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Feasibility of remote self-collection of dried blood spots, hair, and nails among people with HIV (PWH) with hazardous alcohol use

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Abstract

Background: Use of biomarkers in behavioral HIV research can help to address limitations of self-reported data. The COVID-19 pandemic forced many researchers to transition from standard in-person data collection to remote data collection. We present data on the feasibility of remote self-collection of dried blood spots (DBS), hair, and nails for the objective assessment of alcohol use, antiretroviral therapy adherence, and stress in a sample of people with HIV (PWH) who are hazardous drinkers.

Methods: Standardized operating procedures for remote self-collection of DBS, hair, and nails were developed for an ongoing pilot study of a transdiagnostic alcohol intervention for PWH. Prior to each study appointment, participants were mailed a kit containing materials for self-collection, instructions, a video link demonstrating the collection process, and a prepaid envelope for returning samples.

Results: A total of 133 remote study visits were completed. For DBS and nail collection at baseline, 87.5% and 83.3% of samples, respectively, were received back to the research lab, of which 100% of samples were processed. Although hair samples were intended to be analyzed, most of the samples (77.7%) were insufficient or the scalp end of the hair was not marked. We, therefore, decided that hair collection was not feasible in the framework of this study.

Conclusion: An increase in remote self-collection of biospecimens may significantly advance the field of HIV-related research, permitting the collection of specimens without resource-

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intensive lab personnel and facilities. Further research is needed on the factors that impeded participants' ability to complete remote biospecimen collection.

Behavioral HIV research commonly involves heavy reliance on participants' self-reports about behavioral and psychological events. Although participant self-report remains the most widely used method of measurement, social desirability and recall biases may influence the accuracy of such data (Haeffel & Howard, 2010). Sensitive health-related behaviors and indices of psychological functioning, such as substance use (Del Boca & Darkes, 2003), sexual behavior (O'Sullivan, 2008), and medication adherence (Iacob et al., 2017) may be particularly prone to inaccurate self-reports, especially if there is the perception of negative consequences associated with actual behaviors. Misreporting of sensitive health indices may be common among populations that have been historically marginalized within healthcare systems, such as people with HIV (PWH; (Kontomanolis et al., 2017). Additionally, many constructs in behavioral health research are multidimensional (e.g., stress), consisting of psychological, behavioral, and biological components that may not necessarily correlate highly with each other. Biomarkers are a method of measurement whose strengths and biases are not the same as those of self-report and thus can serve as a second measure of health-related indices to corroborate self-reported data and assess the biological component of multidimensional constructs.

Biomarkers are identified through biospecimen collection that can be used alongside self-reported data (Strimbu & Tavel, 2010). In the HIV literature, the most commonly used biomarkers are those directly correlated with behaviors and indices of psychological functioning that increase risk for onward transmission and/or are associated with HIV treatment-related outcomes— e.g., biomarkers of antiretroviral therapy (ART) adherence (de Truchis et al., 2016), substance use (Hahn et al., 2010), inflammation (Nixon & Landay, 2010), stress (Glover et al., 2010), and condomless sex (Lemos et al., 2019). These biomarkers require biospecimens such as blood, urine, saliva, nails, and/or hair, and are usually collected on-site within research facilities (Poste, 2012). Remote collection is less common, although the COVID-19 pandemic, and its associated impact on face-to-face human subjects research, forced many researchers to transition from standard in-person data collection to remote data collection (McDermott & Newman, 2021). If feasible and acceptable to research participants, an increase in remote self-collection of biospecimens could significantly advance the field of HIV-related research, permitting the collection of specimens without resource-intensive laboratory personnel and facilities. The COVID-19 pandemic gave us an opportunity to transition an ongoing pilot randomized clinical trial (RCT; NCT03974061) of an alcohol intervention for PWH to a completely remote clinical trial (Woolf-King et al., 2022). To determine the success of this transition, we assessed the feasibility and acceptability of the remote self-collection of biospecimens for objective measures of alcohol use, ART adherence, and stress.

Remote collection of dried blood spots (DBS).

DBS have been used to test for viral load (Teran et al., 2021), ART adherence (Jennings et al., 2022), and, most pertinent to our ongoing pilot RCT, alcohol use among PWH (Bajunirwe et al., 2014; Hahn et al., 2016). The importance of including biomarkers

of alcohol use (e.g., phosphatidylethanonl) in clinical research has been increasingly recognized in the field (Shayani Ghosh, 2019). DBS are less invasive and expensive than intravenous blood draws and easy to collect, store, and transport. Yet few studies have examined the feasibility of remote self-collection of DBS among PWH. In one study, a sample of men who have sex with men (MSM) with HIV completed at-home self-collection of DBS for viral load testing (Teran et al., 2021). Of 56 participants, 91% (51/56) and 77% (43/56) returned their specimens to the laboratory at baseline and 3-month follow-up, respectively, and all samples were successfully processed. Conversely, Hirshfield et al., (2018) found that only 60.8% (337/554) of DBS samples returned to their laboratory had an adequate blood sample (i.e., > half-filled DBS card) for viral load testing in a larger sample of 554 MSM with HIV. Among a sample of 39 hepatitis C virus (HCV) or HIV viremic patients, 87% (34/39) of participants returned their DBS specimen; however, only 36% (12/33) of samples had 5/5 blood spots adequately filled (Prinsenberg et al., 2020). While the broader literature has found remote self-sampling of DBS to be feasible (Boons et al., 2019; Jager et al., 2015; Miesse et al., 2021; Tanna & Lawson, 2015), PWH are a population faced with unique psychosocial and medical stressors (e.g., psychopathology, chronic pain) that may serve as additional barriers to remote biospecimen collection (Addis et al., 2020; Wainberg et al., 2014). To our knowledge, no study to date has investigated the feasibility of at-home self-collection of DBS for assessing PEth levels among PWH.

Remote collection of hair samples.

Hair samples have been used to test for several biomarkers in the HIV literature, including viral load (Baxi et al., 2015; Pintye et al., 2017), substance use (Kader et al., 2012), stress (Chen et al., 2021; Zhang et al., 2022), and, most predominately, antiretrovirals (ARVs; Gandhi et al., 2019). Adequate adherence to ARVs is essential for achieving optimal HIV care outcomes (Tchakoute et al., 2022); thus, identification of objective metrics of ART adherence is pertinent to HIV treatment. Hair samples are noninvasive, relatively easy to collect and store (Gandhi et al., 2019), and can provide information about cumulative exposure to chronically administered medications. However, there is a dearth of research on the feasibility of remote self-collection of hair samples among PWH. In one of a few studies, eight PWH were recruited to complete home-collected and study-collected hair samples for assessing ARV concentrations (Saberi et al., 2017). Of the 26 home-collected hair samples that were expected, 92.3% (24/26) were received back to the laboratory, and all samples were in good condition for analysis. When recruiting participants, six participants were unable to participate because of baldness or having a finely shaved head (Saberi et al., 2017). In a separate pilot study, 84.3% (78/93) of participants returned hair samples to the laboratory (Saberi et al., 2019). Across study appointments, there was one hair sample (1.3%) that could not be analyzed due to low amount of hair (Saberi et al., 2019). The current study aimed to add to the sparse literature on self-collected hair samples for ARV measurement.

Remote collection of nail samples.

We identified only one study in the HIV literature that utilized nail samples to assess a biomarker of a health behavior (i.e., alcohol use; Budhwani et al., 2021); however,

the broader literature with HIV-uninfected participants has used nail samples to test for substance use (Cappelle et al., 2015; Fosen et al., 2017), trace element exposure (Salcedo-Bellido et al., 2021), and, most commonly, stress (Fischer et al., 2020). Stress has been shown to be related to more rapid disease progression among PWH (Kołodziej, 2016; Leserman, 2008), underscoring the importance of its measurement in HIV-related research. The most frequently utilized biomarker of stress is cortisol (Hellhammer et al., 2009). Cortisol is the primary glucocorticoid produced by the activation of the hypothalamic pituitary adrenal (HPA) axis after a stressor (Hellhammer et al., 2009). Cortisol levels can be assessed through a variety of biospecimens, including saliva and urine for assessing transitory acute stress and hair and fingernails for measuring cumulative chronic stress (El-Farhan et al., 2017). Given the prevalence of chronic stress among PWH (Valdez et al., 2016) coupled with the anticipated feasibility of fingernail collection as opposed to alternative biomarkers of cortisol, we selected fingernail samples to assess cortisol levels. Fingernail cortisol level have been shown to be moderately associated with cortisol levels in hair and saliva samples across populations, which is expected given the different timeframes assessed through each index of cortisol (Izawa et al., 2021). To our knowledge, no study has assessed the feasibility of at-home self-collection of nail samples among PWH, and only one study has examined feasibility in the general population (Truong et al., 2015).

Purpose of the Present Study

Objective biomarkers can be used with self-report to measure health-related behaviors, potentially increasing confidence in the accuracy of assessments used in clinical research and allowing for measurement of multidimensional constructs. Remote self-collection of biospecimens may be a cost-effective and feasible method for incorporating objective biological outcomes into HIV-related research, especially as remote clinical trials become more popular in the wake of the COVID-19 pandemic. We present here data on the feasibility of remote self-collection of DBS, hair, and nails for the objective assessment of alcohol use, ART adherence, and stress in a sample of PWH. Data were collected as part of an ongoing pilot RCT that transitioned to remote data collection in March 2020 after the onset of the COVID-19 pandemic.

Methods

Study Sample and Procedures

Participants were PWH enrolled in a pilot RCT examining the feasibility and acceptability of a telephone-based Acceptance and Commitment Therapy (ACT) intervention for hazardous alcohol use (ClinicalTrials.gov NCT03974061; Woolf-King et al., 2022). The pilot RCT began in-person enrollment in November 2019, paused enrollment in March 2020 in response to the COVID-19 outbreak, and reinitiated enrollment in November 2020 after the study received approval for the transition to completely remote data collection. Prior to the onset of the COVID-19 pandemic, participants were primarily recruited through in-person visits to a local infectious disease clinic or via a database of people who had formally participated in previous studies. Following the transition to completely remote data collection, participants were recruited through a US-wide online recruitment company —

Trialfacts (https://trialfacts.com). Trialfacts is an online company that recruits research study participants via digital advertising by creating highly targeted ads based on eligibility criteria and the collection of data via online questionnaire software. Additionally, Trialfacts creates a mobile and tablet friendly study Web page, which is the central destination for all interested participants who see and respond to study advertisements. Trialfacts promotes the study to its database of 60,000+ volunteers interested in participating in clinical trials and accesses highly targeted patients searching online for relevant health information and treatment via social media (i.e., Facebook, Instagram, Youtube, Reddit, Quora, Craigslist, and Google search). We also created a large database of 1,165 HIV- and substance use-related service organizations across the US and sent > 6,000 emails to these services to advertise our study. We requested that services provided our recruitment flyer to potential participants; however, we did not have a preexisting relationship with these services and were not able to quantify how many services assisted with our recruitment efforts. Utilizing these recruitment methods, we were able to enroll enough participants (within the constraints of the R34 timeline and budget) to get us very close to our original enrollment goal of N = 60.

Interested participants were screened for eligibility over the phone, and those who were deemed eligible were scheduled for a telephone-based baseline study visit. Eligibility criteria for participation included: (1) ≥18 years of age, (2) HIV-positive, (3) prescribed ART medication, (4) fluent in English, (5) 8^{th} grade literacy level, and (6) scoring ≥4 (≥3 for women) on the Alcohol Use Disorders Identification Test – Consumption (AUDIT-C). (Bush et al., 1998) Individuals who reported current psychosis symptoms, severe levels of depression or anxiety, scored >12 on the AUDIT-C, or were unable to provide informed consent were excluded from the study. During a baseline appointment, participants were randomized to one of two treatment conditions (ACT or a brief alcohol intervention) and scheduled for six weekly telephone-based intervention sessions. A total of 235 participants were screened (n = 192 post-COVID), of which 137 were deemed eligible (n = 117 post-COVID), and 49 participants were consented and randomized to a treatment condition (ACT n = 24; control n = 25). Of those 49 participants, 33 were consented after the study had transitioned to remote data collection. All participants originally consented for in-person data collection elected to continue participation in the study following the transition to remote data collection. After completion of the intervention sessions, participants completed an additional four, telephone-based follow-up study visits at post-treatment and 3-, 6-, and, for those recruited after May 2021 (when an Administrative Supplement was funded), 12-months following baseline. During each study visit, survey measures were administered by research staff and biospecimen collection was attempted, as described below. Nail sample collection also began after the Administrative Supplement was funded. Participants were compensated $50 for each study visit and $5 for each intervention session, with the potential for a $50 bonus payment for completion of all study appointments. For the current investigation, we focused on participants (n = 48) who completed at least one study visit after the clinical trial transitioned to remote data collection in November 2020. All procedures were approved by the Institutional Review Board at Syracuse University. Nail clippings were stored in a locked-filing cabinet at room temperature prior to shipment to Syracuse University.

Remote Biospecimen Self-Collection—Remote self-collection of biospecimens was attempted at all study visits. Prior to each study appointment, participants were mailed a biospecimen collection kit, which included materials for self-collection of biospecimens, written instructions for each collection process, a link to a YouTube video demonstrating the collection process, and a prepaid envelope for returning samples to our laboratory. During all telephone-based study visits, research staff guided participants through the collection process for each biospecimen. Participants were asked to complete the biospecimen collection during the study visit while on the phone with research staff; however, some participants opted to complete the biospecimen collection at an alternative time.

DBS collection.: For DBS collection, participants were instructed to clean one finger of their choosing with an isopropyl alcohol prep pad, rub their hands together to encourage blood flow to their fingers, and angle their arm downwards to increase blood flow. Then, participants were instructed to place the open end of the Surgilance Safety Lancet against the sterilized finger, with the placement slightly off-center, and activate the lancet by pressing it firmly against the puncture site. Participants were instructed to wipe away the first drop of blood that accumulated with a sterile gauze pad, and then allow the remaining blood drops to come into contact with the DBS collection card. Participants were informed to fill all five collection circles on the collection card, and then to dispose of everything that came into contact with the blood sampling materials. Last, participants were instructed to place the collection card into a drying box, write the date of collection on the outside of the drying box, and secure the drying box with a tamper-evident seal. Participants were then asked to place the sealed drying box into a pre-paid, addressed, priority mail envelope and to mail the samples back to our laboratory within 24 hours. Samples received at our laboratory were stored in a −80°F freezer until they were shipped to the United States Drug Testing Laboratories (USDTL) for processing. Samples were shipped after all participants had completed each study visit (e.g., 3-month samples shipped after all participants had completed their 3-month study visit).

Hair collection.: At the time of the study visit, participants were instructed to clean a pair of scissors with an isopropyl alcohol prep pad and isolate a thatch of hair (approximately 50–100 strands) from the occipital region of the scalp. Participants who did not have access to a pair of scissors were provided with a pair in their biospecimen collection kit. Participants were then instructed to cut the hair sample as close to the scalp as possible and place the cut thatch of hair inside a piece of aluminum foil. If participants did not have hair on the occipital region of their scalp (e.g., bald), they were not asked to complete the hair sample collection. Next, participants were asked to place a piece of tape on the distal end of the hair, fold the foil back up to enclose the hair, and place a study ID label on the piece of foil. Then, they were asked to place the folded piece of foil inside the plastic bag with a desiccant pellet and to seal the bag. Collected hair samples were included in the priority mail envelop with the DBS and nail samples and shipped back to our lab within 24 hours. Hair samples were stored in a locked-filing cabinet at room temperature.

Nail collection.: For nail sample collection, participants were instructed to clip their fingernails or toenails three weeks prior to the study appointment and remove any nail

polish one day prior to the appointment. Participants who did not have access to a pair of nail clippers were provided with a pair in their biospecimen collection kit. During the study appointment, participants were instructed to clean the nail clippers with an isopropyl alcohol prep pad, clip either 10 fingernails or 10 toenails, and place the clippings in a provided plastic bag. Participants were informed to remain consistent across collection times. Collected nail clippings were included in the priority mail envelop with the other samples and mailed back to the lab within 24 hours. Nail clippings were stored in a locked-filing cabinet at room temperature prior to shipment to All procedures were approved by the Institutional Review Board at Syracuse University. Nail clippings were stored in a locked-filing cabinet at room temperature prior to shipment to Syracuse University.

Data Analysis Plan

Feasibility was assessed by the proportion of samples returned by participants to the laboratory and the proportion of samples that were deemed acceptable for processing by the respective laboratories. One participant was excluded from analyses because they were on dialysis at the time of study participation, which has been shown to impact the absorption and elimination of PEth (Aboutara et al., 2022), ARVs (Ahuja et al., 1999), and cortisol (Letizia et al., 1996). Data from the baseline, post-treatment, 3-, and 6-month follow-up visits were included in these analyses and we explored patterns of feasibility by these time points.

Results

Sample Description

Forty-eight participants completed at least one remote study visit. Those recruited after May 2021 (when an Administrative Supplement was funded) also completed remote nail collection (n = 24). Participants were an average of 53.9 years old (SD = 9.2) with 20.6 (SD = 10.9) years since HIV diagnosis (Table 1). Half the participants were Black (47.9%) men (91.7%) with a high school diploma or equivalent (66.7%). There were 33, 31, 33, and 36 remote study visits completed at baseline, post-treatment, 3-, and 6-month follow-up, respectively (total = 133). Of the 49 participants who were randomized to a treatment condition, 82% (n = 40) were considered treatment “completers” (i.e., completed at least four treatment sessions, defined *a priori*), 80% (n = 39) completed a post-treatment follow-up study visit, and 73% (n = 35) completed their 3- and 6-month follow-up study visits. Retention rates were consistent with other randomized controlled trials for PWH (Bricker et al., 2014; Chander et al., 2015; Edelman et al., 2019).

Feasibility of Biospecimen Self-Collection

At baseline, 87.5% of DBS samples were successfully returned to the laboratory, of which 100% were successfully processed by USDTL to measure PEth (Table 2). At post-treatment, 80.6% of samples were returned to the laboratory; among those who were consented to remote self-collection at baseline (after March 18th, 2020), a larger percentage (88.8%) of samples were returned. Fewer samples were returned to the laboratory for 3- and 6-month follow-up appointments (70.0% and 66.6%, respectively), but when only participants consented to remote self-collection at baseline were analyzed, rates of return increased to

83.3% and 85.7%, respectively. All DBS samples were successfully processed at USDTL, indicating that the quality of self-collected DBS samples was high. Although outside the scope of this feasibility study, prior research has found fair agreement between PEth results and self-reported alcohol use in this sample (Firkey et al., 2022).

Although hair samples were intended to be analyzed to measure ART concentration, a significant number of samples (77.7%) at baseline were of low amount or a piece of tape was not placed on the distal end of the hair. Additionally, 11.1% of participants at baseline were not able to collect a hair sample because they did not have hair on the occipital region of their scalp, and 27.7% of participants did not return a sample. We thus decided that hair collection was not feasible in this study and did not ship samples for processing.

At baseline, 83.3% of nail samples were returned to the laboratory, of which 100% of samples were processed to measure cortisol levels (Table 3). Feasibility of remote nail sample collection at post-treatment followed a similar pattern, with 85.7% of samples returned to the laboratory and 100% of samples processed. Fewer participants (73.3%) returned nail samples at 3-month follow-up; however, 88.2% of participants returned samples at 6-month follow-up. Notably, all nail samples at 3- and 6-month follow-up were processed.

Discussion

Objective biological outcomes can be used along with self-report to provide two methods of measuring sensitive health behaviors in HIV-related research. Remote self-collection of biospecimens may be a feasible method for incorporating objective biomarkers into remote clinical research. Our findings for the feasibility of remote biospecimen self-collection were generally encouraging. Most participants successfully collected and returned DBS and nail samples to our laboratory, and almost all samples were of high enough quality to be processed. Rates of successful self-collection in this clinical trial were comparable to prior studies (Hirshfield et al., 2018; Prinsenberg et al., 2020; Teran et al., 2021). Although the feasibility of remote DBS collection has been previously documented in the alcohol literature (Martinez & Zemore, 2019), the ability to collect biospecimens without resource-intensive lab personnel and facilities is a significant advancement for the field of HIV research. While nail samples were used to measure cortisol levels in this study, researchers may collect nail samples to measure relevant alcohol biomarkers, such as ethyl glucuronide (Berger et al., 2014). Thus, findings from this study support the feasibility of remote self-collection of two possible biospecimens for assessing alcohol biomarkers. It is important to note that many of the participants in this study were not consented to remote self-collection at baseline and thus did not anticipate the possibility of remote self-collection upfront. Participants who were pre-informed of the remote biospecimen self-collection during the informed consent process at baseline had greater completion rates than those who were originally consented in-person. Moreover, the transition from in-person to remote visits was made rapidly in response to the pandemic, limiting refinement of the remote standardized operating procedures. As such, feasibility may be even higher in trials that are specifically designed to be remote.

Hair samples were not deemed feasible for remote self-collection for this population, with a quarter (27.7%) of participants not returning their samples at baseline, and 77.7% of samples deemed of insufficient quality. In contrast, Saberi and colleagues (2019) found at-home hair sample self-collection to be feasible among PWH, noting that 84.3% of participants returned hair samples for all study visits. This discrepancy may be best explained by the difference in incentive structures across both studies. While Saberi et al. (2019) utilized a gradually increasing incentive structure for receipt of each hair sample, participants in our clinical trial were compensated for completion of the study visit regardless of whether some biospecimens were successfully collected. Consequently, participants in our study may not have been as incentivized to complete hair sample self-collection. It is also possible that collecting hair samples may pose unique procedural challenges and greater participant burden compared to other biospecimens (Wright et al., 2018). For example, each hair type (e.g., straight, curly, coarse) requires different techniques and supplies to collect and secure adequate samples for processing (Wright et al., 2018). Among participants with Afro-textured and extremely short-length hair types, the conventional hair sample collection methods (i.e., cutting as close to the scalp as possible with scissors) may be challenging without extraneous help (Doyle & Brindle, 2019). Biospecimens, such as DBS and nails, that have been shown to be feasible for remote self-collection in this population may be an acceptable alternative to hair samples for examination of ART adherence (Alcaide et al., 2017).

Limitations and Future Directions

Limitations of this study include the modest subsample of participants who completed remote study visits, limited sample of women with HIV, inability to assess nonrespondent bias, and lack of data collected on the factors that impacted participants' experiences with remote biospecimen self-collection. Future research should include a qualitative component that queries participants about the experiences of remote biospecimen self-collection, including desirable and undesirable features of remote self-collection, challenges encountered during remote visits, privacy issues regarding remote self-collection, and preferences for remote versus in-person biospecimen collection. It is also noteworthy that we did not document whether participants opted to complete biospecimen collection at an alternative time, which prevents us from comparing feasibility across those who completed sample collection at the time of the study appointment versus on their own at an alternative time. This also limits our ability to examine concordance across self-reported data and biospecimen data given that the date of collection may have varied. Future research may mitigate this limitation by providing participants with incentives to return their biospecimen samples within a certain timeframe. While an additional possible limitation of this study may have been our inability to determine whether participants had another individual complete biospecimen collection on their behalf, prior analyses of these data have shown fair agreement between self-reported alcohol use and PEth results (Firkey et al., 2022). Other researchers have sought to mitigate this problem by requiring participants to complete the study visit via teleconferencing (Dahne et al., 2020); however, we believe this approach may be inappropriate for a sample of PWH. Specifically, PWH have been historically marginalized and stigmatized within healthcare systems and research (e.g., Kontomanolis et al., 2017), which may negatively impact their comfort level with completing a research

study via video. In fact, we offered participants the option to complete the study visit via a teleconferencing platform and all participants opted to complete the appointment via telephone. A more appropriate solution for this population may be providing specific incentives for timely completion of the biospecimen collection.

Conclusion

Use of objective biomarkers in behavioral HIV research may help ameliorate bias inherent in self-reported data and allow for assessment of multidimensional constructs. With remote clinical research receiving heightened interest in response to the COVID-19 pandemic, it is likely that biospecimen collection will continue to be conducted remotely. Findings from this study indicate that remote self-collection of DBS and nail samples is highly feasible among a sample of PWH enrolled in a pilot RCT, whereas hair samples were less feasible to collect in this population. These data underscore the importance of assessing the feasibility of standardized operating procedures for the population of interest prior to initiating data collection, and indicate that remote self-collection of biospecimens is feasible for behavioral HIV research.

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Table 1.

Characteristics of people with HIV enrolled in a pilot randomized clinical trial for hazardous alcohol use at baseline

		DBS Collection		Nail Collection	
	Total[a] (*N* = 48)	**Compliant[b] (*n* = 29)**	**Non-Compliant[c] (*n* = 4)**	**Compliant[b] (*n* = 20)**	**Non-Compliant[c] (*n* = 4)**
			M (SD)		
Age	53.9 (9.2)	52.0 (10.3)	53.8 (12.8)	53.3 (9.6)	51.8 (11.6)
Years Since HIV Diagnosis	20.6 (10.9)	18.4 (10.6)	21.5 (6.8)	19.2 (11.8)	19.0 (8.0)
			n (%)		
Gender					
Male	44 (91.7%)	26 (89.7%)	4 (100.0%)	17 (85.0%)	4 (100.0%)
Female	3 (6.3%)	2 (6.9%)	0 (0.0%)	2 (10.0%)	0 (0.0%)
Race					
White/Caucasian	18 (37.5%)	10 (34.5%)	0 (0.0%)	7 (35.0%)	0 (0.0%)
Black/African American	23 (47.9%)	14 (48.3%)	4 (100.0%)	10 (50.0%)	3 (75.0%)
Mixed Race/Bi-racial	5 (10.4%)	4 (13.8%)	0 (0.0%)	2 (10.0%)	0 (0.0%)
Ethnicity					
Hispanic or Latinx	7 (14.6%)	5 (17.2%)	0 (0.0%)	3 (15.0%)	1 (25.0%)
Education Level					
≤ High School Diploma	10 (20.9%)	5 (17.2%)	1 (25.0%)	2 (10.0%)	0 (0.0%)
Some College	16 (33.3%)	9 (31.0%)	1 (25.0%)	7 (35.0%)	2 (50.0%)
≥ Associate's Degree	22 (45.8%)	15 (51.7%)	2 (50.0%)	11 (55.0%)	2 (50.0%)
Employment Status					
Full-time/ Part-time	17 (35.4%)	10 (34.4%)	2 (50.0%)	9 (45.0%)	3 (75.0%)
Retired	8 (16.7%)	6 (20.7%)	0 (0.0%)	5 (25.0%)	0 (0.0%)
Unemployed	14 (29.2%)	7 (24.1%)	2 (50.0%)	3 (15.0%)	0 (0.0%)
Disability	8 (16.7%)	5 (17.2%)	0 (0.0%)	2 (10.0%)	1 (25.0%)
Annual Income					
<$10,000	11 (22.9%)	4 (13.8%)	1 (25.0%)	4 (20.0%)	0 (0.0%)
$10,000-$50,000	21 (43.8%)	13 (44.8%)	3 (75.0%)	7 (35.0%)	3 (75.0%)

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		DBS Collection		Nail Collection	
	Total[a] (*N* = 48)	**Compliant[b] (*n* = 29)**	**Non-Compliant[c] (*n* = 4)**	**Compliant[b] (*n* = 20)**	**Non-Compliant[c] (*n* = 4)**
			M (SD)		
>$50,000	11 (22.9%)	8 (27.6%)	0 (0.0%)	6 (30.0%)	1 (25.0%)
State of Residence					
Northeast	35 (72.9%)	17 (58.6%)	3 (75.0%)	9 (45.0%)	2 (50.0%)
Southeast	9 (18.8%)	8 (27.6%)	1 (25.0%)	7 (35.0%)	2 (50.0%)
Midwest	1 (2.1%)	1 (3.4%)	0 (0.0%)	1 (5.0%)	0 (0.0%)
Southwest	2 (4.2%)	2 (6.9%)	0 (0.0%)	2 (10.0%)	0 (0.0%)
West	1 (2.1%)	1 (3.4%)	0 (0.0%)	1 (5.0%)	0 (0.0%)

Note. M = Mean, SD = Standard Deviation. Percentages may not add up to 100% due to missing data (i.e., participants declining to respond to certain measures).

[a]Completed ≥ 1 remote study visit

[b]Consented to remote self-collection at baseline and successfully returned sample

[c]Consented to remote self-collection at baseline but did not successfully return sample

Table 2.

Feasibility of remote self-collection of dried blood spots among people living with HIV who are hazardous drinkers enrolled in a pilot randomized controlled trial

	Total Sample			Consented to Remote Participation		
	# of kits mailed	# (%) of kits received	# (%) of kits processed	# of kits mailed	# (%) of kits received	# (%) of kits processed
Baseline	32	28 (87.5%)	28 (100%)	32	28 (87.5%)	28 (100%)
Post-tx	31	23 (74.2%)	22[a] (95.7%)	26	22 (84.6%)	23 (100%)
3-month f/u	28	20 (71.4%)	20 (100%)	24	19 (79.2%)	19 (100%)
6-month f/u	39	26 (66.6%)	26 (100%)	21	16 (76.2%)	16 (100%)

Note. Remote data collection began on March 18th, 2020. Participants who were originally consented at baseline to remote data collection were categorized as "consented to remote participation." Collection of dried blood spots during the 3-month follow-up appointment began on May 6th, 2020. One participant was excluded from analyses because he was on dialysis at the time of data collection.

[a]One participant withdrew consent to analyze sample after kit was received at USDTL for processing.

Table 3.

Feasibility of remote self-collection of nails among people living with HIV who are hazardous drinkers enrolled in a pilot randomized controlled trial

	# of kits mailed	# (%) of kits received	# (%) of kits processed	# (%) of kits with interpretable results
Baseline	24	20 (83.3%)	20 (100%)	20 (100%)
Post-tx	21	18 (85.7%)	18 (100%)	18 (100%)
3-month f/u	15	11 (73.3%)	11 (100%)	11 (100%)
6-month f/u	17	15 (88.2%)	15 (100%)	15 (100%)

Note. All participants who completed nail sample collection were consented to remote biospecimen collection at baseline. Samples > 2.5mg were able to be processed and have interpretable results.