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Telehealth and Transportation Among African Americans with HIV During the COVID-19 Pandemic

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A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
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Abstract

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Introduction: “Telehealth” and “telemedicine” refer to interactions between patients and medical staff or physicians, with the latter referring specifically to clinical interactions and interventions. While helpful in many ways for patients and providers, telehealth presents its own set of issues. For many African Americans with HIV (AAWH) before the pandemic, access to transportation was already an issue, but not all clinical interactions can take place remotely. This document identifies telehealth and transportation barriers specific to this population.

Methods: This study employs a mixed-methods analysis of quantitative survey data (N=200) and in-depth interview transcripts (N=10) collected from a cohort of AAWH from any of three participating hospitals in Atlanta, GA in 2021. Quantitative analysis included cross-tabulation of predictor demographic/clinical variables with transportation-related outcome variables. Qualitative analysis took a thematic approach centered around the main themes of telehealth and transportation.

Results: We produced descriptive statistics for the overall study population and chi-square statistics for all of our cross-tabulations. The only statistically significant result we found was that persons with comorbidities that are not well controlled are at a higher risk of missing a dose of HIV medication in the past 30 days. Thematic analysis characterized our population’s experiences and attitudes of telehealth and transportation.

Discussion: Our results allow for some comparison with the literature. Our population appeared to have lower likelihood of missing an appointment than the national average during the COVID-19 pandemic. Latino/Hispanic individuals in our study also experienced fewer missed appointments than the literature suggests.

Limitations: The original study whose survey and interview data we used was not meant to focus on telehealth and transportation. This means that there are very few questions about either or our topics. Both the quantitative and qualitative analyses would benefit from basic telehealth and transportation data from participants.

Conclusions: We need more research on these two topics among this population specifically. Clinics providing HIV care continuum services should consider clinical collection of quantitative data on telehealth and transportation. Interventions should be tailored to the individual. Research efforts should continue with further refinement and detail.

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1. INTRODUCTION

1.1. Background

“Telehealth” generally refers to interactions between health care personnel and patients that use telecommunications technologies to deliver health care services and health care-related education. “Telemedicine” is a subcategory of telehealth that refers specifically to clinical interactions and interventions between patient and doctor. [1] This thesis will use “telehealth” throughout unless in specific reference to telemedicine. Originally implemented to accommodate the needs of patients in rural areas with few or no medical providers or services available, telehealth quickly became the only option for many patient-provider interactions in the US starting in March 2020 due to the COVID-19 pandemic. [2, 3]

The COVID-19 (hereafter referred to as “COVID”) pandemic was a uniquely challenging time for all inpatient and outpatient care strategies and involved parties. Certain risk factors made some people more likely to contract the virus and/or have a more adverse experience than others. COVID carried the possibility to worsen or exacerbate underlying medical conditions already experienced by the individual. While using the lessons from the pandemic to inform the new standard approach to telehealth options, we also can use them to plan for the next pandemic or similar event that disrupts in-person care models.

The pandemic forced broad adoption of telehealth services as replacements for certain in-person services to:

- Decrease the likelihood of transmission of the SARS-CoV-2 virus, and
- Reduce the burden on hospitals, clinics, and systems thereof that were already overburdened by an influx of patients needing urgent and intensive care for life-

threatening respiratory conditions who were also presumably infectious during their hospitalization.

Telehealth quickly showed promise of benefit and/or equivalence to overall experience compared to in-person services to both patients and providers, but it also showed areas of concern. Telehealth utilization, acceptance, and attitudes can differ statistically according to a few demographic and clinical variables. Patient digital literacy and health literacy are not uniform, neither are concerns of privacy and confidentiality of telehealth interactions. There are valid concerns about the use of telehealth options that must be addressed to the individual patient's satisfaction. It is easy to offer effective telehealth services to patients who already have favorable opinions about telehealth, speak English, own a smart phone, have a consistent, high-quality home internet connection, and live in the same state as their provider. The pandemic showed us that the needs we should focus efforts on those who are less likely to engage with and/or understand the telehealth options provided to them.

One of the barriers to care and preventive services during the pandemic was a decrease in mobility and/or access to transportation. [4] For many persons with HIV (PWH), transportation access was already an issue before the pandemic lockdowns began. While telehealth services can replace or supplement some services, there are clinical interventions that must be performed in clinic. This means that any attempt to address the needs of patients using telehealth services must address transportation options as well. This is especially important now that hospitals, clinics, and the broader US society are operating at pre-pandemic capacity and there is not an urgent public health need to keep people from interacting in proximity with one another.

1.2. Needs

The HIV care continuum includes recurring, lifelong, in-person care. The pandemic disrupted this routine for all PWH, forcing them and their providers to find alternatives that were feasible and acceptable to both parties. African Americans (AA) experience a disproportionately high amount of the overall HIV cases in Georgia and nationwide. [5, 6] Despite having similar case rates, AA also experience higher rates of hospitalization and death due to COVID-19 than do their white, non-Hispanic counterparts. [7] The COVID-19 pandemic also introduced new obstacles regarding engagement in, and retention to, the HIV care continuum. [8]

As we see later, there are a number of topics that can help us better understand our population with respect to telehealth and transportation such as digital literacy, health literacy, English language proficiency, smart phone ownership and familiarity, home computer ownership and familiarity, patient portal usage and familiarity, cellular phone service plan, internet connection and stability, privacy and confidentiality concerns, rapport and trust towards providers, and insurance/Medicaid/Medicare coverage. Regarding transportation, we can look at topics like household automobile ownership, primary mode(s) of healthcare-related transportation, auto insurance coverage, travel costs per month, distance traveled to provider sites, time spent traveling to provider sites, medical insurance network requirements.

1.3. Goals

To begin to address these issues, we performed a literature review and secondary analysis of qualitative and quantitative data from a previously conducted study of African Americans with HIV (AAWH) regarding COVID-19 perceptions from early in the pandemic. The literature review gives a basis for the issues of telehealth and healthcare-related transportation from different populations, including AAWH. We use the qualitative and quantitative data to specifically characterize our local population of interest: AAWH receiving HIV care in Atlanta.

Analysis of these data also will allow us to see the extent to which known barriers to telehealth utilization/acceptance and healthcare-related transportation affect our specific population. Our goal is to use these methods to identify barriers to, and hopefully facilitators of, telehealth utilization/acceptance and healthcare-related transportation.

We identify themes among AAWH regarding their experiences with telehealth. Patients' concerns about using telehealth, overall acceptability of telemedicine visits, and preference of telemedicine vs. in-person visits are all important to consider. We hope to get an indication of what proportion of our population has personal experience with telehealth for their own HIV care or otherwise. These will allow us to better understand both how to optimize current telehealth services while operating at full capacity in the post-COVID era and how to better prepare for the next pandemic or other long-term, disruptive event.

Regarding transportation, we characterize our population to the extent the data allow. We want to know how these patients get to their appointments, how long they might travel to and from those appointments, and whether they dealt with any transportation-related changes or setbacks during COVID pandemic. The quantitative analysis will include survey responses dealing with missed appointments and COVID testing opportunities, and whether transportation might have anything to do with either.

2. LITERATURE REVIEW

The literature on telehealth and transportation falls loosely into three categories according to what it addresses: pre-COVID era, COVID era with discussion and conclusions that refer specifically to the conditions of the pandemic, and COVID era with discussion and conclusions that additionally or solely refer to post-COVID conditions. Literature on telehealth before March 2020 only describes telehealth use and trends before the broad expansion of its utilization in response to the COVID pandemic, limiting our ability to draw conclusions that still apply in the COVID and post-COVID eras. It is important, however, to describe the pre-COVID-pandemic conditions since the pandemic and its associated lockdowns and public health measures exacerbated certain existing barriers and disparities. Articles that only address an issue that existed during the initial surge still can be helpful for research that explores beyond the COVID surge even if the data were not collected specifically for that purpose. The last category is the most plentiful and insightful. It draws from the first two categories and accounts for the benefits and barriers they identify. The articles reviewed here also divide into two categories with one subcategory: transportation, general telehealth, and telehealth specific to PWH.

2.1. General Issues of Healthcare-Related Transportation

Existing disparities in transportation access and quality are well documented. These disparities can affect healthcare-related decision making, lead to missed or delayed clinical appointments, and lead to unwanted clinical outcomes. Historically, the general focus of health care-related transportation research was on patients who lived in rural areas. In the past decade especially, researchers focused more proportionately on the transportation needs of urban and semi-urban patients. [9] One does not need to live in a rural area to experience transportation barriers and delays. Specialized care availability and insurance coverage networks can dictate long distances traveled for health care regardless of one' residential setting. Transportation is an important social determinant of health. [10]

The COVID pandemic had an incredible impact on mobility and transportation. Most countries immediately imposed social distancing measures to prevent transmission and thereby not exceed the capacity of health care systems. [4] A study from 2020 conducted in the UK showed that the lockdowns led directly and indirectly to decreases in human mobility. By the end of May 2020, automobile traffic was down to 60% of the rate from May 2019 and public transit was down to 80%. By the end of May 2020, automobile traffic was down to 60% of the rate from May 2019 and public transit was down to 80%. It also concluded that while reduced mobility means fewer COVID-related deaths, it holds the potential for many other negative health-related outcomes. [11] Millions of Americans lost their insurance within a very short span of time. Many individuals had to move at some point during the pandemic, leading to long-term reduced access to care and disrupting where patients could seek care. This also led to longer and/or less familiar routes to clinical sites and in some cases having to find a new, in-state provider if they moved across any state lines. [12] Laws and insurance reimbursement paradigms also changed rapidly, and this reformed the landscape of access to care. [13] Utilization among Medicare beneficiaries went from less than 100k in early March 2020 to almost 1.7MM by the end of April 2020. [14]

An analysis of national survey data showed that in 2017, 5.8 million Americans had to delay medical care because they did not have any transportation. The same study found that Hispanics, persons living below the poverty line, Medicaid recipients, and persons with functional limitations had a higher likelihood of experiencing a barrier to transportation access. [15] Another study of the same survey data found that among non-Hispanic, black respondents traveled shorter distances to health care appointments than white respondents, but the two groups had similar median travel times ($p=0.07$). Individuals with less than $25k annual household income had longer trip durations than individuals with over $100k annual household income despite similar distances traveled ($p<0.001$). [16]

One study published in 2018 found that 37.9% of Hispanic women needing surgical care had to travel more than 60 miles to their provider and in general had to travel farther than their non-Hispanic counterparts. The largest difference between Hispanic and non-Hispanic groups was in the 30- to 60-mile range (18.3% vs. 9.8%). [17]

Patients in the US are highly dependent on paratransit options, nonemergency medical transportation (NEMT), rideshare services, and public transit for in-person health care visits. [12] A study conducted in Denver from 2022 found that travel and wait times using public bus were almost three times as long as travel by private vehicle. They found that access to surgical facilities decreased for racial/ethnic minorities and uninsured persons. The study also showed a 4.3-minute increase in bus travel time for each 10% increase in minority population per census tract when controlled for certain other variables like socioeconomic status (SES). [9]

In 2015 in Mississippi, a focus group of eight African American women receiving medical care for HIV found that half the participants primarily used public transit or transportation provided by insurance or Medicaid. Two participants reported occasionally missing HIV care appointments in the past 12 months, and three reported missing an HIV care appointment because of a lack of money to pay for the ride(s). [18] Another focus group study from Mississippi in 2020 highlighted the importance of providers understanding the barriers to health care-seeking behaviors in their communities with transportation being a common theme across groups. [19]

Patient transportation needs changed drastically in the early days of the COVID pandemic, as did the availability of certain modes of transportation. From April 2020 to July 2020, 40% of US adults reported a pandemic-related delay in medical care. Pandemic-related transportation shifts presented barriers to mobility and access to care, especially among those in lower-income settings. Public transit services reduced operations and restricted access, ride-sharing services suspended their low-cost options, and many volunteer programs dedicated to providing transportation for low-income individuals either reduced or suspended their operations. [12] One study of a health system with operations in seven states in the Western and Southwestern US found that transportation insecurity was associated with higher odds of SARS-CoV-2 infection (OR 1.11; p=0.0285). [20]

An online survey study enrolled adult frequent health care users (at least six outpatient medical appointments in the past year) enrolled in Medicaid or Medicare in North Carolina in 2021 and found that 35.3% of survey respondents reported delayed medical appointments because of transportation barriers and 18.3% reported appointments missed altogether. 15.2% reported travel costs that prevented attending a medical appointment, and 20.7% reported that not having a ride prevented them from seeking and/or receiving health care services. Almost one in three respondents experienced barriers to transportation that resulted in late, truncated, or missed treatment sessions from June 2020 to June 2021. Not surprisingly, having a household vehicle significantly reduced the probability of delayed and missed appointments. [21]

Dialysis patients are much less likely to drive to their own appointments when compared to the reference, with many relying on public transit, paratransit, or family and friends. Federal guidelines dictate when and where individuals can access substance use disorder (SUD) medication, placing parameters on when transportation is needed. Transportation issues and travel times can greatly affect one's decision to initiate and/or adhere to SUD treatment. [12]

Health systems and their clinical teams should seek to understand their patients' transportation needs and choices, as well as any barriers thereto. The success of efforts to improve transportation and access to health care depends on how well agencies and clinics tailor their efforts to meet specific needs of certain patient populations. [12] One thing lacking in the literature is transportation-related solutions to transportation barriers. There are articles that provide telehealth solutions to transportation barriers, and there are articles that compile lists of transportation barriers, but there is little effort among researchers to investigate transportation-related solutions explicitly.

2.2. General Issues of Telehealth

The expansion of the use of telehealth services in the early days of the COVID pandemic was unprecedented. On March 13, 2020, an Emergency Declaration under the Stafford Act and National Emergencies Act gave the Centers for Medicare and Medicaid Services (CMS) power to waive Medicare program requirements if necessary. Four days later, CMS expanded telehealth under Medicare so beneficiaries could access telehealth services at any location rather than only at designated sites. Soon after, CMS expanded the scope of services eligible for telehealth options and expanded the range of provider specialties who could provide these options. [14]

Telehealth access and uptake during the COVID pandemic was “rapid, disorganized, and iterative.” [22] State and regional differences in access to telehealth services exacerbated this chaos. [14] Federal relief funding helped many community clinics stay open and offer services, and the adoption of telemedicine services allowed clinics more ways to maintain incoming revenue streams during the pandemic. [12] Telehealth options overcame physical disconnection between members of an individual patient’s team of providers, especially in triaging and consultation, and especially during times like the early months of the pandemic where inundation of health care systems was a real possibility. [23] Many behavioral health providers changed to an entirely virtual format. [24]

Effective telehealth utilization requires a certain level of digital literacy and health literacy on the part of the patient. Mobile phone use might be widespread, but this does not translate directly to informed utilization of telehealth options. [25] The sudden shift towards telehealth services to decrease the individual and overall risk of spreading the SARS-CoV-2 virus did not coincide with a sudden increase in digital literacy and/or health literacy. One study from 2019 enrolled 20 participants from a hospital with a patient population similar to that of one of the hospitals from our surveys and interviews and found that ten of them had low digital literacy (LDL) and low health literacy (LHL), and of those ten, seven had low English proficiency as well. [25]

Telemedicine is not able to reach all patients, and of those it reaches, its effects and utility vary greatly, dependent mostly on a few key variables according to one study: Age, Income, English speaker? (Y/N), Level of education, Broadband internet access? (Y/N), and Insurance status. [12] Another study showed that women are more likely to utilize telehealth services than men, age is somewhat predictive of utilization, but race/ethnicity was not. [14] Survey respondents from a Ryan White-funded clinic in Atlanta showed no significant differences in telehealth usefulness, quality, satisfaction, or concern between racial and age groups. Despite the aforementioned higher likelihood of engaging with telehealth services, women participants in this study had specific (and statistically significant when compared to men) concerns about doctors' abilities to examine them well in virtual settings. [26]

Generally, providers had little experience with video visits at all before the COVID pandemic, and they had no experience with phone visits as an ongoing expectation. We saw a chaotic expansion of video platform use without coinciding training for providers and their staff. [22] Staff needed, and still need, training specific to virtual interactions so both provider and patient can get the most out the brief time they have together. [24] Team-based approaches currently are more difficult to manage with telehealth services vs. in-clinic visits. Telemedicine visits can inhibit or delay the establishment of rapport between provider and patient, and providers must focus more intently on “the human touch.” [27] In addition to the telemedicine-specific issues, there were certain operational considerations to be made such as changing demand for physical clinical spaces and new scheduling requirements for clinical staff. [24] Despite technical challenges and variation in technological savvy among and between providers and patients, a study published in 2022 showed that health care providers and staff in Brooklyn, NY and Brookhaven, CT saw telehealth as helpful in connecting to patients and re-engaging individuals lost to follow-up. [28]

Barriers to telehealth utilization and benefit among patients are numerous and sometimes difficult to predict. A 2021 study identified 13 system-level barriers to telehealth services during the COVID pandemic including overall adequacy and accuracy of tools being used in telehealth interactions, legal considerations, insurance policies and reimbursements, telehealth systems design and maintenance, and resource availability. The most commonly reported individual barriers to telehealth utilization were low technology acceptance and adoption, low volume of internet use, lack of confidence with technology, sensory impairments, low health literacy, and low digital literacy. Furthermore, populations including low-income families and the elderly are more likely than others to experience interruption of internet connection and/or latency issues. [13, 29] Another 2021 study identified similar limitations and highlighted patient concerns with privacy of telehealth sessions, confidentiality of data collected during those sessions, impersonality of interactions, and inherent differences between in-person interactions and remote ones. As mentioned earlier regarding transportation, differences in laws and licensing standards between states also pose barriers to patients who do not reside in the same state as a potential provider despite the ability to connect remotely. [2]

A 2021 survey of physicians who cared for patients ≥65yo during the COVID pandemic showed that older patients faced barriers to engagement with telehealth services despite recent increases in tech savvy among older adults. The study also showed a decline in usage of telehealth as the pandemic eased up. Physician and patient preferences changed and there was administration-level pressure to return to in-person visits. [22] There is an enormous gap in tech savvy between the youngest and oldest age ranges, with lower smart phone access and/or experience among elderly and low-income patients eligible for Medicaid. Some families and individuals were not able to keep up with cellular phone plans, and some individuals were unable to keep a consistent phone number or mobile device. [13]

Despite the barriers, there is benefit and equivalence to be found in telehealth services vs. in-person. Remote visits can decrease or remove travel to and from clinical appointments, save money, and decrease time away from work. They helped to improve compliance with COVID-related public health measures, especially in the first two years of the pandemic. [8] Telehealth offers more avenues to engage and/or re-engage patients in care and prioritize new and existing health concerns. Ideally, it can offer more flexibility and it can center the patient’s preferences. [28] There are certain specialties and areas of care that lend themselves better to telehealth than others. [12] Certain interactions and interventions “obligate[d] in-person care,” and others showed “potential for virtual care”. Some monitoring can be self-performed at home and communicated with providers remotely. [30]

We can take lessons from the experiences of non-PWH patient populations as well, especially those whose condition is a common HIV comorbidity such as SUD, alcoholism, mental health

(MH) disorders, physical disabilities, and kidney disease. According to Chen et al, there are five areas of care whose patient populations are particularly susceptible to transportation disruptions: end stage renal disease (ESRD), cancer care, prenatal care, SUD/MH disorders, and individuals with disabilities. [12] Telehealth holds the opportunity to decrease the frequency of in-person medical appointments, thereby reducing the need to travel, thereby reducing the likelihood of experiencing a barrier to traveling.

A 2020 study from a large health care system in the Boston area performed a retrospective review of electronic health record data from January 2020 to August 2020 and compared that to the same windows from 2018 and 2019. They found unsurprisingly that MH visits increased during the COVID pandemic surge, but SUD visits dropped. MH and SUD visit volumes dropped among Black patients and Hispanic patients when compared to non-Hispanic, White patients. These decreases perhaps reflected a decrease in access to employer-provided health insurance. The study also found disparities of care for patients from racial and/or ethnic minority populations, as well as for SUD patients. [31]

Persons with disabilities (PWDS) comprise about one fifth of the US population according to a 2019 CDC figure. They are more likely to experience barriers to equitable care, and they are more likely to have chronic conditions that require ongoing management. PWDS also are less likely to have internet access and/or a smart phone. [32] A 2019 study enrolling at a safety net hospital showed that 70% of participants reported difficulty texting because of an inability to type, low literacy, and/or physical disability. [25]

Obstetrics (OB) care had to adapt rapidly to meet the needs of pregnant patients in the early days of the pandemic. Providers found that they could hold certain sessions virtually, like genetics counseling, maternal-fetal medicine consultations, and surveillance of pregnancy complications.

Many elements of post-partum care also lend themselves well to a telehealth-based model. Losses to follow-up are not a concern for this population; pregnant and post-partum persons are usually very good at attending their appointments. The goal with this population was non-interruption of the OB care due to incidental barriers beyond their control. [30]

In addition to primary medical care, things like support groups for clinical and mental health conditions needed the ability to continue during the pandemic. Support group attendance can improve applicable treatment regimen adherence and overall quality of life. [33] The COVID pandemic itself caused anxiety and stress, and people turned to substances even more. Among persons with SUD, recovery support is needed to decrease the chances of a relapse. [34] Telemedicine also may be useful as a long-term tool in the post-COVID era to address opioid use disorder during pregnancy and the post-partum period. [30]

Telehealth also presents a way to overcome barriers in access to subspecialty care. Getting referrals can be difficult and the requirements upon referrals can be complicated. Different strategies include electronic consultations, live interactive telemedicine, “store-and-forward” telemedicine, tele-mentoring, patient portals, and remote patient monitoring. [35] Whatever the approach, it is important to identify the best mode(s) of telehealth service for each individual interaction. [14]

2.3. Telehealth and Transportation among PWH and AAWH

Regarding our specific populations of interest, we identified a few common concerns early in the pandemic. COVID-related public health response measures reduced access to routine HIV testing despite advancements in, and increased availability of, at-home testing options. Obstacles arose in linking individuals to HIV care such as symptomatic COVID patients increasingly straining health systems and causing widespread delays, and an overall shift in resources towards COVID-related preparedness and response. [36] Loss of social and clinical services for PWH during the shelter-in-place era decreased the ability of telemedicine options to effectively replace in-person sessions. [37] Over the same period, Ryan White-funded facilities went from 22% offering telehealth services to 99%. The were forced to offer these services but lacked the resources to effectively utilize them. [37] Existing research showed no significant difference between telehealth vs. in-person groups with respect to viral load and year-round viral control rate, but lockdowns and shifts in inpatient and outpatient care models like the ones we saw in 2020 can hinder antiretroviral therapy (ART) adherence. [8, 36]

The pandemic posed challenges to the current HIV care continuum paradigm and the “90-90-90” targets, where 90% of PWH know their HIV status, 90% of those diagnosed with HIV are on ART, and 90% of all people on ART achieve viral suppression. In particular, the pandemic caused reductions in HIV testing, prevention-seeking behaviors, and use of PrEP, while increasing the proportion of PWH with advanced disease at the time of diagnosis. The pandemic also gave rise to more widespread and more severe experience of MH comorbidities and alcohol/substance abuse apparently caused or exacerbated by social isolation and uncertainty about the pandemic. [38]

A study at a Ryan White-funded clinic in Atlanta enrolled a population representative of the PWH population there: 84% assigned male at birth (AMAB) and 78% African American with a median age of 55. The study showed that PWH had similar concerns to other patient populations: phone and internet connectivity and cost, tech knowledge issues, and difficulty communicating with providers, but participants were generally satisfied with their experiences. [26] A 2020 survey of PWH in Brooklyn and Brookhaven, CT asked participants to rate the usefulness of telemedicine regarding their own care and in general. 74.3% of participants viewed telemedicine visits to be as good as, or better, than an in-person visit, while 19.9% viewed them as worse. The investigators also found lower odds of having a favorable opinion of telemedicine visits among smart phone non-owners than among smart phone owners [OR 0.27 (0.13-0.59)]. [28]

Researchers in Seattle enrolled PWH at an HIV clinic who were engaged in HIV care within 24 months before March 15, 2020, to measure their retention to care. Univariate analysis showed that age, race, insurance type, and history of patient portal login were associated with history of a video visit. Utilization of video visits plateaued at around 10% of overall telehealth sessions. Multivariate analysis showed that PWH ≥50yo were more likely to complete video visit compared to their 18 to 35-year-old counterparts. Black PWH and Asian/Pacific Islander (AAPI) PWH were less likely to complete a video visit than White PWH, and PWH who used Medicaid were less likely to complete a video visit than PWH with private insurance. [39]

Not all subgroups within PWH are likely to experience broad acceptance of telemedicine options. [27] A 2022 study of PWH found that patients aged 46-60 were more likely to use telehealth options compared to individuals aged 31-45. It also showed that non-white participants were less likely to attend virtual visits than their white counterparts. [40] Another study of persons in HIV care showed that individuals over 65 were less interested in telehealth options than the younger groups. A safety net HIV clinic in San Francisco in 2020 switched to phone visits except when otherwise requested by patient or provider. Researchers found that the clinic offered telehealth options to homeless individuals at a much lower rate than they did to housed individuals. [41]

Research on telehealth and HIV outcomes was incredibly limited before the pandemic which made it difficult to compare the current climate to previous ones. Among PWH, men who have sex with men (MSM), persons who use drugs and persons who inject drugs (PWUD/PWID), sex workers (SW) trans persons, and incarcerated persons were particularly susceptible to interruptions to the HIV care continuum during the pandemic. Such interruptions caused by pandemic-related restrictions or even personal experience of COVID could make for worse HIV-related outcomes. [38] This is especially disconcerting when one considers studies that show positive HIV status itself poses a statistically significant clinical risk for COVID. [27]

Telehealth presents new and more complex confidentiality concerns among a population where confidentiality is already a major consideration. [27] A mixed-methods study of persons receiving HIV care during the COVID pandemic found that some participants found it difficult to speak about personal or sensitive information during telemedicine visits. Clinical staff also reported concerns about privacy and confidentiality regarding this new, widespread use of telemedicine. [28] Privacy of telehealth sessions was a concern for unhoused persons and persons living in group or family settings. The prospect of having discussions about personal health and HIV care in a non-clinical setting where family members or other cohabitants could hear the conversation was unsettling. [37]

Researchers in Atlanta enrolled men and women living with HIV aged 20-37 in 2020 for a longitudinal investigation of HIV care continuum- and COVID-related experiences. The majority of participants used more than one substance, had notable comorbidities, and demonstrated signs of clinical depression. The researchers administered questionnaires, conducted interviews, and collected dried blood spots and urine specimens. The majority of participants had HIV viremia at baseline, showed markers of renal disorders, and showed one or more indications of substance use. At 1-month follow-up, COVID-protective behaviors like social distancing meant decreased access to food and medications, and it increased the likelihood of disruptions of the HIV care continuum, whether initiated by patient or provider. ART adherence actually improved over the first month, but this may be associated with increased overall health concerns and/or increased likelihood of staying at home. 19% of participants indicated that they missed an HIV care appointment in the past 30 days. [42]

Many of the risk factors for increased severity of symptomatic COVID-19 experience are highly prevalent among PWH, and those with a greater risk did not engage in more, or better, COVID-protective behaviors. On the other end, participants who engaged in greater COVID-protective behaviors showed higher likelihood of being unable to get to pharmacy, being unable to procure needed medications, and having a provider cancel an appointment. 40% of participants reported an inability to access food at some point during the early months of the pandemic, and among those, 22% were not food insecure at their baseline assessment. [42]

A study of an HIV clinic in San Francisco found that homeless individuals experienced higher odds of viral non-suppression than housed individuals despite higher rates of clinical visit attendance during the early months of the pandemic. The researchers also found an increased odds of viral non-suppression across all participants during the shelter-in-place era than before the pandemic (OR 1.31; 1.08-1.53). [41]

While transportation is not an issue experienced personally by prisoners with HIV, transportation issues and lack of resources for transportation of personnel and equipment can make it difficult for qualified, dedicated providers and counselors to travel to jail and prison facilities. Physicians at correctional facilities rarely have the training or experience to provide HIV care and treatment.

Prisoners with HIV usually have limited access to subspecialty providers, and they trail the non-incarcerated substantially in all phases and aspects of the HIV care continuum. [43]

There are certain themes across the literature on PWH during the pandemic that should serve as lessons that we apply to everyday HIV care. Privacy and confidentiality, Individual tailoring of care, cultural sensitivity, trust/rapport, proactive community engagement, staff training, and patient health/digital literacy issues were common. [24, 26, 27, 37] There was little variability to the options offered as well, offering no alternatives for some patients. [40] Balancing in-person services and telehealth services and identifying the best mode(s) of telehealth service will be of particular importance going forward. [37] We still need further investigation into what influences differing telehealth-seeking behaviors between demographic groups and patient types. [37]

Being proactive about offering telehealth services means committing to the establishment of private telehealth sessions and confidential storage and transfer of any data collected during the sessions. Patients have privacy concerns, and they can have difficulty speaking about private information over the phone. [2, 27, 28] Proactivity also means seeking feedback from patients, being especially mindful of communities who have a mistrust of the medical and health care systems. [27] Telehealth approaches must address disparities in access and benefit and engage the populations that we see marginalized by telehealth adoption. [26] We cannot afford to leave out anyone while making this change to the new norm. This means further research that obtains thorough demographic data in association with robust survey and interview data. [24]

It is important to not focus too heavily on certain findings being COVID-era-specific and instead explore the areas of need that the pandemic uncovered. [44] Further exploration should focus on implications beyond the COVID era. We need to improve patient experience using an approach based on the individual’s needs and preferences. Telemedicine for HIV care shows success with patients who are already interested in using telemedicine, making it easier to focus on the ones who do not show interest initially. [37] It is necessary to find a balance where acceptability and utility do not lose out to innovative use of technology for its own sake. [27]

Even though issues like patient variability of digital literacy exist, telehealth is a useful and beneficial tool going forward. [22] PWH are generally satisfied with their experiences, but we can improve every aspect and phase of telehealth services. The best ways to implement telehealth services are still not identified, and we must continue to explore how to best fit patients' needs. [26]

3. METHODS

The original study from which these data were collected (SYNERGY) enrolled 200 English-speaking, adult AAWH participants from a clinic and two hospitals across two healthcare systems in Atlanta. Recruitment occurred through in-person outreach in these clinics by clinic-based study recruitment staff and study personnel. This was a mixed-methods, cross-sectional study that sought to describe reasons for personal changes in health- and healthcare-related behaviors as well as barriers and facilitators to HIV care continuum retention during the COVID pandemic. Investigators administered surveys and conducted in-depth interviews with a subset of 10 participants. Investigators identified potential participants from three existing, IRB-approved Emory University School of Medicine studies where participants gave their permission to be contacted for future research. These studies included an AIDS-related malignancies consortium, a women's HIV study, and a multi-healthcare system HIV disease registry. No individuals from recognized vulnerable populations were included in the study.

Our current analysis of the survey data includes descriptive statistics of demographic data and certain clinically related variables. There were no questions specific to telehealth in the survey. There were only two questions that asked specifically about transportation, and they were conditional questions that only appeared if someone reported not being able to attend a healthcare provider's appointment or not being tested for COVID. Thematic analysis of interview transcripts was used to identify themes relevant to our investigation. We started with the broad themes of telehealth and transportation and expanded as much as we could considering the limited interview data specific to those two topics. We analyzed quantitative survey data using SAS 9.4 (Cary, NC), and we coded and analyzed qualitative data using MAXQDA 24.2.0 (Berlin).

Demographic survey variables include gender, sex assigned at birth, marital status, education level, employment status, insurance status, living status, and Hispanic/Latino ethnicity. This was the only variable collected on ethnicity. All participants identify as Black and/or African American, but there were no questions about race in the survey. The original survey unfortunately did not collect participant age. Other variables include essential worker status during the lockdown periods, history of significant comorbidities, recent lapse in ART regimen, COVID test received, flu vaccine received, and healthcare appointment missed. We produced frequency figures on all variables.

We kept some of the predictor variables as they were, and we converted others to identify more easily what the responses told us. Sex assigned at birth, gender, and education level were all kept as they were. We converted the ethnicity and health insurance variables to exclude the "Decline to answer” responses and account for cases where a respondent checked multiple boxes. We also converted the housing status variable into “Lives in a house or apartment? (Y/N),” and we converted the comorbidities variable into “Comorbidities that are not well controlled? (Y/N).” Regarding the outcome variables, we converted them all to dichotomous, yes/no variables: “Missed a medical appointment,” “Missed an appointment due to transportation,” “Missed a COVID test due to transportation,” and “Missed at least one dose of HIV medication over the past 30 days.” This allows us to see which exposures have any potential association with our outcomes.

We approached the interview transcripts already knowing our two general themes of telehealth and transportation. We reviewed the transcripts in their entirety and looked for facilitators, barriers, and any other potentially associated themes. From this, we assembled a list of search terms for all the transcripts including “telehealth,” “video,” “phone,” “telemedicine,” “transportation,” “car,” “bus,” “train,” “MARTA,” “ride,” “miss,” “delay,” and “late.” This initial review showed that medical appointment adherence, changes in how the participant received their medications, and ART adherence could be useful in contextualizing the role of telehealth and transportation during the COVID pandemic and in times of normal capacity.

The low overall volume of discussion about telehealth and transportation made it easy to identify themes and stay focused on them. We included every mention of telehealth and transportation in our themes and identified any other content that was relevant to our two main themes. There were also sub-themes in both telehealth and transportation that included utilization, acceptability, COVID pandemic-related changes, and usual mode of transportation for healthcare appointments. Most of the content included in our themes was direct responses to the telehealth and transportation questions and further provision of context by the interviewee.

4. RESULTS

4.1. Quantitative Analysis Results

We performed an analysis of survey responses keeping in mind that the entire population identifies as Black and/or African American. The survey did not collect participant age, so we are unable to show any comparisons related to age. Analysis of available data showed that survey participants included 93 (46.5%) females, 101 males (50.5%), 4 transgender women (2%), one transgender man (0.5%), and one nonbinary person (0.5%). Sex assigned at birth distribution was 92 (46%) female and 108 (54%) male. Only 6 participants (3.1%) identified as Latino.

Most respondents (N=102, 52%) reported some level of post-high school education, with nearly a third reporting only a high school diploma/GED (64, 32%). Less than half of respondents reported current, steady employment. One in four respondents (50, 25%) reported full-time employment or were self-employed, while 23 participants (11.5%) indicated part-time employment. The majority of participants reported living in a house or an apartment. Five out of six participants said that they live in a house or apartment that they rent or own (133, 66.5%) or in a house or apartment that belongs to a family member (33, 16.5%).

Health insurance coverage status can be an important tool in characterizing a patient population and predicting outcomes. Almost two thirds of respondents reported either private insurance or Medicare/Medicaid (or both) as their insurance coverage. “Medicare or Medicaid” (109, 55.9%) was the most frequent response for insurance status. The only other common responses were private insurance (45, 23.1%) and no insurance (35, 18%). 160 participants (82.1%) reported at least some type of insurance coverage. While not a perfect marker for ART adherence, 186 participants (93%) indicated they were currently taking ART medications for their HIV diagnosis. It is important to consider comorbidities among this population as well, as 25 participants (12.5%) reported currently experiencing a health condition other than HIV that is not well controlled.

Just over one in four participants (56, 28%) reported being unable to attend at least one healthcare provider appointment because of the pandemic. Of those 56, seven participants (12.5%) cited transportation as the reason for the miss. The most common reason for not attending an appointment was “Because I was worried about catching the coronavirus” (31, 55.4%). Whether or not an individual ever got tested for COVID can be useful to this analysis, but unlike with attending a healthcare appointment, some individuals chose not to get tested for reasons such as mistrust or disbelief in the government or medical and public health systems. 66 participants reported not getting a COVID test during the pandemic responded when asked why they had not been tested yet for COVID. Of those, 5 (7.6%) chose “Testing was not available in my area,” including only one participant (1.5%) that chose both that response and “I haven't had transportation to or from a testing location.” Whether or not an individual was still able to obtain all medications was another potential indicator of transportation issues. 18 participants (9%) reported being unable to obtain their usual medications, and of those, 10 (55.6%) had interruptions in obtaining at least one of their HIV medications.

When we cross-tabulate, we see that many of the expected values are very close to the observed values. The column percentages for the “Yes” responses to the outcome variables are almost all very close to the overall percentages for each predictor variable. Notable exceptions include the following:

- HS grads and GED recipients made up over 57% of the respondents that missed an appointment due to transportation while making up only 32% of all respondents. Likelihood of missing an appointment due to transportation decreased as the education level ascends.
- Persons who use only Medicaid or Medicare made up 85.7% of the respondents that missed an appointment due to transportation while making up only 55.9% of all respondents. The only persons that missed an appointment were either on Medicaid/Medicare or they had no health insurance.
- Persons with comorbidities that are not well controlled comprised 12.5% of the overall study population, but comprised:
    - 19.6% of respondents who missed a healthcare appointment
    - 28.6% of respondents who missed a healthcare appointment because of transportation
    - 20% of respondents who missed at least one does of HIV medication in the past 30 days

Chi-square tests and Fisher's exact tests show that only the final sub-bullet produced a statistically significant result (p=0.024) out of all the cross-tabulations. This means that most of our predictor variables did not show association with the results: sex, gender, Latino ethnicity, living status, education level, and health insurance status. (see Table 1 for all cross-tabulated results)

4.2. Qualitative Analysis Results

Thematic analysis of qualitative interview transcript data focuses on issues potentially relevant to telehealth and transportation. The length, depth, and level of detail in responses varies between interviewees, but the responses give valuable insight about our population of interest. We get a baseline understanding of how AAWH dealt with the initial stages of the COVID pandemic. The interviews show us who had at least one telemedicine visit, who had any changes to their usual mode of transportation, who missed medical appointments, and who had changes to how they receive their medications. Exposure to telemedicine was evenly split among the interviewees who provided a response to this question. Eight of the ten interviewees indicated whether they had at least one telemedicine visit with their provider, with the responses being four "Yes" and four "No." One of interviewees that answered "No" also indicated that she had a telemedicine appointment with a provider regarding their child's medical care rather than their own, so they had some familiarity and experience with the concept. Overall, interviewees seemed pleased or ambivalent about any telemedicine visits they had so far. Some unintended benefits of telemedicine visits appear in the transcripts. One participant, though seemingly not too impressed with their telemedicine visits overall, brings up the fact that the lag between acute onset of symptoms and in-person visit with provider can be problematic, and telemedicine directly addresses that: "Zoom, [...] it's okay. It's okay because your doctor gets to see you when you're at your worst because sometimes when you go to the doctor, you don't feel the same symptoms as you [were] before you went."

No one reported specifically having a negative experience with telemedicine, but two of the six interviewees that spoke to this topic indicated that they still prefer in-person visits to telemedicine visits for their HIV care. One of these two indicated that they prefer in-person "because I like to talk to my doctor," and the other stated that they simply are more comfortable with in-person interactions with their provider: “I’m used to seeing the doctor in person, so he can… [examine] me and check some stuff out that he can’t do on the phone.”

One interviewee reported becoming more familiar with their smart phone during the course of the pandemic. When asked whether anything positive came out of their experience with the pandemic, they responded, “Yes, something positive came out of it. I learned how to work my phone, and go on Zoom, and I’ve learned to love a lot of things on the phone that I said a year before that I didn’t think I’d ever be doing that. All I wanted to do was just answer the phone and hang up.” Another interviewee spoke about how the COVID pandemic, and specifically their familiarity with Zoom as a communication tool, made it more appealing to join and be active on social media.

We get some crucial insight on issues of transportation from the interviews. Some interviewees state one or more modes of transportation that they used during the first year of the pandemic. We also see responses that speak to whether they experienced any transportation-related changes or barriers to care because of the COVID pandemic. Four interviewees reported their usual mode of transportation. Two reported owning and using a car, one reported primarily using MARTA trains, and one reported primarily using MARTA Mobility, an Americans with Disabilities Act (ADA) Complementary Paratransit service for persons who are unable to ride regular MARTA fixed-route trains and buses. This response also tells us that we have at least one interviewee with at least one disability that affects their personal mobility without having to ask that question explicitly. One of the persons who owned a car indicated some difficulty in maintaining the car and having to walk and take a bus to make their medical appointments for a period of time: “My car went out. So, I was on the bus and having to walk two miles to get to the closest bus stop, which made it difficult for me to get to my doctors' appointments and stuff like […] medication, and all that."

Eight interviewees stated whether they missed at least one clinical appointment during the COVID pandemic. Three reported missing an appointment, and five missed no appointments. Of those that did miss an appointment, the responses are very brief but unsurprising given what we know about the first year of the COVID pandemic. One interviewee stated that they were "afraid of being around people." Another suggested that they missed an appointment because their clinic or provider "was shut down," presumably as part of COVID pandemic-related business closures or lockdown measures. The third stated simply that they missed the appointment "due to COVID," saying of providers and clinics in the early weeks of the COVID pandemic, "some of [my appointments] were postponed because they were scared of COVID. And didn't know what to do."

Just as with telehealth and transportation, the COVID pandemic also brought about changes in medication obtainment. Many patients were offered mail delivery of medication. Of our interviewees, eight stated whether they saw any changes in how they obtain their medication. Only two reported a change, stating that they opted for mail delivery. The remaining six reported no changes from how they got their medications before the COVID pandemic.

5. DISCUSSION

Even with limited data, this analysis highlighted issues of transportation and telehealth services that can help inform planning for other public health emergencies (e.g. pandemics, natural disasters) that may disrupt access to healthcare services. Our current analysis at least allows us to characterize our population demographically and with respect to a few key clinical considerations both general and specific to the participant's HIV care. The SYNERGY study's purpose was to better understand how patients dealt with the initial stages of the pandemic, and the survey and interview data reflect that. The questions and answers mostly were specific to the first six months of the COVID pandemic. In many respects, COVID produced a new set of conditions that ended up being the now normal, standard way of existing. There was no going back to the pre-COVID mode of operation, so we confidently can extrapolate the results of the study to the post-COVID era.

Having limited data on telehealth and transportation from our surveys and interviews allows us to focus intently on these topics. It forces us to analyze what we have in a more rigorous way, and it forces us to think about what questions we might incorporate into subsequent research instruments such as surveys and interview guides to make them more useful.

The literature before the COVID pandemic on telehealth and/or transportation among AALWH unsurprisingly is limited, and even the literature on these topics and population produced after the pandemic's onset is inadequate in its volume and scope. The literature on telehealth among AAWH is more substantial than the literature on transportation among AAWH. Contrarily, our survey collects no telehealth data and some transportation data, making it difficult to compare our results to the literature. We need to conduct more research on these topics with our population of interest.

When we do compare our results to the literature, we see reasons to be optimistic with respect to missed medical appointments. According to Chen, 40% of Americans experienced a missed appointment over a similar timeline for which 28% of our study population missed an appointment. [12] Wolfe, citing data from 2017, showed that Hispanics and Medicaid recipients (among others) had a higher likelihood of experiencing a barrier to transportation access. [15] None of our Latino/Hispanic survey respondents missed a medical appointment because of a transportation issue. For now, we must tailor approaches to the individual based on a few key demographic variables like gender, age, race/ethnicity, digital literacy, and health literacy among others.

Our quantitative analysis shows us that very few participants missed a COVID testing opportunity because of a transportation issue (1.5%), but a larger proportion of participants reported missing a medical appointment because of a transportation issue (12.5%). We see that the severity of transportation barriers among our population is not as great as the literature might indicate. Even in times of great uncertainty and stress, our population generally was able to maintain their HIV care continuum. We also do not see any significant variation between groups within most of our predictor variables. We can use these results to show potential groups or sub-groups of patients to whom we might focus efforts to ease and improve telehealth and healthcare-related transportation. For instance, even though the health insurance variable did not appear to produce any statistically significant differences between groups, we still might want to focus on patients with Medicaid/Medicare and patients without health insurance when we consider implementing efforts to provide transportation support to patients.

We need to find out exactly what kinds of appointments patients missed, and what specific kinds of transportation issues led to these missed appointments. We should ask patients what kinds of transportation issues they contend with, whether or not they led specifically to an unintended or unwanted outcome like a missed appointment. Any analysis like this would benefit from collection of contextual data. In this case, things like car ownership, public transit usage rates, paratransit usage rates, and average distance traveled to medical appointments would be incredibly useful in future analyses. Knowing how our population travels, how often, and for how long on average would be useful bases for better understanding the needs of this population.

6. LIMITATIONS

This current analysis has several limitations to address. The original study was not designed to measure telehealth and transportation exposures or outcomes, and as a result, we have limited data to analyze. Rather, information on our topics of interest was intended to be mere context for the main questions about COVID, the COVID pandemic, and their HIV care. The survey provides very little information specific to transportation, and it provides no information about telehealth whatsoever. There are a few very important variables that were not collected in the survey. Most of the interviews included one specific question about telehealth utilization and acceptance, but not all. There was one question in most of the interviews that asked only about changes in transportation caused by the COVID pandemic.

The survey notably did not collect age as a variable. This would have been helpful in the current analysis since we aim to identify groups for whom we need to specifically tailor telehealth and/or transportation solutions. As we showed in our literature review, age is an important predictor of telehealth and transportation-related outcomes. Including age in the survey also would have given us our only continuous variable in the entire analysis. An age distribution would be helpful at least to characterize the study population. Other useful demographic variables might include annual income and length of current residency.

Also not included in the survey were any questions related to telehealth. Questions about overall tech savvy, smart phone ownership, computer ownership/access, home internet connectivity and speed, digital literacy, digital health literacy, and history of use of online patient portals would yield useful information about our population of interest. Questions about patients' history of telehealth utilization and attitudes towards telehealth would show how many participants used telehealth services and how many participants felt positively or negatively about such services. There are not any useful related variables in the survey that might give insight into the respondent's personal situation regarding telehealth. The interviews provided some of these types of information, but not from all interviewees. Ideally, we would see some of the interview questions reinforced by specific, coinciding questions in the survey.

The survey only poses two questions that contain that word "transportation," and they are both conditional questions. They only appear when a respondent indicates that they missed either a medical appointment or a COVID testing opportunity, and they are only available to select as a reason for missing an appointment. This means that the survey only registers an issue with transportation if it caused a missed medical or COVID testing appointment. There can be barriers to transportation that do not always result in missed appointments, but they are still relevant to the experience of the individual. This also restricts the number of respondents to these questions, meaning we only have responses about transportation from less than half of the total survey population.

Useful survey questions would include automobile ownership and access, usual mode of transportation for healthcare appointments, usage rates of public transit, rideshares, and paratransit, and average travel times to HIV care clinics. Questions with scaled responses dealing with personal transportation-related barriers to, and facilitators of, timely access to clinical care would give participants some way of showing their own experience. These would allow us to see the issues that posed problems to patients but perhaps did not quite reach the level of preventing access to a healthcare provider appointment or COVID test. The best approach for a study like this would be to ask a wider range of questions with some overlap or redundancy so that we get richer data specific to our topics.

The interview also has significant limitations in its ability to answer questions related to our topics of interest. The interviews included questions about telehealth and transportation, but not many, and they did not prompt any real sort of discussion or elaboration. There were very few interviews conducted, and only ten were fit for transcription and analysis. The interviews themselves tended to be very short overall with most interviewees providing very brief answers to the questions. The questions regarding transportation and telehealth were not posed the same way to all interviewees.

There was only one dedicated question about telehealth in most of the interviews, and it only asked whether the participant ever had a telemedicine appointment since the beginning of the pandemic. In one case it was not asked at all because the participant broached the topic first. There was little or no follow-up to the yes/no response given by the participants. This gives us very limited ability to assess patient knowledge and attitudes of telehealth options. We get some elaboration on experiences and attitudes from a few of the interviewees, and it is worthy of consideration when presenting the results of this study, but we must be cautious in drawing any conclusions solely from these transcripts. The interviews also asked no specific questions that we could use as indicators of telehealth savvy or acceptance. Like the survey, any questions that would yield answers about the participant’s digital literacy, digital health literacy, smart phone and personal computer ownership and familiarity, and use of online patient portals would be useful in an analysis such as this one.

Like the interview questions and responses on telehealth, transportation serves primarily as a contextual topic in the interview. Ideally, the interview guide would include more questions about transportation coming from different angles. The interview only asked specifically about changes in transportation and/or income because of the COVID pandemic. Some interviewees stated their usual mode of transportation for healthcare appointments, but most did not. Patterns like this effectively rule out any quantitative analysis of interview transcript data on our topics of interest and restrict us to our thematic analysis.

7. CONCLUSIONS

The study results are fairly reassuring, especially with respect to our two topics of interest. Overall, this population was fairly resilient with regard to dealing with issues that arose from the COVID pandemic. We can use these results to formulate not only solutions for the telehealth and transportation issues faced by our population, but also future research on these topics among AAWH. At the very least, this thesis shows the necessity of further exploration of these issues. To fully understand the ways that patients experience telehealth and transportation, we need to conduct more prospective research specifically on the topics, and these studies need to incorporate the lessons learned here about survey and interview guide formulation and inter-interviewer variability. Being purposeful about future iterations of research studies on these topics will decrease the chances of placing an undue burden upon future study participants. Well-constructed research instruments and consistency in data collection are crucial.

The results do not allow us to make many conclusions about telehealth other than the fact that we need survey questions specific to the topic, and we need more variety to the questions in the interview guide as well as more options for further probing on telehealth questions. This means potentially using existing, standard telehealth questionnaires and transportation questionnaires. Regarding implementation of solutions, clinics serving this population should collect some of these data clinically if possible. Assessing an individual's personal barriers to and experiences with telehealth and healthcare-related transportation appear to be necessary at least according to our study results that say we have few, if any, ways to predict who will need attention simply according to the demographic and clinical variables we have from our survey and interview.

APPENDICES

Table 1	**Missed any healthcare appointment**				
	No	**Yes**	**Row Totals (Column %)**	**Chi-Square**	**Fisher's Exact**
Gender (N=200)				**p=0.897**	**N/A**
Cisgender Female	65	28	93		
(Row Percentage)	69.9%	30.1%	46.5%		
Gender queer or Nonbinary	1	0	1		
	100.0%	0.0%	0.5%		
Cisgender Male	74	27	101		
	73.3%	26.7%	50.5%		
Transgender Female	3	1	4		
	75.0%	25.0%	2.0%		
Transgender Male	1	0	1		
	100.0%	0.0%	0.5%		
Sex Assigned at Birth (N=200)				**p=0.479**	**p=0.529**
Female	64	28	92		
	69.6%	30.4%	46.0%		
Male	80	28	108		
	74.1%	25.9%	54.0%		
Ethnicity (N=197)				**p=0.117**	**p=0.186**
Non-Latino	135	56	191		
	70.7%	29.3%	97.0%		
Latino	6	0	6		
	100.0%	0.0%	3.1%		
Education level (N=200)				**p=0.553**	**N/A**
K-9th	5	0	5		
	100.0%	0.0%	2.5%		
9th-11th grade	17	10	27		
	63.0%	37.0%	13.5%		
HS grad/GED	48	16	64		
	75.0%	25.0%	32.0%		
Some college	36	11	47		
	76.6%	23.4%	23.5%		
Tech/Vocational/Associate's	18	11	29		
	62.1%	37.9%	14.5%		
Bachelor's degree	10	5	15		
	66.7%	33.3%	7.5%		

Table 1 (cont.)	**Missed any healthcare appointment**				
	No	**Yes**	**Row Totals (Column %)**	**Chi-Square**	**Fisher's Exact**
Master's degree	7	2	9		
	77.8%	22.2%	4.5%		
Doctorate	1	1	2		
	50.0%	50.0%	1.0%		
Other	2	0	2		
	100.0%	0.0%	1.0%		
Health Insurance (N=195)				**p=0.420**	**N/A**
Only Medicaid or Medicare	82	27	109		
	75.2%	24.8%	55.9%		
Military or VA	1	1	2		
	50.0%	50.0%	1.0%		
No Health Insurance	25	10	35		
	71.4%	28.6%	18.0%		
Private insurance	29	16	45		
	64.4%	35.6%	23.1%		
Other	4	0	4		
	100.0%	0.0%	2.1%		
Lives in a house or apartment? (N=200)				**p=0.277**	**p=0.326**
No	18	4	22		
	81.8%	18.2%	11.0%		
Yes	126	52	178		
	70.8%	29.2%	89.0%		
Comorbidities not well controlled? (N=200)				**p=0.057**	**p=0.093**
No	130	45	175		
	74.3%	25.7%	87.5%		
Yes	14	11	25		
	72.0%	28.0%	12.5%		

Table 2	**Missed an appointment because of transportation issues**				
	No	**Yes**	**Row Totals (Column %)**	**Chi-Square**	**Fisher's Exact**
Gender (N=56)				**p=0.468**	**N/A**
Cisgender Female	23	5	28		
(Row Percentage)	82.1%	17.9%	50.0%		
Gender queer or Nonbinary	0	0	0		
	0.0%	0.0%	0.0%		
Cisgender Male	25	2	27		
	92.6%	7.4%	48.2%		
Transgender Female	1	0	1		
	1.8%	0.0%	1.8%		
Transgender Male	0	0	0		
	0.0%	0.0%	0.0%		
Sex Assigned at Birth (N=56)				**p=0.225**	**p=0.422**
Female	23	5	28		
	82.1%	17.9%	50.0%		
Male	26	2	28		
	92.9%	7.1%	50.0%		
Ethnicity (N=56)				**(Row sum zero)**	
Non-Latino	49	7	56%		
	87.5%	12.5%	100.0%		
Latino	0	0	0		
	0.0%	0.0%	0.0%		
Education level (N=56)				**p=0.506**	**N/A**
K-9th	0	0	0		
	0.0%	0.0%	0.0%		
9th-11th grade	10	0	10		
	100.0%	0.0%	17.9%		
HS grad/GED	12	4	16		
	75.0%	25.0%	28.6%		
Some college	9	2	11		
	81.8%	18.2%	19.6%		
Tech/Vocational/Associate's	10	1	11		
	90.9%	9.1%	19.6%		
Bachelor's degree	5	0	5		
	100.0%	0.0%	8.9%		

Table 2 (cont.)	**Missed an appointment because of transportation issues**				
	No	**Yes**	**Row Totals (Column %)**	**Chi-Square**	**Fisher's Exact**
Master's degree	2	0	2		
	100.0%	0.0%	3.6%		
Doctorate	1	0	1		
	100.0%	0.0%	1.8%		
Other	0	0	0		
	0.0%	0.0%	0.0%		
Health Insurance (N=54)				**p=0.198**	**N/A**
Only Medicaid or Medicare	21	6	27		
	77.8%	22.2%	50.0%		
Military or VA	1	0	1		
	100.0%	0.0%	1.9%		
No Health Insurance	9	1	10		
	90.0%	10.0%	18.5%		
Private insurance	16	0	16		
	100.0%	0.0%	29.6%		
Other	0	0	0		
	0.0%	0.0%	0.0%		
Lives in a house or apartment? (N=56)				**p=0.433**	**p=1.000**
No	4	0	4		
	100.0%	0.0%	7.1%		
Yes	45	7	52		
	86.5%	13.5%	92.9%		
Comorbidities not well controlled? (N=56)				**p=0.525**	**p=0.614**
No	40	5	45		
	88.9%	11.1%	80.4%		
Yes	9	2	11		
	81.8%	18.2%	19.6%		

Table 3	**No COVID test because of transportation issues**				
	No	**Yes**	**Row Totals (Column %)**	**Chi-Square**	**Fisher's Exact**
Gender (N=200)				**p=0.9903**	**N/A**
Cisgender Female	91	2	93		
(Row Percentage)	97.9%	2.2%	46.5%		
Gender queer or Nonbinary	1	0	1		
	100.0%	0.0%	0.5%		
Cisgender Male	98	3	101		
	97.0%	3.0%	50.5%		
Transgender Female	4	0	4		
	100.0%	0.0%	2.0%		
Transgender Male	1	0	1		
	100.0%	0.0%	0.5%		
Sex Assigned at Birth (N=200)				**p=0.785**	**p=1.000**
Female	90	2	92		
	97.8%	2.2%	46.0%		
Male	105	3	108		
	97.2%	2.8%	54.0%		
Ethnicity (N=197)				**p=0.688**	**p=1.000**
Non-Latino	186	5	191%		
	97.4%	2.6%	97.0%		
Latino	6	0	6		
	100.0%	0.0%	3.1%		
Education level (N=200)				**p=0.579**	**N/A**
K-9th	5	0	5		
	100.0%	0.0%	2.5%		
9th-11th grade	27	0	27		
	100.0%	0.0%	13.5%		
HS grad/GED	61	3	64		
	95.3%	4.7%	32.0%		
Some college	47	0	47		
	100.0%	0.0%	23.5%		
Tech/Vocational/Associate's	28	1	29		
	96.6%	3.5%	14.5%		
Bachelor's degree	15	0	15		
	100.0%	0.0%	7.5%		

Table 3 (cont.)	**No COVID test because of transportation issues**				
	No	**Yes**	**Row Totals (Column %)**	**Chi-Square**	**Fisher's Exact**
Master's degree	8	1	9		
	88.9%	0.0%	4.5%		
Doctorate	2	0	2		
	100.0%	0.0%	1.0%		
Other	2	0	2		
	100.0%	0.0%	1.0%		
Health Insurance (N=195)				**p=0.601**	**N/A**
Only Medicaid or Medicare	106	3	109		
	97.3%	2.8%	55.9%		
Military or VA	2	0	2		
	100.0%	0.0%	1.0%		
No Health Insurance	33	2	35		
	94.3%	5.7%	18.0%		
Private insurance	45	0	45		
	100.0%	0.0%	23.1%		
Other	4	0	4		
	100.0%	0.0%	2.1%		
Lives in a house or apartment? (N=200)				**p=0.426**	**p=1.000**
No	22	0	22		
	100.0%	0.0%	11.0%		
Yes	173	5	178		
	97.2%	2.8%	89.0%		
Comorbidities not well controlled? (N=200)				**p=0.392**	**p=1.000**
No	170	5	175		
	97.1%	2.9%	87.5%		
Yes	25	0	25		
	100.0%	0.0%	12.5%		

Table 4	**Missed at least one dose of HIV medication in the past 30 days**				
	No	**Yes**	**Row Totals (Column %)**	**Chi-Square**	**Fisher's Exact Test**
Gender (N=200)				**p=0.679**	**N/A**
Cisgender Female	57	34	97		
(Row Percentage)	62.6%	37.4%	47.9%		
Gender queer or Nonbinary	1	0	1		
	100.0%	0.0%	0.5%		
Cisgender Male	53	40	93		
	57.0%	43.0%	49.0%		
Transgender Female	3	1	4		
	75.0%	25.0%	2.1%		
Transgender Male	1	0	1		
	100.0%	0.0%	0.5%		
Sex Assigned at Birth (N=200)				**p=0.453**	**p=0.462**
Female	57	33	90		
	63.3%	36.7%	47.4%		
Male	58	42	100		
	58.0%	42.0%	52.6%		
Ethnicity (N=188)				**p=0.568**	**p=0.679**
Non-Latino	112	70	182		
	61.5%	38.5%	96.8%		
Latino	3	3	6		
	50.0%	50.0%	3.2%		
Education level (N=190)				**p=0.497**	**N/A**
K-9th	5	0	5		
	100.0%	0.0%	2.6%		
9th-11th grade	15	11	26		
	57.7%	42.3%	13.6%		
HS grad/GED	37	23	60		
	61.7%	38.3%	31.6%		
Some college	23	21	44		
	52.3%	47.7%	23.2%		
Tech/Vocational/Associate's	16	12	28		
	57.1%	42.9%	14.7%		
Bachelor's degree	9	5	14		
	64.3%	35.7%	7.4%		

Table 4 (cont.)	**Missed at least one dose of HIV medication in the past 30 days**				
	No	**Yes**	**Row Totals (Column %)**	**Chi-Square**	**Fisher's Exact Test**
Master's degree	7	2	9		
	77.8%	22.2%	4.7%		
Doctorate	2	0	2		
	100.0%	0.0%	1.1%		
Other	1	1	2		
	50.0%	50.0%	1.1%		
Health Insurance (N=187)				**p=0.551**	**N/A**
Only Medicaid or Medicare	70	38	108		
	64.8%	35.2%	57.8%		
Military or VA	1	1	2		
	50.0%	50.0%	1.1%		
No Health Insurance	16	17	33		
	48.5%	51.5%	17.7%		
Private insurance	24	17	41		
	58.5%	41.5%	21.9%		
Other	2	1	3		
	66.7%	33.3%	1.6%		
Lives in a house or apartment? (N=190)				**p=0.133**	**p=0.152**
No	9	11	20		
	45.0%	55.0%	10.5%		
Yes	106	64	170		
	62.4%	37.7%	89.5%		
Comorbidities not well controlled? (N=190)				**p=0.024**	**p=0.029**
No	105	60	165		
	63.6%	36.4%	86.8%		
Yes	10	15	25		
	40.0%	60.0%	13.2%		

REFERENCES

1. FCC, *Telehealth, Telemedicine, and Telecare: What's What?* [cited 2024 July 1]; Available from: https://www.fcc.gov/general/telehealth-telemedicine-telecare-whats-what.
2. Gajarawala, S.N. and J.N. Pelkowski, *Telehealth Benefits and Barriers.* J Nurse Pract, 2021. **17**(2): p. 218-221.
3. Gilman, M. and J. Stensland, *Telehealth and Medicare: payment policy, current use, and prospects for growth.* Medicare Medicaid Res Rev, 2013. **3**(4).
4. Nouvellet, P., et al., *Reduction in mobility and COVID-19 transmission.* Nat Commun, 2021. **12**(1): p. 1090.
5. CDC, *Estimated HIV Incidence and Prevalence in the United States, 2015-2019* in *HIV Surveillance Supplemental Report*. 2021. Available from: https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-26-1.pdf
6. CDC, *Risk for COVID-19 Infection, Hospitalization, and Death By Race/Ethnicity*. 2021 April 23, 2021 [cited 2024 July 1]; Available from: https://stacks.cdc.gov/view/cdc/105453
7. CDC, *Fast Facts: HIV in the US by Race and Ethnicity*. 2024 May 21, 2024 [cited 2024 July 1]; Available from: https://www.cdc.gov/hiv/data-research/facts-stats/race-ethnicity.html
8. Budak, J.Z., et al., *The Impact of COVID-19 on HIV Care Provided via Telemedicine-Past, Present, and Future.* Curr HIV/AIDS Rep, 2021. 18(2): p. 98-104.
9. Carmichael, H., B. Tran, and C.G. Velopulos, *When more is less: Urban disparities in access to surgical care by transportation means.* Am J Surg, 2022. **223**(1): p. 112-119.
10. Ellis, E.K., S.; Quan, J.: Sutton, W.; Regenstein, M.; Shafi, T., *Dialysis Transportation: The Intersection of Transportation and Healthcare*. 2019, Transportation Research Board: Washington, DC.
11. Hadjidemetriou, G.M., et al., *The impact of government measures and human mobility trend on COVID-19 related deaths in the UK.* Transp Res Interdiscip Perspect, 2020. **6**: p. 100167.
12. Chen, K.L., et al., *How is the COVID-19 pandemic shaping transportation access to health care?* Transp Res Interdiscip Perspect, 2021. **10**: p. 100338.
13. Oluyede, L., et al., *Addressing transportation barriers to health care during the COVID-19 pandemic: Perspectives of care coordinators.* Transp Res Part A Policy Pract, 2022. **159**: p. 157-168.
14. Verma, S., *Early Impact Of CMS Expansion Of Medicare Telehealth During COVID-19*, in *Health Affairs Blog*. July 15, 2020.
15. Wolfe, M.K., N.C. McDonald, and G.M. Holmes, *Transportation Barriers to Health Care in the United States: Findings From the National Health Interview Survey, 1997-2017.* Am J Public Health, 2020. **110**(6): p. 815-822.

16. Labban, M., et al., *Disparities in Travel-Related Barriers to Accessing Health Care From the 2017 National Household Travel Survey.* JAMA Netw Open, 2023. **6**(7): p. e2325291.

17. Yang, R.L. and I. Wapnir, *Hispanic Breast Cancer Patients Travel Further for Equitable Surgical Care at a Comprehensive Cancer Center.* Health Equity, 2018. **2**(1): p. 109-116.

18. Evans, S.D. and B.E. Williams, *Transportation-related barriers to care among African American women living with HIV/AIDS: "What you getting out of the cab for?".* Online J Rural Urban Res, 2013. **3**(1).

19. Connell, C.L., et al., *Barriers to Healthcare Seeking and Provision Among African American Adults in the Rural Mississippi Delta Region: Community and Provider Perspectives.* J Community Health, 2019. **44**(4): p. 636-645.

20. Rozenfeld, Y., et al., *A model of disparities: risk factors associated with COVID-19 infection.* Int J Equity Health, 2020. **19**(1): p. 126.

21. Cochran, A.L., et al., *Transportation barriers to care among frequent health care users during the COVID pandemic.* BMC Public Health, 2022. **22**(1): p. 1783.

22. Goldberg, E.M., et al., *Telehealth was beneficial during COVID-19 for older Americans: A qualitative study with physicians.* J Am Geriatr Soc, 2021. **69**(11): p. 3034-3043.

23. Monaghesh, E. and A. Hajizadeh, *The role of telehealth during COVID-19 outbreak: a systematic review based on current evidence.* BMC Public Health, 2020. **20**(1): p. 1193.

24. Haque, S.N., *Telehealth Beyond COVID-19.* Psychiatr Serv, 2021. **72**(1): p. 100-103.

25. Nouri, S.S., et al., *Assessing Mobile Phone Digital Literacy and Engagement in User-Centered Design in a Diverse, Safety-Net Population: Mixed Methods Study.* JMIR Mhealth Uhealth, 2019. **7**(8): p. e14250.

26. Galaviz, K.I., et al., *Patient Experiences with Telemedicine for HIV Care During the First COVID-19 Wave in Atlanta, Georgia.* AIDS Res Hum Retroviruses, 2022. **38**(5): p. 415-420.

27. Mgbako, O., et al., *COVID-19, Telemedicine, and Patient Empowerment in HIV Care and Research.* AIDS Behav, 2020. **24**(7): p. 1990-1993.

28. Harsono, D., et al., *Experiences with Telemedicine for HIV Care During the COVID-19 Pandemic: A Mixed-Methods Study.* AIDS Behav, 2022. **26**(6): p. 2099-2111.

29. Khoshrounejad, F., et al., *Telehealth-Based Services During the COVID-19 Pandemic: A Systematic Review of Features and Challenges.* Front Public Health, 2021. **9**: p. 711762.

30. Kern-Goldberger, A.R. and S.K. Srinivas, *Obstetrical Telehealth and Virtual Care Practices During the COVID-19 Pandemic.* Clin Obstet Gynecol, 2022. **65**(1): p. 148-160.

31. Yang, J., et al., *Disparities in outpatient visits for mental health and/or substance use disorders during the COVID surge and partial reopening in Massachusetts.* Gen Hosp Psychiatry, 2020. **67**: p. 100-106.

32. Friedman, C. and L. VanPuymbrouck, *Telehealth Use By Persons with Disabilities During the COVID-19 Pandemic.* Int J Telerehabil, 2021. **13**(2): p. e6402.

33. Marasca, C., et al., *Telemedicine and support groups could be used to improve adherence to treatment and health-related quality of life in patients affected by inflammatory skin conditions during the COVID-19 pandemic.* Clin Exp Dermatol, 2020. **45**(6): p. 749.

34. Volkow, N.D., *Collision of the COVID-19 and Addiction Epidemics.* Ann Intern Med, 2020. **173**(1): p. 61-62.

35. Ray, K.N. and J.M. Kahn, *Connected Subspecialty Care: Applying Telehealth Strategies to Specific Referral Barriers.* Acad Pediatr, 2020. **20**(1): p. 16-22.

36. Jiang, H., Y. Zhou, and W. Tang, *Maintaining HIV care during the COVID-19 pandemic.* Lancet HIV, 2020. **7**(5): p. e308-e309.

37. Smith, E. and M.E. Badowski, *Telemedicine for HIV Care: Current Status and Future Prospects.* HIV AIDS (Auckl), 2021. **13**: p. 651-656.

38. Guaraldi, G., et al., *Human Immunodeficiency Virus (HIV) Care Models During the Coronavirus Disease 2019 (COVID-19) Era.* Clin Infect Dis, 2021. **73**(5): p. e1222-e1227.

39. Wood, B.R., et al., *Visit Trends and Factors Associated With Telemedicine Uptake Among Persons With HIV During the COVID-19 Pandemic.* Open Forum Infect Dis, 2021. **8**(11): p. ofab480.

40. Friedman, E.E., et al., *Age and Racial Disparities in Telehealth Use Among People with HIV During the COVID-19 Pandemic.* AIDS Behav, 2022. **26**(8): p. 2686-2691.

41. Spinelli, M.A., et al., *Viral suppression rates in a safety-net HIV clinic in San Francisco destabilized during COVID-19.* AIDS, 2020. **34**(15): p. 2328-2331.

42. Kalichman, S.C., et al., *Intersecting Pandemics: Impact of SARS-CoV-2 (COVID-19) Protective Behaviors on People Living With HIV, Atlanta, Georgia.* J Acquir Immune Defic Syndr, 2020. **85**(1): p. 66-72.

43. Young, J.D., et al., *Improved virologic suppression with HIV subspecialty care in a large prison system using telemedicine: an observational study with historical controls.* Clin Infect Dis, 2014. **59**(1): p. 123-6.

44. Kim, K., *Impacts of COVID-19 on transportation: Summary and synthesis of interdisciplinary research.* Transp Res Interdiscip Perspect, 2021. **9**: p. 100305.