

A Community-Engaged, Team-Based Approach to HIV Care and Research in the Mostly Rural Deep South

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Abstract

Numerous disparities exist in rates of HIV infection, the number of people living with HIV and/or AIDS, AIDS-related deaths, and HIV outcomes throughout the United States and in Alabama. People living with HIV are more likely than individuals in the general population to experience depression and anxiety and to have histories of substance abuse, yet they are less likely to access treatment, especially in the rural South (Burnam et al., 2001). This paper describes a mixed-methods study that used a community-based participatory research (CBPR) approach to develop and evaluate a multilevel program involving group counseling, telemedicine, and peer support to improve mental health, substance abuse, and HIV-related outcomes, including HIV treatment adherence and retention, among people living with HIV in Alabama.

Numerous disparities exist in rates of HIV infection, the numbers of people living with HIV and/or AIDS, AIDS-related deaths, and HIV outcomes throughout the United States and in Alabama. Despite a significant scale-up of HIV treatment across the globe, the overall effectiveness of HIV treatment is severely undermined by attrition of people living with HIV across the HIV care continuum (McNairy & El-Sadr, 2012). Research indicates that a myriad of biopsychosocial barriers can hinder engagement with HIV care. People living with HIV are more likely than individuals in the general population to experience depression and anxiety and to have histories of substance abuse, yet they are less likely to access treatment, especially in the rural Deep South (Burnam et al., 2001; Kral et al., 2018; Linton et al., 2017; López et al., 2018). This is significant because substance abuse and mental illness are major risk factors for HIV transmission; they may also challenge patients' engagement in the HIV care continuum, which is essential to decreasing HIV viral load and transmission. Thus, interventions that better address coexisting HIV and/or AIDS and substance abuse and/or mental illnesses are needed, particularly in the rural Deep South. The purpose of this paper is to describe findings from a mixed-methods study that used a community-based participatory research (CBPR) approach involving group counseling, telemedicine, and peer support to improve mental health, substance abuse, and HIV treatment adherence among a

primarily African American sample of people living with HIV in mostly rural Alabama.

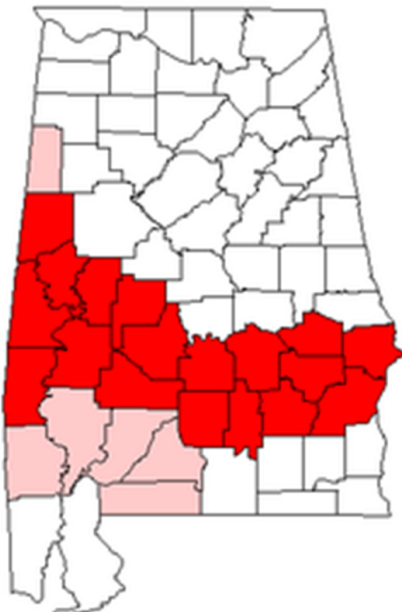
Background

At the end of 2018, an estimated 1.2 million persons aged 13 years and older were living with HIV in the United States, including an estimated 161,200 persons (13%) whose infections had not been diagnosed (Centers for Disease Control and Prevention [CDC], 2019). Southern states accounted for 44% of all people living with HIV in the United States, despite the fact that only 37% of the U.S. population resides in the South (Millett et al., 2010; Southern AIDS Coalition, 2013; White House Office of National AIDS Policy, 2010). Additionally, the United States had 37,968 new HIV diagnoses in 2018, with residents of the South making up 51% of those diagnosed; of these individuals, 53% identified as Black/African American (CDC, 2019). Furthermore, in 2017, of the 15,807 deaths of people with diagnosed HIV in the United States, nearly half (47%) were in the South (CDC, 2020).

Of the U.S. states that currently bear the highest burden of HIV, eight are in the South—including Alabama, which is in the Deep South (CDC, 2020). Alabama has 15,041 (diagnosed) people living with HIV, with a prevalence rate of 296 per 100,000 (Alabama Department of Public Health, 2019). African Americans make up 27% of Alabama's population and account for an astounding 74% of all new HIV diagnoses

and 64% of all prevalent HIV cases (Alabama Department of Public Health, 2019). Alabama's Black Belt region is of particular concern for people living with HIV. The Black Belt (Figure 1) refers to several (18–24) mostly southern counties in Alabama that are linked to the region's black topsoil. African American plantation workers were historically enslaved here, and freedmen still reside within the region. This study recruited participants from Tuscaloosa County and the following Black Belt counties: Hale, Pickens, Greene, and Sumter. This region is mostly rural, and residents face a myriad of challenges—such as higher rates of poverty, lower socioeconomic status, limited public transportation, poor access to health care services, poor access to housing programs, and limited employment opportunities—that are associated with risky behaviors and HIV risk. These challenges are of concern because, when comparing rural areas to nonrural areas, they hinder access to HIV care across the continuum (Prejean et al., 2013; Reif et al., 2017). Unless such disparities are investigated and addressed, the recent scale-up of HIV treatment across the globe will remain severely undermined by attrition of people living with HIV across the HIV care continuum—not only in the Deep South but also around the world (McNairy & El-Sadr, 2012).

Figure 1. Alabama's Black Belt Region



Note. Counties highlighted in red are historically considered part of the Black Belt region. Counties highlighted in pink are sometimes considered part of the region. Wikimedia. <https://commons.wikimedia.org/wiki/File:AlabamaBlackBelt.png>

Attrition and poor engagement within the HIV care continuum have negative health outcomes. Poor engagement in HIV care is associated with delayed receipt of antiretroviral therapy (ART); nonadherence to ART; increased viral load; antiretroviral resistance; suboptimal counts of CD4 cells, a type of T-cell that plays an essential role in the immune system (Giordano et al., 2007; Horstmann et al., 2010; Robbins et al., 2007; Skarbinski et al., 2015); an increased risk of clinical events and death (Bradley et al., 2014; Giordano et al., 2007; Park et al., 2007); and an increase in HIV transmission (Mugavero et al., 2013; Skarbiski et al., 2015). Additionally, suboptimal ART adherence—that is, if individuals take less than 90–95% of their prescribed treatments—contributes to antiretroviral resistance and worse medical outcomes (Bangsberg et al., 2001; Gardner et al., 2008; López et al., 2018; Mannheimer et al., 2008; Montaner et al., 1998; Paterson et al., 2000; Stansell et al., 2001). Furthermore, ART is important in HIV prevention because lower or undetectable viral load resulting from optimal ART adherence is linked to a lower risk of HIV transmission (Eaton et al., 2012; Nguyen et al., 2011; Skarbinski et al., 2015).

Although great strides have been made in improving HIV care attrition and engagement over the last decade, a multitude of complex biological (e.g., viral load), psychological (e.g., depression), and societal (e.g., transportation) factors can interfere with care. Out of the 1.2 million people living with HIV in the United States, it is estimated that only 60% are virally suppressed and only 57% are engaged in HIV care (Bradley et al., 2014; CDC, 2019). Additionally, African Americans fall below these estimates; only 43% are virally suppressed and 46% are engaged in care (Bradley et al., 2014; CDC, 2021). The literature supports that linkage to and retention in HIV care has been generally worse among racial and ethnic minorities (Beattie et al., 2019; CDC, 2014; Hall et al., 2012; Horstmann et al., 2010; Rebeiro et al., 2013; Ulett et al., 2009). In addition, poor mental health, stigma, and substance use are consistently associated with poor engagement in the health care pipeline (Conviser & Pounds, 2002; Felker-Kantor et al., 2019; Ironson et al., 2005; Mehta et al., 1997). This is notable because although there is an increased prevalence of depression, anxiety, and substance abuse among people living with HIV and/or AIDS when compared to the general

population, these individuals are less likely to access treatment, especially in the Deep South (Albritton et al., 2017; Burnam et al., 2001; Kral et al., 2018; Linton et al., 2017; López et al., 2018).

Substance abuse, depression, and anxiety are highly prevalent among people living with HIV. The literature indicates that up to 86% of people living with HIV use illicit drugs and hazardous levels of alcohol (Dombrowski et al., 2018). Among HIV-positive men who have sex with men, 52.3% reported substance abuse (Skeer et al., 2012). Often coexisting with substance abuse are depression and/or anxiety (Burnam et al., 2001; Dombrowski et al., 2018; Giordano et al., 2018; Halkitis, 2005; Kalichman et al., 2017), with reports that there are more people with substance abuse disorders who report depression or anxiety than people with substance abuse disorders who don't report depression or anxiety (Braxton et al., 2007; Cook et al., 2004, 2006; Dalmida et al., 2009; Eller et al., 2010; Heywood & Lyons, 2016; Lopes et al., 2012; Morrison et al., 2014; Sherr et al., 2011; Tedaldi et al., 2012). This trend is significant within the context of HIV care because depression, anxiety, and/or substance abuse can adversely affect ART adherence (Albritton et al., 2017; Gonzalez, Batchelder, et al., 2011; Gonzalez, Psaros, et al., 2011; Grau et al., 2017; Harding et al., 2010; Irvine et al., 2017; Kalichman et al., 2017; Ogburn et al., 2019; Safren et al., 1999, 2001; Sherr et al., 2011), immune function (Ickovics et al., 2001), disease progression, comorbidity and mortality (Beck & Reilly, 2006; Dombrowski et al., 2018; Fairfield et al., 1999; Freeman, 2006; Giordano et al., 2018; Ickovics et al., 2001; Leserman, 2003; Leserman et al., 2002; National Institute on Drug Abuse [NIDA], 2012; Nyamathi et al., 2017; Sherr et al., 2011), and quality of life (Dalmida et al., 2011).

Compared to those with substance abuse disorders alone, people with comorbid psychiatric and substance use disorders engage in more behaviors that put them at risk of HIV exposure (Avants et al., 2000; Disney et al., 2006; Kral et al., 2018; Linton et al., 2017) and are more likely to report an HIV and/or AIDS diagnosis (Dausey & Desai, 2003; Kral et al., 2018; Linton et al., 2017). Literature indicates that mental health services and substance abuse treatment integrated within the HIV care continuum are effective in improving outcomes for people living with HIV (Dombrowski et al., 2018; Giordano et al., 2018). Mental health services coupled with HIV care via mental health referrals (Nunn et al., 2010), counseling (Kalichman et al., 2011), and group-

based interventions (Magidson et al., 2014) have been correlated with increased adherence and retention (Tucker et al., 2017). Additionally, studies have indicated that the integration of substance abuse treatment within the HIV care continuum for people living with HIV with histories of drug abuse may delay the progression of HIV and result in better health outcomes (Cook et al., 2006; Lucas et al., 2006; Volkow & Montaner, 2011). Although the literature supports the notion that people living with comorbid HIV, substance abuse, and mental illness have poorer health outcomes, few programs exist to address their unique needs.

In an effort to address these needs and to improve universal HIV outcomes, considerable research continues to examine the efficacy of various strategies. It is well established within the literature that cultural beliefs and the reluctance of people living with HIV to discuss and/or disclose relevant topics (e.g., sexual issues, psychiatric struggles) for various reasons (e.g. stigma) pose major barriers to implementing effective programs that nurture HIV treatment adherence and continued engagement (Salam, 2014). To counter these obstacles, community-based interventions that address unique barriers and culturally sensitive practices have been shown to be an effective approach to community acceptance and engagement when they are incorporated at the inception of HIV programs (Salam, 2014). One way to bridge the gap between community and researchers is by implementing peer leadership (Brown et al., 2018).

The term "peer leadership" is broad and includes community empowerment, advocacy via training and/or support, participation in community-based research, participation in decision-making, and observation of the responses of peers or people experiencing similar conditions or issues (Brown et al., 2018). Within the context of community-based research, peer leaders are immersed in and advocate for community needs related to values, norms, belief systems, social practices, and cultural practices (Brown et al., 2018; Salam, 2014). Research supports the use of peer-led community-based research to enrich community acceptance and engagement, particularly in vulnerable communities (Kteily-Hawa et al., 2019; O'Brien et al., 2017). A growing body of literature suggests that engagement in HIV care improves when peer leaders are equal partners and are incorporated into the care continuum (Maman et al., 2016; Pearlman et al., 2002).

The integration of technology in the HIV care continuum is the subject of a growing body of literature that supports both community-centered and peer leadership approaches. Integration of technology in various forms has proven to assist in resource-constrained settings (Simoni et al., 2007). Of particular relevance to people living with HIV in the Deep South, technology has increased access to HIV care in areas that struggle with geographically dispersed clinics, shortages of HIV providers (e.g., physicians, psychiatrists, psychologists, and nurse practitioners), and HIV stigma (Ibitoye et al., 2021; Maloney et al., 2020; Simoni et al., 2007). Although there are many technological approaches, telemedicine is an innovative approach that offers timely access to care, cost savings, and high patient satisfaction (Brecht et al., 1996; Dinesen et al., 2016; Dobrusin et al., 2020; Grabowski & O'Malley, 2014; León et al., 2011; Norris, 2002; Patel & Young, 2014; Ramaswamy et al., 2020; Thaker et al., 2013; Young et al., 2014). *Telemedicine* is the use of medical information exchanged from one site to another via electronic communications to improve a patient's clinical health status (Grady et al., 2009). Telemedicine includes a growing variety of applications and services and may employ two-way video, smartphones, wireless tools, and other forms of telecommunication technology (Grady et al., 2009). Although few studies have used or evaluated telemedicine interventions among people living with HIV, two studies have shown promising outcomes in terms of increased ART adherence rates, decreased viral load, and improved CD4 cell count (León et al., 2011; Patel & Young, 2014).

Psychiatric counseling through telemedicine has also been shown to have positive effects—similar to the effects of in-person counseling—in populations across varying age groups (Fortney et al., 2013; Hilty et al. 2018). Cognitive behavioral therapy (CBT) and motivational interviewing (MI) are two in-person counseling interventions commonly used with people living with HIV who struggle with psychiatric disorders and substance abuse. Various studies support CBT and group CBT as effective in reducing anxiety, depression, and substance abuse and in increasing adherence among people living with HIV (Brandt et al., 2019; Safren et al., 2012; Tobin et al., 2017). Additionally, motivation-based interventions have a positive correlation with behavior changes that foster improved health outcomes for people living with HIV (Dillard et al., 2017; Parsons et al., 2007).

All in all, research indicates that a synergy of biopsychosocial and technological approaches that address culturally sensitive, structural, environmental, and individual barriers may be most promising for improving the HIV care continuum. Literature supports telemedicine, peer leader support, and mental health and substance abuse counseling as effective interventions to improve outcomes for people living with HIV, yet these interventions have not been examined as parts of a cohesive whole.

Study Purpose

The purpose of this paper is to describe the preliminary and baseline findings of a mixed-methods intervention study that was implemented with a CBPR approach. The intervention consisted of group counseling via telemedicine and peer support and aimed to improve mental health, substance abuse, and HIV-related outcomes, including HIV treatment adherence and retention, among people living with HIV in Alabama. This project was designed to address the National HIV/AIDS Strategy's Step 2.C: to increase access to care and improve health outcomes for people living with HIV by "[supporting] comprehensive, coordinated, patient-centered care for people living with HIV, including addressing HIV-related co-occurring conditions and challenges in meeting basic needs" (White House Office of National AIDS Policy, 2010, p. 21). Substance abuse and mental illness are major risk factors for HIV transmission and may challenge people living with HIV engagement in the HIV care continuum, which is critically needed to *retain* people living with HIV in the continuum of care and to decrease HIV viral load and transmission. Thus, interventions that better address coexisting HIV and/or AIDS and substance abuse and/or mental illness are needed, particularly in rural settings such as those in the Deep South.

Study Design and Procedures

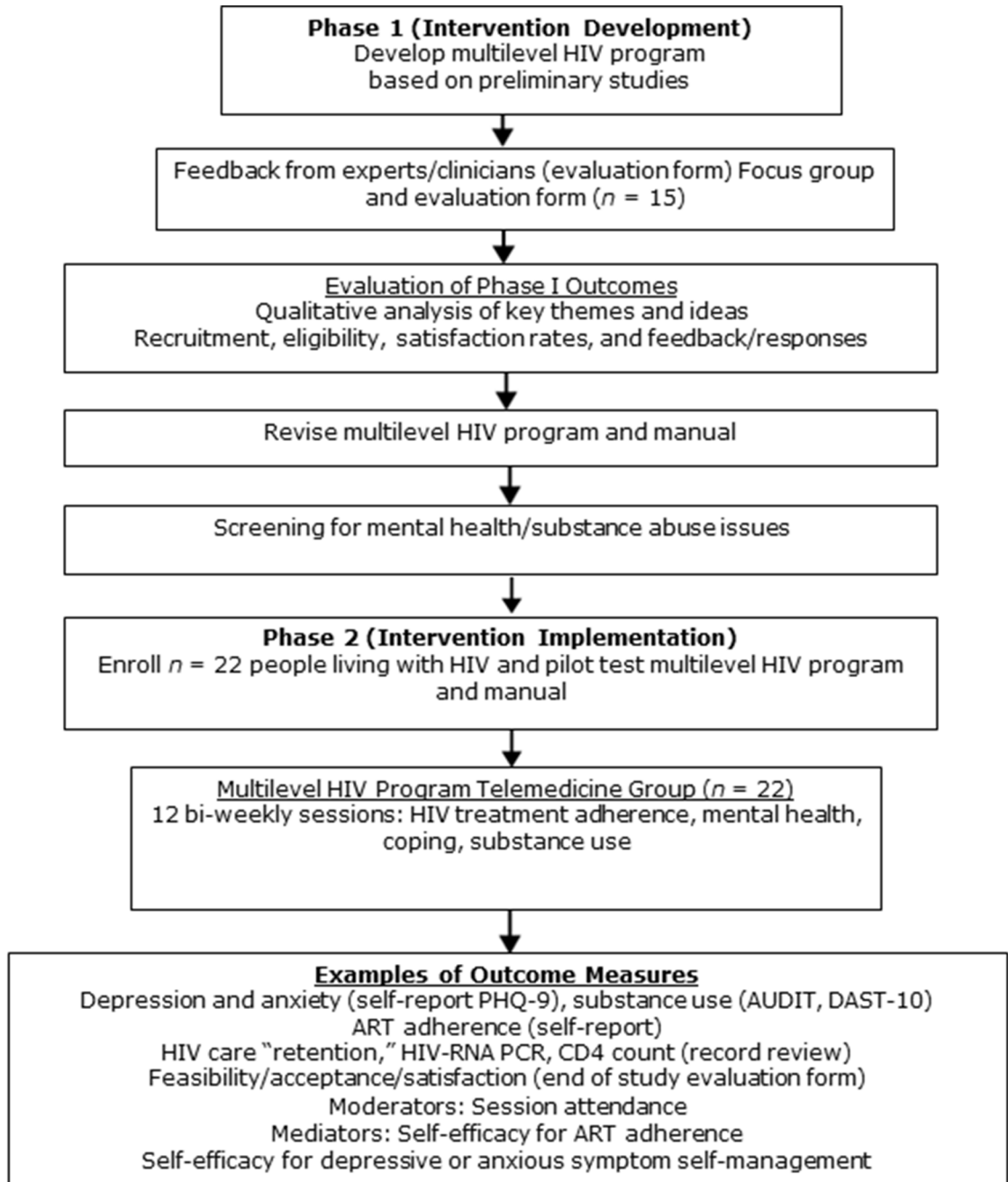
Design, Setting, Sample, and Recruitment

The study procedures were reviewed and approved by the institutional review board of the principal investigator's institution. The study was conducted at a local AIDS service organization (ASO) that provides clinical and social services for individuals living with HIV and/or AIDS. The ASO was located in a mostly rural county in Alabama and served clients in 10 Alabama counties. Nine of these counties are considered rural. The study recruited participants from Tuscaloosa County and the following Black Belt counties: Hale, Pickens, Greene, and Sumter.

The study was collaboratively designed and implemented—including the selection of inclusion criteria, study measures, program content and timing/schedule, recruitment plan, training plan, implementation plan, and evaluation plan—by three interdisciplinary researchers, including a doctorate-prepared executive director of an ASO, clients, and ASO staff.

A mixed-methods, longitudinal design and CBPR approach were utilized to implement the study. The target population included individuals who self-identified as having HIV and/or AIDS and who resided in the target counties. The study was implemented and data were collected in two phases over a 2-year period, as shown in Figure 2. Following is a brief description of the study phases.

Figure 2. Study Schema



Phase 1: HIV Peer Leadership and Counseling Intervention Protocol Development and Training

Development of the HIV Peer Leadership Protocol and Training of Peer Leaders. A literature review was conducted to examine existing peer leadership programs and interventions for comorbid HIV and substance abuse. Based on the literature review, we developed an HIV peer leader and advocacy training protocol based on a previous HIV peer leadership program (Simoni et al., 2007) and the modified version of the HIV peer advocacy leadership training (Simoni et al., 2007). Specifically, the protocol focused on treatment adherence, social needs such as housing and transportation, mental health and substance abuse support, and wellness advocacy. Additionally, it included elements of group cofacilitation and telemedicine. The protocol was developed by an interdisciplinary research team and community partners (i.e., our partner ASO staff and representatives of individuals living with HIV and/or AIDS).

After the development of the peer leadership program was complete, HIV peer leaders were recruited and trained. Peer leaders were recruited either through nomination by community ASO partners or via self-nomination. Eligibility criteria for peer leaders included (a) self-identifying as HIV-positive, (b) demonstrating leadership and advocacy skills within the people living with HIV community, and (c) having reliable transportation to at least one study site. A total of four peer leaders were selected. Two of these peer leaders also participated in the development of the peer leader protocol/training manual. All four peer leaders attended a half-day training session based on the HIV and peer leadership advocacy protocol developed. The training was led by one of the co-principal investigators. In addition to the peer leaders, other members of the research team, including the co-principal investigators, coinvestigators, research assistants, and a licensed counselor, attended the training.

Development of the Counseling Intervention Protocol and Training of Counselors. A comprehensive literature review was conducted to examine the availability of manual-based behavioral interventions for comorbid substance abuse and mental health issues (specifically anxiety and depressive symptoms) among individuals with HIV and/or AIDS. Based on information and recommendations from various organizations, the research team developed a manual-based treatment protocol, or treatment

manual, as a framework for use by licensed professional counselors in group therapy settings. The treatment manual was based on CBT and also used MI techniques and guidelines from the Substance Abuse and Mental Health Services Administration (SAMHSA), NIDA, and the American Telemedicine Association (Grady et al., 2011; NIDA, 2012; SAMHSA, 2000, 2013). An intervention manual was also developed based on this information. The treatment manual included 12 sessions that covered the following topics: (a) orientation to treatment/counseling; (b) interconnections between substance abuse, depression, and HIV and/or AIDS; (c) substance use motivation and consequences; (d) CBT and stages of change; (e) treatment stigma; (f) attitudes and beliefs; (g) values and values clarification; (h) relapse prevention; (i) HIV services to help relapse prevention; and (j) conclusion and next steps. After the manual was developed, three focus groups were conducted with a sample of individuals who self-identified as having an HIV diagnosis and who reported anxiety and/or depressive symptoms. The purpose of these focus groups was to receive feedback on content covered by the manual and to discern whether participants felt that the content covered issues that they and their peers faced. Participants were also invited to provide any additional comments. The manual was updated based on these focus group reviews, after which it was sent to experts in the field (including a substance abuse counselor, a nurse with experience working with individuals with disabilities, and a community partner) for review and feedback.

Preintervention Focus Groups. Focus group participants were recruited using flyers posted at a community-based ASO and an HIV clinic. Three focus groups were held with 15 total people living with HIV to assess their initial reactions to the proposed intervention. Subjects were screened in person or via telephone using a screening form, and they were asked to provide written informed consent. The eligibility criteria for focus group participation included: (a) HIV-positive status for at least 6 months, (b) age of 18–65 years, (c) an ability to speak English, (d) self-reported symptoms of depression or anxiety and/or substance abuse, and (e) a willingness to participate. Participants were compensated \$25 for their time. Each focus group lasted approximately 90–120 minutes and included a brief demonstration of a mock telemedicine counseling session.

A focus group guide was developed and used to interview focus group participants. Each focus group was facilitated by the principal investigator and the co-principal investigator. All focus groups were audio-recorded and transcribed. The first focus group conducted included peer leaders. In the course of the focus groups, participants and peer leaders were asked to rate the proposed intervention and to provide suggestions for improvement.

Phase 2: Intervention Implementation

Phase 2 entailed the implementation of the intervention. Activities in this phase included (a) recruitment, screening, and enrollment of participants; (b) implementation of the intervention; and (c) data collection.

Recruitment, Screening, and Enrollment.

Potential participants were recruited from a local ASO and an HIV clinic via recruitment flyers or were recruited or referred by ASO staff through their clinical and outreach programs. Potential participants who were interested in participating in the study were screened for eligibility. The eligibility criteria for intervention participation included: (a) self-identification as having HIV and/or AIDS; (b) self-reported symptoms of depression, anxiety and/or substance abuse or dependence; and (c) current use of ART. Eligible people living with HIV were asked to provide written informed consent. Participants received \$15 upon completion of each computerized assessment.

Implementation of the Intervention. Eligible and consenting participants then underwent 12 2-hour group sessions delivered once every 2 weeks. Each group session was co-led by an in-person peer leader and by a licensed professional counselor who called in via a videoconferencing platform. A peer leader and a study team member were present at each group session and connected the counselor to the session.

Before beginning the intervention with a new group/cohort, members of the study team visited each study site to test internet connectivity. Connectivity issues were only encountered at one site, which was located in one of the most rural areas of the study. To boost connectivity, the study team purchased a small, add-on satellite and paid for high-speed internet access at that site for the duration of all of the sessions.

Data Collection. Data were collected at three time intervals: preintervention (T1), postintervention (T2), and at a 3-month follow-up (T3). Specifically, data were first collected from

participants via a preintervention assessment (T1). After participants underwent the 10 group counseling sessions over a 6-month period, they then completed a postintervention assessment (T2) and another assessment at a 3-month follow-up point (T3). At each of these three collection points, participants completed a computerized assessment that included a sociodemographic questionnaire, the HIV Knowledge Questionnaire (HIV-KQ-18; Carey & Schroder, 2002), the Patient Health Questionnaire (PHQ-9; Kroenke et al., 2010; Spitzer et al., 1999) to assess mental health, the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993), the Drug Abuse Screening Test (DAST-10; Skinner, 1982), and two HIV medication adherence surveys—the AIDS Clinical Trials Group (ACTG) Adherence Survey and the Antiretroviral General Adherence Survey (AGAS; Holstad et al., 2010). A program evaluation survey was also offered at T2.

Data Analysis

Data analysis included descriptive statistics of demographics and mental health, substance use, HIV knowledge, and HIV medication adherence. Longitudinal study outcomes were examined using repeated measures analysis of variance (ANOVA) in SPSS version 24. Analysis of qualitative focus group data was conducted using NVivo version 11 (QSR International). Conventional content analysis methods were used to identify common themes and categories (Hsieh & Shannon, 2005).

Results

Phase 1

HIV Peer Leadership Training. All four peer leaders completed surveys after attending the training. All peer leaders were HIV-positive and identified as Black/African American. All reported that they liked that the session was interactive and engaging, and they said that they learned more about telemedicine and group facilitation skills. Respondents reported that some of the information about HIV statistics was overwhelming and that too much time was spent on those subjects. Most importantly, the respondents felt that the session prepared them to cofacilitate the counseling support groups. To improve the session, respondents suggested spending more time on telemedicine and making sure that peer advocates are involved at all levels of planning the training session, including seeking peer leader input on the final training manual and the cofacilitation sessions of the training.

Focus Groups. Fifteen total people living with HIV participated in the three focus groups, with each participant attending one focus group. One focus group was held in a rural county, and two focus groups were held in an urban county. All participants were HIV-positive and Black. More than a third of participants identified as gay, lesbian, or bisexual (40.0%, $n = 6$). The average age of focus group participants was 51 (± 9.5 years) and ages ranged from 25 to 62 years. A majority of the participants were on disability or unemployed (93.3%, $n = 14$). Eighty percent ($n = 12$) of the participants reported public support as their main source of income, had an annual income of less than \$20,000, and received health insurance through Medicare or Medicaid.

Qualitative Findings From Focus Groups. Three major categories emerged from the preintervention focus group data: mental health, substance abuse, and telemedicine. Common themes included (a) barriers to medication adherence, (b) benefits of peer leadership, (c) benefits of telemedicine, (d) benefits of group therapy, (e) protective and resilience factors (social support, health behaviors, religion/spirituality), (f) poly-stigma (of being Black, gay, HIV-positive, and living in the rural South), and (g) transportation as a barrier to HIV care. The most common mental health themes included depression and anxiety. The most common substance use themes included alcohol, marijuana, and nicotine, and most participants discussed substance abuse and mental issues as barriers to HIV treatment adherence. Some described continued adherence to ART despite substance abuse.

Several themes emerged related to telemedicine. The majority of people living with HIV were not familiar with telemedicine, and seeing a live demonstration improved their understanding of it. Participants believed that telemedicine could be a major benefit in rural settings, and they discussed the importance of privacy and data security as they relate to telemedicine.

Participants also felt that coed group therapy sessions would be most beneficial, and they expressed a preference for smaller groups. All participants were receptive to peer leaders as cofacilitators of group therapy. Many focus group participants identified transportation as a major barrier to HIV care. Participants residing in the rural county described a lack of public transportation and ride share services. They also reported having to sometimes pay relatives

and friends to drive them to their HIV clinic appointments, which were approximately 60 to 120 miles away.

Phase 2: Results of Participants Enrolled in the Intervention

Demographics of Participants. A total of 22 participants started Phase 2 of the study, out of which 15 (71.4%) completed counseling sessions. The participant demographics are detailed in Table 1. The mean age of the participants preintervention was 46.3 ($SD = 11.1$), and at the end of the intervention the mean age of the participants was 43.7 years ($SD = 11.8$). At preintervention, a majority of the participants identified as Black/African American (95.5%, $n = 21$). Over half reported their gender as male (68.2%, $n = 15$), and were unemployed (77.2%, $n = 17$). Half of the participants indicated that they had never been married (50.0%, $n = 11$), had a high school education or GED (50.0%, $n = 11$), and slightly less than half of the participants attended some college or had a college degree (40.9%, $n = 9$). Nearly one third identified their religion as Christian (31.8%, $n = 7$) and slightly less than half described their sexual orientation as heterosexual or straight (45.5%, $n = 10$).

While there were some differences in the demographic composition of the participants by the end of the intervention due to fallout, the demographic proportions did not change significantly. However, there were some notable changes. All participants who reported that they had never been married were retained from preintervention to postintervention, thus 73.3% ($n = 11$) of participants indicated that they had never been married postintervention compared to 50.0% ($n = 11$) at preintervention. A higher proportion of participants (46.7%, 7 of 15) identified as gay or lesbian postintervention compared to 45.5% (10 of 22) at preintervention, and a higher proportion of participants reported their religious affiliation as Christian postintervention (66.7%, $n = 14$) compared to preintervention (45.5%, $n = 10$).

Program Evaluation Results. None of the participants rated their overall impression of the program as poor. A majority of participants rated the program as good or excellent (72.7%, $n = 16$) and a few rated it as okay/fair (9.1%, $n = 2$). Similarly, the majority (77.3%, $n = 17$) of participants rated the program as having good (36.4%, $n = 8$) or excellent (40.9%, $n = 9$) acceptability. The majority of participants reported satisfaction with the group format (72.7%, $n = 16$),

Table 1. Characteristics of Intervention Participants

	Pre-Intervention (T1, N=22)		Post-Intervention (T2, N=15)	
	Frequency (n)	%	Frequency (n)	%
Gender				
Female	7	31.8	5	33.3
Male	15	68.2	10	66.7
Race/Ethnicity				
Black/African American	21	95.5	14	93.3
Other or mixed race	1	4.5	1	6.7
Marital Status				
Married	1	4.5	1	4.5
Separated/divorced	5	22.7	2	13.4
Widowed	2	9.1	-	
Never Married	11	50.0	11	73.3
Committed Relationship	2	9.1	1	9.1
Missing/Didn't respond	1	4.5	-	
Sexual Orientation				
Heterosexual/straight	10	45.5	6	40.0
Gay/Lesbian	10	45.5	7	46.7
Bisexual	1	4.5	2	13.3
Unsure/questioning	1	4.5	-	
Highest Education Level				
Junior High or Middle School	2	9.1	1	6.7
High School or GED	11	50.0	7	46.7
College degree	7	31.8	6	39.9
Some college (no degree)	2	9.1	1	6.7
Religious Affiliation				
Christian	10	45.5	14	66.7
Other	1	4.8		
Missing/Didn't Respond	10	45.5	1	33.3
Current Employment Status				
Employed	4	18.2	3	20.0
Unemployed	17	77.2	12	80.0
Other	1	4.5	-	
Main Source of Income				
Family	3	13.6	-	
Public support (i.e. SSI, SSDI, TANF)	16	72.7	-	
Other sources	3	13.6	-	

Table 2. HIV Knowledge, Drug Abuse, Alcohol Use, and Depressive Symptoms

	Mean (SD)	Range (Min–Max)	N	%
HIV knowledge	15.1 (2.3)	10 (8–18)	22	
Drug use (DAST-10)	0.50 (0.91)	3 (0–3)	22	
None (score 0)			15	68.2
Low (scores 1 to 2)			5	22.7
Moderate to high (scores 3 to 6)			2	9.1
Alcohol use (AUDIT)	3.9 (5.9)	21 (0–21)	22	
Low risk (scores 0 to 7)			16	72.7
Risky (scores 8 to 21)			6	27.3
Depressive symptoms (PHQ-9)*	8.5 (6.5)	22 (1–23)	16	
Minimal (scores 1 to 4)			5	31.1
Mild (score 5 to 9)			6	37.8
Moderate to high (scores 10 to 23)			5	31.1

* PHQ-9 data was missing for 6 participants

the biweekly frequency of sessions (63.6%, $n = 14$), the 90-minute length of the sessions (72.7%, $n = 16$), the number of sessions (12; 63.6%, $n = 14$), and the facilitators (72.7%, $n = 16$). One participant provided narrative feedback that they would have liked more sessions.

Participants' HIV Knowledge and Alcohol and Drug Use. Descriptive characteristics of participants' HIV knowledge, drug abuse, alcohol use, and depressive symptoms are presented in Table 2. Participants' preintervention, postintervention, and 3-month follow-up scores for mean HIV knowledge, alcohol use, and drug use are presented in Table 3. Overall, participants reported a relatively high degree of HIV knowledge, as assessed by the 18-item HIV knowledge questionnaire at T1 ($M = 14.8$, $SD = 2.4$), T2 ($M = 14.4$, $SD = 2.2$), and T3 ($M = 15.8$, $SD = 2.5$). At baseline, most participants answered at least 75% of questions correctly ($n = 18$, 81.8%), and many answered around 95% or higher correctly ($n = 9$, 41%).

The AUDIT and DAST-10 assessment instruments were utilized to assess drug use. Results of the AUDIT showed that nearly half (47.7%) of the respondents reported no alcohol use at T1, and 26.7% and 37.5% reported no alcohol use

at T2 and T3, respectively. Results of the DAST-10 showed that over half (57.1%) reported having not used any mind-altering drugs at T1, and 46.7% and 50.0% reported drug use at T2 and T3, respectively.

Participants' Depressive Symptoms. Depressive symptomology was assessed using the PHQ-9. At T1, 23.9% of the participants reported moderate to severe symptoms of depression. The proportion of participants reporting moderate to severe depression symptoms was 33.4% and 37.5% at T2 and T3, respectively.

Differences Across Time Points. Eight participants provided data at all three points. A one-way repeated measures ANOVA was conducted to evaluate whether there were any significant differences across the various time points. Results showed that there was no significant time effect in any of the four measures (see Table 4), although the mean differences trended in the expected directions and some approached significance. For example, the following results were found in HIV knowledge: Wilks' Lambda = 0.50, $F(2, 6) = 2.95$, $p = 0.13$, $\eta^2 = 0.50$. Thus, there was no significant evidence to reject the null hypothesis indicated by the different participant knowledge scores as measured at T1, T2, and T3. Although

Table 3. Participant Descriptives Preintervention, Post Intervention, and at 3-Month Follow-Up

	T1		T2		T3	
Number of participants						
Valid (i.e., with data)	21		15		8	
Missing	1		7		14	
HIV knowledge						
Mean	14.8		14.4		15.8	
Median	14.5		15.0		16.0	
Standard deviation	2.4		2.2		1.0	
Range	10		7		2.5	
Minimum	8		11		14.5	
Maximum	18		18		17	
	T1		T2		T3	
	<i>N</i> = 21	%	<i>N</i> = 15	%	<i>N</i> = 8	%
Alcohol use (AUDIT)						
No problem	10	47.6	4	26.7	3	37.5
Low (0–7)	7	33.5	8	53.4	-	-
Risky (8–15)	3	14.4	1	6.7	3	37.5
High risk (16+)	1	4.8	2	13.3	2	25
Drug use (DAST-10)						
No Problem (0)	12	57.1	7	46.7	4	50.0
Low (1–2)	5	23.8	5	33.3	3	37.5
Moderate (3–5)	4	19.1	1	6.7	1	12.5
High (6+)	-	-	2	13.4	-	-
Depression (PHQ-9)						
None (0)	5	23.8	2	13.3	1	12.5
Minimal (1–4)	5	23.8	5	33.3	1	12.5
Mild (5–9)	6	28.6	3	20.0	3	37.5
Moderate (10–14)	3	14.3	4	26.7	1	12.5
Severe (15+)	2	9.6	1	6.7	2	25.0

not statistically significant, these results show: (a) improvement in average HIV knowledge scores from baseline to 3-months post-intervention (but a reduction HIV knowledge immediately post-intervention); (b) a reduction of average depressive symptoms scores from baseline to immediate post-intervention and 3-months post-intervention; (c) a

reduction of average alcohol use from baseline to immediate post-intervention and 3-months post-intervention; and (d) a reduction of average drug use from baseline to 3-months post-intervention (with a slight increase instead of a decrease immediately post-intervention).

Table 4. Wilks' Lambda Across Three Time Intervals for HIV Knowledge, Depression, Alcohol and Drug Use

Effect: Wilks' Lambda		
	Mean	SD
HIV knowledge		
T1	15.75	1.85
T2	14.44	2.15
T3	15.81	0.96
Depression (PHQ-9)		
T1	10.13	7.49
T2	6.25	6.90
T3	8.88	6.94
Alcohol use (AUDIT)		
T1	7.38	7.67
T2	5.00	6.95
T3	5.25	4.37
Drug use (DAST-10)		
T1	1.38	1.69
T2	1.75	2.87
T3	1.00	1.20

Note. N = 8; SD = standard deviation.

Discussion

This study used a CBPR approach to develop and evaluate the feasibility of a group counseling intervention designed for people living with HIV with depression or anxiety and/or substance use issues. The intervention in question used telemedicine, licensed counselors, peer leaders, and CBT and MI techniques. Study results demonstrated that the intervention was feasible and acceptable to this sample of participants. Longitudinal data and more in-depth qualitative analysis will be presented in separate papers.

HIV Peer Leadership

The purpose of HIV peer leaders within our study was to bridge the gap between participants and researchers during telemedicine support groups. The HIV peer leaders selected for our study were HIV-positive, adhered to their own HIV treatment, demonstrated culturally competent leadership within the community of people living with HIV, and identified as Black/African American. Their role within this study was twofold: (a) to cofacilitate telemedicine counseling sessions through role modeling, educating, and mentoring and (b) to provide feedback on telemedicine sessions. Overall, feedback was positive. Peer leaders suggested that they could be incorporated earlier into the planning process for future sessions to ensure that participants did not get overwhelmed or bored by subjects that may not be of interest to them. This feedback is relevant and in sync with community-based research; empowering peer leaders to contribute their culturally competent expertise provides crucial information to the research team and ensures that community HIV participants stay engaged, and keeping participants engaged is essential for long-term retention. As such, future peer leadership involvement in telemedicine may contribute to successful HIV engagement and retention in care.

Preintervention Focus Groups

The purpose of this study's preintervention focus groups was twofold: (a) to assess initial reactions to a mock telemedicine counseling session that modeled the proposed intervention and (b) to acquire feedback for improvement to the proposed telemedicine intervention. Overall, participants' feedback was that the telemedicine program was feasible and acceptable. Major categories that emerged from the three preintervention focus groups (mental health, substance use, and telemedicine) encompassed seven emergent

psychosocial themes related to barriers to HIV care and benefits of services, all of which are common within HIV literature. Supported by literature, the resultant themes indicated that a biopsychosocial approach, as opposed to a traditional biomedical approach, may better foster engagement and retention in HIV care (Beattie et al., 2019; Felker-Kantor et al., 2019; Kalichman et al., 2017). A biopsychosocial approach addresses biological (e.g., medication, viral load, CD4 count), psychological (e.g., depression, anxiety), and societal (e.g., transportation, stigma) factors. Although literature supports addressing the HIV continuum of care through a biopsychosocial lens, barriers to HIV care remain complex. Fortunately, emergent themes from the focus groups suggested that the introduction of telemedicine may have positive impacts on HIV care for people living with HIV in the rural South. Based on feedback from peer leaders and focus group participants, the telemedicine counseling sessions were updated to include pertinent, culturally specific content that addressed mental health and substance use.

Group Counseling Intervention

Results of the current study indicated that changes in alcohol and substance use across the three time intervals (i.e., preintervention [T1], postintervention [T2], and at a 3-month follow-up point [T3]) were not statistically significant (See Table 3), but they trended in the intended directions.

Overall results showed improvement in mean scores representing HIV knowledge from baseline to 3-months post-intervention, a reduction of depressive symptoms from baseline to immediately post-intervention and 3-months post-intervention, a reduction of alcohol use from baseline to immediate post-intervention and 3-months post-intervention, and a reduction of drug use from baseline to 3-months post-intervention. While differences can be seen in proportions when the variables are divided into various categories, the small numbers that were retained across the three intervals made it hard to reach viable conclusions about the significance of changes (T1, $n = 21$; T2, $n = 15$, T3, $n = 8$). Similar conclusions apply to a review of depressive symptoms. These results are inconsistent with qualitative findings from the preintervention focus groups and counter a rich body of literature that independently and cohesively supports the potential benefits of social services delivered alongside HIV care (Dombrowski et

al., 2018; Giordano et al., 2018; Halkitis et al., 2005; Kalichman et al., 2017). The results of this study highlight the difficulties associated with engagement and retention of participants, especially those from disadvantaged backgrounds who may be dealing with a myriad of other issues.

Vital to an accessible, sustainable, and retainable HIV continuum of care are reformed systems that view health equity through a biopsychosocial lens, particularly for those living in the rural South. In addition to involving peer leaders as a part of the research team, another way to improve participant engagement and retention is by leveraging communication and technology through telemedicine. Utilizing a community-based approach to communication among and between people living with HIV and researchers will empower people living with HIV to give voice and meaning to the struggles of HIV care. One way to incorporate such meaning into accessible and sustainable interventions is through telemedicine. Telemedicine has the potential to provide access to treatment to larger volumes of people living with HIV in rural areas, particularly in the Deep South. In this study, telemedicine overcame transportation and geographic barriers by providing access to group counseling without participants having to travel long distances. Telemedicine also addressed barriers related to stigma, since participants reported feeling comfortable participating in a virtual group session.

Conclusion

The results of this study add new knowledge to the fields of HIV, substance abuse, and mental health research. They also provide preliminary evidence that can help strengthen strategies to empower people living with HIV with the skills they need to promote engagement in the continuum of mental health, substance abuse, and HIV care. Sustained engagement promotes retention, which in turn allows people living with HIV to get and maintain negligible HIV viral loads. In order to get the HIV epidemic to zero, engagement and retention must be optimized.

First, this study fills gaps in the literature to better understand HIV, substance use, and mental health comorbidities, and it offers guidance on how to improve interventions for this unique population of people living with HIV in the rural Deep South. Second, this study may serve as a model for how best to engage people living with HIV, ASOs, academic researchers, and practitioners in equitable CBPR. It also models

the role of people living with HIV as cofacilitators during group counseling sessions. Additionally, including input from peer leaders and community partners helped to bridge the gap between researchers and participants and was critical during facilitation, in planning the intervention, and in training team members. Lastly, this study provides an impetus for future collaborative studies that seek to foster authentic healing relationships through innovative approaches.

References

- Alabama Department of Public Health. (2019). *HIV/AIDS statistics quarterly report: 2019 - Volume 3 (January–September)*. https://www.alabamapublichealth.gov/hiv/assets/hiv_report_3rd_qtr_2019.pdf
- Albritton, T., Martinez, I., Gibson, C., Angley, M., & Grandelski, V.R. (2017). What about us? Economic and policy changes affecting rural HIV/AIDS services and care. *Social Work in Public Health, 32*(4), 273–289. <https://doi.org/10.1080/19371918.2017.1282388>
- Avants, S.K., Warburton, L.A., Hawkins, K.A., & Margolin, A. (2000). Continuation of high-risk behavior by HIV-positive drug users: Treatment implications. *Journal of Substance Abuse Treatment, 19*(1), 15–22. [https://doi.org/10.1016/S0740-5472\(99\)00092-6](https://doi.org/10.1016/S0740-5472(99)00092-6)
- Bangsberg, D.R., Perry, S., Charlebois, E.D., Clark, R.A., Roberston, M., Zolopa, A.R., & Moss, A. (2001). Non-adherence to highly active antiretroviral therapy predicts progression to AIDS. *AIDS, 15*(9), 1181–1183.
- Beattie, C.M., Wiewel, E.W., Zhong, Y., Brown, P.A., Braunstein, S.L., Farquhar, X.P., & Rojas, J. (2019). Multilevel factors associated with a lack of viral suppression among persons living with HIV in a federally funded housing program. *AIDS and Behavior, 23*, 784–791. <https://doi.org/10.1007/s10461-019-02399-7>
- Beck, J.S., & Reilly, C. (2006). Nurses integrate cognitive therapy treatment into primary care: Description of clinical application of a pilot program. *Topics in Advanced Practice Nursing, 6*(3).
- Bradley, H., Hall, H.I., Wolitski, R.J., Van Handel, M.M., Stone, A.E., LaFlam, M., Skarbinski, J., Higa, D.H., Prejean, J., Frazier, E.L., Patel, R., Huang, P., An, Q., Song, R., Tang, T., & Valleroy, L.A. (2014). Vital signs: HIV diagnosis, care, and treatment among persons living with HIV—United States, 2011. *Morbidity and Mortality Weekly Report, 63*(47), 1113–1117. <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6347a5.htm>

- Brandt, C.P., Paulus, D.J., Lopez-Gamundi, P., Green, C., Lemaire, C. & Zvolensky, M. (2019). HIV anxiety reduction/management program (HAMRT): Pilot randomized controlled trial. *AIDS Care*, 31(12), 1527–1532. <https://doi.org/10.1080/09540121.2019.1597962>
- Braxton, N.D., Lang, D.L., Sales, J.M., Wingood, G.M., & DiClemente, R.J. (2007). The role of spirituality in sustaining the psychological well-being of HIV-positive Black women. *Women Health*, 46(2–3), 113–129. https://doi.org/10.1300/J013v46n02_08
- Brecht, R.M., Gray, C.L., Peterson, C., & Youngblood, B. (1996). The University of Texas Medical Branch—Texas Department of Criminal Justice telemedicine project: Findings from the first year of operation. *Telemedicine Journal*, 2(1), 25–35. <https://doi.org/10.1089/tmj.1.1996.2.25>
- Brown, G., Reeders, D., Cogle, A., Madden, A., Kim, J., & O'Donnell, D. (2018). A systems thinking approach to understanding and demonstrating the role of peer-led programs and leadership in the response to HIV and hepatitis C: Findings from the W3 project. *Frontiers in Public Health*, 6, Article 231 <https://doi.org/10.3389/fpubh.2018.00231>
- Burnam, M.A., Bing, E.G., Morton, S.C., Sherbourne, C., Fleishman, J.A., London, A.S., Vitiello, B., Stein, M., Bozzette, S.A., & Shapiro, M.F. (2001). Use of mental health and substance abuse treatment services among adults with HIV in the United States. *Archives of General Psychiatry*, 58(8), 729–736. <https://doi.org/10.1001/archpsyc.58.8.729>
- Carey, M.P., & Schroder, K.E.E. (2002). Development and psychometric evaluation of the brief HIV Knowledge Questionnaire. *AIDS Education and Prevention*, 14(2), 172–182. <https://doi.org/10.1521/aeap.14.2.172.23902>
- Centers for Disease Control and Prevention. (2014, November). *CDC fact sheet: HIV in the United States: The stages of care*. U.S. Department of Health and Human Services. <http://www.cdc.gov/nchhstp/newsroom/docs/HIV-Stages-of-Care-Factsheet-508.pdf>
- Centers for Disease Control and Prevention. (2019, July). *Selected national HIV prevention and care outcomes in the United States*. U.S. Department of Health and Human Services. <https://www.cdc.gov/hiv/pdf/library/factsheets/cdc-hiv-national-hiv-care-outcomes.pdf>
- Centers for Disease Control and Prevention. (2020, May). *Diagnoses of HIV infection in the United States and dependent areas, 2018 (Updated)* (HIV Surveillance Report, Vol. 31). U.S. Department of Health and Human Services. <https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-report-2018-updated-vol-31.pdf>
- Centers for Disease Control and Prevention. (2021, September). *HIV and African American people*. U.S. Department of Health and Human Services. <https://www.cdc.gov/hiv/group/raciaethnic/africanamericans/index.html>
- Conviser, R., & Pounds, M.B. (2002). The role of ancillary services in client-centred systems of care. *AIDS Care*, 14(1), 119–131. <https://doi.org/10.1080/09540120220150018>
- Cook, J.A., Grey, D., Burke, J., Cohen, M.H., Gurtman, A.C., Richardson, J.L., Wilson, T.E., Young, M.A., & Hessol, N.A. (2004). Depressive symptoms and AIDS-related mortality among a multisite cohort of HIV-positive women. *American Journal of Public Health*, 94(7), 1133–1140. <https://doi.org/10.2105/AJPH.94.7.1133>
- Cook, J.A., Grey, D., Burke-Miller, J., Cohen, M.H., Anastos, K., Gandhi, M., Richardson, J., Wilson, T., & Young, M. (2006). Effects of treated and untreated depressive symptoms on highly active antiretroviral therapy use in a US multi-site cohort of HIV-positive women. *AIDS Care*, 18(2), 93–100. <https://doi.org/10.1080/09540120500159284>
- Dalmida, S.G., Holstad, M.M., Diiorio, C., & Laderman, G. (2009). Spiritual well-being, depressive symptoms, and immune status among women living with HIV/AIDS. *Women and Health*, 49(2–3), 119–143. <https://doi.org/10.1080/03630240902915036>
- Dalmida, S.G., Holstad, M.M., Dilorio, C., & Laderman, G. (2011). Spiritual well-being and health-related quality of life among African-American women with HIV/AIDS. *Applied Research in Quality of Life*, 6(2), 139–157. <https://doi.org/10.1007/s11482-010-9122-6>
- Dausey, D.J., & Desai, R.A. (2003). Psychiatric comorbidity and the prevalence of HIV infection in a sample of patients in treatment for substance abuse. *The Journal of Nervous and Mental Disease*, 191(1), 10–17.
- Dillard, P.K., Zuniga, J.A., & Holstad, M.M. (2017). An integrative review of the efficacy of motivational interviewing in HIV management. *Patient Education and Counseling*, 100(4), 636–646. <https://doi.org/10.1016/j.pec.2016.10.029>

- Disney, E., Kidorf, M., Kolodner, K., King, V., Peirce, J., Beilenson, P., & Brooner, R.K. (2006). Psychiatric comorbidity is associated with drug use and HIV risk in syringe exchange participants. *The Journal of Nervous and Mental Disease*, 194(8), 577–583. <https://doi.org/10.1097/01.nmd.0000230396.17230.28>
- Dinesen, B., Nonnecke, B., Lindeman, D., Toft, E., Kidholm, K., Jethwani, K., ... & Nesbitt, T. (2016). Personalized telehealth in the future: A global research agenda. *Journal of Medical Internet Research*, 18(3), e5257. <https://doi.org/10.2196/jmir.5257>
- Dobrusin, A., Hawa, F., Gladshteyn, M., Corsello, P., Harlen, K., Walsh, C.X., Alaparthi, L., Weinstein, M., Baig, N., Sousa, A. & Gunaratnam, N.T. (2020). Gastroenterologists and patients report high satisfaction rates with telehealth services during the novel coronavirus 2019 pandemic. *Clinical Gastroenterology and Hepatology*, 18(11), 2393–2397. <https://doi.org/10.1016/j.cgh.2020.07.014>
- Dombrowski, J.C., Ramchandani, M., Dhanireddy, S., Harrington, R.D., Moore, A., & Golden, M.R. (2018). The Max Clinic: Medical care designed to engage the hardest-to-reach persons living with HIV in Seattle and King County, Washington. *AIDS Patient Care and STDs*, 32(4), 149–156. <https://doi.org/10.1089/apc.2017.0313>
- Eaton, J.W., Johnson, L.F., Salomon, J.A., Bärnighausen, T., Bendavid, E., Bershteyn, A., Bloom, D.E., Cambiano, V., Fraser, C., Hontelez, J.A.C., Humair, S., Klein, D.J., Long, E.F., & Hallett, T.B. (2012). HIV treatment as prevention: Systematic comparison of mathematical models of the potential impact of antiretroviral therapy on HIV incidence in South Africa. *PLoS Medicine*, 9(7), Article e1001245. <https://doi.org/10.1371/journal.pmed.1001245>
- Eller, L.S., Bunch, E.H., Wantland, D.J., Portillo, C.J., Reynolds, N.R., Nokes, K.M., Coleman, C.L., Kempainen, J.K., Kirksey, K.M., Corless, I.B., Hamilton, M.J., Dole, P.J., Nicholas, P.K., Holzemer, W.L., & Tsai, Y.-F. (2010). Prevalence, correlates, and self-management of HIV-related depressive symptoms. *AIDS Care*, 22(9), 1159–1170. <https://doi.org/10.1080/09540121.2010.498860>
- Fairfield, K.M., Libman, H., Davis, R.B., Eisenberg, D.M., & Phillips, R.S. (1999). Delays in protease inhibitor use in clinical practice. *Journal of General Internal Medicine*, 14(7), 395–401. <https://doi.org/10.1046/j.1525-1497.1999.08198.x>
- Felker-Kantor, E.A., Wallace, M.E., Madkour, A.S., Duncan, D.T., Andrinopoulous, K., & Theall, K. (2019). HIV stigma, mental health, and alcohol use disorders among people living with HIV/AIDS in New Orleans. *Journal of Urban Health*, 96, 878–888. <https://doi.org/10.1007/s1152-019-00390-0>
- Fortney, J.C., Pyne, J.M., Mouden, S.B., Mittal, D., Hudson, T.J., Schroeder, G.W., Williams, D.K., Bynum, C.A., Mattox, R., & Rost, K.M. (2013). Practice-based versus telemedicine-based collaborative care for depression in rural federally qualified health centers: A pragmatic randomized comparative effectiveness trial. *American Journal of Psychiatry*, 170(4), 414–425. <https://doi.org/10.1176/appi.ajp.2012.12050696>
- Freeman, S.M. (2006). Cognitive behavioral therapy in advanced practice nursing: An overview. *Topics in Advanced Practice*, 6(3).
- Gardner, E.M., Sharma, S., Peng, G., Hullsiek, K.H., Burman, W.J., MacArthur, R.D., Chesney, M., Telzak, E.E., Friedland, G., & Mannheimer, S.B. (2008). Differential adherence to combination antiretroviral therapy is associated with virological failure with resistance. *AIDS*, 22(1), 75–82. <https://doi.org/10.1097/QAD.0b013e3282f366ff>
- Giordano, T.P., Gallagher, K., Davich, J.A.W., Rathore, M., Borne, D., Davies, E., Altics, F.L., & Cabral, H. (2018). The impact of housing and HIV treatment on health-related quality of life among people with HIV experiencing homelessness or unstable housing. *American Journal of Public Health*, 108(S7), S531–S538. <https://doi.org/10.2105/AJPH.2018.304731>
- Giordano, T.P., Gifford, A.L., White, A.C., Jr., Suarez-Almazor, M.E., Rabeneck, L., Hartman, C., Backus, L.I., Mole, L.A., & Morgan, R.O. (2007). Retention in care: A challenge to survival with HIV infection. *Clinical Infectious Diseases*, 44(11), 1493–1499. <https://doi.org/10.1086/516778>
- Gonzalez, J.S., Batchelder, A.W., Psaros, C., & Safren, S.A. (2011). Depression and HIV/AIDS treatment nonadherence: A review and meta-analysis. *Journal of Acquired Immune Deficiency Syndrome*, 58(2), 181–187. <https://doi.org/10.1097/QAI.0b013e31822d490a>
- Gonzalez, J.S., Psaros, C., Batchelder, A., Applebaum, A., Newville, H., & Safren, S.A. (2011). Clinician-assessed depression and HAART adherence in HIV-infected individuals in methadone maintenance treatment. *Annals of Behavioral Medicine*, 42(1), 120–126. <https://doi.org/10.1007/s12160-011-9268-y>

- Grabowski, D.C., & O'Malley, A.J. (2014). Use of telemedicine can reduce hospitalizations of nursing home residents and generate savings for medicare. *Health Affairs*, 33(2), 244–250. <https://doi.org/10.1377/hlthaff.2013.0922>
- Grady, B., Myers, K.M., Nelson, E.-L., Belz, N., Bennett, L., Carnahan, L., Decker, V.B., Holden, D., Perry, G., Rosenthal, L., Rowe, N., Spaulding, R., Turvey, C.L., White, R., & Voyles, D. (20011). Evidence-based practice for telemental health. *Telemedicine and e-Health*, 17(2), 131–148. <https://doi.org/10.1089/tmj.2010.0158>
- Grau, L.E., Griffiths-Kundishora, A., Heimer, R., Hutcheson, M., Nunn, A., Towey, C., & Stopka, T.J. (2017). Barriers and facilitators of the HIV care continuum in southern New England for people with drug or alcohol use and living with HIV/AIDS: Perspectives of HIV surveillance experts and service providers. *Addiction Science and Clinical Practice*, 12, Article 24. <https://doi.org/10.1186/s13722-017-0088-7>
- Halkitis, P.N., Kutnick, A.H., & Slater, S. (2005). The social realities of adherence to protease inhibitor regimens: Substance use, health care and psychological states. *Journal of Health Psychology*, 10(4), 545–558. <https://doi.org/10.1177/1359105305053422>
- Hall, H.I., Gray, K.M., Tang, T., Li, J., Shouse, L., & Mermin, J. (2012). Retention in care of adults and adolescents living with HIV in 13 U.S. areas. *Journal of Acquired Immune Deficiency Syndrome*, 60(1), 77–82. <https://doi.org/10.1097/QAI.0b013e318249fe90>
- Harding, R., Lampe, F.C., Norwood, S., Date, H.L., Clucas, C., Fisher, M., Johnson, M., Edwards, S., Anderson, J., & Sherr, L. (2010). Symptoms are highly prevalent among HIV outpatients and associated with poor adherence and unprotected sexual intercourse. *Sexually Transmitted Infections*, 86(7), 520–524. <https://doi.org/10.1136/sti.2009.038505>
- Heywood, W., & Lyons, A. (2016). HIV and elevated mental health problems: Diagnostic, treatment, and risk patterns for symptoms of depression, anxiety, and stress in a national community-based cohort of gay men living with HIV. *AIDS and Behavior*, 20, 1632–1645. <https://doi.org/10.1007/s10461-016-1324-y>
- Hilty, D.M., Sunderji, N., Suo, S., Chan, S. & McCarron, R.M. (2018). Telepsychiatry and other technologies for integrated care: Evidence base, best practice models and competencies, *International Review of Psychiatry*, 30(6), 292–309, <https://doi.org/10.1080/09540261.2019.1571483>
- Hsieh, H.-F., & Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288. <https://doi.org/10.1177/1049732305276687>
- Holstad, M.M., Foster, V., Dilorio, C., McCarty, F., & Teplinskiy, I. (2010). An examination of the psychometric properties of the Antiretroviral General Adherence Scale (AGAS) in two samples of HIV-infected individuals. *Journal of the Association of Nurses in AIDS Care*, 21(2), 162–172. <https://doi.org/10.1016/j.jana.2009.08.002>
- Horstmann, E., Brown, J., Islam, F., Buck, J., & Agins, B.D. (2010). Retaining HIV-infected patients in care: Where are we? Where do we go from here? *Clinical Infectious Diseases*, 50(5), 752–761. <https://doi.org/10.1086/649933>
- Ibitoye, M., Lappen, H., Freeman, R., Jordan, A., & Aronson, I.D. (2021). Technology-based interventions to increase point-of-care HIV testing and linkage to care among youth in the US: A systematic review. *AIDS and Behavior*, 25, 1829–1838. <https://doi.org/10.1007/s10461-020-03112-9>
- Ickovics, J.R., Hamburger, M.E., Vlahov, D., Schoenbaum, E.E., Schuman, P., Boland, R.J., & Moore, J. (2001). Mortality, CD4 cell count decline, and depressive symptoms among HIV-seropositive women: Longitudinal analysis from the HIV Epidemiology Research Study. *Journal of the American Medical Association*, 285(11), 1466–1474. <https://doi.org/10.1001/jama.285.11.1466>
- Ironson, G., O'Cleirigh, C., Fletcher, M.A., Laurenceau, J.P., Balbin, E.G., Klimas, N.G., Schneiderman, N., & Solomon, G.F. (2005). Psychosocial factors predict CD4 and viral load change in men and women with human immunodeficiency virus in the era of highly active antiretroviral treatment. *Psychosomatic Medicine*, 67(6), 1013–1021. <https://doi.org/10.1097/01.psy.0000188569.58998.c8>
- Irvine, M.K., Chamberlin, S.A., Robbins, R. S., Kulkarni, S.G., Robertson, M.M., & Nash, D. (2017). Come as you are: Improving care engagement and viral load suppression among HIV care coordination clients with lower mental health functioning, unstable housing, and hard drug use. *AIDS and Behavior*, 21(6), 1572–1579. <https://doi.org/10.1007/s10461-016-1460-4>
- Kalichman, S.C., Kalichman, M.O., & Cherry, C. (2017). Forget about forgetting: Structural barriers and severe non-adherence to antiretroviral therapy. *AIDS Care*, 29(4), 418–422. <https://doi.org/10.1080/09540121.2016.1220478>

- Kalichman, S.C., Kalichman, M.O., Cherry, C., Swetzes, C., Amaral, C.M., White, D., Jones, M., Grebler, T., & Eaton, L. (2011). Brief behavioral self-regulation counseling for HIV treatment adherence delivered by cell phone: An initial test of concept trial. *AIDS Patient Care and STDs*, 25(5), <https://doi.org/10.1089/apc.2010.0367>
- Kral, A.H., Lambdin, B.H., Comfort, M., Powers, C., Cheng, H., Lopez, A.M., Murdoch, R.O., Neilands, T.B., & Lorvick, J. (2018). A strengths-based case management intervention to reduce HIV viral load among people who use drugs. *AIDS and Behavior*, 22(1), 146–153. <https://doi.org/10.1007/s10461-017-1903-6>
- Kroenke, K., Spitzer, R.L., Williams, J.B.W., & Löwe, B. (2010). The Patient Health Questionnaire somatic, anxiety, and depressive symptom scales: A systematic review. *General Hospital Psychiatry*, 32(4), 345–359. <https://doi.org/10.1016/j.genhosppsych.2010.03.006>
- Kteily-Hawa, R., Hari, S., Pui-Hing Wong, J., Chikermane, V., & Chambers, L.A. (2019). Development and implementation of peer leader training for community-based participatory sexual health research. *Progress in Community Health Partnerships*, 13(3), 303–319. <https://doi.org/10.1353/cpr.2019.0058>
- Leserman, J. (2003). HIV disease progression: Depression, stress, and possible mechanisms. *Biological Psychiatry*, 54(3), 295–306. [https://doi.org/10.1016/S0006-3223\(03\)00323-8](https://doi.org/10.1016/S0006-3223(03)00323-8)
- Leserman, J., Petitto, J., Gu, H., Gaynes, B.N., Barroso, J., Golden, R.N., Perkins, D.O., Folds, J.D., & Evans, D.L. (2002). Progression to AIDS, a clinical AIDS condition and mortality: Psychosocial and physiological predictors. *Psychological Medicine*, 32(6), 1059–1073. <https://doi.org/10.1017/S0033291702005949>
- León, A., Cáceres, C., Fernández, E., Chausa, P., Martin, M., Codina, C., Rousaud, A., Blanch, J., Mallolas, J., Martinez, E., Blanco, J.L., Laguno, M., Larrousse, M., Milinkovic, A., Zamora, L., Canal, N., Miró, J.M., Gatell, J.M., Gómez, E.J., & García, F. (2011). A new multidisciplinary home care telemedicine system to monitor stable chronic human immunodeficiency virus-infected patients: A randomized study. *PloS ONE*, 6(1), Article e14515. <https://doi.org/10.1371/journal.pone.0014515>
- Linton, S.L., Cooper, H.L.F., Kelley, M.E., Karnes, C.C., Ross, Z., Wolfe, M.E., Friedman, S.R., Des Jarlais, D., Semaan, S., Tempalski, B., Sionean, C., DiNenno, E., Wejnert, C., & Paz-Bailey, G. (2017). Cross-sectional association between ZIP code-level gentrification and homelessness among a large community-based sample of people who inject drugs in 19 US cities. *BMJ Open*, 7(6), Article e013823. <https://doi.org/10.1136/bmjopen-2016-013823>
- Lopes, M., Olfson, M., Rabkin, J., Hasin, D.S., Alegria, A.A., Lin, K.-H., Grant, B.F., & Blanco, C. (2012). Gender, HIV status, and psychiatric disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry*, 73(3), 384–391. <https://doi.org/10.4088/JCP.10m06304>
- López, J.D., Shacham, E., & Brown, T. (2018). The impact of the Ryan White HIV/AIDS medical case management program on HIV clinical outcomes: A longitudinal study. *AIDS and Behavior*, 22(9), 3091–3099. <https://doi.org/10.1007/s10461-018-2124-3>
- Lucas, G.M., Griswold, M., Gebo, K.A., Keruly, J., Chaisson, R.E., Moore, R.D. (2006). Illicit drug use and HIV-1 disease progression: A longitudinal study in the era of highly active antiretroviral therapy. *American Journal of Epidemiology*, 163(5), 412–420. <https://doi.org/10.1093/aje/kwj059>
- Magidson, J.F., Seitz-Brown, C.J., Safren, S.A., & Daughters, S.B. (2014). Implementing behavioral activation and life-steps for depression and HIV medication adherence in a community health center. *Cognitive and Behavioral Practice*, 21(4), 386–403. <https://doi.org/10.1016/j.cbpra.2013.10.002>
- Maloney, K.M., Bratcher, A., Wilkerson, R., & Sullivan, P.S. (2020). Electronic and other new media technology interventions for HIV care and prevention: A systematic review. *Journal of the International AIDS Society*, 23(1), Article e25439. <https://doi.org/10.1002/jia2.25439>
- Maman, S., Kajula, L., Balvanz, P., Kilonzo, M., Mulawa, M., & Yamanis, T. (2016). Leveraging strong social ties among young men in Dar es Salaam: A pilot intervention of microfinance and peer leadership for HIV and gender-based violence prevention. *Global Public Health*, 11(10), 1202–1215. <https://doi.org/10.1080/17441692.2015.1094105>
- Mannheimer, S., Thackeray, L., Huppler Hullsiek, K., Chesney, M., Gardner, E.M., Wu, A.W., Telzak, E.E., Lawrence, J., Baxter, J., & Friedland, G. (2008). A randomized comparison of two instruments for measuring self-reported antiretroviral adherence. *AIDS Care*, 20(2), 161–169. <https://doi.org/10.1080/09540120701534699>

- McNairy, M.L., & El-Sadr, W.M. (2012). The HIV care continuum: No partial credit given. *AIDS*, 26(14), 1735–1738. <https://doi.org/10.1097/QAD.0b013e328355d67b>
- Mehta, S., Moore, R.D., & Graham, N.M.H. (1997). Potential factors affecting adherence with HIV therapy. *AIDS*, 11(14), 1665–1670.
- Millett, G.A., Crowley, J.S., Koh, H., Valdiserri, R.O., Frieden, T., Dieffenbach, C.W., Fenton, K.A., Benjamin, R., Whitescarver, J., Mermin, J., Parham-Hopson, D., & Fauci, A.S. (2010). A way forward: The National HIV/AIDS Strategy and reducing HIV incidence in the United States. *Journal of Acquired Immune Deficiency Syndromes*, 55, S144–S147. <https://doi.org/10.1097/QAI.0b013e3181fbc04>
- Montaner, J.S.G., Reiss, P., Cooper, D., Vella, S., Harris, M., Conway, B., Wainberg, M.A., Smith, D., Robinson, P., Hall, D., Myers, M., & Lange, J.M.A. (1998). A randomized, double-blind trial comparing combinations of nevirapine, didanosine, and zidovudine for HIV-infected patients: The INCAS Trial. *Journal of the American Medical Association*, 279(12), 930–937. <https://doi.org/10.1001/jama.279.12.930>
- Morrison, M.F., Petitto, J.M., Ten Have, T., Gettes, D.R., Chiappini, M.S., Weber, A.L., Brinker-Spence, P., Bauer, R.M., Douglas, S.D., & Evans, D.L. (2014). Depressive and anxiety disorders in women with HIV infection. *American Journal of Psychiatry*, 159(5), 789–796. <https://doi.org/10.1176/appi.ajp.159.5.789>
- Mugavero, M.J., Amico, K.R., Horn, T., & Thompson, M.A. (2013). The state of engagement in HIV care in the United States: From cascade to continuum to control. *Clinical Infectious Diseases*, 57(8), 1164–1171. <https://doi.org/10.1093/cid/cit420>
- National Institute on Drug Abuse. (2012). *HIV/AIDS and drug abuse: Intertwined epidemics*. U.S. Department of Health and Human Services. https://www.drugabuse.gov/sites/default/files/drugfacts_hiv_aids_0.pdf
- Nguyen, V.-K., Bajos, N., Dubois-Arber, F., O'Malley, J., & Pirkle, C.M. (2011). Remedicalizing an epidemic: From HIV treatment as prevention to HIV treatment is prevention. *AIDS*, 25(3), 291–293. <https://doi.org/10.1097/QAD.0b013e3283402c3e>
- Norris, T.E., Hart, G.L., Larson, E.H., Tarczy-Hornoch, P., Masuda, D.L., Fuller, S.S., House, P.J., & Dyck, S.M. (2002). Low-bandwidth, low-cost telemedicine consultations in rural family practice. *Journal of American Board of Family Practice*, 15(2), 123–127.
- Nunn, A., Cornwall, A., Fu, J., Bazerman, L., Loewenthal, H., & Beckwith, C. (2010). Linking HIV-positive jail inmates to treatment, care, and social services after release: Results from a qualitative assessment of the COMPASS program. *Journal of Urban Health*, 87(6), 954–968. <https://doi.org/10.1007/s11524-010-9496-7>
- Nyamathi, A., Reback, C.J., Shoptaw, S., Salem, B.E., Zhang, S., & Yadav, K. (2017). Impact of tailored interventions to reduce drug use and sexual risk behaviors among homeless gay and bisexual men. *American Journal of Men's Health*, 11(2), 208–220. <https://doi.org/10.1177/1557988315590837>
- O'Brien, N., Greene, S., Carter, A., Lewis, J., Nicholason, V., Kwaramba, G., Ménard, B., Kaufman, E., Ennabil, N., Andersson, N., Loufly, M., de Pokomandy, A., & Kaida, A. (2017). Envisioning women-centered HIV care: Perspectives from women living with HIV in Canada. *Women's Health Issues*, 27(6), 721–730. <https://doi.org/10.1016/j.whi.2017.08.001>
- Ogburn, D.F., Schoenbach, V.J., Edmonds, A., Pence, B.W., Powers, K.A., White, B.L., & Dzialowy, N. (2019). Depression, ART adherence, and receipt of case management services by adults with HIV in North Carolina, Medical monitoring project, 2009–2013. *AIDS and Behavior*, 23, 1004–1015. <https://doi.org/10.1007/s10461-018-2365-1>
- Park, W.B., Choe, P.G., Kim, S.-H., Jo, J.H., Bang, J.H., Kim, H.B., Kim, N.J., Oh, M., & Choe, K.W. (2007). One-year adherence to clinic visits after highly active antiretroviral therapy: A predictor of clinical progress in HIV patients. *Journal of Internal Medicine*, 261(3), 268–275. <https://doi.org/10.1111/j.1365-2796.2006.01762.x>
- Parsons, J.T., Golub, S.A., Rosof, E., & Holder, C. (2007). Motivational interviewing and cognitive-behavioral intervention to improve HIV medication adherence among hazardous drinkers: A randomized controlled trial. *Journal of Acquired Immune Deficiency Syndromes*, 46(4), 443–450. <https://doi.org/10.1097/qai.0b013e318158a461>
- Patel, M.C., & Young, J.D. (2014). Delivering HIV subspecialty care in prisons utilizing telemedicine. *Disease-a-Month*, 60(5), 196–200. <https://doi.org/10.1016/j.disamonth.2014.04.001>
- Paterson, D.L., Swindells, S., Mohr, J., Brester, M., Vergis, E.N., Squier, C., Wagener, M.M., & Singh, N. (2000). Adherence to protease inhibitor therapy and outcomes in patients with HIV infection. *Annals of Internal Medicine*, 133(1), 21–30. <https://doi.org/10.7326/0003-4819-133-1-200007040-00004>

- Pearlman, D.N., Camberg, L., Wallace, L.J., Symons, P., & Finison, L. (2002). Tapping youth as agents for change: Evaluation of a peer leadership HIV/AIDS intervention. *Journal of Adolescent Health, 31*(1), 31–39. [https://doi.org/10.1016/S1054-139X\(02\)00379-8](https://doi.org/10.1016/S1054-139X(02)00379-8)
- Prejean, J., Tang, T., & Hall, H.I. (2013). HIV diagnoses and prevalence in the southern region of the United States, 2007–2010. *Journal of Community Health, 38*(3), 414–426. <https://doi.org/10.1007/s10900-012-9633-1>
- Ramaswamy, A., Yu, M., Drangsholt, S., Ng, E., Culligan, P.J., Schlegel, P.N., & Hu, J.C. (2020). Patient satisfaction with telemedicine during the COVID-19 pandemic: Retrospective cohort study. *Journal of Medical Internet Research, 22*(9), e20786. <https://doi.org/10.2196/20786>
- Rebeiro, P., Althoff, K.N., Buchacz, K., Gill, J., Horberg, M., Krentz, H., Moore, R., Sterling, T. R., Brooks, J.T., Gebo, K.A., Hogg, R., Klein, M., Martin, J., Mugavero, M., Rourke, S., Silverberg, M.J., Thorne, J., & Gange, S.J. (2013). Retention among North American HIV-infected persons in clinical care, 2000–2008. *Journal of Acquired Immune Deficiency Syndrome, 62*(3), 356–362. <https://doi.org/10.1097/QAI.0b013e31827f578a>
- Reif, S., Safley, D., McAllaster, C., Wilson, E., & Whetten, K. (2017). State of HIV in the US Deep South. *Journal of Community Health, 42*(5), 844–853. <https://doi.org/10.1007/s10900-017-0325-8>
- Robbins, G.K., Daniels, B., Zheng, H., Chueh, H., Meigs, J.B., & Freedberg, K.A. (2007). Predictors of antiretroviral treatment failure in an urban HIV clinic. *Journal of Acquired Immune Deficiency Syndrome, 44*(1), 30–37. <https://doi.org/10.1097/01.qai.0000248351.10383.b7>
- Safren, S.A., O'Cleirigh, C.M., Bullis, J.R., Otto, M.W., Stein, M.D., & Pollack, M.H. (2012). Cognitive behavioral therapy for adherence and depression (CBT-AD) in HIV-infected injection drug users: A randomized controlled trial. *Journal of Consulting and Clinical Psychology, 80*(3), 404–415. <https://doi.org/10.1037/a0028208>
- Safren, S.A., Otto, M.W., & Worth, J.L. (1999). Life-steps: Applying cognitive behavioral therapy to HIV medication adherence. *Cognitive and Behavioral Practice, 6*(4), 332–341. [https://doi.org/10.1016/S1077-7229\(99\)80052-2](https://doi.org/10.1016/S1077-7229(99)80052-2)
- Safren, S.A., Otto, M.W., Worth, J.L., Salomon, E., Johnson, W., Mayer, K., & Boswell, S. (2001). Two strategies to increase adherence to HIV antiretroviral medication: Life-steps and medication monitoring. *Behaviour Research and Therapy, 39*(10), 1151–1162. [https://doi.org/10.1016/S0005-7967\(00\)00091-7](https://doi.org/10.1016/S0005-7967(00)00091-7)
- Salam, R.A., Haroon, S., Ahmed, H.H., Das, J.K., & Bhutta, Z.A. (2014). Impact of community-based interventions on HIV knowledge, attitudes, and transmission. *Infectious Diseases of Poverty, 3*, Article 26. <https://doi.org/10.1186/2049-9957-3-26>
- Saunders, J.B., Aasland, O.G., Babor, T.F., de la Fuente, J.R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption—II. *Addiction, 88*(6), 791–804. <https://doi.org/10.1111/j.1360-0443.1993.tb02093.x>
- Sherr, L., Clucas, C., Harding, R., Sibley, E., & Catalan, J. (2011). HIV and depression—A systematic review of interventions. *Psychology, Health and Medicine, 16*(5), 493–527. <https://doi.org/10.1080/13548506.2011.579990>
- Simoni, J.M., Pantalone, D.W., Plummer, M.D., & Huang, B. (2007). A randomized controlled trial of a peer support intervention targeting antiretroviral medication adherence and depressive symptomatology in HIV-positive men and women. *Health Psychology, 26*(4), 488–495. <https://doi.org/10.1037/0278-6133.26.4.488>
- Skarbinski, J., Rosenberg, E., Paz-Bailey, G., Hall, H.I., Rose, C.E., Viall, A.H., Fagan, J.L., Lansky, A., & Mermin, J.H. (2015). Human immunodeficiency virus transmission at each step of the care continuum in the United States. *JAMA Internal Medicine, 175*(4), 588–596. <https://doi.org/10.1001/jamainternmed.2014.8180>
- Skeer, M.R., Mimiaga, M.J., Mayer, K.H., O'Cleirigh, C., Covahey, C., & Safren, S.A. (2012). Patterns of substance use among a large urban cohort of HIV-infected men who have sex with men in primary care. *AIDS and Behavior, 16*(3), 676–689. <https://doi.org/10.1007/s10461-011-9880-7>
- Skinner, H.A. (1982). The drug abuse screening test. *Addictive Behaviors, 7*(4), 363–371. [https://doi.org/10.1016/0306-4603\(82\)90005-3](https://doi.org/10.1016/0306-4603(82)90005-3)
- Southern AIDS Coalition. (2013). *Southern AIDS Coalition southern states manifesto: Update 2012*. <https://www.rwhp.org/extra/Southern-States-Manifesto-Update-2012.pdf>
- Spitzer, R.L., Kroenke, K., Williams, J.B.W., & the Patient Health Questionnaire Primary Care Study Group. (1999). Validation and utility of a self-report version of PRIME-MD: The PHQ primary care study. *Journal of the American Medicine Association, 282*(18), 1737–1744. <https://doi.org/10.1001/jama.282.18.1737>

Stansell, J., Holtzer, C., Mayer, S., DeGuzman, D., Hamel, E., & Lapins, D. (2001, February 4–8). *Factors affecting treatment outcomes in a medication event monitoring system* [Paper presentation]. 8th Conference on Retroviruses and Opportunistic Infections, Chicago, IL, United States.

Substance Abuse and Mental Health Services Administration. (2000). *Substance abuse treatment for persons with HIV/AIDS* (HHS Publication No. 12-4137). U.S. Department of Health and Human Services. <https://store.samhsa.gov/sites/default/files/d7/priv/sma12-4137.pdf>

Substance Abuse and Mental Health Services Administration. (2013). *The NSDUH report: HIV/AIDS and substance use, 2010*. U.S. Department of Health and Human Services. <https://www.rti.org/publication/nsduh-report-hiv-aids-and-substance-use>

Tedaldi, E.M., van den Berg-Wolf, M., Richardson, J., Patel, P., Durham, M., Hammer, J., Henry, K., Metzler, S., Önen, N., Conley, L., Wood, K., Brooks, J.T., & Buchacz, K. (2012). Sadness in the SUN: Using computerized screening to analyze correlates of depression and adherence in HIV-infected adults in the United States. *AIDS Patient Care and STDs*, 26(12), 718–729. <https://doi.org/10.1089/apc.2012.0132>

Thaker, D.A., Monypenny, R., Olver, I., & Sabesan, S. (2013). Cost savings from a telemedicine model of care in northern Queensland, Australia. *Medical Journal of Australia*, 199(6), 414–417. <https://doi.org/10.5694/mja12.11781>

Tobin, K., Davey-Rothwell, M.A., Nonyane, B.A.S., Knowlton, A., Wissow, L., & Latkin, C.A. (2017). RCT of an integrated CBT-HIV intervention on depressive symptoms and HIV risk. *PLoS ONE*, 12(12), Article e0187180. <https://doi.org/10.1371/journal.pone.0187180>

Tucker, J.D., Tso, L.S., Hall, B., Ma, Q., Beanland, R., Best, J., Li, H., Lackey, M., Marley, G., Rich, Z.C., Sou, K.-L., & Doherty, M. (2017). Enhancing public health HIV interventions: A qualitative meta-synthesis and systematic review of studies to improve linkage to care, adherence, and retention. *EBioMedicine*, 17, 163–171. <https://doi.org/10.1016/j.ebiom.2017.01.036>

Ulett, K.B., Willig, J.H., Lin, H.-Y., Routman, J.S., Abroms, S., Allison, J., Chatham, A., Raper, J.L., Saag, M.S., & Mugavero, M.J. (2009). The therapeutic implications of timely linkage and early retention in HIV care. *AIDS Patient Care and STDs*, 23(1), 41–49. <https://doi.org/10.1089/apc.2008.0132>

Volkow, N.D., & Montaner, J. (2011). The urgency of providing comprehensive and integrated treatment for substance abusers with HIV. *Health Affairs*, 30(8), 1411–1419. <https://doi.org/10.1377/hlthaff.2011.0663>

White House Office of National AIDS Policy. (2010). *National HIV/AIDS strategy for the United States*. <https://www.hiv.gov/federal-response/hiv-national-strategic-plan/national-hiv-aids-strategies-2010-2020>

Young, J.D., Patel, M., Badowski, M., Mackesy-Amiti, M.E., Vaughn, P., Shicker, L., Puisis, M., & Ouellet, L.J. (2014). Improved virologic suppression with HIV subspecialty care in a large prison system using telemedicine: An observational study with historical controls. *Clinical Infectious Diseases*, 59(1), 123–126. <https://doi.org/10.1093/cid/ciu222>

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