	4 (22.22)	5 (50)
Asian	—	1 (10)
Mixed race	1 (5.56)	—
Prefer not to answer	1 (5.56)	1 (10)
Ethnicity		
Hispanic or Latinx	1 (5.56)	—
Not Hispanic or Latinx	14 (77.78)	9 (90)
Prefer not to answer	3 (16.67)	1 (10)
Sexual orientation		
Gay or lesbian	6 (33.33)	n/a
Straight (or heterosexual)	11 (61.11)	
Prefer not to answer	1 (5.56)	
Place of residence		
Urban (vs. rural)	14 (77.78)	n/a
Education		
Less than high school	2 (11.11)	n/a
Highschool diploma or GED	9 (50)	
Some college	1 (5.56)	
Any college degree or higher	6 (33.33)	
Health insurance ^a		
AIDS Drug Assistance Program	7 (38.89)	n/a
Public insurance	11 (61.11)	
Private insurance	5 (27.78)	
No insurance	1 (5.56)	
Time since HIV diagnosis, years		
Mean (SD)	19.4 (9.77)	n/a
Health status at the day of the interview		
0–100 (best health), mean (SD)	82.72 (19.12)	n/a
Work experience, years		
Mean (SD)	n/a	14.65 (10.13)
Technological confidence		
Not at all confident	2 (11.11)	—
Only a little confident	3 (16.67)	—
Somewhat confident	4 (22.22)	2 (20)
Very confident	9 (50)	8 (80)

^aMultiple responses possible.

GED, General Educational Development Test; HIV, human immunodeficiency virus; n/a, not applicable; SD, standard deviation.

Perceived value of telehealth

There was heterogeneity in the perceived value of telehealth. Most interviewees (58.8% of PWH and 50% of providers) agreed or strongly agreed that telehealth was as valuable as in-person HIV care. Yet, almost one in four PWH

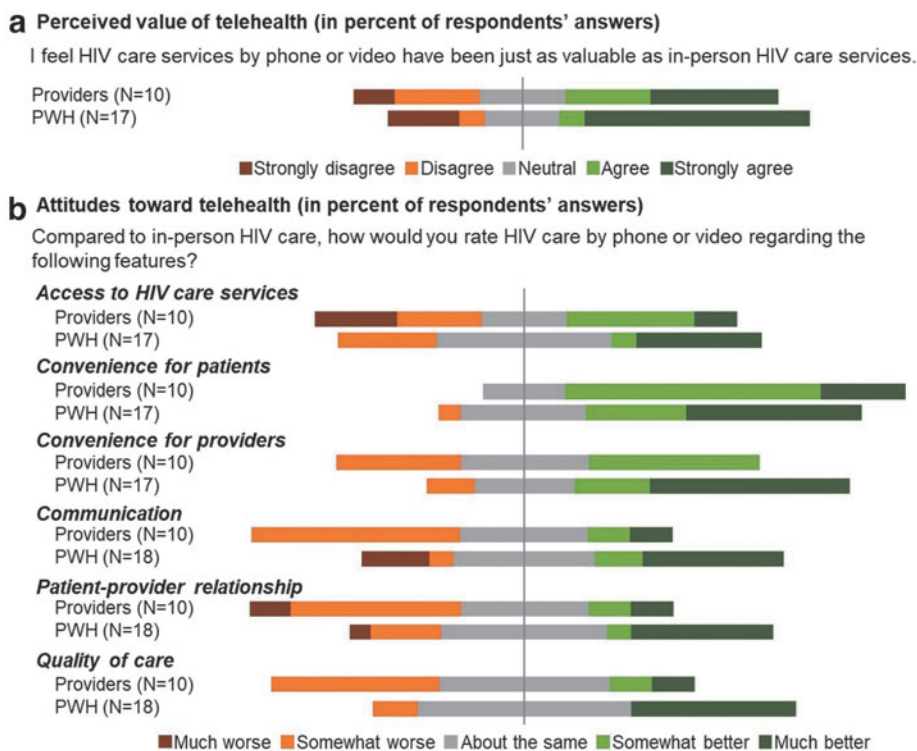


FIG. 2. PWHs' and HIV care providers' perceived value of and attitudes toward telehealth. HIV, human immunodeficiency virus, PWH, people living with HIV.

(23.5%) and almost one in three providers (30%) disagreed or strongly disagreed with the comparability of value between visit types (Fig. 2).

Several differences emerged between PWH and provider ratings of the value of telehealth. Both groups were split on the value of telehealth for improving access to HIV care and its convenience for patients. PWH rated the convenience for providers higher than providers (64.7% of PWH vs. 40% of providers responded with much or somewhat better). Around 44.4% of PWH versus 20% of providers responded that communication through telehealth was much or somewhat better than in in-person care, whereas 22.3% of PWH and 50% of providers rated communication to be much or somewhat worse in telehealth. Similar heterogeneity was observed regarding the patient-provider relationship and quality of care. While almost two in five PWH (38.9%) and only one in five providers (20%) perceived the relationship much or somewhat better in telehealth, 22.3% of PWH and 50% of providers perceived it much or somewhat worse.

While most respondents (50% of PWH and 40% of providers) perceived the quality of care in telehealth as comparable to in-person care, PWH rated the quality of care higher than providers: 38.8% of PWH versus 20% of providers rated it much or somewhat better; 11.1% of PWH and 40% of providers perceived it as somewhat worse.

Willingness to use telehealth and the future role of telehealth in HIV care

PWH's willingness to use or consider telehealth in HIV care in the future varied. While few PWH reported that they prefer telehealth, many PWH perceived it as an option when in-person care is not possible. One person explained,

"If I didn't have transportation or if I broke my foot or broke my leg and I couldn't drive to an appointment, telehealth would be very, very beneficial. So, I think it's something that is and can be beneficial and can continue to be beneficial in the future" (PWH interview #104).

Other PWH were not interested in using telehealth in the future as one person said, "I don't have it. [...] It's like, it's good to, you know, to have that interaction in the same room, so you know you can talk" (PWH interview #106). Another person shared, "I don't think anything would make me [want to] use it. I like to see my doctor because he can look at you and tell if something is wrong" (PWH interview #113).

All providers reported being willing to continue or revisit telehealth HIV care services in the future. Many believed that telehealth in HIV care will increase or continue in the future as one provider said, "I think the bells been rung. I think that once you ring the bell, it's hard to unring it" (Provider interview #008). To guide successful telehealth in HIV care, providers suggested that telehealth may be most beneficial when used as a care complement rather than a substitute for in-person care. One provider said that they

"see telehealth really being a good instrument when someone is used to seeing their doctor every six months because they have pretty significant issues, and they might need that three-month follow-up or something in between to get them through. I think that's where it's going to have its most utility" (Provider interview #008).

Other providers suggested alternating telehealth and in-person care. One provider explained,

"If they're a stable HIV patient and I know they're adherent with their HIV medication. I don't mind doing a telehealth visit, you know, once a year. But I definitely want to see them in person, at least once a year. Just to make sure you know everything is OK" (Provider interview #007).

Telehealth improvements

Recommendations to improve telehealth in HIV care were organized by the telehealth barriers framework³⁹ and addressed barriers related to (1) technology, (2) the virtual nature of HIV care visits, (3) administrative processes, and (4) the SDH.

Strategies to address technological barriers. PWH and providers recommended user-friendly telehealth platforms and telehealth training to address technological barriers. One person living with HIV recommended, “Make your platform that you’re [going to] use more friendly usable, so that even the little child know how to do it. OK? Take the kinks out of it” (PWH interview #102). Another person explained the need for hands-on training to navigate telehealth and technology,

“Honey, I’m 59, I graduated high school in 79, OK? So, you see that gap? Thank you. But now they do telehealth. [...] You can send me the instructions but I’m a visual learner. You understand what I’m saying? I’m a visual learner I can read it, but I still don’t get it” (PWH interview #105).

A provider explained that they needed “someone [to] actually sit down with me and to go through the process. I think that’s a big one. And actually show, walk me through the process instead of sending bits and pieces through emails” (Provider interview #005). Providers further suggested technological support and an enhanced telehealth setup at the HIV clinic. One provider explained,

“If there were stations like this [tablet name] where you can just click on the patient name and connect with them, that would be easy, but trying to expect people to know which software to use on the computer or on their handheld devices and how to do this securely and safely [...] I don’t think that’s ideal in my opinion” (Provider interview #009).

Strategies to address barriers related to the virtual nature of telehealth. PWH requested to ensure that they can see their regular HIV care provider and that there is an option for multidisciplinary telehealth visits, including their case manager, nurse, mental health care providers, and other HIV care providers. One person explained,

“You [got to] bring all the team players in, like especially when it comes to healthcare. Make sure that all the doctors [are going to] participate, all the nurses, all the case managers that they know exactly what they’re doing when they come online” (PWH interview #102).

To improve communication barriers, PWH suggested using language free of medical jargon as PWH may not know its meaning and offering language interpretation services for telehealth for PWH whose primary language is not English or PWH who have trouble hearing. PWH suggested incorporating nonhealth care-related conversations to build and maintain a personal provider–patient relationship. One person shared, “From my experience, at least let’s get [an] opportunity to know each other first before you try to ask me my business. Let’s get comfortable with each other, then let’s get to know one [another]” (PWH interview #105). A provider recommended using technology such as remote monitoring devices and video connections to overcome challenges with

physical exam components. They said, “You really can’t do a full exam on the patient. Maybe my opinion [about telehealth] would change if I experienced the newer technology” (Provider interview #005).

Strategies to address administrative processes. A person living with HIV recommended implementing interim check-in calls to assess patient needs between scheduled visits. They described the benefits of having

“a liaison, such as someone is saying to call each patient on certain days just calling to see how you’re doing. Do you need anything? Do you need to talk to somebody, you know? When is your next appointment, you know? Maybe I can squeeze you in sooner because you got this problem” (PWH interview #112).

Providers recommended streamlining telehealth processes and appointments;

“Different doctors use different versions and the set up for it is different. I guess having more consistency or a better way of communicating so that patients are set up and know how to use it [before their telehealth visit]. Cause that’s the biggest issue I think we have” (Provider interview #002).

One provider suggested that it would be helpful to have guidance on identifying what visit type is most appropriate for each patient and visit.

Strategies to address barriers related to SDH. One person living with HIV recommended providing digital devices to PWH to support telehealth access. They stated,

“If they could provide devices [...] some type of program, to where a person could even pick up a device or get it mailed to them when it’s time for their appointment. But then you know just like leasing it and then be there like you go to the library, you can check out a book and you have it for a certain amount of time. I think that would be very, very beneficial for those that don’t have access to a device to have a telehealth appointment” (PWH interview #104).

Discussion

Following the notion that *Telehealth is here to stay*,^{54,55} this study provided novel qualitative findings on PWH’s and HIV care providers’ perceptions of the future of telehealth in HIV care and which adjustments to improve telehealth options will be necessary to meet their needs.

Our findings indicate that the perceived value of and attitudes toward telehealth among and between PWH and HIV care providers are perceived heterogeneously, which is in line with other studies.^{26,56–58} While most interviewees perceived telehealth HIV care to be as valuable as in-person care, there were PWH and providers who perceived telehealth to be an inferior care modality. Notably, PWH rated the convenience for providers more positive than HIV care providers themselves, which highlights the need for shared decision making to adequately reflect the attitudes and preferences of all parties involved. As our study sample was small and results may not be generalizable beyond our sample, future research needs to assess systematic variation in the perceived value of and attitudes toward telehealth among and between PWH and HIV care providers to better guide tailored visit type allocation.

Interviewees expressed predominantly negative attitudes toward communication and the patient–provider relationship in telehealth HIV care, which echoes reported telehealth challenges related to communication difficulties and telehealth visits feeling impersonal.^{16,22,24,26,27,57} Recommendations to improve communication challenges included time for personal, nonhealth care-related conversation within telehealth visits, using language free of medical jargon, and offering language interpretation services for telehealth. Future research is needed to evaluate if communication barriers are specific to telehealth or occur in in-person care as well, and if the recommended strategies to improve communication and the patient–provider relationship can improve attitudes toward telehealth.

Providers were unanimously open to considering telehealth HIV care yet imposed limiting parameters for two telehealth dimensions. The first limiting parameter addressed the scope of telehealth HIV care services. Telehealth was described as a complimentary tool in the care of PWH. Interview findings underlined that, in its current form, telehealth cannot fully replace in-person HIV care visits. Innovative telehealth strategies such as remote monitoring devices and telehealth exam kits may be able to widen the perceived suitability of telehealth. The second limitation related to the patient population that was considered suitable for telehealth. Providers perceived telehealth to be suitable for established, stable, and generally healthy PWH. This consideration needs to be further investigated and included in HIV care visit type decisions to ensure adequate HIV care.

Study findings highlight varied willingness to use telehealth among PWH. While many PWH express some level of interest in telehealth for routine HIV care or when in-person care is inconvenient or impossible, others refuse telehealth HIV care services. These results are in line with other studies reporting that a substantial proportion of PWH were interested in continued telehealth HIV care encounters beyond the pandemic.^{24,27,58} Imbert et al. found that there are two distinctly different preference profiles among PWH. One group of PWH had a strong preference for seeing the same provider at each visit, while other PWH favor care flexibility in telehealth for HIV care.⁵⁶ Further, research by Wong et al. highlights benefits of telehealth, such as privacy and convenience, for people facing or fearing stigma in response to seeking HIV care services.⁵⁹ Future research is needed to identify candidates who are open to using telehealth and develop guidelines on including patients in the visit type decision process. Varied and conditional willingness to use telehealth in conjunction with heterogeneous perceptions of value and attitudes toward telehealth underline the well-established need for patient-centered approaches in HIV care.

Building on the proposed patient-centered differentiated service delivery (“DSD 2.0”) model,⁶⁰ our findings suggest adding a potential new dimension of preference-concordant HIV care visit type to differentiated service delivery models.

In our study, we identified various recommendations to improve telehealth in HIV care. Recommendations addressed challenges related to technology, the virtual nature of telehealth visits, administrative processes, and SDH, suggesting the need for multilevel improvement strategies. Notably, only one interviewee suggested device distribution programs addressing the lack of access to technology. In our scoping review, we found that SDH were reported to amplify other

telehealth barriers among PWH, including limited access to technology, lack of rural connectivity, and low digital literacy.³⁹ Structural interventions promoting economic stability, digital literacy, and access to broadband internet for all PWH are needed to unfold the full potential of telehealth and to reduce HIV care inequalities.

There are several limitations to this study. First, there may be limited generalizability as this study focused on a small sample of PWH and HIV care providers from SC; however, data saturation for both PWH and HIV care provider interviews was reached. Second, our sampling quotas aiming to include at least 25% of PWH who are non-Hispanic White and at least 25% of PWH who live in rural areas were missed by 2.8% each. Further, most PWH participating in our study were female, while only 27% of PWH in SC are female.⁴⁵ While we included a diverse sample of PWH in our study, perspectives of rural, non-Hispanic White, and male PWH may be underrepresented. Third, our study identified heterogeneous perceptions of willingness to use telehealth, the value of telehealth HIV care, and attitudes toward telehealth. Extending this work through the collection of quantitative survey data with a large and diverse sample of PWH and HIV care providers would be useful to examine the relationship between willingness to use telehealth, the perceived value of and attitudes toward telehealth, and sociodemographic and clinical characteristics.

In conclusion, telehealth in HIV care is here to stay yet not blankly suitable for all PWH and care encounters in its current form. Visit type decision processes need to be shared and patient centered, that is, it is crucial to involve PWH, and consider their preferences and health care needs. Existing telehealth options require multilevel adjustments to achieve high levels of visit and medication adherence and reduce inequalities.

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Ethics Approval

The study protocol was determined to be exempt from review by the Institutional Review Board at the HIV care providing institution (#1883275).

Informed Consent

All interviewees consented verbally to participate in in-depth interviews.

Data, Materials, and/or Code Availability

Due to the qualitative nature of this research, participants of this study did not agree for their data to be shared publicly, therefore supporting data are not available.

Authors' Contributions

V.Y., J.O., S.W., C.D., and H.A. contributed to the study conception and design. Study instruments were developed by

V.Y., J.O., S.W., C.D., N.N., N.L.H., B.O., O.O., S.Q., X.L., and H.A. Data collection and analysis were performed by V.Y., S.G., D.A., and C.C. The first draft of the article was written by V.Y. and all authors commented on previous versions of the article. All authors read and approved the final article.

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