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Authors

Goldhammer, Hilary

Marc, Linda

Psihopaidas, Demetrios

et al.

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Hilary Goldhammer, SM¹ ; Linda G. Marc, ScD^{1,2};
Demetrios Psihopaidas, PhD, MA³; Nicole S. Chavis, MPH³ ;
Massah Massaquoi, MPH¹; Sean Cahill, PhD^{1,4,5};
Greg Rebchook, PhD⁶; Sari Reisner, ScD^{1,2,7,8};
Kenneth A. Mayer, MD^{1,2,8,9}; Stacy M. Cohen, MPH³;
and Alex S. Keuroghlian, MD, MPH^{1,8,10}

Abstract

Transgender women experience a disproportionate prevalence of HIV and barriers to linkage to care, retention in care, medication adherence, and viral suppression. As part of a national cooperative agreement funded by the Health Resources and Services Administration's HIV/AIDS Bureau, we searched the literature from January 1, 2010, through June 1, 2020, for English-language articles on interventions designed to improve at least 1 HIV care continuum outcome or address 1 barrier to achieving HIV care continuum outcomes among transgender women diagnosed with HIV in the United States. To be included, articles needed to identify transgender women as a priority population for the intervention. We found 22 interventions, of which 15 reported quantitative or qualitative outcomes and 7 reported study protocols. Recent interventions have incorporated a range of strategies that show promise for addressing pervasive structural and individual barriers rooted in societal and cultural stigma and discrimination against transgender people. Cross-cutting themes found among the interventions included meaningful community participation in the design and implementation of the interventions; culturally affirming programs that serve as a gateway to HIV care and combine gender-affirming care and social services with HIV care; interventions to improve behavioral health outcomes; peer-led counseling, education, and navigation; and technology-based interventions to increase access to care management and online social support. Ongoing studies will further elucidate the efficacy and effectiveness of these interventions, with the goal of reducing disparities in the HIV care continuum and bringing us closer to ending the HIV epidemic among transgender women in the United States.

Keywords

HIV infection, intervention, transgender women, linkage to care, retention in care

The term “transgender” describes a diversity of people whose gender identity and sex assigned at birth do not correspond according to traditional expectations. Although transgender people use a variety of terms to describe themselves, for the purposes of this review, we define transgender women as people assigned male sex at birth who have a feminine gender identity. This definition is commonly used for research on transgender women with HIV.¹ Transgender women experience a disproportionate prevalence of HIV compared with the general population. A 2019 systematic review estimated the prevalence of HIV among transgender women in the United States as 14.1%.² More than 80% of incident HIV among transgender women occurs among those who identify as Black/African American or Latina/Hispanic.³

Transgender women with diagnosed HIV must overcome extensive challenges to progress along the HIV care continuum of linkage to HIV care, retention in care, adherence to

¹ The Fenway Institute, Fenway Health, Boston, MA, USA

² Harvard T.H. Chan School of Public Health, Boston, MA, USA

³ HIV/AIDS Bureau, Health Resources and Services Administration, Rockville, MD, USA

⁴ Boston University School of Public Health, Boston, MA, USA

⁵ Bouve College of Health Sciences, Northeastern University, Boston, MA, USA

⁶ Center for AIDS Prevention Studies, University of California, San Francisco, San Francisco, CA, USA

⁷ Brigham and Women's Hospital, Boston, MA, USA

⁸ Harvard Medical School, Boston, MA, USA

⁹ Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA

¹⁰ Massachusetts General Hospital, Boston, MA, USA

Corresponding Author:

Alex S. Keuroghlian, MD, MPH, The Fenway Institute, Fenway Health, 1340 Boylston St, Boston, MA 02215, USA.

Email: akeuroghlian@partners.org

antiretroviral therapy (ART), and viral suppression.^{1,4,5} Pervasive social stigma and discrimination against transgender women create vulnerability to unemployment, homelessness, food insecurity, lack of health insurance, engagement in survival sex, and incarceration.^{4,5} These social determinants and structural factors strongly contribute to adverse HIV health outcomes.⁶⁻⁸ Acute and daily exposure to abuse, harassment, bias, and discrimination among transgender women is associated with behavioral health comorbidities, such as depression, posttraumatic stress disorder (PTSD), and substance use disorders, all of which can further reduce medication adherence and engagement in HIV care.⁸⁻¹⁰ Transgender women often also mistrust health care institutions because of experiences of mistreatment and denial of services as a result of their gender identity.¹¹⁻¹³ In addition, transgender women with HIV may prioritize gender-affirming hormone therapy over ART when they have insufficient time or finances, and some transgender women report concerns that ART will interfere with the effectiveness of hormones.^{14,15}

To facilitate HIV care engagement for transgender women, research suggests that interventions integrate gender-affirming treatment with HIV care and use education, resources, navigation, emotional and social support, and tools to build self-efficacy,⁸ reduce isolation, enhance trust with the health system, and minimize concerns of drug–drug interactions.^{15,16} Structural interventions are needed to create de-stigmatized and inclusive HIV clinical spaces with staff members who are transgender women themselves, health care providers trained in gender-affirming treatments, and services to meet legal, social, and behavioral health needs.^{17,18}

Although HIV prevention studies with transgender women have been reviewed,¹⁹ to our knowledge, no review of interventions for transgender women with HIV has been conducted. We searched the peer-reviewed literature from the past 10 years for interventions designed to help transgender women diagnosed with HIV progress along the HIV care continuum from linkage to care to viral suppression. We analyzed interventions for cross-cutting themes and public health implications related to research, implementation, replication, and scale-up. This work is part of a larger initiative, Using Evidence-Informed Interventions to Improve Health Outcomes Among People Living With HIV (E2i), which is funded by the Health Resources and Services Administration's HIV/AIDS Bureau (HRSA HAB) of the US Department of Health and Human Services (grants U69HA31067; U90HA31099). E2i is working to eliminate disparities for transgender women and other priority populations in the Ryan White HIV/AIDS Program, which focuses on providing care and treatment services for people diagnosed with HIV. The initiative supports the identification, piloting, implementation science evaluation, and scale-up of interventions with demonstrated effectiveness at improving outcomes along the HIV care continuum for priority populations with HIV, such as transgender women, with the goal of

eliminating HIV disparities and ultimately ending the HIV epidemic.²⁰⁻²²

Methods

We searched PubMed and PsycINFO for peer-reviewed articles published from January 1, 2010, through June 1, 2020. In our search, we used various combinations of the following terms: “transgender,” “trans,” “transsexual,” “gender identity,” “HIV,” “evaluat*,” “intervention,” “treatment outcome,” “medication adherence,” and “viral load.” To check for interventions missed by the search words, we also pursued relevant references from literature reviews. In addition, because transgender health is a growing field of research, we searched for protocols of ongoing studies in the National Institutes of Health US Library of Medicine's clinical trials database (clinicaltrials.gov) using 2 search terms: transgender and HIV. Given the small number of completed studies of interventions for transgender women with HIV, we believed it valuable to search for and describe forthcoming intervention studies that thoroughly illustrate the scope of current research on transgender women's HIV-related health. For similar reasons, we chose to include observational cohort studies in addition to evaluations of demonstration projects and clinical trials in instances when the study provided qualitative or quantitative data on a program developed to enhance HIV care continuum outcomes for transgender women with HIV.

Eligible studies met all of the following criteria: (1) identified transgender women as a priority population for the study and, if reported, had a sample of at least 10% transgender women with HIV; (2) described an intervention focused primarily on improving at least 1 HIV care continuum outcome for transgender women diagnosed with HIV (linkage to care, engagement/retention in care, ART adherence, or viral suppression) or 1 barrier to achieving HIV care continuum outcomes (eg, psychosocial factors, access-to-care barriers, stigma-related barriers); (3) the study was conducted in the United States, which is where most studies with this population have occurred; and (4) the article was written in English. After selecting intervention studies based on eligibility criteria, we reviewed the interventions for cross-cutting themes and strategies.

Results

Our search yielded 22 interventions, of which 15 reported outcome data or lessons learned (Table 1),^{18,23-36} and 7 published a study protocol (Table 2).³⁷⁻⁴³ One article reported on 2 interventions.³⁵ The participant populations of 11 interventions exclusively comprised transgender women with HIV.^{25,28,29,31-33,35,37,39,42} An additional intervention exclusively included transgender and nonbinary people.⁴⁰ Six interventions did not report a number or percentage of transgender women but explicitly recruited transgender

Table 1. HIV care continuum interventions for transgender women with HIV in the United States, January 1, 2010, through June 1, 2020

Description of intervention	Study design, sample, and setting	Key strategies	HIV care continuum goal(s) and key findings
Adams et al,¹⁸ 2018 Project Silk is a recreational space designed for young Black MSM and transgender people that offers discreet HIV testing, linkage to HIV care, and social services through on-site specialists and peer navigators.	<ul style="list-style-type: none"> • Pre-post program evaluation • 226 clients per year • Percentage of transgender women not provided • 100% Black • Age 13-29 y • Recreation-based space in Pittsburgh, PA 	<ul style="list-style-type: none"> • Youth advisory board recruited from the local community • Culturally tailored, stigma-free, and safe space • Low-barrier entry to care • Peer navigators 	<ul style="list-style-type: none"> • Linkage • Of the 15 clients newly diagnosed with HIV, 13 (87%) were linked to care; all 21 clients with HIV who were out of care were re-engaged in care
Brito et al,²³ 2020 Community clinics were designed to provide comprehensive, client-centered, and affirming HIV primary care services for MSM and transgender women. The clinics have discreet storefronts in communities with high HIV prevalence and poverty.	<ul style="list-style-type: none"> • Retrospective cohort study • Community clinics: 129 clients • Comparison hospital-based clinics: 129 clients • 11% Transgender women • 71% Black • Median age, 38 y • Network of 6 clinics in Chicago, IL 	<ul style="list-style-type: none"> • Affirming, comprehensive HIV primary care for transgender women and MSM • On-site services for behavioral health disorders • Peer outreach workers • Convenient locations in areas of high HIV incidence and prevalence 	<ul style="list-style-type: none"> • Viral suppression • During a 4-year period, no differences in probability of virologic failure by setting were found; community clinics had significantly more clients who were transgender women ($P = .03$), uninsured ($P < .01$), and unstably housed ($P < .01$)
Burgess et al,²⁴ 2020 The Louisiana Wellness Centers are 6 community wellness programs established to provide holistic, welcoming, nonjudgmental HIV/sexually transmitted infection prevention services and engagement in care for MSM and transgender people in areas of high HIV prevalence in Louisiana.	<ul style="list-style-type: none"> • Case study of a 3-year demonstration project • 3214 clients • Percentage of transgender women not provided • Community-based wellness centers in Monroe, Shreveport, Alexandria, Lafayette, Baton Rouge, and New Orleans, LA 	<ul style="list-style-type: none"> • Affirming and culturally tailored health services for MSM and transgender people • Convenient locations in areas of high HIV incidence and prevalence • Community advisory boards • On-site social, health, and wellness support services or referrals 	<ul style="list-style-type: none"> • Linkage • Of the 44 clients newly diagnosed with HIV, 40 (91%) were linked to care within 90 days; of the 5 people identified as out of care, 4 were re-engaged in HIV care; both metrics exceeded local health department outcomes
Collier et al,²⁵ 2015 Healing Our Women for Transgender Women (HOW-TW) is a manualized intervention adapted for transgender women from an intervention for cisgender women with HIV. ²⁶ HOW-TW includes 11 weekly, 2-hour small group sessions co-facilitated by trained staff members and focused on emotional and cognitive processing of trauma, coping, and resilience. Participants write narratives of abuse experiences and practice relaxation, affect regulation, problem-solving, and assertive communication.	<ul style="list-style-type: none"> • Pre-post intervention • 21 participants • 100% Transgender women • 52% Black • 24% Latinx/Hispanic • Mean age, 38 y • Reproductive and sexual health clinic in New York, NY 	<ul style="list-style-type: none"> • Building of skills and self-efficacy for improving medication adherence, drug and sexual risk behaviors, and psychological functioning • Addresses consequences of trauma • Enhancement of social support • Meals, transportation reimbursement, and gift card incentives 	<ul style="list-style-type: none"> • Adherence • 17 of 21 participants were retained in the program • Participants had high average attendance and high satisfaction • Post-intervention, participants reported significant decreases in depressive symptoms ($P = .05$) and increases in positive coping strategies related to trauma and substance use ($P = .05$)
Cunningham et al,²⁷ 2018 Linking Inmates to Care in Los Angeles (LINK LA) is a manualized 12-session, 24-week intervention during which full-time peers deliver HIV care continuum counseling, education, and navigation for men and transgender women with HIV before and immediately after release from county jail. Peers accompany clients to 2 HIV care appointments and facilitate communication with health care providers.	<ul style="list-style-type: none"> • Randomized controlled trial • Intervention group: 125 participants • Control group: 125 participants (standard case management) • 15% Transgender women • 42% Black • 31% Latinx/Hispanic • Mean age, 40 y • County jail/community in Los Angeles, CA 	<ul style="list-style-type: none"> • Peer navigation before and after release from jail (peers were selected based on experiences with incarceration, HIV care retention, and recovery from substance use disorder) • Knowledge, support, and skills building for managing HIV care and overcoming social stigma 	<ul style="list-style-type: none"> • Linkage, adherence, retention, and viral suppression • At 12 months, the adjusted probability of viral suppression remained 49% for the intervention group and declined from 52% to 30% for the control group ($P = .02$); among those linked to care, the intervention group had a greater improvement in retention in care than the control group ($P = .047$); there were no differences in linkage or adherence between groups

(continued)

Table 1. (continued)

Description of intervention	Study design, sample, and setting	Key strategies	HIV care continuum goal(s) and key findings
<p>Empson et al,²⁸ 2017</p> <p>Seeking Safety is an evidence-based, present-focused, manualized, cognitive-behavioral therapy program addressing co-occurring PTSD and substance use disorders. For this adaptation of Seeking Safety for transgender women, participants received 12 weekly 2-hour group sessions facilitated by social workers using modules selected for relevance for transgender women. Financial incentives were given based on number of sessions attended.</p>	<ul style="list-style-type: none"> • Pre-post intervention • 7 participants • 100% Transgender women • 71% Black • 29% White • Mean age, 42 y • HIV clinic in San Francisco, CA 	<ul style="list-style-type: none"> • Present-focused, flexible curriculum to enhance coping skills and set health care goals • Concurrently addresses trauma and substance use disorders • Meals during sessions • Financial incentives to complete sessions 	<ul style="list-style-type: none"> • Adherence • Participants attended an average of 8 sessions; incentives were reported as important for attendance • At 2 weeks post-intervention, participants reported a decline in PTSD symptoms ($P = .05$) and a nonsignificant decline in alcohol and drug use
<p>Hirshfield et al,²⁹ 2021</p> <p>Transgender Women Engagement and Entry to Care Project (TWEET) offers twice-weekly, ~90-minute peer-led educational group sessions, called “Transgender Leader-Teach Back” sessions, with interactive discussions about HIV, sexual health, wellness, gender affirmation, mental health, and other topics to increase engagement in care. Participants also receive help with referrals to on-site HIV care and social services. Participants who complete at least 3 sessions are invited to become Peer Leaders, who recruit participants and lead at least 1 Teach Back session.</p>	<ul style="list-style-type: none"> • Pre-post intervention • 163 participants • 100% Transgender women • 93% Latinx/Hispanic • Mean age, 38 y • Primary care health center in Queens, NY 	<ul style="list-style-type: none"> • Co-location of HIV services with educational program • Engaging and culturally tailored program for transgender women • Opportunity to learn and implement leadership skills and model positive health behaviors 	<ul style="list-style-type: none"> • Retention, viral suppression • 83% of participants were retained in HIV care during the 5-year study period • Among participants with HIV viral load data, viral load decreased significantly ($P < .05$) from pre- to post-intervention • 39% of participants became Peer Leaders; the proportion of Peer Leaders with an undetectable viral load increased significantly ($P = .04$) from pre- to post-intervention
<p>Kuo et al,³⁰ 2019</p> <p>CARE + Corrections is a 1-hour computerized motivational interviewing counseling session for people recently released from the criminal justice system to support linkage to community HIV care and ART adherence. Participants also receive a printout of goals and relevant referrals and a mobile phone with scheduled text messages with medication and appointment reminders and supportive scripted messages.</p>	<ul style="list-style-type: none"> • Evaluation of preliminary efficacy using a randomized design • Intervention group: 57 participants • Control group: 57 participants (opioid use prevention video; printout of HIV resources) • 18% Transgender women • 85% Black • Mean age, 42 y • Department of Corrections and community in District of Columbia 	<ul style="list-style-type: none"> • Computerized counseling • Telephone and automated text messages to promote cognitive and behavioral change • Resource lists 	<ul style="list-style-type: none"> • Linkage, adherence, viral suppression • After 6 months, the proportion of participants who linked to care and achieved viral suppression improved, but there were no statistically significant differences between the intervention and control groups
<p>Kuhns et al,³¹ 2021</p> <p>TransLife Care (TLC) is a safe space drop-in center for transgender women of any HIV status within a housing and social service agency serving people in sexual and gender minority communities and people with HIV. The center provides bundled services, such as housing, employment, legal, and linkage/referral to HIV and other health services but not on-site HIV care. The intervention was primarily designed and delivered by transgender women.</p>	<ul style="list-style-type: none"> • Pre-post intervention • 120 participants • 100% Transgender women • 94% Black • Mean age, 31 y • Housing and social service agency in Chicago, IL 	<ul style="list-style-type: none"> • Comprehensive and culturally affirming services to address social and structural factors that act as barriers to HIV care for transgender women 	<ul style="list-style-type: none"> • Linkage, adherence, retention, viral suppression • 48% of participants became engaged in 1 or more TLC services • Among all participants, HIV medication use and viral suppression remained stable during a 24-month period, while engagement and retention in HIV care declined • Receipt of TLC services was significantly associated with retention in HIV care ($P = .04$)

(continued)

Table 1. (continued)

Description of intervention	Study design, sample, and setting	Key strategies	HIV care continuum goal(s) and key findings
Nemoto et al,³² 2021			
The Princess Project offers up to 9 individual motivational enhancement intervention (MEI) sessions by a trained peer health educator to increase HIV care engagement and well-being. MEI is a client-centered therapy that respects clients' autonomy and self-efficacy. Clients also receive referrals to health and social service agencies, along with continuous monitoring. Clients may also join an optional weekly support group.	<ul style="list-style-type: none"> • Qualitative interviews • 60 participants • 100% Transgender women • 80% Black • Mean age, 41 y • Health and social service agencies in Alameda County, CA 	<ul style="list-style-type: none"> • Peer health education using MEI • Peer navigation and monitoring • Financial incentives for attendance • Support group 	<ul style="list-style-type: none"> • Linkage, adherence, retention • 7 of the transgender women who completed sessions reported feeling connected to a trusted peer; better able to focus on health; getting and staying sober; and positive experiences with receiving care • 5 of the transgender women who left the program reported that the health educators changed several times or that they were mainly interested in incentives
Reback et al,³³ 2021			
The Alexis Project is a 2-part intervention that includes (1) peer health navigation: during 12-18 months, navigators help to develop client-centered treatment plans and directly link clients to HIV care and other needed services; they also help to address complex barriers and increase self-efficacy in managing treatment; (2) contingency management: clients receive escalating financial rewards tied to achievements of HIV behavioral and biomedical milestones.	<ul style="list-style-type: none"> • Pre-post intervention • 139 participants • 100% Transgender women • 39% Black • 38% Hispanic/Latinx • Mean age, 36 y • Community center in Hollywood, CA 	<ul style="list-style-type: none"> • Peer navigation to overcome barriers and engage in care • Contingency management to promote behavioral change 	<ul style="list-style-type: none"> • Linkage, medication adherence, retention, viral suppression • Participants attended an average of 6.6 peer health navigation sessions • Higher attendance in navigation sessions was associated with achievement of behavioral and biomedical milestones ($P < .01$) • 85% of participants were linked to HIV care; 57% were retained in care • 83% of participants who enrolled with a detectable viral load, and achieved a minimum 1 log viral load reduction, achieved full viral suppression
Tanner et al,³⁴ 2018			
weCare is a social media intervention tailored for racially and ethnically diverse young MSM and transgender women. A peer health educator electronically communicates with participants through existing social media apps to encourage linkage and retention, answer questions, offer social support, use theory-informed scripted messages to boost behavioral action, send reminders, and provide navigation help.	<ul style="list-style-type: none"> • Pre-post intervention • 91 participants • 100% MSM and transgender women • Percentage of transgender women not provided • 79% Black • 13% Hispanic/Latinx • Mean age, 25 y • Infectious disease clinic in Guilford County, NC 	<ul style="list-style-type: none"> • Community-based participatory research approach • Social media apps to overcome access barriers • Peer education and counseling 	<ul style="list-style-type: none"> • Linkage, adherence, retention, viral suppression • At 12 months, missed appointments decreased significantly from 68.0% to 53.3% ($P = .04$); viral suppression increased significantly from 61.3% to 88.8% ($P < .001$)
Wilson et al,³⁵ 2021			
The Brandy Martell Project is located within an existing HIV and gender-affirming care program that provides a legal services clinic; peer navigators; and workshops for career counseling, anger management, HIV care support, and transgender women's health care.	<ul style="list-style-type: none"> • Pre-post intervention • 48 participants (Brandy Martell) • 55 participants (TransAccess) • 100% Transgender women • 59% Black • 24% Hispanic/Latinx • Mean age, 39 y • Brandy Martell: community health center; TransAccess: wellness center and public health clinic partnership; both located in San Francisco, CA 	<ul style="list-style-type: none"> • Peer navigation • Comprehensive services, including a legal services clinic • Collaboration between a community center and public health clinic 	<ul style="list-style-type: none"> • Linkage, adherence, retention • At 12 months, 55% of participants received peer navigation services; receipt of peer-led services was significantly associated with improvements in linkage ($P = .01$), retention ($P = .02$), and prescription of ART ($P < .01$)
TransAccess provides weekly on-site behavioral health, transgender health, and HIV primary care services in an established transgender drop-in wellness center that also provides comprehensive services and peer navigators.			

(continued)

Table 1. (continued)

Description of intervention	Study design, sample, and setting	Key strategies	HIV care continuum goal(s) and key findings
Xiao and Mains,³⁶ 2016			
The Yadumu Project offers integrated, team-based care for HIV primary care, substance use disorders, and mental health services, arranged by case managers. Although originally designed for Black men, the program staff opened the project up to all genders and racial and ethnic groups.	<ul style="list-style-type: none"> • Pre–post intervention • 129 participants • 22% Transgender women • 72% Black • Median age, 45 y • Free primary care clinic in San Francisco, CA 	<ul style="list-style-type: none"> • Integrated care and services for people with HIV and co-occurring behavioral health problems in a one-stop shop 	<ul style="list-style-type: none"> • Retention • During a 3-month period, 39% of transgender women were retained in the program

Abbreviations: app, application; ART, antiretroviral therapy; MSM, men who have sex with men; PTSD, posttraumatic stress disorder.

Table 2. Study protocols of HIV care continuum interventions for transgender women with HIV in the United States

Description of intervention	Study design, sample, and setting	Key strategies	HIV care continuum goal(s) and key outcomes
Dale,³⁷ 2020			
Writing to Alleviate Violence Exposure for Transgender Women (WAVE–TW) is designed for transgender women with a detectable viral load and history of trauma/abuse. This intervention provides 1 individual session of cognitive–behavioral therapy to promote ART adherence (LifeSteps) and 4 individual sessions of trauma-focused writing to address PTSD and depressive symptoms.	<ul style="list-style-type: none"> • Open pilot trial • 20 participants • 100% Transgender women • Age, ≥18 y • Miami, FL 	<ul style="list-style-type: none"> • Cognitive–behavioral therapy for medication adherence • Expressive writing to confront trauma experiences 	<ul style="list-style-type: none"> • Adherence, viral suppression • Feasibility and acceptability; change in depressive symptoms, PTSD symptoms, adherence, viral load
Muessig and Hightow-Weidman,³⁸ 2019			
<ul style="list-style-type: none"> • AllyQuest (AQ) is a smartphone app designed to improve adherence by including medication and appointment reminders, social support via daily chat, gaming features, skills-building challenges, education, small financial rewards dependent on app use, and a personalized profile and avatar. • AQ+ Next Step Counseling is a higher-intensity intervention that includes AQ plus in-app texting with an adherence counselor. 	<ul style="list-style-type: none"> • Sequential multiple assignment randomization pilot trial • 60 participants • 100% MSM and transgender women • Age range, 15–24 y • Chapel Hill, NC 	<ul style="list-style-type: none"> • Smartphone gaming app to support ART adherence by motivating behavior change and providing social support • Enhanced version includes adherence counseling via texting 	<ul style="list-style-type: none"> • Adherence, viral suppression • Feasibility and acceptability; difference in adherence, viral suppression
Reback et al,³⁹ 2019			
Text Me, Girl! provides 3 tailored text messages per day for 90 days to engage young transgender women in care and promote medication adherence. The text scripts are theory-based and promote action.	<ul style="list-style-type: none"> • Randomized controlled trial • Intervention group: 61 participants • Control group: 69 participants (delayed treatment) • 100% Transgender women • Age range, 18–34 y • Los Angeles, CA 	<ul style="list-style-type: none"> • Automated text messages tailored and personalized to encourage young transgender women with HIV to change behaviors 	<ul style="list-style-type: none"> • Linkage, adherence, retention, viral suppression • Differences in linkage, adherence, retention, viral suppression
Reisner,⁴⁰ 2018			
The provision of gender-affirming care (ie, hormone therapy and/or surgical interventions) for transgender and nonbinary people in a primary care setting to reduce disparities in HIV-related outcomes	<ul style="list-style-type: none"> • Observational, longitudinal prospective cohort study (12 months) • 4500 clients • 45% Transgender women • Age, ≥18 y • 2 health centers in Boston, MA, and New York, NY 	<ul style="list-style-type: none"> • Medical gender affirmation delivered in primary care to improve HIV outcomes 	<ul style="list-style-type: none"> • Viral suppression • Change in viral suppression

(continued)

Table 2. (continued)

Description of intervention	Study design, sample, and setting	Key strategies	HIV care continuum goal(s) and key outcomes
Arnold et al,⁴¹ 2019			
Optimizing the HIV Treatment Continuum with a Stepped Care Model for Youth Living with HIV is a stepped care intervention for treatment-experienced young people with HIV. Participants may progress from least to most intensive care as warranted. The steps are: (1) reminder texts and telephone monitoring called Automated Messaging and Monitoring Intervention (AMMI); (2) AMMI plus peer support via social media; and (3) AMMI, peer support, plus electronically delivered coaching by trained community peers.	<ul style="list-style-type: none"> • Randomized controlled trial • Intervention group: 110 participants • Control group: 110 participants (AMMI only) • 100% Gay, bisexual, transgender, and/or homeless young people • Ages, 12-24 y • 13 clinics, community organizations, and shelters in Los Angeles, CA, and New Orleans, LA 	<ul style="list-style-type: none"> • Stepped approach to intensity of intervention • Automated reminder texts • Peer support through social media • Peer coaching 	<ul style="list-style-type: none"> • Adherence, retention, viral suppression • Differences in adherence, retention, viral suppression, substance use, mental health, sexual behavior
Sevelius,⁴² 2017			
Healthy Divas involves 6 peer-led, manualized, individual counseling sessions, and 1 group workshop, during a 3-month period. In Healthy Divas, transgender women identify and receive tools, information, and support to accomplish personal goals related to gender affirmation and HIV, and to address complex barriers to care engagement.	<ul style="list-style-type: none"> • Randomized controlled trial • 278 participants • Control group: treatment as usual • 100% Transgender women • Community and health organizations in Los Angeles and San Francisco, CA 	<ul style="list-style-type: none"> • Peer counseling and education • Integration of gender affirmation goals with HIV care goals • Based on frameworks of gender affirmation and health care empowerment 	<ul style="list-style-type: none"> • Linkage, adherence, retention, viral suppression • Difference in viral suppression, composite engagement in care measure (adherence, linkage, retention)
Schneider,⁴³ 2020			
In the Navigating Insurance Coverage Expansion (NICE) intervention, organizations provide in-person assistance to enroll clients in health insurance coverage at the time of HIV testing, and to link clients to HIV care.	<ul style="list-style-type: none"> • Randomized controlled trial • 800 participants • Control group: standard clinic procedures • Black and Hispanic MSM and transgender people • 3 sites in Chicago, IL 	<ul style="list-style-type: none"> • Structural change in organization to assist with health insurance coverage and immediate linkage to care 	<ul style="list-style-type: none"> • Linkage, retention • Differences in linkage, retention, viral suppression, health insurance enrollment

Abbreviations: app, application; MSM, men who have sex with men; PTSD, posttraumatic stress disorder.

women^{18,24,34,38,41,43}; all other interventions reported sample populations of 11% to 45% transgender women with HIV.^{25,27,30,40} Five interventions came from a multisite demonstration project funded by the Special Projects of National Significance (SPNS) program, Enhancing Engagement and Retention in Quality HIV Care for Transgender Women of Color (2012-2017).⁴⁴

Cross-cutting Themes

The 22 interventions implemented a range of strategies to overcome individual and structural barriers to linkage, retention, medication adherence, and viral suppression for transgender women with HIV. A common theme reported by most interventions was the formation of collaborative partnerships between transgender women community members and project staff members to overcome structural barriers and create culturally relevant programs that meet the most pressing needs of the local population of transgender women.

Meaningful community participation gives voice to the concerns of priority populations, while increasing the potential for an intervention's acceptability and sustainability.⁴⁵ Some interventions involved transgender women in the development of curricular topics and content^{29,32,33,38,39,42}; other interventions formed community advisory boards or used community-based participatory research methods to assess needs and interests and to provide ongoing feedback as the intervention or program continued.^{18,24,34}

Another common strategy across many interventions to overcome structural barriers involved the creation of programs, support groups, or recreational and drop-in spaces as a gateway for transgender women to engage in HIV care.^{18,23,24,29,31,32,35,42} These programs offered a low-barrier and appealing entry to health care institutions by providing opportunities for social connections, information on a range of health and wellness topics, legal assistance for name change and immigration, employment counseling, and other services that transgender women may

prioritize over HIV care. Colocation of HIV care with these programs and services reduced transportation and other access barriers while increasing comfort with and trust in the organizations and health care providers and offering a continuum of services. HIV care interventions that combine gender-affirming care with HIV care, or that offer comprehensive services, have a similar advantage in that transgender women may initially come for gender-affirming medical care, housing, substance use disorder, or other services and eventually access HIV care.⁴⁶ Likewise, transgender women who initially come for HIV care may be more likely to remain in care if the same location offers support for psychosocial and subsistence services. Importantly, these organizations strived to offer welcoming and nonjudgmental services for transgender women, a critical need for a population that experiences high levels of stigma in health care and public services.⁴⁷

Several interventions trained transgender women peers to deliver education, counseling, social support, or navigation as an implementation strategy.^{18,23,27,29,32-35,41,42} Peer delivery is a method for boosting the efficacy and cultural relevancy of an intervention.^{46,48} Because peers have similar demographic characteristics to participants, they can serve as role models, develop caring relationships with clients, and provide culturally attuned communication and insight.⁴⁹ In 3 interventions, transgender women peers provided education and counseling during in-person individual or group sessions^{29,32,42}; 2 interventions provided remote coaching and education through social media.^{41,43} Peer sessions were designed to motivate and build self-efficacy to engage participants in HIV care, while respecting and integrating the participant's gender affirmation and other personal health and wellness goals. The Transgender Women Engagement and Entry to Care Project (TWEET) intervention implemented a unique strategy of having peer training and leadership as a core element, thus further enhancing the skills and agency of participants.²⁹ In several interventions, peers served as patient health navigators.^{18,27,32,33,35} Patient navigation is another strategy that leverages trusting and caring relationships with either peers or case manager social workers to support people who are newly diagnosed with HIV or who are out of care to connect to recommended services.⁵⁰

Four interventions focused primarily on addressing mental health and substance use as individual barriers to engagement in HIV care.^{25,28,36,37} A free clinic provided integrated care for people with co-occurring HIV, substance use, and psychiatric disorders but retained only 39% of transgender women.³⁶ The other 3 interventions adapted existing interventions to support transgender women with histories of trauma and, in 1 intervention, co-occurring substance use disorders.^{25,28,37} These interventions used evidence-based methods, such as expressive writing, cognitive processing, and cognitive-behavioral therapy, to increase coping skills and reduce symptoms of trauma and depression.

Behavioral economics theory purports that contingency-based financial rewards can motivate behavioral change.⁵¹ The Alexis Project intervention augmented a peer health navigation intervention with escalating financial rewards tied to achievements along the HIV care continuum. Other interventions granted monetary incentives for attendance in program sessions. As noted previously, many transgender women with HIV experience dire economic hardships.^{25,28,32} Cash incentives, or small culturally relevant gifts, may motivate some transgender women to change health behaviors, although questions remain about the long-term sustainability of this strategy.⁵¹

Technology-based health interventions are becoming increasingly common because of the nearly ubiquitous use of smartphones, tablets, social media applications (apps), and personal computers. Advantages include ease and low cost of scale-up, ability to reach people who otherwise may not access health venues, potential to support self-efficacy and self-management of HIV care, and social support from others with shared HIV status.^{52,53} Although smartphone interventions hold promise for reaching and engaging young transgender women as well as people in various sexual and gender minority groups, their feasibility and sustainability have come into question because young people often lose or change cell phones.⁵⁴ We found 5 technology-based interventions that primarily used scripted, automated, or personalized text or social media messaging to support medication and appointment adherence and to inspire behavioral change.^{30,34,38,39,41} Some interventions also included gaming features, rewards, calendar reminders, and peer social support,^{30,34,38} and one is testing a stepped method that adds on remote counseling for participants who did not respond to the more basic package.⁴¹

Discussion

Because this narrative topical review was focused on thematic synthesis, we summarized but did not systematically evaluate the methods or outcomes of each study. Overall, we found that the study designs and methodologies were not robust. Two studies reported only qualitative and program evaluation data,^{24,32} and most studies with quantitative outcomes used nonrandomized designs, with the most frequent design being pre-post intervention.^{18,25,28,29,31,33-36} Although only 2 of the completed intervention studies were randomized controlled trials,^{27,30} 5 study protocols described randomized designs,^{38,39,41-43} indicating that more rigorous research is forthcoming. In addition, several interventions were conducted as part of the Enhancing Engagement and Retention in Quality HIV Care for Transgender Women of Color multisite initiative with transgender women of color, from which additional findings will be published in 2022.^{44,55}

All studies with pre-post designs found at least 1 positive, significant effect on an HIV care continuum outcome

or mediator of HIV care continuum outcomes, indicating their potential for randomized trials and broader scale-up.^{18,25,28,29,31,33-36} Given the variation and weaknesses in study designs and measurement of outcomes, as well as variations in strategies, settings, and populations, it would not be possible to derive conclusions about the efficacy of the interventions, even with a systematic or meta-analytic approach. Moreover, because many of the interventions were holistic interventions with multiple components, their complexity makes it difficult to isolate the factors that contributed to an intervention's success. Given the practical challenges of evaluating multilevel and holistic interventions for transgender women with traditional study designs, using an implementation science evaluation framework may prove helpful for understanding which interventions are effective for transgender women with HIV.²⁰ In addition, mixed-method study designs with both quantitative and qualitative components could help to disaggregate broader findings about effectiveness.

Another challenge for researchers is the recruitment of enough transgender women with HIV to achieve sufficient sample size. Reasons why transgender women may not participate in research include a lack of time or transportation, concerns about stigma related to being transgender and having HIV, mistrust in the motivations of researchers, and possibly low levels of acceptance of randomized trials that deny control groups an opportunity to engage in an intervention.^{56,57} It is therefore notable that 5 studies in our review recruited more than 100 transgender women.^{29,31,33,39,42} These relatively large sample sizes suggest that interventions for this population are feasible, acceptable, and desired. It is also worth noting that most studies were conducted in clinics or community-based organizations rather than research facilities, making their findings potentially relevant to organizations with similar resources and populations of focus.^{18,23-35,40-43}

Public Health Implications

Interventions for transgender women must overcome complex structural, systems-level, and individual-level barriers, yet still be feasible to implement. Through the E2i initiative and other projects funded through SPNS, HRSA HAB is applying insights from implementation science to accelerate the identification and scale-up of interventions for transgender women and other priority populations across the Ryan White HIV/AIDS Program.²⁰⁻²² The goal of these projects is to widely disseminate best practices, findings, and lessons learned through publications and broadly accessible implementation toolkits to guide replication and adaptation at Ryan White HIV/AIDS Program sites and other direct service organizations. The TWEET and Healthy Divas interventions have recently been piloted and evaluated at 6 Ryan White HIV/AIDS Program-funded sites in diverse geographic areas as part of HRSA HAB's E2i initiative.^{21,22} The initiative is using an evaluation plan adapted from the Proctor

Model⁵⁸ that allows simultaneous assessment of HIV health outcomes along with the implementation strategies that drive successful uptake and organizational integration of the interventions. Future products from this and other SPNS initiatives will help to eliminate persistent gaps in outcomes along the HIV care continuum for transgender women.

To achieve HIV health equity for transgender women in the United States, it is critical to develop, implement, and disseminate interventions that break down pervasive structural barriers rooted in societal and cultural stigma and discrimination toward transgender people, while supporting empowerment of transgender women to make choices that improve their health and well-being.^{46,49} The findings of this topical review suggest that recent interventions have incorporated strategies that show promise for addressing barriers to engagement of transgender women along the HIV care continuum. Forthcoming publications from ongoing studies will further elucidate the efficacy and effectiveness of these interventions, with the goal of reducing disparities and ending the HIV epidemic among transgender women in the United States.

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ORCID iDs

Hilary Goldhammer, SM  <https://orcid.org/0000-0002-4382-2296>
Nicole S. Chavis, MPH  <https://orcid.org/0000-0001-8311-5804>

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