FY 2020 Houston EMA Ryan White Part A/MAI Service Definition **Substance Abuse Services - Outpatient**	
HRSA Service Category Title: **RWGA Only**	Substance Abuse Services Outpatient
Local Service Category Title:	Substance Abuse Treatment/Counseling
Budget Type: **RWGA Only**	Fee-for-Service
Budget Requirements or Restrictions: **RWGA Only**	Minimum group session length is 2 hours
HRSA Service Category Definition: **RWGA Only**	***Substance abuse services outpatient*** is the provision of medical or other treatment and/or counseling to address substance abuse problems (i.e., alcohol and/or legal and illegal drugs) in an outpatient setting, rendered by a physician or under the supervision of a physician, or by other qualified personnel.
Local Service Category Definition:	Treatment and/or counseling HIV-infected individuals with substance abuse disorders delivered in accordance with State licensing guidelines.
Target Population (age, gender, geographic, race, ethnicity, etc.):	HIV-infected individuals with substance abuse disorders, residing in the Houston Eligible Metropolitan Area (EMA/HSDA).
Services to be Provided:	Services for all eligible HIV/AIDS patients with substance abuse disorders. Services provided must be integrated with HIV-related issues that trigger relapse. All services must be provided in accordance with the Texas Department of Health Services/Substance Abuse Services (TDSHS/SAS) Chemical Dependency Treatment Facility Licensure Standards. Service provision must comply with the applicable treatment standards.
Service Unit Definition(s): **RWGA Only**	**Individual Counseling:** One unit of service = one individual counseling session of at least 45 minutes in length with one (1) eligible client. **A single session lasting longer than 45 minutes qualifies as only a single unit** – no fractional units are allowed. Two (2) units are allowed for initial assessment/orientation session. **Group Counseling:** One unit of service = 60 minutes of group treatment for one eligible client. A single session must last a minimum of 2 hours. Support Groups are defined as professionally led groups that are comprised of HIV-positive individuals, family members, or significant others for the purpose of providing Substance Abuse therapy.
Financial Eligibility:	Refer to the RWPC's approved *Financial Eligibility for Houston EMA/HSDA Services.*
Client Eligibility:	HIV-infected individuals with substance abuse co-morbidities/ disorders.
Agency Requirements:	Agency must be appropriately licensed by the State. All services must be provided in accordance with applicable Texas Department of State Health Services/Substance Abuse Services (TDSHS/SAS) Chemical Dependency Treatment Facility Licensure Standards. Client must not be eligible for services from other programs or providers (i.e. MHMRA of

	Harris County) or any other reimbursement source (i.e. Medicaid, Medicare, Private Insurance) unless the client is in crisis and cannot be provided immediate services from the other programs/providers. In this case, clients may be provided services, as long as the client applies for the other programs/providers, until the other programs/providers can take over services. All services must be provided in accordance with the TDSHS/SAS Chemical Dependency Treatment Facility Licensure Standards. Specifically, regarding service provision, services must comply with the most current version of the applicable Rules for Licensed Chemical Dependency Treatment. Services provided must be integrated with HIV-related issues that trigger relapse. Provider must provide a written plan no later than 3/30/17 documenting coordination with local TDSHS/SAS HIV Early Intervention funded programs if such programs are currently funded in the Houston EMA.
Staff Requirements:	Must meet all applicable State licensing requirements and Houston EMA/HSDA Part A/B Standards of Care.
Special Requirements: **RWGA Only**	Not Applicable.

FY 2021 RWPC "How to Best Meet the Need" Decision Process

Step in Process: **Council**		Date: **06/11/2020**
Recommendations:	Approved: Y:_____ No: _____ Approved With Changes:_____	If approved with changes list changes below:
1.		
2.		
3.		

Step in Process: **Steering Committee**		Date: **06/04/2020**
Recommendations:	Approved: Y:_____ No: _____ Approved With Changes:_____	If approved with changes list changes below:
1.		
2.		
3.		

Step in Process: **Quality Improvement Committee**		Date: **05/19/2020**
Recommendations:	Approved: Y:_____ No: _____ Approved With Changes:_____	If approved with changes list changes below:
1.		
2.		
3.		

Step in Process: **HTBMTN Workgroup #2**	Date: **04/21/2020**
Recommendations:	Financial Eligibility:
1.	
2.	
3.	

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FY 2018 PERFORMANCE MEASURES HIGHLIGHTS
RYAN WHITE GRANT ADMINISTRATION
HARRIS COUNTY PUBLIC HEALTH (HCPH)

TABLE OF CONTENTS

HCPH is the local public health agency for the Harris County, Texas jurisdiction. It provides a wide variety of public health activities and services aimed at improving the health and well-being of the Harris County community.

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Highlights from FY 2018 Performance Measures

Measures in this report are based on the 2018/2019 Houston Ryan White Quality Management Plan, Appendix B. HIV Performance Measures.

Substance Abuse Treatment

- During FY 2018, 16 (57%) clients utilized primary medical care after accessing Part A substance abuse treatment services.
- Among clients with viral load tests, 69% were virally suppressed during this time period.

Ryan White Part A
HIV Performance Measures
FY 2018 Report

Substance Abuse Treatment
All Providers

HIV Performance Measures	FY 2017	FY 2018	Change
A minimum of 70% of clients will utilize Parts A/B/C/D primary medical care after accessing Part A-funded substance abuse treatment services*	12 (46.2%)	16 (57.1%)	**10.9%**
75% of clients for whom there is lab data in the CPCDMS will be virally suppressed (<200)	14 (66.7%)	18 (69.2%)	**2.5%**
90% of clients will complete substance abuse treatment program	See data below		

***Overall, the number of clients who received primary care in FY 2018 was 21 (84.0%), with 16 receiving the services through Ryan White and 5 receiving the services through other insurance such as Medicare.**

Number of clients completing substance abuse treatment program during FY 2018 (March 2018 to February 2019): **13**

Number of clients engaged in substance abuse treatment program during FY 2018: **25**

Number of clients completing substance abuse treatment during FY 2018 who entered treatment in FY 2017: **5**

HRSA
Ryan White & Global HIV/AIDS Programs

HRSA's Ryan White HIV/AIDS Program

The Intersection of HRSA's Ryan White HIV/AIDS Program and the Opioid Epidemic

A recent study has shown that the overall number of deaths in people with HIV in the United States is declining (12.7% decline from 2011 to 2015), yet the number of opioid overdose deaths in people with HIV is on the rise (47% increase from 2011 to 2015).[1] The Health Resources and Services Administration's (HRSA) Ryan White HIV/AIDS Program (RWHAP) recipients have spent decades building systems of care to meet the needs of people with HIV, including providing services to address individuals' medical and social needs. In consideration of the opioid crisis, RWHAP recipients are facing the need to redouble their efforts to provide services to the most vulnerable populations, meeting clients where they are and working to improve individual-level and overall public health.

[1] Bosh KA, Crepaz N, Dong X, et al. Opioid overdose deaths among persons with HIV infection, United States, 2011–2015. [Abstract number 147]. Abstract presented at the 2019 Conference on Retroviruses and Opportunistic Infections; March 7, 2019; Seattle, Washington.

To better understand the current impact of the opioid epidemic on the RWHAP, HRSA HIV/AIDS Bureau (HAB) hosted a Technical Expert Panel (TEP) on the "RWHAP Response to the Opioid Epidemic" in summer 2018. The TEP convened RWHAP recipients and other experts to discuss the intersection of the RWHAP and the opioid epidemic and how services for people with HIV who have substance use disorder could be bolstered to improve health outcomes. This technical assistance document provides examples from the TEP and follow-up phone interviews with TEP participants of activities RWHAP recipients are currently implementing for people with HIV who have substance use disorders; it also highlights how HRSA RWHAP providers can provide services to address clients' behavioral health needs, including those related to substance use.

> *"Like in the early years of HIV/AIDS, when homophobia led to responses of blame and fear, addiction is seen as a social problem rather than a defined disease. At the crux of another public health crisis, we need to take responsibility as a community, as providers, as human beings, for those who are living with addiction … This epidemic is a crisis that knows no geographic or economic boundaries. And the impact of it is felt across racial and ethnic minorities, and especially in disadvantaged populations. Like the HIV/AIDS epidemic, addiction touches just about every family in the U.S."*
>
> RADM Sylvia Trent-Adams, Ph.D., R.N. F.A.A.N., Principal Deputy Assistant Secretary for Health

CONSIDERATIONS FROM RWHAP PROVIDERS ON IMPLEMENTING SERVICES

RWHAP recipients are already engaging in work related to the intersection of HIV and the opioid epidemic, identifying the need in their jurisdiction and ways to implement work in what can be a challenging environment. The following overarching practices are important to consider when working to address the concomitant HIV and opioid epidemics in your jurisdiction.

- **Conduct training and provide technical assistance in all settings.** Consider a broad response to the opioid epidemic, with collaboration and program initiation from prevention, care, and treatment programs.

- **Explore opportunities to diversify funding.** Identify if funding is available from multiple sources (HIV prevention, RWHAP, Substance Abuse and Mental Health Services Administration [SAMHSA], etc.) to ensure that comprehensive services can be offered to clients. Within the evolving healthcare landscape, RWHAP funds can make it possible for "out-of-the-box thinking."

> *"When I asked them to come to the table, I asked as a partner. 'Let's do this together' instead of 'I'm doing this.' We need to collaborate and pull from our collective strengths."*
>
> Shannon Stephenson, Chief Executive Officer, Cempa Community Care

- **Use data to understand the needs of your client population.** Assess the data trends of clients accessing services at your site. Are there increases in the number of **new** clients who report injection drug use as a risk factor? Have the demographics of these clients changed or remained the same? What are the clinical outcomes of people with HIV who also have substance use needs? Understanding these questions can support program-planning activities.

- **Engage all providers.** Coordinate with local organizations to ensure that where a person initiates service does not define or limit the types of services they receive. Co-locate services when possible; for example, work to increase the co-location of medication-assisted treatment (MAT) and HIV treatment. Socioeconomic circumstances are at the core of linkage. Poverty, risk of HIV and other diseases, lack of jobs, and homelessness can be pervasive, ongoing, and unresolvable. Integrating services helps to treat the whole person.

- **Ensure warm hand-offs.** When possible, have a direct (i.e., in person) "hand-off" of a client from one service provider to another, helping to ensure the client successfully engages with the next provider.

> *"We need to better coordinate with local organizations to ensure that wherever patients land, we can ensure they get care."*
>
> Pamposh Kaul, Clinical Director, Ohio Regional AIDS Education and Training Centers

- **Encourage mainstreaming behavioral health services.** Work to incorporate behavioral health assessment and treatment into all RWHAP services. When all RWHAP clients are engaged in behavioral health, the engagement is destigmatized, and mental health and substance use risk factors can be assessed in a more consistent manner.

- **Assess and address emergent issues.** Inventory service systems to identify existing or emerging needs and issues. Consider if providers could establish and support mobile services to intensify efforts.

- **Understand the opioid epidemic and engage the community in which you are working.** Understand the type(s) of opioid epidemic in your jurisdiction (i.e., injection drug use, prescription drug use). There are different approaches to addressing the opioid epidemic, depending on the type of overuse experienced in a jurisdiction. Mobilize the broader community in which you are doing work to unify the effort. Develop a community action plan with a broad range of partners (e.g., military, tribal groups, homeless shelters, faith centers, emergency departments, barber shops/salons, police and other first responders, health department, etc.).

- **Ensure a client-centered approach to services.** Stigma toward substance users remains, even among some RWHAP recipients and subrecipients. RWHAP recipients have an opportunity to serve as leaders in implementing programs that meet substance users "where they are" without judgment, maintaining client rights, and ensuring that access to MAT and other interventions is not contingent on abstinence. The RWHAP has demonstrated high acuity in achieving viral suppression among people with HIV in general; however, reengagement and retention remain at the forefront of challenges when working with complex clients. Focusing on meeting clients where they are and embracing the challenges of individual circumstances could help increase access to and retention in the RWHAP systems of care for people with HIV who have substance use disorder.

> *"Many clients seem to be ready to be engaged—we will always offer resources and allow clients to know when they want to engage."*
>
> Tammy Miller, RWHAP Part C Clinic Manager

IMPLEMENTATION ACTIVITIES

RWHAP recipients have experienced successes in working with people with HIV who have substance use disorder. TEP participants are implementing the following strategies:

Community Engagement

- **Develop a community-level action plan.** The process of developing an action plan includes analysis of what exists within the community, what does not exist in the community, and where people are falling through service gaps. Implementation of the action plan helps to improve workflow.

- **Focus on relationships to gain trust.** Gather broad representation of community leadership and members to create a consortium to tackle the opioid problem in individual communities. This emboldens people to continue and further the work on their own.

- **Collaborate with health centers to establish an HIV, HCV, and substance use disease management portfolio.** Health centers have a wide range of services, eliminating the need for clients to be referred out to additional providers. Invest RWHAP funds in existing resources, like health centers, and work to bolster them. Coordinate with local providers and provide them with training and resources to assist them in furthering the services they are able to provide.
- Address and work to reduce **stigma.**

Development of Comprehensive and Integrated Services

- **Support syringe services programs (SSP).** RWHAP funds can be used to support SSPs, with the exception of needles/syringes and related equipment. The most effective SSP model is multi-tiered: for example, a full SSP that is open five days a week for 40 hours a week, with mobile clinics that go to various locations two hours a week.

"I would say that stigma and transportation are the biggest obstacles to any kind of care in rural communities—addiction, HIV, mental health. There is tremendous stigma around any of these topics. What that turns out to mean in the field is the work is slower than you would like, painstaking. You have to spend a lot of time gaining people's trust, and even then, they may not agree, but at least they would listen to you."

Judith Feinberg, Professor, Behavioral Medicine & Psychiatry, West Virginia University

- Establish **local treatment and prevention** for people who have substance use disorder.
- **Develop and support programs that distribute naloxone** at saturation levels directly to people in communities at high risk.
- Streamline **immediate access to medical care** to ensure that people with HIV do not have to wait for care.
- Investigate the ability of **MAT providers** to prescribe and/or administer HIV medications.

"Stigma is crosscutting, regardless of health care policy and financing landscapes."

Daniel Raymond, Deputy Director, Planning & Policy, Harm Reduction Coalition

- Develop a **case management model for people who have substance use disorder,** combining lessons learned from medical and nonmedical case management implementation. Establish and share coordinated care plans across RWHAP and behavioral health.

Systems Changes

- Explore opportunities to enact **policy changes** to make buprenorphine available in more settings, including SSPs, jails, emergency departments, and homeless shelters.

"Medicaid expansion has been critical because it opens up opportunity. [It] opens up people to a range of services beyond what Part A would fund. [It] opens up PrEP [pre-exposure prophylaxis]. It has been critical for people accessing services."

Coleman Terrell, Director, Philadelphia Part A

- **Educate** all team and support system members (RWHAP case managers, primary care providers, family, etc.) on addiction disease and management in an effort to enact change.
- **Provide training** on pain management, including dealing with both the pain people have and the reasons why people might be misusing substances. Give options for people who might be ready for harm reduction, not elimination.
- **Support frontline staff** who are directly impacted by trauma on a regular basis.

Although RWHAP recipients have implemented work related to the opioid crisis into their service structures, TEP participants noted that those efforts are just beginning to meet the needs. They indicated that much more effort is needed to fully address the HIV and opioid epidemics. HRSA HAB encourages recipients to consider ways to further their efforts to address the opioid epidemic in their existing and future service structures.

HOW HRSA'S RWHAP CAN SUPPORT PEOPLE WITH HIV WHO HAVE SUBSTANCE USE DISORDER

RWHAP recipients are funded to provide a range of services to support the HIV-related needs of eligible individuals. HRSA HAB Policy Clarification Notice (PCN) 16-02 details the allowable uses of RWHAP funds to provide services to both people with HIV and, in some instances, people who are affected by HIV. To be an allowable cost under the HRSA RWHAP, all services must—

- Relate to HIV diagnosis, care, and support,
- Adhere to established HIV clinical practice standards consistent with U.S. Department of Health and Human Services (HHS) Clinical Guidelines for the treatment of HIV and other related or pertinent clinical guidelines, and
- Comply with state and local regulations and be provided by licensed or authorized providers, as applicable.

Although PCN 16-02 specifically outlines the allowable activities under the Substance Abuse Outpatient Care and Substance Abuse Services (residential) service categories, all core medical and support services can be leveraged to assist RWHAP clients who have substance use disorder (refer to HRSA HAB PCN 16-02 for the complete service category definitions).

In March 2016, HHS released guidance on the use of federal funding to support SSPs. The guidance maintains the prohibition of the use of federal funds to purchase sterile needles or syringes for the purpose of injection of any illegal drug; however, it includes funding SSPs as an allowable use of federal funds. In April 2016, HRSA issued guidance specific to the use of HRSA funds (including RWHAP funds) to support certain components of SSPs. RWHAP recipients should coordinate with their project officers when considering implementation of SSP components as part of their RWHAP-funded work.

RESOURCES

The following resources are available for RWHAP recipients to explore how they can further implement behavioral health services for people with HIV who have substance use disorder.

amfAR. 2019. "Opioid Epidemic/Drug Policy." www.amfar.org/opioid-drug-policy.

Centers for Disease Control and Prevention. 2019. "Opioids Portal." www.cdc.gov/opioids.

Dawson, L., and J. Kates. 2018. "HIV and the Opioid Epidemic: 5 Key Points." Kaiser Family Foundation. www.kff.org/hivaids/issue-brief/hiv-and-the-opioid-epidemic-5-key-points.

U.S. Department of Health and Human Services. August 2012. *Training Manual: Integration of Buprenorphine into HIV Primary Care Settings*. Available at www.targethiv.org/sites/default/files/file-upload/resources/HRSA.%20SPNS.%20IHIP%20buprenorphine%20training%20manual.%20508%20compliant.pdf.

U.S. Department of Health and Human Services. 2018. "Substance Use and HIV Risk." www.hiv.gov/hiv-basics/hiv-prevention/reducing-risk-from-alcohol-and-drug-use/substance-use-and-hiv-risk.

U.S. Department of Health and Human Services. 2019. "Help, Resources and Information: National Opioids Crisis." www.hhs.gov/opioids.

Role of Substance Use Providers in Ending the HCV & HIV Epidemics

Summary:

Technical assistance slide set helps educate substance use disorder treatment providers on their critical role in diagnosing and treating those with HCV and HIV.

Our nation's substance use crisis is closely linked to a steep rise in infectious diseases associated with injection drug use, especially hepatitis C and HIV. Approximately 70 percent of new hepatitis C infections occur among people who inject drugs and nine percent of new HIV infections in the United States are related to injection drug use.

Addressing the syndemic of drug misuse and infectious diseases requires a coordinated, multidisciplinary approach. The National Alliance for HIV Education and Workforce Development (NAHEWD) created a customizable slide set to help educate substance use disorder treatment providers on how important tier role is in supporting HIV and hepatitis C testing, prevention, and treatment for their patients. The resource was developed as part of NAHEWD's role in the SAMHSA- supported Opioid Response Network.

This technical assistance resource emphasizes that the guiding principles of substance use care—harm reduction, screening and other prevention interventions, treatment initiation, and linkage to ongoing medical care—are similar to those of viral hepatitis and HIV care. All models focus on patient safety and wellness, with effective medication being critical for the individual's health and for related public health benefits.

While hepatitis C testing rates remain sub-optimal across opioid treatment programs, substance use providers have opportunities to test individuals who inject drugs for hepatitis C and HIV during both intake and follow-up visits, and to facilitate care or linkage to care and treatment when indicated. Identifying people who are early in their infection is critical because with timely diagnosis and curative treatment, people with hepatitis C can prevent potential severe outcomes such as liver disease, cirrhosis, liver cancer, and even death.

Today's highly effective curative treatment is the most powerful tool we have to achieve the goal of hepatitis C elimination. But to fully realize its potential, we need to increase hepatitis C efforts with people who use drugs who are most likely to transmit the virus to others. Increasing hepatitis C cure is possible through leveraging existing infrastructure and providing much-needed viral hepatitis and HIV services in the substance use disorder treatment programs that people who use drugs already access and trust. This slide set is ready-to-use to help call attention to and provide support for opportunities to cure hepatitis C.

Related blog posts:

- SAMHSA Urges Focus on Synergistic Epidemics of Substance Use Disorder, HIV, and Viral Hepatitis
- Substance Misuse, Infectious Disease, and the Powerful Potential of Syringe

Service Programs
- Three Medical Societies Identify Specific Infections of Concern in Relation to the Opioid Crisis

Injection drug use and infectious diseases go hand-in-hand. Substance use disorder treatment providers are well-positioned to diagnose and treat people with hepatitis C & HIV https://go.usa.gov/xpphF

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Prevention and Wellness

Public Health and Safety

frontiers in Public Health

REVIEW
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Substance Use Among Older People Living With HIV: Challenges for Health Care Providers

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Older people living with HIV (OPLWH) have higher rates of substance use (tobacco, alcohol, and other drugs) than their HIV-negative peers. Addressing health care needs of OPLWH who use substances is more challenging than for those who do not: they are highly impacted by comorbid conditions, substance use can interact with other medications (including antiretroviral therapy-ART) and reduce their effectiveness, and substance use has been associated with reduced adherence to ART and increased risky behaviors (including sexual risks). People who use substances also suffer disparities along the HIV continuum of care, resulting in lower viral suppression rates and poorer health outcomes. They are especially impacted by stigma and stress, which have implications for HIV treatment and care. Recommendations for health care providers working with OPLWH who use substances include: (1) the need to screen and refer for multiple associated conditions, and (2) training/continuing education to enhance care management and maximize health outcomes.

Keywords: aging, HIV, substance use, alcohol, smoking, comorbidities

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INTRODUCTION

As treatments for HIV have improved, the population of older people living with HIV (OPLWH) has increased. In 2015 it was estimated that more than 47% of those living with HIV were aged 50 and older, and 7% were 65 and older (1). The proportion of adults living with HIV aged 50 and older increases by an average of 2% annually (2), and 17% of new infections are among people aged 50 and older (1).

Aging and HIV are each associated with a broad range of comorbidities and treatment needs. Addressing the health care needs of OPLWH who use substances, including tobacco, alcohol, and other drugs, is even more challenging than for those who do not use these substances. These challenges come from several sources: OPLWH who use substances are highly impacted by comorbid conditions and substance use can interact with other medications including anti-retroviral therapy (ART) reducing their effectiveness or resulting in unanticipated side-effects. In addition, while some research indicates that OPLWH are more adherent to ART than younger populations living with HIV (3), HIV-infected people who use substances may be less adherent to ART, and suffer disparities all along the continuum of care including lower retention in care, delayed initiation of ART and poorer HIV treatment outcomes (4).

OPLWH have higher rates of substance use than their HIV-negative peers (5). In addition, while rates of substance use largely decline with increasing age in the general population, this has not been found among OPLWH (6). Thus, as the population of those who are HIV-infected continues to age, there is a need for health care providers, especially those working with geriatric populations, to become knowledgeable about the impact of substance use on OPLWH so that their health care needs are optimally identified and addressed.

The authors of this article represent several disciplines, including nursing, psychology, gerontology, social work and epidemiology, and bring multiple perspectives to research and practice. The article will provide an overview of substance use prevalence among OPLWH who are aged 50 and older and many of the comorbidities and associated challenges encountered in managing their health needs. The importance of addressing psychosocial factors and sexual risk behaviors among substance-using OPLWH are also discussed. A final section provides recommendations for screening for the needs of OPLWH and for associated training needs of health care professionals working with them.

PREVALENCE OF SUBSTANCE USE AMONG OPLWH

Surveying 1,000 older adults (aged 50 and older) living with HIV in New York City, the ROAH(Research on Older Adults with HIV) study (7) found that more than half (54%) of the participants were actively enrolled in recovery programs and over one-third reported current (past 3 months) use of illicit substances (37%) or alcohol (38%). Prevalence of specific substances was: tobacco (57%), marijuana (23%), pain killers (38%) cocaine (15%), and heroin (7%) (8). Alcohol is the most frequently used substance among OPLWH (9). Other studies have shown substance use prevalence rates (excluding alcohol) of over 50% in OPLWH (10). Importantly, while injection drug use as a transmission category for HIV has declined in incidence, accounting for 9% of new HIV cases in the US in 2016, it constitutes approximately 18% of people living with HIV (11).

The high rate of substance use among OPLWH is likely to continue. As the baby boomer generation ages, due to their greater experience with mood-altering substances, they use higher levels of alcohol and other substances than previous generations (12).

Men Who Have Sex With Men

Men who have sex with men (MSM) account for more than half of all people living with HIV (54%) and about 70% of new infections (13). It has been widely documented that MSM are more likely to use illicit drugs as compared to their heterosexual counterparts (14, 15). About one-third of new HIV infections among MSM have been attributed to risk behaviors related to non-injection substance use (including the use of alcohol and other drugs before having sex) (16).

In the ROAH study (7), 53.0% of HIV-positive MSM aged 50 and older in NYC reported alcohol use, 21.4% reported using poppers (i.e., nitrite inhalants), 22.9% reported "hard" drug use (i.e., crystal methamphetamine, cocaine, crack, heroin, ecstasy, GHB, ketamine, and/or LSD/PCP), and 28.0% reported marijuana use. In a more recent study of HIV-positive MSM aged 50 years and older, 48.2% had used an illicit drug in the past 30 days (17).

Tobacco and Alcohol

Alcohol and tobacco are not always included in studies of substance use, in part because of their legal status. However, because of their widespread use and significant adverse impacts on OPLWH, they are covered in more specific detail below.

Tobacco

Smoking is a major risk factor for a variety of life-threatening chronic diseases such as coronary heart disease, diabetes, and cancer (18). Smoking is also a source of inflammation and impaired immune function (19). The health impacts of smoking are of particular concern among people living with HIV, as they are almost twice as likely to smoke than the national average (42.4 vs. 20.6%), are less likely to quit (20) and already have compromised immunity and a predisposition for chronic inflammation (21). Furthermore, adults with HIV who smoke are more likely to be poor, homeless, previously incarcerated, depressed, and have lower educational attainment than those who do not smoke (20), and thus have multiple risk factors for poor health outcomes.

Smoking has been shown to increase the incidence of both AIDS and non-AIDS-related mortality (21, 22). HIV and smoking serve as independent and interacting risk factors for serious conditions such as cardiovascular disease, chronic obstructive pulmonary disease (COPD), human papillomavirus (HPV), and related cancers (21). In addition, smoking may have indirect adverse effects on health by lowering ART adherence (mediated by depressive symptoms) (23), and reducing the effectiveness of ART medication (24, 25). In older adults, smoking may also increase the likelihood of fractures by further decreasing bone mineral density already diminished by the effects of HIV and ART (21, 26).

Alcohol

Heavy alcohol use contributes to hypertension, liver disease, cancers, cardiac dysrhythmia, gastrointestinal problems, neurocognitive deficits, bone loss, depression, and impaired judgment leading to risky behaviors (27, 28). Other consequences include suicide, child maltreatment, and unsafe sex and drug injection practices associated with HIV (29, 30). Furthermore, OPLWH are more susceptible to the negative effects of alcohol use, as tolerance lowers with age, metabolism slows, and interaction with prescription medications may impact the effectiveness of medications or exacerbate side effects (31). The prevalence of alcohol use disorders is higher among people living with HIV than the national average (32), and there is higher morbidity and mortality at lower levels of alcohol consumption among HIV-positive individuals compared with those who are HIV-negative (33).

Alcohol has been found to have an impact on HIV disease severity and mortality (9). Heavy alcohol consumption, HIV, and aging independently increase the risk for several comorbidities including cardiovascular disease, liver cirrhosis, diabetes pneumonia and myopathy (34), hypertension and impaired renal function (35). Furthermore, heavy alcohol use among HIV positive people has been linked with reduced engagement at every stage of the HIV care continuum, resulting in increased viral loads, and faster disease progression (36). There is also some conflicting evidence for interactions between alcohol and ART which may reduce ART efficacy, for example by disrupting membrane transporter proteins for some ART medications (37).

Overall, there is a high rate of substance use among OPLWH, and this is related to comorbidities and disease progression. Thus, efforts to screen for substance use and address its consequences are essential in the care of OPLWH.

CO-MORBIDITIES OF OPLWH

OPLWH have a higher number of comorbidities than is found in their non-infected age counterparts (38, 39). In the ROAH study (7), depression was the most common comorbidity, and 40% of participants reported 4 or more comorbidities, with an average of 3.3, about three times higher than seen among community dwelling adults 70 years and older (40). A recent review article (41) noted that among OPLWH, complications associated with aging can appear clinically in essentially every organ system. Vance (42) found that in OPLWH who were >60 years old, 20.5% had coronary artery disease, 67.1% had hypertension, 65.8% had hyperlipidemia, 28.8% had diabetes, 24.7% had peripheral neuropathy, 23.3% had renal disease, 12.7% had hepatitis C, and 38.4% had depression with the success of ART, OPLWH are dying from non-AIDS related conditions more often than AIDS-related conditions (43). Accelerated or accentuated aging has been proposed among OPLWH and attributed as a cause of higher frequencies of co-morbidities (44).

The multimorbidity found among OPLWH has been attributed to several causes, including: (1) the impact of chronic HIV infection (44); (2) behavioral factors related to substance use; (3) elevated rates of inflammation and immune activation (45); and (4) the higher toxicity of early forms of ART (46). Few studies have the power to control for the many variables that contribute to this high rate of multimorbidity in OPLWH (47).

Polypharmacy and Adherence

The high rates of multimorbidity among OPLWH result in increased pill burden and disease management (42, 48). Polypharmacy has been associated with side effects, drug interaction, and challenges to adherence (49). In one study, OPLWH who were in their 50s were prescribed an average of 12.5 medications (42).

While higher numbers of medications are associated with greater odds of having a fall requiring medical attention for older populations, this is further exacerbated for those with substance use disorders (50). In addition, there are several shared cytochrome enzymes in the metabolism of antiretroviral medications with different substances including alcohol, cocaine, opioids, and marijuana. Therefore, drug-drug interactions between antiretroviral medications and substance use through cytochrome enzymes could decrease the efficacy of antiretroviral therapy, thereby worsening HIV-related outcomes (51).

Many studies have reported relationships between substance use and non-adherence to medications (52) including non-adherence to ART (53). For example, one study of OPLWH examined the relationship between ART non-adherence (number of days when ART was skipped) and days when study participants used alcohol, marijuana, cocaine/crack, opiates, amyl nitrite (poppers), and other drugs. The best adherence (92% reported >90% adherence) was among those reporting no substance use, and the poorest ART adherence was among those reporting polydrug use (<65% reporting >90% adherence) (10).

Geriatric Conditions

As OPLWH age, there is evidence of an increased burden of age-related chronic conditions (44). These geriatric conditions (or syndromes) have distinguishing features that set them apart from other health conditions—they effect multiple organ systems and are influenced by environmental factors. These conditions are common among vulnerable populations including adults with comorbidities (as is frequently found in OPLWH), and are typically followed by a decline in functional health (54). Common geriatric conditions include falls, cognitive impairment, urinary incontinence, delirium, and frailty (54). The recognition and management of geriatric conditions is critical because they are independently associated with functional decline and mortality (55). When geriatric conditions are addressed, the health status of older adults improves, particularly for vulnerable populations. This is evidenced by decreasing mortality risks, nursing home admissions, and acute care utilization (56, 57). Geriatric conditions are common among OPLWH, including cognitive impairment, falls, urinary incontinence, and difficulty with 1 or more instrumental activities of daily living (58). The recognition and treatment of geriatric conditions in OPLWH should be incorporated into HIV care (59).

Attention to geriatric conditions is particularly relevant for substance-using OPLWH. Problems associated with prolonged substance use and substance use-related comorbidities and behaviors have been linked to accelerated rates of frailty (60, 61). Drug use has a wide array of physiologic effects on the body that may place OPLWH at heightened risk for geriatric conditions. Substance use itself can impact geriatric conditions directly as excess or harmful alcohol use, prescription opioid use, and benzodiazepine use have all been associated with an increase in falls and cognitive changes (60, 62). A recent paper posited the impact of drug addiction on early onset of age-related disease, through toxicity and lifestyle factors (63).

Cognitive Functioning

Advanced age increases susceptibility to HAND (HIV-associated neurocognitive disorder) in HIV-infected persons, and it is estimated that about 50% of all ART patients present with cognitive impairment (64). Substance use has an impact on CNS structures related to cognitive function. For example, an

escalated pattern of cocaine intake is associated with long-lasting damage to the prefrontal cortex, thus affecting cognitive function including executive function, attention, and memory (65). Additionally, stimulant drugs including amphetamine, cocaine, methamphetamine, and ecstasy impact on adult hippocampal neurogenesis. Exposure to stimulant drugs has an effect on neurogenesis regulation in adult brains which can result in drug-induced impairment in cognitive function (66).

Chronic substance use has been shown to lead to impaired cognitive performance. Relationships that have been identified include the following: (1) cocaine affects long-lasting memory (67); (2) amphetamine use is related to attention and impulse control (68); (3) opioids impact attention and performance on memory tasks (69); (4) alcohol affects working memory and attention (70); (5) cannabis impacts cognitive shifting and sustained attention (71); and (6) nicotine has been shown to have an impact on working memory and sustained attention (72).

The manifestations of the cognitive impairments depend on many factors including the types and frequency of substance use, the individual's genetic makeup, age, and environmental factors. The persistence of substance use over time is associated with long-lasting cognitive decline, a particular concern for OPLWH. For example, long-term cannabis users reported having more deficits on memory and sustained attention than short-term users (73). A study of ex-ecstasy abusers found persistent relatively poor score in verbal memory over 2.5 years of abstinence (74). In another study, persons with polysubstance dependence (cocaine or heroin) had deficits in executive function over 5 months of abstinence (75).

The multiple comorbidities found in OPLWH are related to HIV status and aging and impact many organ systems as well as psychiatric conditions such as depression and impairments in cognitive functioning. Thus, care for OPLWH requires a multidisciplinary team and holistic approach.

PSYCHOSOCIAL INFLUENCES ON OPLWH WHO USE SUBSTANCES

Psychosocial influences have also been shown to have significant impact on health outcomes of OPLWH. Two important influences on the health of all HIV-infected populations that have been especially prevalent among people who use substances are stigma and stress/trauma.

Stigma

Stigma has been associated with HIV since early in the epidemic (76) and continues in the post-ART era (77). Emlet (78) noted that OPLWH contend with stigma related to ageism, including social discrimination from their peer networks and employment situations, and institutional/structural discrimination from health care providers.

Older adults who are members of sexual minorities fear rejection and neglect from health care providers, especially non-professional workers. In one study, 83% cited rejection by neighbors in their communities, as well as observations of rejection of partners and friends in long term care (79).

Some of the more recent literature on stigma notes the intersectionality of stigmas (80), i.e., stigma experienced on the basis of multiple characteristics, such as HIV status, older age, racial minority status, gender identity, real or perceived substance use and for MSM, stigma based on their sexuality. For example, intersectional stigma was identified in a study of older Black women living with HIV, who reported stigma related to gender, race, age, and disease (81).

Stigma has been found to be related to poorer health behaviors for PLWH (82, 83), including lower levels of adherence to ART, and lower usage of health and social services. Stigma also impacts disclosure and self-esteem among OPLWH (83). Interventions or factors found to help coping with stigma include social support (80) and spirituality (84).

Stress and Trauma

Early childhood abuse and PTSD has been associated with subsequent substance use, risky behaviors, and HIV (85, 86). For example, Lee (87) found that among a sample of people who inject drugs, almost one-third (30.9%) reported childhood sexual abuse, and this was associated with syringe sharing. In addition, many people who use substances have experienced poverty, homelessness, or incarceration, with resultant exposure to chronic and acute stressful life events. Minority stress related to sexual orientation has been related to increased substance use (88). Several pathways leading from stress and trauma to substance use and risky behaviors have been proposed (e.g., depression) and trauma-informed therapy for substance users has been recommended (89).

RISKY SEXUAL BEHAVIOR

Many older adults remain sexually active well into their 7th−9th decades of life (90) and OPLWH have been shown to continue to engage in sexual behavior (91, 92). In the ROAH study, 40% of OPLWH reported engaging in anal or vaginal sex in the prior 3 months, and 75% of those sexually active reported having sex more than 2–3 times per month (91). Importantly, almost half of those who were sexually active reported having unprotected anal or vaginal sex in the past 3 months and about 21% of participants reported recent unprotected sex with HIV-negative partners or partners whose HIV status was unknown. Those who were sexually active were more likely to report recent drug use. Further, many studies have shown that substance use is related to risky sexual behaviors, e.g., condomless anal sex among HIV+ MSM (93), and risky sexual behaviors among HIV-infected MSM and women (94). Sexual risk may also vary with partner type. One study of OPLWH found that substance use was related to increased condomless sex with casual partners but not with main partners (95).

Similar to their younger peers, drug use by older adults with HIV is a prime predictor of engagement in high-risk sexual behavior and non-adherence to medications (96, 97). Poor adherence to ART is of concern for the health of the infected patient, and in addition, the resultant high viral loads increase the probability that HIV can be transmitted to sexual partners.

Substance use has been associated with greater sexual risk among MSM, but it is unclear whether sexual risk differs between older and younger MSM (98). In the ROAH Study, erectile dysfunction drugs and poppers were both associated with increased odds for condomless anal/vaginal sex among HIV-positive bisexual and gay men (99). There is some evidence to suggest that cognitive functioning may be an important factor to consider in the association between substance use and sexual risk behavior. In a study of older HIV-positive MSM, drinking to intoxication and current illicit substance use were associated with condomless anal sex when controlling for impairment on two or more cognitive tests, marijuana use, lifetime illicit substance use and HIV diagnosis on or before 1996 (93).

In addition to addressing substance use and co-morbidities of OPLWH, attention to psychosocial factors such as experiences of stigma and stress can also enhance their health status. Sexual health discussions with care providers can serve to reduce risks for both the OPLWH and their sex partners.

RECOMMENDATIONS FOR CARE PROVIDERS

As part of their HIV care, many OPLWH are screened and treated for the co-morbidities identified in this paper, especially non-communicable diseases. However, screening may not be consistent across all patient groups, and as many OPLWH move into geriatric care environments, some important comorbidities, particularly substance use disorders, may be missed. Specific recommendations related to the care of OPLWH who are substance users include patient screening needs and staff training requirements. These are outlined in the following section.

Screening for Smoking and Providing Cessation Counseling

Many of the risks associated with tobacco use can be reduced by cessation, e.g., bacterial pneumonia in people living with HIV (100). In addition, the time since an HIV-positive individual has abstained from smoking is inversely correlated with risk for cardiovascular disease (101). One study showed that for those over 50 who stop smoking, smoking-related cardiovascular disease risks excess vanishes within 5 years after smoking cessation (102). Smoking cessation is a crucial intervention for promoting positive health outcomes among people living with HIV, especially OPLWH. Multiple interventions have been used for smoking cessation in this population, with varying degrees of success (103). Recommendations for the role of health care providers include the use of a brief intervention which consists of: routinely asking patients about tobacco use and their willingness to stop smoking, efforts to increase motivation to quit, and a range of cessation strategies such as providing nicotine substitution, and referral to stop smoking clinics (102).

Screen for Alcohol and Other Substance Use

The US Preventative Services Task Forces recommends screening all adults for alcohol misuse (104). The National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines low risk drinking as 1 drink per day (or 7 per week) and no more than 3 drinks per single day for men and women over 65 (105). OPLWH are encouraged to limit or abstain from alcohol consumption. Those with positive screening scores for misuse, hazardous or binge drinking (4 drinks for women and 5 drinks for men in about 2 h) should receive brief behavior counseling. The components of SBIRT (screening, brief intervention, and referral to treatment) provide an integrated approach to screening and intervention (106) and can be undertaken by physicians, nurses, or ancillary care providers (107). A positive score on the screener supports a brief intervention, where information about potential health risks based on the pattern of use is provided. Patients assessed with the likelihood of a moderate to severe substance use disorder should be referred to specialty treatment. This model has yielded positive outcomes across a range of health care settings and patient populations (106). Several screening tools are recommended for use with SBIRT, including computer-assisted self-interview instruments (108).

Assess for Depression and Other Mental Health Comorbidities

Depression is the most frequent comorbidity among OPLWH (7) and is one of the most underdiagnosed conditions in aging populations (109). Symptoms of clinical depression can be exacerbated in the presence of chronic conditions such as HIV (110). The validity of the Patient Health Questionnaires has been studied in primary care settings and with older adults (111, 112). Screening for stress and trauma should also be considered, as they are associated with substance use.

Assess for Geriatric Conditions Including Cognitive Deficits

Best practices for addressing geriatric conditions or syndromes is the prevention of geriatric conditions using an interprofessional team knowledgeable in caring for older adults. For example, preventing falls and reducing polypharmacy can prevent the emergence of associated geriatric conditions. Assessment of risk for geriatric conditions, therefore, is a component of integrated care. The Montreal Older Adults Cognitive Assessment (MOCA) is a brief, culturally sensitive tool that has been used extensively with persons with co-occurring chronic medical conditions. It has high sensitivity and specificity for mild cognitive impairment and Alzheimer's dementia (113). Cognitive assessment can provide data to the clinician about the severity of impairment related to NCDs, capacity for psychosocial interaction and the type of health teaching that may be useful in enhancing adherence, reducing risk behaviors, and better health practices generally.

Screen for Risky Sexual Behavior

Care providers are often uncomfortable discussing sexual intimacy, especially with older populations. The frequency of sexual health discussions between physicians and older patients has been found to be suboptimal (114), perhaps due to discomfort on the part of the health care provider or the assumption that people over the age of 65 are not sexually active. It is

important for care providers to ask their patients who are OPLWH (as well as their other older patients) about their sexual behaviors and discuss the need for protection, review condom use skills, and provide condoms. This can also provide patients the opportunity to discuss their questions and concerns about various sexual activities. For OPLWH who are active with HIV-negative or HIV status-unaware sexual partners, PrEP (pre-exposure prophylaxis) should be raised as a prevention tool. Discussion of efforts to end HIV transmission and the campaign U=U (undetectable = untransmittable) can also inform this discussion. Further, exploration of other aspects of sexual health beyond HIV prevention can also be raised for the holistic care of OPLWH.

Provide Access to Drug Treatment and Harm Reduction Services

There are a wide array of evidence-based treatments available for people who use substances. These include medications for smoking [Chantix, Habitrol, Nicorette (115)], alcohol [naltrexone(Vivitrol), Acamprosate, Disulfiram (116)] and for prescription opioid and heroin use [methadone, buprenorphine and naltrexone (117)]. A variety of behavioral counseling and self-help programs (including 12-step programs), can also be effective independently or often as adjuncts for these medication-assisted treatments.

The use of a harm reduction approach with substance users has increased in acceptance in the health arena, moving the focus of care from abstinence only to reducing the negative consequences of substance abuse. Harm reduction is consistent with the ethical codes for health care providers, which require respect for patients and use of evidence-based care, and has been found to help patients adopt healthy behaviors (118). For OPLWH, harm reduction efforts include assisting patients who wish to access treatment (HIV and substance use) and respecting patients' choices to continue substance use, e.g., for those who engage in drug injection, referring them to syringe exchange programs.

TRAINING/CONTINUING EDUCATION NEEDS FOR STAFF IN FACILITIES WITH OPLWH

As the population of OPLWH grows, there is rising concern that their care providers, and care facilities for them (e.g., assisted living, geriatric care and long-term skilled nursing facilities), are not ready to provide needed services related to substance use. Recommendations for continuing education and training for health care providers treating OPLWH are listed below, and many of these can be incorporated in continuing education and graduate and undergraduate programs for clinicians planning to work with this population. Guidelines for the management of OPLWH are available (www.HIV-Age.org), and should be consulted in developing continuing education programs. Education recommendations include:

Training Programs on Beliefs About HIV, Sexual Minorities, and Substance Users

Both professional and non-professional care providers may hold stigmatizing attitudes and training should target myths or stigma that may be associated with the OPLWH. Sexual minority men, other persons with non- traditional gender identities, and those who use substances may fear being stigmatized, which can interfere with effective communication. Staff training in such techniques as motivational Interviewing and substance use counseling can also be helpful in understanding the basis for continued substance use (e.g., peer influences and depression), and provide tools for engaging clients.

Information on Ethical and Legal Obligations to Provide Care, Advocacy, and Support Services (119)

Ethical and legal guidelines for health care providers apply to accommodations in assisted living, nursing and long term care facilities. While facilities are required to post and adhere to Patients' Bill of Rights [e.g., (120)], enhancing staff skills in applying these to advocacy and care delivery may be needed. For example, training on patients' participation in their own care planning is paramount for ethical care delivery.

Information on Newer HIV-Related Treatments and Care Interventions (e.g., ART Regimens, Pre-exposure Prophylaxis [PrEP] for HIV-Negative Sexual Partners)

As treatment has been centered in HIV/AIDS dedicated centers, providers in care facilities for older populations, not specializing in this area, may need to expand their knowledge in treating this population, including education about new treatment developments.

Use of Multidisciplinary, Holistic Approaches to Care, Including Patient-Centered Care

These approaches may not be prevalent in long-term care facilities, but continue to be identified as most effective in reorienting health care models and reforming health systems. Appreciation for minority race/ethnic and cultural differences in perceptions of health care services can also serve to enhance patient-centered care.

Use of a Care Management Model

Comprehensive care with the integration of behavioral and other medical treatment provided by practitioners of multiple disciplines is now advocated in all care settings. Given the complexity of circumstances and comorbidities faced by many substance users, best practice suggests that long term care facilities and ambulatory clinics caring for older adults would be best served by embracing the "care manager" or "case manager" approach to coordinate professional and non-professional providers, and link clients to social services within communities.

Education on the Management of Co-morbidities

The prevalence of many co- morbidities in this population, with the possibility for interactions of medications, and adverse reactions to prescribed medications, requires training for staff, particularly for managing medications for OPLWH who are using alcohol, cocaine or other substances.

Education on Evidence-Based Treatment and Best Practices for Substance Use Disorders

The last decade has led to the expanded use of Medication Assisted Treatment (MAT) for opioid treatment, and harm reduction approaches. Practitioners in general health care or geriatric care may be unaware of new biomedical or behavioral treatment models for people who use substances. It has been reported that some nursing facilities refuse to admit patients if they are taking medication to treat opioid addiction (121). Problems emerging around this may be due to gaps in staff training, and persistence in the erroneous belief that 12 step models requiring abstinence, because of their dominance, are the gold standard for addiction treatment. Knowledge of these changes and support for MAT can help OPLWH find suitable program placements (122).

LIMITATIONS AND CONCLUSIONS

It should be noted that while broad in scope, this paper has several limitations. It was developed to identify key issues that should be considered in providing care to substance -using OPLWH. As such, it does not provide a comprehensive review of the literature. In addition, while some of the recommendations are practiced in many clinical settings (e.g., screening for substance use and referral for drug treatment) they are often not widely implemented across patient groups, especially OPLWH and those entering geriatric care facilities.

As the population of OPLWH continues to increase, clinicians working with those who are substance users will need to address a broad range of issues. For OPLWH, especially those who have been or are currently substance users, care management must go beyond a focus on viral suppression. Integrated care to address their treatment needs, with the contributions of multiple professional disciplines and health care specialties, will be needed to maximize health outcomes for this population. Furthermore, in addition to addressing the individual needs of OPLWH, structural barriers to the delivery of needed health care services must also be addressed, including availability of drug treatment and harm reduction services, as well as social conditions that impact their health (e.g., homelessness).

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SD conceived of the paper and drafted sections. TC, VD, VG-R, BH, SK, MN, DO, and BW wrote sections of the paper. All authors reviewed the final manuscript.

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Very few people with HIV stop smoking after brief advice from clinicians

Roger Pebody *February 2020*

Two recent reports highlight the low rates of smoking cessation achieved using recommended brief interventions during routine appointments at HIV clinics.

Smoking is responsible for the loss of more life-years in people with HIV than HIV itself. People living with HIV are more likely to smoke than the general population and may be at greater risk of smoking-related illnesses, including heart disease, lung disease and some cancers. Effective smoking cessation interventions are therefore a priority, but it is unclear whether those developed for the general population have sufficient impact.

In Italy, smoking cessation experts trained HIV doctors at ten hospitals in Italy to deliver the 5A's intervention, which involves clinicians asking about smoking, advising smokers of the benefit of stopping, assessing motivation to quit (using the stages of change model), assisting smokers in their quit attempt and arranging follow-up with stop smoking services. They were encouraged to offer this support at multiple clinic visits and outcomes were assessed after two years.

Of 1087 patients seen, 561 were smokers. Two years later, 41 of the 561 (7.3%) had successfully quit smoking for at least six months.

Quit rates were higher amongst patients who were assessed as being more ready for behaviour change (in the 'preparation' or 'contemplation' stages) than others. They were also higher (10.8%) in people attending the four clinics which said they *did* repeat discussions about smoking at multiple appointments. The intervention was only partially implemented by the other six clinics, because of time constraints and a perceived lack of interest from patients.

Of note, only 22 patients were given nicotine replacement therapy, medications such as varenicline *(Champix)* or e-cigarettes. This means the results mostly reflect the impact of counselling on its own, without pharmacological support. Also, three clinics were unable to refer patients to a specialist stop smoking service. Four could refer to a service in their hospital and three to a service in the same city, but none had this available within their own clinic.

In London, smoking cessation experts trained three healthcare assistants (nursing assistants) at the HIV clinic of the Royal Free Hospital to provide brief advice, as

recommended by UK guidelines. The approach is broadly similar to the 5As, but with a greater emphasis on referral to a stop smoking service in the patient's local area. As well as information and advice, these services can prescribe nicotine replacement therapy and other medications.

"4% of all identified smokers quit."

Of 1548 patients who were asked about smoking, 385 were smokers. Almost all were offered a referral to a stop smoking service, but only 154 accepted the referral. Follow-up with the stop smoking services three months later showed that 36 patients did attend the service, 78 did not and attendance was unknown for 40 patients. Of the 36 who did attend, 16 were recorded as having quit smoking (the duration of the quit was not reported). This means that 4% of all identified smokers quit.

Nonetheless, an economic analysis was more encouraging. Costs were modest due to the low pay grade of the staff involved and the brevity of the intervention. The estimated costs were £5.22 (GBP) for each smoker identified and £55.77 for each individual who attended stop smoking services.

The authors suggest that having a stop smoking service within the HIV clinic might remove a barrier. "If the risk of smoking-related morbidity among people living with HIV is to be reduced, more sustainable referral pathways and ways of improving uptake of smoking cessation services must be developed," they say.

Younger people with HIV lose lung function faster

Keith Alcorn

People living with HIV under the age of 50 lose lung function faster than HIV-negative people, a review of a large US cohort has shown. People with a previous low CD4 cell count also had faster declines in lung function.

The findings were presented at the 2020 Conference on Retroviruses and Opportunistic Infections. Conference presentations are taking place online to minimise the risk of coronavirus transmission.

Lung function can decline for a variety of reasons. Lung function declines in everyone as they age but smokers and people who are obese will suffer greater declines in lung function. Asthma and chronic obstructive pulmonary disease (COPD) are the most common forms of lung disease, but many conditions can cause loss of lung function.

COPD refers to chronic obstructive bronchitis and emphysema. These conditions limit the flow of air into the lungs and the uptake of oxygen from the lungs into the bloodstream, leading to coughing, shortness of breath and wheezing. COPD is a progressive condition and smoking is the most common cause.

Although some studies have found an association between smoking and COPD in people with HIV, not all studies have been able to confirm that smoking behaviour explains an increased prevalence of abnormal lung function in people with HIV.

To investigate the impact of HIV-related factors on lung function, researchers from Johns Hopkins University Bloomberg School of Public Health and the University of North Carolina at Chapel Hill designed a longitudinal cohort study (SHIELD, Study of HIV Infection in the Etiology of Lung Disease). The study recruited 2216 participants (1168 HIV negative) with a median age of 50 years. Two-thirds were male, 85% were black and 79% were current smokers with an average of 19 pack-years of smoking history at baseline.

Smoking was more common in HIV-negative people (85% vs 72%), who also had a longer smoking history (20 vs 17 pack-years).

Lung function was measured using the FEV1 and FVC tests and was lower at baseline in people with HIV than HIV-negative people (FEV1, 2.59 vs 2.84 litres; FVC 3.46 vs 3.79 litres).

Participants underwent lung function tests semi-annually from 2009 to 2017.

The investigators modelled the average decline from the age of 40 in people under 50, and the average decline from the age of 60 in people over 50.

In under-50s, FEV1 declined faster in people with HIV than in those without HIV (-46ml/year vs 32ml/year) and people with HIV also started with lower FEV1 levels (-133ml lower). In HIV-negative people, FEV1 declined at the expected rate for people of this age group. In people with HIV, the annual decline was almost 50% greater.

The rate of decline did not differ in over-50s between HIV-positive and HIV-negative people.

Detectable viral load made little difference to the rate of decline in people with HIV. Across the entire age range, current CD4 cell count did not affect the rate of FEV1 decline in people with HIV and did not differ from HIV-negative people.

Lowest-ever CD4 cell count did affect the rate of decline; people with nadir CD4 counts below 200 experienced more rapid decline in lung function than people with higher nadir CD4 counts. People with nadir CD4 counts above 200 did not experience faster declines in lung function than HIV-negative people.

The findings suggest that arresting damage to lung function in people with HIV needs to begin early, with smoking cessation a priority.

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Smoking Predicts Food Insecurity Severity among Persons Living with HIV

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Abstract

Food insecurity is a key social and health issue among persons living with HIV (PLHIV). Food insecurity oftentimes co-occurs with substance use, but little is known about the relationship between tobacco use and food insecurity particularly among PLHIV. In this study, we prospectively examined the association of cigarette smoking with food insecurity in a cohort of 108 individuals seeking vocational rehabilitation services. Over the 12-month study period, smokers at baseline reported consistently higher levels of food insecurity compared to non-smokers. Smoking remained an independent risk factor for greater food insecurity, controlling for sociodemographic characteristics and known confounders (e.g., substance use, depression). Food insecurity is a key structural and socioeconomic barrier that may partially explain HIV-related health disparities observed among smokers. Further research is needed to characterize the bio-behavioral mechanisms linking smoking and food insecurity as well as test whether smoking cessation can reduce food insecurity in PLHIV who smoke.

Keywords

HIV; food insecurity; smoking; substance use

INTRODUCTION

Food insecurity is a key social and health issue among persons living with HIV (PLHIV) worldwide, as an independent risk factor for HIV morbidity [1] and mortality [2]. As HIV is becoming increasingly concentrated among socioeconomically disadvantaged segments of

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the population, approximately one in two PLHIV in resource-rich settings reported experiencing food insecurity [3,4]. Through pathways involving nutrition (e.g., macro- and micronutrient deficiencies), mental health (e.g., depression, anxiety, substance use), and health behaviors (e.g., medication non-adherence, risky sex), food insecurity is bi-directionally linked with HIV disease progression [5]. Given the well-documented detrimental effects of food insecurity on the health sequelae of PLHIV, there is a need to examine further possible risk factors for food insecurity in order to inform the development of comprehensive interventions to address this structural and social determinant of health.

Factors influencing food insecurity occur on multiple levels, with key structural and social factors including poverty, issues of access, and housing instability [5–8]. Interacting with these structural and social factors, substance use oftentimes co-occurs with the experience of food insecurity [9–12]. For example, in a study of 250 PLHIV who were experiencing homelessness and unstable housing, recent crack cocaine use was independently associated with two-fold greater odds of food insecurity [13]. The intersection of food insecurity and substance use is an important area for further research, as the two are likely to be bi-directionally associated. Substance use places competing demands on limited resources which could thereby exacerbate food insecurity [14,15], yet the experience of food insecurity has also been found to be associated with increased prevalence of substance use [12]. In a study of 503 PLHIV using substances, those experiencing food and housing insecurity were more likely to engage in poor coping strategies, such as diversion of their medications, in part to manage the immediate stressors of daily living in impoverished conditions [10].

Extant literature on food insecurity and substance use among PLHIV has largely focused on illicit substances, such as use of injection drugs, heroin, and crack cocaine. The role of tobacco has received less attention with regards to associations with food insecurity in the HIV literature, but an independent association has been reported in the general population [16]. Tobacco use is known to be disproportionately high among PLHIV [17,18], such that advancements in anti-retroviral therapy have unfortunately been met with smoking as a significant contributor to early mortality [19] and non-AIDS-defining cancer mortality [20]. In a study of over 14,000 PLHIV in New York City, smokers were more likely to have unsuppressed viral load and low CD4 cell counts (<200 cells/mm) compared to non-smokers [21].

There is a small but growing body of literature on food insecurity and tobacco use among PLHIV. For example, a study of 183 PLHIV who were of Hispanic ethnicity reported that smoking prevalence was significantly higher among those with food insecurity (63%) versus without food insecurity (32%) [22]. In another study, 671 participants with HIV were provided with $30 grocery gift cards as study participation incentives, and 74% (n = 498) returned receipts that reflected how the gift cards were spent. Those who experienced any food insecurity (compared to those without food insecurity) were more likely to spend the gift cards towards the purchase of tobacco products [14]. The findings suggested that the addictive nature of tobacco presented a competing survival demand amidst the struggle of living with limited resources [14]. Given these trends, better understanding how tobacco use contributes to experiences of food insecurity is needed to inform the development of

interventions and policies that aim to address the disproportionate burden of smoking, food insecurity, and their related health problems.

The current study examined predictors of food insecurity severity over a 12-month study period in a cohort of PLHIV who were engaged in vocational rehabilitation services. We hypothesized that cigarette use would independently predict food insecurity severity after adjusting for key confounders such as depressive symptoms, substance use, and quality of life [12,13,23].

METHODS

Procedures and Setting

Data for this study were drawn from a prior investigation examining outcomes of a vocational rehabilitation program for PLHIV. The original purpose of the study and the procedures are outlined in greater detail in Gómez et al [24]. To summarize, from January 2011 through January 2012, 108 participants were enrolled in the study within 30 days of initiating vocational rehabilitation services through the Positive Resource Center's Employment Services Program in San Francisco, California. After obtaining informed consent, participants completed a baseline assessment, which was re-administered at a 6-month and a 12-month follow-up assessment. At each study visit, participants were remunerated with a $50 pre-loaded debit card for their time and travel expenses. All study procedures were approved by the University of California San Francisco Institutional Review Board. The current study utilized data from the baseline and 12-month follow-up assessments. Of the 108 participants initially enrolled, 82% (n = 89) completed assessments at the 12-month follow-up.

Measures

The primary outcome variable was food insecurity severity, measured via the Household Food Insecurity Access Scale (HFIAS) [25]. HFIAS is a nine-item self-report measure of food insecurity, assessing issues related to access to food (e.g., worrying about not enough food, limitations in variety of foods) and frequency of access-related issues in reference to the past month. HFIAS may be used as a categorical or continuous measure of food insecurity. We selected to use the continuous measure in the analyses, as the continuous measure is better able to capture changes over time [25]. Scores range from 0 to 27, with higher scores indicating greater severity of food insecurity. We used the categorical measure for sample description.

The main independent variable was current smoking, assessed by asking participants how often they smoked cigarettes during the past 3 months. Those who reported current smoking were further categorized into daily smoking (responses of "more than once a day") and nondaily smoking (responses ranging from "once a month" to "2 to 3 times a week").

Covariates included demographic characteristics and known confounders of food insecurity, including depressive symptoms, substance use, and quality of life related to mental health and physical health [12,13,23]. Depressive symptoms were measured using the Beck Depression Inventory-II [26], a 21-item self-report measure assessing the severity of

depressive symptoms in reference to the past two weeks. Scores range from 0 to 63, with higher scores indicating greater depressive symptom severity. Substance use severity was measured by the Drug Abuse Screening Test-10 item version [27], which measures consequences resulting from substance use over the past 12 months (e.g., withdrawal symptoms from substance use). Scores range from 0 to 10, with higher summed scores indicating greater substance use severity. We also included an item measuring hazardous drinking over the past 3 months, defined as having 6 or more alcoholic drinks on one occasion (yes or no). Overall mental health quality of life and physical health quality of life were assessed using the Medical Outcome Study HIV Health Survey. Scores range from 0 to 100 with higher scores indicating better mental health- and physical health-related quality of life [28].

Analysis

Baseline differences between smokers and non-smokers were examined using *t*-tests and chi-square tests. Cohen's *d* was used to compare the magnitude of the difference between means, in which 0.20 indicates a "small" effect, 0.50 indicates a "medium" effect, and 0.80 indicates a "large" effect [29]. We conducted a two-step hierarchical multiple regression analysis to examine predictors of food insecurity severity at the 12-month follow-up, controlling for food insecurity severity at baseline. We used data from the baseline and 12-month assessments, as not all study variables were captured at the 6-month assessment. Prior to the regression analysis, we examined correlations amongst study variables to identify potential issues of multicollinearity.

Predictors in Model 1 included sociodemographics (age, gender, race, years since HIV diagnosis, disability status, and employment status) and covariates measured at baseline (substance use severity, depressive symptoms, hazardous drinking, mental health quality of life, and physical health quality of life). In Model 2, we included smoking status (smoking or non-smoking) measured at baseline to examine whether there was a significant change in the model's adjusted R^2. As a sensitivity analysis, and to examine whether food insecurity was associated with patterns of smoking, we repeated Step 2 with daily smoking (versus all others who did not indicate daily smoking) in the model.

RESULTS

Participant Characteristics

The majority of participants were men (90%), identified as being predominantly or exclusively gay (82%), and had a mean age of 46.7 years (*SD* = 9.3). For race/ethnicity, 16% identified as African American, 18% as Hispanic/Latino, 51% as non-Hispanic White, and 16% identified as other or multiracial. For educational level, 47% reported a college degree or higher, 40% reported some college, and 13% reported high school or less. On average, participants reported having been diagnosed with HIV for 14.7 years (*SD* = 8.4). Because the original study was conducted in the context of a vocational rehabilitation program, nearly two-thirds of participants (63%) were receiving disability benefits, either receiving Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI).

At baseline, 28% (n = 30) were considered current smokers, and among them, 70% (n = 21) reported smoking daily. About half, or 55% (n = 59), reported any food insecurity at baseline. Table 1 displays participant characteristics collected at study baseline by smoking status and the corresponding p-values of comparisons. Current smokers, compared to non-smokers, were significantly younger in age ($t(106) = 2.62$, $p = 0.01$, Cohen's $d = 0.54$) and had been more recently diagnosed with HIV ($t(104) = 2.16$, $p = 0.03$, Cohen's $d = 0.47$). Moreover, smokers reported significantly greater food insecurity severity ($t(106) = 2.45$, $p = 0.02$, Cohen's $d = 0.48$), depressive symptoms ($t(105) = 1.99$, $p = 0.05$, Cohen's $d = 0.40$), and substance use severity ($t(105) = 2.85$, $p = 0.01$, Cohen's $d = 0.58$) compared to non-smokers. Among the 30 smokers at baseline with available data at the 12-month follow-up (n = 19), 90% reported that they continued to smoke.

Predictors of Food Insecurity Severity

In Model 1 of the hierarchical multiple regression analysis predicting food insecurity severity at the 12-month follow-up (Table 2), significant baseline predictors were greater food insecurity severity at baseline (B (SE) = 0.34 (0.14), $\beta = 0.39$, $p = 0.016$) and younger age (B (SE) = −0.35 (0.14), $\beta = -0.46$, $p = 0.015$). No other variables, including sociodemographics and baseline covariates (substance use, depressive symptoms, mental health quality of life, and physical health quality of life), were significant. The adjusted R^2 of Model 1 was 0.36. In Model 2, smoking status at baseline was a significant predictor of food insecurity severity at the 12-month follow-up (B (SE) = 0.59 (0.22), $\beta = 0.31$, $p = 0.010$), controlling for confounders as shown in Table 2. The only other significant variable in Model 2 was food insecurity severity at baseline (B (SE) = 0.37 (0.13), $\beta = 0.41$, $p = 0.006$). The adjusted R^2 of Model 2 was 0.45, showing that the addition of baseline smoking in Model 2 explained significantly more variance in food insecurity at 12 months compared to Model 1 ($\Delta R^2 = 0.09$, $p = 0.010$). A sensitivity analysis using baseline daily smoking (versus others) did not change the results.

DISCUSSION

This is among the first longitudinal studies to highlight that cigarette use is an independent risk factor for food insecurity among PLHIV, after adjusting for known confounders such as comorbid substance use. In this sample of PLHIV engaged in vocational rehabilitation services, we found that smoking status at baseline predicted significantly greater levels of food insecurity severity at the 12-month follow-up, above and beyond other correlates of food insecurity. In fact, smoking explained 9% of the variance in food insecurity at 12 months; these results held regardless of whether one was a daily smoker, suggesting that either pattern of smoking (daily or non-daily) was associated with more severe food insecurity outcomes in this case.

Smoking may contribute to the experience of food insecurity in a number of ways. Depending on levels of cigarette consumption, the money spent on buying cigarettes may be directly competing with money needed for subsistence needs, such as food [30]. This may be particularly the case for persons living in impoverished conditions, as with many PLHIV in urban settings [6]. In a multi-national study using data from the International Tobacco

Control Policy Evaluation Survey, 28% of U.S. respondents who were smokers reported smoking-induced deprivation, which was defined as spending money on cigarettes that could be better spent on household essentials like food [31]. Importantly, lower income, racial minority status, and perceived stress were associated with increased odds of reporting smoking-related deprivation. Food insecurity may be a byproduct of smoking-induced deprivation, and these previous findings suggest a disproportionate burden of smoking-induced deprivation for disadvantaged or marginalized groups.

The association between smoking and food insecurity is likely more complex than spending patterns alone. Other possibilities are that smoking indirectly contributes to food insecurity through factors associated with declining health (e.g., limit one's workforce participation and earning potential), which could subsequently create higher health care costs and increase financial burden. Potential health declines are already a salient issue in HIV. Although the exact pathophysiological effects of tobacco smoke and nicotine on HIV is not yet well understood, there is evidence that smoking has more negative physical health effects, such as immunosuppression, for smokers with HIV compared to smokers without HIV [32]. This investigation furthers our understanding of smoking-related harms for PLHIV, particularly highlighting that smoking has prospective and exacerbation effects on food insecurity. Further research should examine the mechanisms linking smoking and food insecurity, which are likely to be complex and multifaceted.

Although the present study focused on a unidirectional association between smoking and food insecurity, the potential reciprocal association between the two should be acknowledged and further examined. For example, a study of women experiencing homelessness or unstable housing (half of whom were living with HIV) reported a bidirectional relationship between food insecurity and cigarette smoking [33]. One of the characteristics of food insecurity, particularly when food insecurity is more severe, is the experience of feeling hungry but not eating due to not having enough money for food [34]. In addition to nicotine being the primary psychoactive substance in cigarettes that creates pleasurable feelings for the smoker, nicotine also has the effect of suppressing appetite and regulating eating behaviors [35]. Thus, the effects of nicotine on appetite suppression has been raised as a possibility for food insecurity's association with smoking, as individuals may be using cigarettes to curb feelings of hunger [33]. Furthermore, whether this is part of an intentional behavioral process that those with greater food insecurity are smoking cigarettes when feeling hungry, or food insecurity is attributable to limited economic resources due to the financial burdens of nicotine addiction is an area that remains to be examined.

The prevalence of smoking in the current study (28%) was lower than other published studies of population groups with HIV, with large epidemiological studies reporting smoking prevalence at about 40% [17,36] and smaller studies reporting even higher [37,38]. The relatively lower smoking prevalence in our study may be partially due to a geographic effect, given that smoking prevalence in California is lower than the national average [39]. It also serves to highlight the unique characteristics of this particular sample of PLHIV who were actively seeking vocational rehabilitation services. Most notably, the sample was well educated with the majority (87%) reporting that they completed at least some college.

Smoking prevalence tends to decline with greater education in the general population and among PLHIV [17]. The lower smoking rate may also reflect quitting among former smokers. About 20% of PLHIV are former smokers [17], and although we did not assess former smoking in the current study, we did find that non-smokers (which would include former smokers) were older than current smokers, and this might reflect individuals who were once smokers but have since quit. Furthermore, because our sample was drawn from individuals engaged in vocational rehabilitation services, individuals who smoke may be more motivated to quit prior to enrollment in preparation to enter or re-enter the workforce.

It is also noteworthy that current smokers in this study reported higher levels of depressive symptoms and substance use severity, which underscores the potential benefits of comprehensive approaches for smoking cessation. Clinical research has documented the efficacy of cognitive-behavioral interventions targeting depression and substance use to optimize HIV/AIDS prevention [40,41]. However, the efficacy of smoking cessation interventions for PLHIV have been modest at best [42,43], and many have not been tailored to address the unique barriers to smoking cessation. For example, one study of 57 smokers living with HIV reported that HIV symptom distress was associated with smoking outcome expectancies, such as relief from emotional distress and enhancement of positive mood [44]. There is a need to promote smoking cessation through interventions that are tailored to address the unique barriers for smokers who are living with HIV. A research question to be investigated in the future is whether smoking cessation can reduce food insecurity among PLHIV. Given that our study sample was drawn from individuals seeking vocational rehabilitation services, our findings also have implications for providing evidence-based smoking cessation resources in such settings.

We acknowledge that our findings must be interpreted in light of some limitations. The current study sample included individuals who were seeking vocational rehabilitation services and had relatively higher levels of education. The extent to which these findings may be generalizable to other samples in both urban and non-urban settings and with different educational backgrounds is not yet known. Our assessment of smoking status was based on self-reported cigarette smoking frequency in the past three months, and we were unable to include biochemical verification or assess other smoking-related characteristics, such as lifetime and former smoking, as well as use of other tobacco or nicotine delivering products. It is also important to note that we cannot conclude causality from our findings, and these limitations highlight areas to be examined in future investigations.

This investigation found that smoking was significantly predictive of food insecurity severity in this sample of PLHIV. An important implication is that expanded smoking cessation services for this population may have the potential to extend beyond physical health benefits by also impacting key social and health determinants, such as food insecurity. Both cigarette use and food insecurity disproportionately impact the health and wellbeing of individuals who are living with HIV. Better understanding their association, including the potential reciprocal nature and mechanisms, is needed to inform efforts to improve health outcomes.

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Table 1

Demographic and Other Characteristics of Study Participants by Smoking Status

	Total (*N* = 108)	Non-smokers (*n* = 78)	Current smokers (*n* = 30)	*p* value
Age, M (*SD*)	46.6 (9.3)	48.0 (8.7)	42.9 (10.0)	0.01
Male, *n* (%)	97 (89.8)	70 (89.7)	27 (90.0)	0.97
Race/ethnicity, *n* (%)				0.24
Black/African American	17 (15.7)	12 (15.4)	5 (16.7)	
Hispanic/Latino	19 (17.6)	17 (21.8)	2 (6.7)	
White, non-Hispanic	55 (50.9)	36 (46.2)	19 (63.3)	
Other or multiracial	17 (15.7)	13 (16.7)	4 (13.3)	
Sexual orientation, *n* (%)				0.10
Predominantly or exclusively heterosexual	16 (14.8)	8 (10.4)	8 (26.7)	
Equally heterosexual and homosexual	3 (2.8)	2 (2.6)	1 (3.3)	
Predominantly or exclusively homosexual	88 (81.5)	67 (87.0)	21 (70.0)	
Disability status- on SSI or SSDI, *n* (%)	67 (62.6)	47 (60.3)	20 (69.0)	0.35
Years since HIV diagnosis, M (*SD*)	14.0 (8.4)	15.6 (8.2)	11.7 (8.5)	0.03
Education level, *n* (%)				0.07
High school or less	14 (13.0)	7 (9.0)	7 (23.3)	
Some college or trade school	43 (39.8)	30 (38.5)	13 (43.3)	
College or more	51 (47.2)	41 (52.6)	10 (33.3)	
Personal annual income, *n* (%)				0.34
< $5,000	16 (14.8)	13 (16.7)	3 (10.0)	
$5,000 - $11,999	31 (28.7)	22 (28.2)	9 (30.0)	
$12,000 - $15,999	23 (21.3)	13 (16.7)	10 (33.3)	
$16,000 - $24,999	24 (22.2)	18 (23.1)	6 (20.0)	
$25,000 - $34,999	9 (8.3)	7 (9.0)	2 (6.7)	
> $35,000	5 (4.6)	5 (6.4)	0 (0.0)	
Hazardous drinking, *n* (%)	33 (30.6)	21 (26.9)	12 (40.0)	0.43
Depressive symptoms, M (*SD*)	15.8 (11.3)	14.4 (10.2)	19.3 (13.5)	0.05
Substance use severity, M (*SD*)	1.8 (2.5)	1.4 (2.2)	2.9 (3.0)	0.01
Mental health-related quality of life, M (*SD*)	46.7 (9.8)	46.7 (9.2)	43.9 (11.6)	0.20
Physical health-related quality of life, M (*SD*)	45.9 (9.9)	46.9 (9.8)	46.1 (9.9)	0.71
Food insecurity at baseline, M (*SD*)	4.6 (6.1)	3.7 (5.2)	6.8 (7.6)	0.02
Food insecurity at follow-up, M (*SD*)	(*n* = 89) 3.9 (6.0)	(*n* = 70) 3.1 (5.6)	(*n* = 19) 6.8 (1.6)	0.03

Notes. Not all categories match overall sample size due to individuals who did not provide answers. All characteristics are measured at baseline, unless otherwise noted. SSI = Supplemental Security income; SSDI = Social Security Disability Insurance

Table 2

Results from Hierarchical Multiple Regression Analysis Predicting Severity of Food Insecurity at 12-Month Study Follow-Up ($N = 89$)

	Model 1 (Adjusted $R^2 = 0.36$)			Model 2 (Adjusted $R^2 = 0.45$)		
Variable	**B (SE)**	**Beta**	**p- value**	**B (SE)**	**Beta**	**p-value**
Food insecurity severity at baseline	0.34 (0.14)	0.39	0.02	0.37 (0.13)	0.41	0.01
Age	−0.35 (0.14)	−0.46	0.02	−0.25 (0.13)	−0.33	0.07
Male (vs. female)	0.52 (0.47)	0.14	0.28	0.52 (0.43)	0.15	0.24
White (vs. non-White)	0.14 (0.22)	0.08	0.52	0.13 (0.20)	0.08	0.52
Years since HIV diagnosis	−0.06 (0.13)	−0.07	0.67	−0.06 (0.12)	−0.07	0.65
Disability status	−0.19 (0.30)	−0.11	0.52	−0.25 (0.27)	−0.15	0.36
Unemployed	−0.03 (0.33)	−0.02	0.92	−0.08 (0.31)	−0.04	0.79
Substance use severity	−0.17 (0.12)	−0.17	0.17	−0.18 (0.11)	−0.18	0.12
Depressive symptoms	−0.05 (0.17)	−0.05	0.79	−0.07 (0.16)	−0.08	0.67
Hazardous drinking	−0.31 (0.28)	−0.18	0.28	−0.25 (0.26)	−0.15	0.35
Mental health quality of life	−0.15 (0.16)	−0.18	0.36	−0.12 (0.12)	−0.14	0.33
Physical health quality of life	−0.14 (0.13)	−0.18	0.29	−0.17 (0.15)	−0.21	0.26
Current smoking at baseline	Not included in Model 1			0.59 (0.22)	0.31	0.01