



Leveraging U = U in Interventions for Black Women Living With HIV: A Scoping Review and Call To Action

Megan A. Jones¹ · Simone Sawyer¹ · Isabella Bowman¹ · Maniza A. Habib² · Deborah Wassertzug³ · Tamara Taggart^{1,4}

Accepted: 2025-02-10

The Author(s) 2025. This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

Introduction

Despite significant reductions in the incidence and prevalence of human immunodeficiency virus (HIV) over recent decades, certain subgroups continue to experience disproportionate HIV-related health disparities. Cisgender Black women, in particular, remain disproportionately affected by HIV [1]. In 2019, Black women constituted 54% of all women diagnosed with HIV in the United States (US), despite making up less than 15% of the female population [1]. In addition, Black women living with HIV (BWLH) also face several barriers to HIV-related health care, including inadequate social support, pervasive HIV stigma, poor quality HIV health care services, microaggressions and discrimination, psychological comorbidities (e.g., depression, anxiety), and structural barriers including limited transportation access and lack of health insurance coverage [2–5].

These social-structural and psychosocial barriers often lead to adverse HIV-related health outcomes, including suboptimal antiretroviral therapy (ART) adherence, inadequate linkage to care following diagnosis, higher viral load, increased HIV-related mortality, and worsened quality of life [6–9]. Compared to white women and Hispanic/Latina/x

women living with HIV, BWLH are less frequently linked to care after diagnosis, experience reduced ART adherence, and are less likely to achieve viral suppression [4, 7, 10]. In addition, BWLH may also experience higher rates of substance use compared to their HIV-negative peers; this is detrimental to HIV-related health outcomes and is often found to be associated with a higher viral load and reduced medication adherence [11, 12]. Extant literature posits that structural barriers, such as poverty, housing instability, incarceration, and discrimination in health care settings may drive these disparities in HIV-related health outcomes [2, 13, 14]. In addition, BWLH tend to experience heightened psychosocial barriers, such as HIV-related stigma, difficulty coping with their HIV status, and reduced social support compared to other demographic groups, further contributing to disparities in HIV [3, 15–18].

Despite the significant disparities faced by BWLH, there remains a paucity of interventions specifically designed to improve outcomes for this population [19, 20]. This gap is particularly concerning given the intersectional nature of the challenges faced by BWLH, in which race, gender, and HIV status interact to create unique barriers to care and well-being. Prior reviews have examined interventions to support

✉ Tamara Taggart
ttaggart@gwu.edu

Megan A. Jones
megan.jones@gwu.edu

Simone Sawyer
ssawyer20@gwu.edu

Isabella Bowman
bella_bowman@gwmail.gwu.edu

Maniza A. Habib
manizahabib@gmail.com

Deborah Wassertzug
deborah.wassertzug@email.gwu.edu

¹ Department of Prevention and Community Health, Milken Institute School of Public Health, George Washington University, Washington, DC, USA

² Department of Global Health, Milken Institute School of Public Health, George Washington University, Washington, DC, USA

³ Paul Himmelfarb Health Sciences Library, School of Medicine & Health Sciences, George Washington University, Washington, DC, USA

⁴ Department of Social and Behavioral Sciences, Yale University, New Haven, CT, USA

people living with HIV (PLWH), including those designed to reduce HIV-related stigma, reduce behavioral risk-taking, address substance use, improve mental health outcomes, and improve health literacy [21–26]. However, there appears to be few studies examining interventions tailored to BWLH more broadly, potentially exacerbating racial and gender disparities in HIV. Since 2016, significant emphasis has been placed on the concept of ‘undetectable=untransmittable’, or ‘U=U’, meaning that PLWH who sustain an undetectable viral load cannot transmit the virus via sexual contact [27]. Thus, improving HIV-related health outcomes not only mitigates HIV-related morbidities and mortalities for PLWH, but it also serves as a critical HIV prevention strategy and a key component of the US *Ending the HIV Epidemic* (EHE) initiative [28]. This paradigm shift guides the development of programs and interventions aimed at improving health outcomes for PLWH. For instance, U=U has been shown to be an effective messaging strategy that is associated with increased HIV testing, reduced HIV-related stigma, and overall improved health outcomes for PLWH [29–31]. Therefore, U=U has the potential to mitigate the HIV-related intersectional stigma often experienced by BWLH by disseminating accurate non-stigmatizing information about HIV transmission, thereby reducing fears and stigmatization [32, 33]. Further, promoting U=U may facilitate ART adherence, and more broadly, engagement in HIV care among BWLH [34]. Given the epidemiological shift in HIV that has occurred in recent decades, U=U provides a foundation upon which to develop more empowering, destigmatizing, and comprehensive interventions that address the unique needs and challenges faced by BWLH, while promoting their overall well-being and quality of life.

Ultimately, the limited number of interventions for BWLH represents a missed opportunity to leverage the empowering message of U=U in addressing the unique challenges faced by this group. This gap not only fails to capitalize on the potential benefits of U=U for BWLH - such as reduced stigma, improved treatment adherence, and enhanced quality of life - but also risks exacerbating existing

racial disparities in HIV, underscoring the need for a comprehensive review of existing research in this area. Therefore, the purpose of the current scoping review is to provide an overview of the available research evidence related to interventions that support BWLH, published between 2016, when U=U was first introduced, and 2024, and to identify opportunities to better integrate U=U messaging and principles in future interventions tailored to this population to address persistent inequities.

Methods

Search Strategy

This review was designed by domain experts (TT and MJ) in consultation with a health sciences librarian (DW). We conducted the search in accordance with the PRISMA Statement [35]. We searched PubMed, CINAHL, PsycINFO, Scopus, and Web of Science for research published (in print or electronically) in English between January 1, 2016, and February 16, 2024. The search used keyword searches of the title and abstract fields as well as controlled vocabulary to identify intervention research articles to improve HIV treatment among BWLH (see the Appendix for a full list of search terms; search terms used in Pubmed are in Table 1). Search terms were informed by search terms used in other systematic reviews and in consultation with our domain experts and librarian [22–26]. Reference sections of relevant review articles were searched for any intervention studies not identified through the above search, but that potentially met the inclusion criteria for this review.

Selection Criteria

The articles selected for this review were screened for relevance, duplication, and meeting the selection criteria. The inclusion criteria were: (1) Reported on an intervention study to improve HIV-related health outcomes, (2) 60% or more of the sample is cisgender Black/African American women ages 18 years and older living with HIV, and (3) published in a peer-reviewed journal after 2016 to capture intervention studies just prior to and after the U=U campaign was launched by Prevention Access Campaign in early 2016 [36]. We excluded studies that were: (1) Majority of the population was not cisgender Black/African American women living with HIV, (2) outside of the US, (3) study in a language other than English, (4) intervention outcomes did not include HIV-related health outcomes, and (5) commentaries, letters to the editor or opinion pieces, dissertations, protocols, and retrospective chart reviews.

Table 1 List of search terms for pubmed

(“Black or African American”[MeSH Terms] OR “Black*”[Title/Abstract] OR “African American*”[Title/Abstract])
 (“women”[MeSH Terms] OR “female”[MeSH Terms] OR “woman*”[Title/Abstract] OR “women*”[Title/Abstract] OR “female*”[Title/Abstract])
 (HIV [Title/Abstract] OR AIDS [Title/Abstract] OR human immunodeficiency virus [tiab] OR acquired immunodeficiency syndrome [tiab])
 (“engag*”[Title/Abstract] OR “treat*”[Title/Abstract] OR “care continuum”[Title/Abstract] OR “Antiretroviral Therapy, Highly Active”[Mesh] OR ART[Title/Abstract] OR “antiretroviral therapy”[Title/Abstract] OR HAART OR “highly active antiretroviral therapy”[Title/Abstract])
 (2016:2024[pdat])

Data Management

Covidence, a widely-used systematic review data management program [68], was used for deduplication and to conduct title, abstract, and full-text review (see PRISMA diagram, Fig. 1). Working in pairs, the full research team independently reviewed and evaluated all retrieved title and abstract and then the full text of each article using the aforementioned criteria. Discrepancies during title and abstract, and full-text review were resolved by the first and senior author (MJ, TT).

Data Extraction and Study Quality

Data were extracted from full-text articles using a set of 18 defined fields related to the study design, methods, outcomes, and implications; intervention characteristics, components, and approach; and study sample characteristics, size, and retention. Given the importance of using theory when developing interventions, we extracted data to quantify studies where authors stated the theories or frameworks they used to guide their work including common health behavior theories. We also extracted whether the intervention included U=U and U=U messaging as an intervention element. Members of the research team independently extracted data from each article. The first, second, and senior authors (MJ, SS, TT) reviewed all extracted data for accuracy and completeness.

We conducted a risk of bias quality assessment using the Joanna Briggs Institute's Evidence Synthesis Critical Appraisal Tool checklist for each type of study design included in the review [37]. The checklists contain questions about the research methods, study design, sample, and analyses to evaluate the quality and validity of each study. After reviewing the checklist items, it was determined that a minimum of 70% of the checklist items must be met for the study to be included in the review as low risk of bias.

Results

Study Selection

Electronic database searches identified 2,192 studies with relevant key terms, after removing duplicates. During title and abstract review, 2,154 studies were determined to be irrelevant and were therefore excluded. Thirty-eight studies were assessed for eligibility in a full-text review; 30 were excluded because they did not meet the inclusion criteria (e.g., wrong population, no intervention, irrelevant outcomes). The final sample for the present scoping review included eight studies. Five studies met 100% of the

checklist criteria for inclusion in the review. The remaining three studies met at least 70% of the checklist criteria. We did not exclude any full text articles based on study quality. Therefore, the studies included in this review showed strong methodological rigor in terms of the design and execution of research and demonstrated low risk of bias.

Descriptive Study Characteristics

The eight included studies were published between 2018 and 2023. Study recruitment occurred in a health clinic and in the community (e.g., community health centers, support groups, research registries, and flyers in community settings). The descriptive study characteristics are summarized in Table 2.

Sample Sociodemographics and Retention

In total, 669 PLWH participated in the studies ($M=83.62$, $SD=85.88$; range=5 to 239); of the seven studies that reported retention, average retention was 88.4% ($SD=4.9$). 91% of the total participants were BWLH. Of the studies that reported the age range and mean age of the participants, the mean age was 45.4 years ($SD=6.82$, range=18–65) and all participants were 18 years or older. Among the eight studies reviewed, only one reported the sexual orientation of its participants; in that particular study, all participants identified as heterosexual.

Intervention Modalities, Components, and Durations

Study interventions occurred in clinical spaces ($N=2$), community settings ($N=1$), both clinical and community spaces ($N=1$), research spaces ($N=2$), and completely digital/remote ($N=2$). Most interventions were delivered in-person ($N=5$), with the remainder using digital platforms such as video calls and SMS/text messages ($N=3$). The intervention components varied widely; components included medication delivery ($N=1$), individual counseling sessions ($N=4$) (e.g., cognitive behavioral therapy for adherence and depression (CBT-AD), counseling for adherence, etc.), educational modules ($N=2$) (e.g., curriculum about HIV designed to improve health literacy, psychoeducation on treatment models, etc.), skills training ($N=4$) (e.g., coping mechanisms to deal with stigma and discrimination, using medication event-monitoring systems (MEMS), cognitive strategies to address trauma symptoms, problem-solving to address medication adherence, etc.), group workshops ($N=1$) (e.g., large- and small-group discussions, brainstorming, dyadic presentations, and role play), text messages and/or phone calls ($N=2$), audiovisual materials ($N=2$) (e.g., films), and

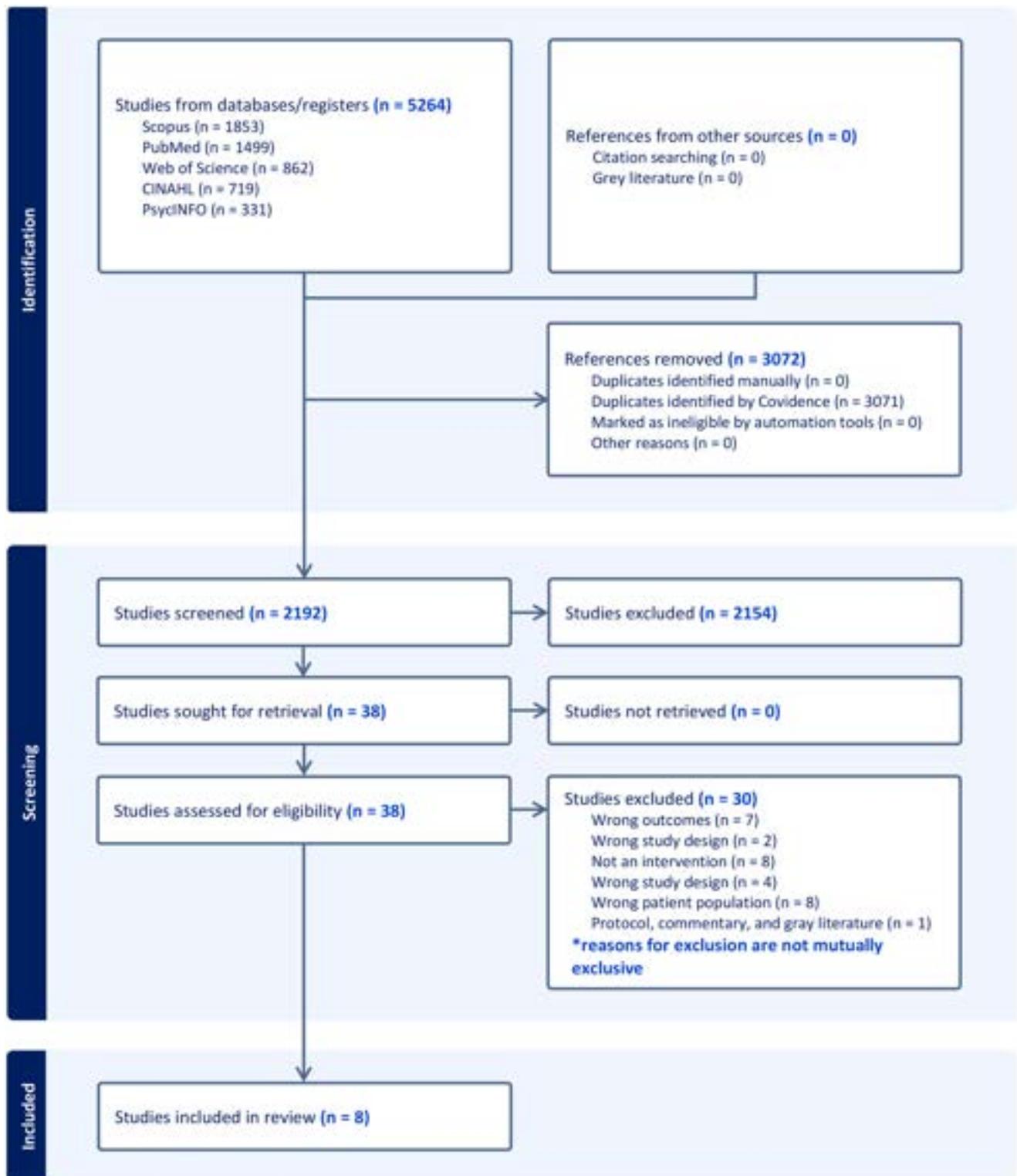


Fig. 1 PRISMA-diagram-describing-screening-and-selection-process

Table 2 Study, sample, and intervention details for the 8 included studies

Citation	Sample	Setting and location	Intervention modalities	Intervention duration	Intervention components	Key Findings
Amutah-Onukagha et al., 2021 [49]	<i>N</i> =17; 100% BWLH	Clinical space; Jamaica Plain, MA	In-person	6 weeks	Educational modules	The health literacy intervention showed both feasibility and acceptability in a community setting.
Bryant et al., 2023 [43]	<i>N</i> =130; 100% BWLH; <i>M</i> _{age} =32.2	Digital; Southern USA	Digital	18 min	Audiovisual materials; text messages	The film-based intervention is an effective strategy for improving intentions to disclose HIV status to an intimate partner.
Cook et al., 2019 [47]	<i>N</i> =221; 83% BWLH; <i>M</i> _{age} =48	Clinical space and community settings; Miami, FL	In-person	4 months	Medication delivery; individual counseling sessions	Participation in the intervention, in either condition, was associated with a reduction in drinking alcohol, suggesting that the non-medication aspects of participation in a research study motivated participants to reduce their alcohol consumption.
Dale & Safren, 2018 [41]	<i>N</i> =5; 100% BWLH	Research space; urban city in Northeastern USA	In-person	10 weeks	Individual counseling sessions; skills training; medication event-monitoring systems (MEMS)	The tailored Cognitive Behavioral Therapy (CBT) intervention showed promise in improving HIV medication adherence and decreasing trauma symptoms.
Junkins et al., 2021 [50]	<i>N</i> =22; 100% BWLH	Research space; Alabama	Digital	10–12 weeks	Individual counseling sessions; skills training; medication event-monitoring systems (MEMS)	Telemedicine-administered psychotherapy demonstrated both feasibility and acceptability; depression symptoms were reduced among participants in both study conditions.
Kim et al., 2020 [48]	<i>N</i> =53; 77.8% BWLH; <i>M</i> _{age} =51.4	Digital; USA	Digital	8 weeks	Audiovisual materials; individual counseling sessions	The odds of achieving three-month prolonged abstinence from tobacco use were higher among those who received the digital storytelling intervention than among those in the control condition.
Lucero et al., 2020 [42]	<i>N</i> =14; 100% BWLH; <i>M</i> _{age} =49	Community setting; Florida	In-person	30 days	Skills training; telephone calls; medication event-monitoring systems (MEMS)	Both objective and subjective ART adherence improved among participants who completed the intervention.
Rao et al., 2018 [44]	<i>N</i> =239; 100% BWLH; <i>M</i> _{age} =46.5	Clinical space; Chicago, IL	In-person	2 days	Group workshops; educational modules; skills training	While the intervention did not reduced levels of HIV stigma, the results suggest that social support may be a key aspect of HIV-related stigma reduction.

medication event-monitoring systems (MEMS) (*N*=3). Intervention durations ranged from 18 min to four months.

Intervention Purposes, Measures, and Outcomes

The overarching goal of all eight studies was to support and improve health outcomes for BWLH, with individual studies varying in their specific approaches and outcomes. Two studies primarily assessed the feasibility and acceptability of their respective interventions. The remaining six studies examined various HIV-related and general health outcomes as the primary outcomes, including alcohol consumption (*N*=1), HIV-related stigma (*N*=2), smoking cessation (*N*=1), ART adherence (*N*=3), viral load suppression (*N*=1), trauma symptom reduction (*N*=1), and HIV status disclosure (*N*=1).

The studies used various measures to evaluate the interventions including sociodemographics (*N*=8), clinical

assessments (e.g., blood pressure, CD4 count, viral load) (*N*=4), behavioral self-report measures (e.g., substance use, sexual behavior) (*N*=2), assessments of health-related beliefs and attitudes including self-efficacy and behavioral intentions (*N*=3), knowledge assessments (*N*=1), questions about living with HIV (e.g., time since diagnosis and health care utilization) (*N*=3), ART adherence (*N*=3), HIV-related stigma (*N*=2), perceived social support (*N*=1), and measures of depression (*N*=1) (e.g., CES-D Depression Scale). There was some variability in how ART adherence was measured among the included studies. Three studies utilized the Wisepill MEMS device [38], which objectively measures ART adherence (e.g., percent ART adherence over a given time period). One of these studies also measured subjective adherence using a three-item self-report measure that assesses adherence during the past 30 days [39]. Two other studies used a standardized self-report measure of ART adherence during a 30-day time period [40]. The

primary outcomes of the studies and the related findings are described below:

ART Adherence

Two studies [41, 42] assessed the impact of an intervention on ART adherence as a primary outcome. Both utilized the Wisepill MEMS device to measure objective ART adherence. In one [42], the intervention, which focused on the Wisepill MEMS device and training participants to use it, the average overall objective ART adherence was 81.08%, and 30-day medication event patterns were generally characteristic of ART adherence. Another study [41] showed that of the women who were taking ART, all either improved their adherence or maintained 100% adherence as a result of the intervention.

A third study [43] examined ART adherence intentions; however, no significant difference in intentions was observed between the intervention and control groups.

Viral Load Suppression

One study [41] examined viral load suppression as a primary outcome. Only one of the five study participants with a detectable viral load at baseline changed from a detectable viral load at baseline to an undetectable viral load at follow-up; however, viral load data obtained via medical records were not consistently available for all study participants.

HIV Status Disclosure

One study [43] assessed intentions to disclose HIV status to intimate partners following the film-based intervention. The findings indicated that participants in the intervention group had increased intentions to disclose their status to a partner compared to participants in the control group.

HIV Stigma

Two of the interventions in the included studies [43, 44] aimed to reduce HIV-related stigma. In one study [44], the group workshop-based intervention was not significantly associated with reductions in HIV stigma; however, both the intervention and control groups experienced decreases in mean stigma scores. Post hoc analyses suggested that these decreases may be due to increased perceived social support, rather than from the intervention itself. Another study [43] focused specifically on internalized HIV stigma, or the extent to which one internalizes negative beliefs or feelings about HIV in relation to themselves [45]; results suggested that the film-based intervention

was not associated with any changes in internalized HIV stigma.

Trauma Symptom Reduction

One study [41] utilized the Davidson Trauma Scale (DTS) [46] to assess whether the intervention played a role in the reduction of trauma symptoms. Results suggested that the intervention was effective at reducing trauma symptomology, as all five participants scored lower for post-traumatic stress disorder (PTSD) symptoms on the DTS when assessed at follow-up.

Alcohol Consumption

One study [47] examined the impact of a naltrexone medication on the reduction of drinking to below unhealthy amounts among BWLH. The naltrexone intervention significantly reduced alcohol use among participants in the intervention group compared to those in the control group at the 1- and 3-month follow-ups, but there was no significant difference at the 4- and 7-month follow-ups. HIV viral suppression was found to be better among participants who reduced or quit drinking alcohol.

Smoking

One study [48] examined the impact of an intervention that incorporated both a film and individual counseling sessions on smoking cessation, measured by the 7-day point prevalence abstinence (i.e., not having a single puff of a cigarette during the past seven days). While no difference in the 7-day point prevalence abstinence rates were found between the intervention and control groups, those in the intervention group did have greater odds of achieving 3-month prolonged abstinence compared to those in the control group.

Feasibility and Acceptability

For two studies [49, 50], the primary outcomes were the feasibility and acceptability of the interventions. Amutah-Onukagha and colleagues [49] found that their health literacy intervention showed potential for improving health outcomes for BWLH in community settings via increased confidence, better disease management, advocacy skills, and goal-setting. Similarly, findings from Junkins and colleagues [50] suggest that the telemedicine-administered psychotherapy intervention was effective at addressing the mental health concerns of BWLH; depression symptoms decreased in both study arms and all participants maintained high ART-adherence.

Theoretical Frameworks, Models, and Approaches

Several of the included studies drew on various theories, models, and approaches to develop the interventions. Self-Efficacy Theory [51] ($N=1$), cognitive-behavioral approaches ($N=2$) (e.g., cognitive-behavioral problem solving, culturally-adapted cognitive behavioral therapy for adherence and depression (CBT-AD)), motivational interviewing ($N=2$), trauma-informed principles ($N=1$), gender empowerment theory ($N=1$), and the disclosure processes model [52] ($N=1$). For each of these, the theory, model, or approach was briefly described, and authors included a concise description of how the theory or model informed their intervention development.

Inclusion of U=U in the Interventions

Despite the emphasis on U=U as a key HIV prevention strategy since 2016, none of the included studies explicitly described U=U or U=U messaging as an intervention component.

Discussion

The current scoping review aims to describe interventions specifically designed for BWLH, with a focus on identifying opportunities to integrate U=U messaging and principles. Our findings reveal a critical gap that despite BWLH being disproportionately affected by HIV, there are few interventions for this population. Moreover, none of the included studies explicitly leveraged U=U messaging. While these studies provide an important foundation, reducing health disparities for BWLH will require interventions that utilize a health equity lens building upon U=U, address barriers across multiple levels of the socioecological model [53], and apply intersectional frameworks to address the complex interplay of race, gender, and HIV status.

Supporting the well-being of BWLH from a health equity perspective is a critical component of reducing health disparities and improving outcomes for this population. Drawing on an equity lens requires an intentional focus on BWLH as a priority subgroup for HIV in treatment resources, research, interventions, and policies, as well as a more nuanced understanding of the unique social-structural barriers they face. U=U health communication messaging [27, 36] is one strategy that has the potential to guide the development of more equitable and comprehensive interventions and policies for BWLH. For instance, U=U may help to mitigate intersectional stigma and help to address the specific needs of BWLH [27, 36]. Despite our review assessing studies published since U=U was launched, none of the included

studies explicitly utilized the concept of U=U in the development or implementation of their interventions. Given the potential promise of U=U as an effective messaging tool to promote treatment as prevention and reduce intersectional stigma (e.g., [29, 32, 54]), future interventions for BWLH should consider integrating U=U principles to enhance equity and address population specific needs. For example, interventions might incorporate U=U messaging into counseling or health education sessions to empower BWLH to maintain care and to reduce internalized stigma. Interventions guided by U=U might also address structural barriers by including advocacy for policies that remove barriers to care and reflect the latest scientific evidence on HIV transmission risk. It is possible that a lack of awareness about or skepticism of U=U among researchers and intervention developers is posing a barrier to the inclusion of U=U in more interventions supporting those living with HIV. Since U=U was introduced less than ten years ago, it is essential that health care providers and researchers continue to be made aware of and educated about the concept in order for it to be utilized in HIV prevention and care interventions to its full potential. In addition, our review also indicates a lack of emphasis on addressing barriers to engagement in HIV treatment and care at multiple levels of the socioecological model [53]. Despite the need for multilevel intervention strategies to effectively achieve EHE goals, few studies in the current scoping review [43, 44] incorporated multilevel intervention strategies. While several of the included studies incorporated individual, interpersonal or community level strategies into the interventions (e.g., individual counseling, group-based workshops, community-based settings), only one [49] incorporated strategies at the institutional level; in this case, this was the addition of advocacy as part of the intervention. Ultimately, to better address HIV-related health disparities for BWLH, there is a need for future interventions that incorporate strategies and outcomes addressing multilevel drivers of disparities, especially social-structural barriers. These interventions should aim to leverage Black women's strengths and assets by providing spaces where BWLH feel physically and psychologically safe and are able to build and maintain their social support systems, reduce stressors, and be empowered to advocate for their needs [55]. Strategies to do so may include improving economic stability for BWLH [56, 57], as poverty is documented to be a social-structural driver of HIV disparities [13, 58]. These considerations highlight the continued need for intersectional frameworks to be applied to interventions for BWLH to better address the several interlocking systems of oppression that they are navigating.

Surprisingly, we found that six out of the eight studies included in the present review included a discussion of the intersectional barriers that influence BWLH's health

outcomes [41–44, 48, 49]. Yet, only two studies [41, 49] explicitly utilized and applied an intersectional framework within their interventions (i.e., CBPR, advocacy education, gender related coping and resilience, coping strategies for racial and HIV discrimination). It is important for researchers to not only acknowledge the racial, gendered, socioeconomic, and HIV status barriers experienced by BWLH, but also incorporate intersectional theories and approaches within their work in order to address them [59, 60]. Addressing intersectional biases in our broader systems and increasing access to racially and gendered congruent providers can improve access to quality and culturally responsive care for BWLH [3, 61]. Further, the use of community-engagement in HIV intervention development is another way to support the application of intersectional frameworks [62, 63]. The individuals who can best understand the intersectional barriers and facilitators to care are those who live and experience them daily; therefore, including community members in the design of interventions, healthcare systems, and policies is critical to addressing HIV disparities [64]. Thus, engaging BWLH is an imperative component of developing interventions for this population and can help to facilitate the application of intersectional frameworks [59, 60, 64]. Including BWLH as co-investigators, community advisory board members, or staff members on the research team is an essential first step that can greatly strengthen interventions; however, ensuring they have opportunities for capacity building and decision-making power regarding research design, implementation, and evaluation are also essential for intervention effectiveness [62, 63, 65, 66].

The findings of the current scoping review should be interpreted in light of its limitations. First, the review did not include a search of clinical trials, protocols, or NIH Reporter. Therefore, interventions that are recent or currently being tested were not included, as the focus was placed on identifying intervention research with published results. Second, publication bias may also exist because of the exclusion of grey literature and studies published in languages other than English. Next, most of the outcomes in the included studies involved self-report measures, which are vulnerable to biases. For example, although several different types of pharmacologic measures of ART adherence and real-time monitoring are now available [67], most measures of ART adherence in the included studies are based on self-report. Finally, it is possible that the concept of U=U was incorporated into an intervention (e.g., as a component of CBT), but not explicitly reported in the article; therefore, the current scoping review may underestimate the use of U=U in interventions designed to support BWLH.

Conclusion

Overall, few interventions have been developed that are specifically tailored to support BWLH, despite the need for research addressing HIV inequities among this population. Our review highlights the need for HIV intervention research that is specifically tailored to the experiences of BWLH. There is a critical need for the development of more interventions for BWLH that are built on evidence-based strategies. Leveraging U=U messaging is an important component of interventions and could potentially be a powerful tool for reducing HIV-related stigma and empowering BWLH to connect to and remain engaged in care. U=U may also help promote the latest scientific evidence on HIV transmission and may be used to advocate for policy changes that address structural barriers to HIV care access and retention. Multilevel interventions that are guided by health equity and intersectionality frameworks and draw on U=U messaging and community-engaged strategies have great potential for improving the health and well-being of BWLH and ultimately, reducing HIV-related health disparities.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10461-025-04670-6>.

Acknowledgements We would like to thank Thomas Harrod of the Himmelfarb Health Sciences Library at George Washington University, for his suggestions on structuring the search. This research was funded in part by a pilot award from the District of Columbia Center for AIDS Research (DC CFAR), an NIH funded program (P30AI117970), which is supported by the following NIH Co-Funding and Participating Institutes and Centers: NIAID, NCI, NICHD, NHLBI, NIDA, NIMH, NIA, NIDDK, NIMHD, NIDCR, NINR, FIC and OAR. T. Taggart's effort was supported by UG3/UH3AI169655, R01DA056264, and R01MD019763. M. Jones' effort was supported by UG3/UH3AI169655. S. Sawyer's effort was supported by T32MH130247. The funders had no role in the preparation or submission of the manuscript.

Author Contributions Conceptualization (T.T.), data curation (D.W., T.T.), formal analysis (M.J., S.S., I.B., M.H., T.T.), funding acquisition (T.T.), investigation (M.J., S.S., T.T.), methodology (M.J., T.T.), project administration (M.J., T.T.), writing – original draft (M.J., S.S., I.B., M.H., T.T.), writing – review and editing (M.J., S.S., D.W., T.T.).

Competing Interests The authors have no relevant financial or non-financial interests to disclose.

References

1. CDC, Fast Facts HIV, Women HIV, Accessed. Jun. 14, 2024. [Online]. Available: <https://www.cdc.gov/hiv/data-research/facts-stats/women.html>
2. Aziz M, Smith KY. Challenges and Successes in Linking HIV-Infected Women to Care in the United States, *Clinical Infectious*

- Diseases*, vol. 52, no. suppl_2, pp. S231–S237, Jan. 2011, <https://doi.org/10.1093/cid/ciq047>
3. Dale SK, Dean T, Sharma R, Reid R, Saunders S, Safren SA. Microaggressions and Discrimination Relate to Barriers to Care Among Black Women Living with HIV, *AIDS Patient Care and STDs*, vol. 33, no. 4, pp. 175–183, Apr. 2019, <https://doi.org/10.1089/apc.2018.0258>
 4. Geter A, Sutton MY, Hubbard D, McCree. Social and structural determinants of HIV treatment and care among black women living with HIV infection: a systematic review: 2005–2016, *AIDS Care*, vol. 30, no. 4, pp. 409–416, Apr. 2018, <https://doi.org/10.1080/09540121.2018.1426827>
 5. Toth M, Messer LC, Quinlivan EB. Barriers to HIV Care for Women of Color Living in the Southeastern US Are Associated with Physical Symptoms, Social Environment, and Self-Determination, *AIDS Patient Care and STDs*, vol. 27, no. 11, pp. 613–620, Nov. 2013, <https://doi.org/10.1089/apc.2013.0030>
 6. Attonito J, Dévieux JG, Lerner BDG, Hospital MM, Rosenberg R. Antiretroviral treatment adherence as a mediating factor between psychosocial variables and HIV viral load. *J Assoc Nurses AIDS Care*. 2014;25(6):626–37. <https://doi.org/10.1016/j.jana.2014.08.001>.
 7. Geter A, Sutton MY, Armon C, Buchacz K, for the HIV Outpatient Study Investigators. Nov., and, Disparities in Viral Suppression and Medication Adherence among Women in the USA, 2011–2016, *AIDS Behav*, vol. 23, no. 11, pp. 3015–3023, 2019, <https://doi.org/10.1007/s10461-019-02494-9>
 8. Levira F, Todd J, Masanja H. Coming home to die? The association between migration and mortality in rural Tanzania before and after ART scale-up. *Global Health Action*. Dec. 2014;7(1):22956. <https://doi.org/10.3402/gha.v7.22956>.
 9. Pope CN, Stavrinou D, Fazeli PL, Vance DE. Transportation Barriers and Health-Related Quality of Life in a Sample of Middle-Aged and Older Adults Living with HIV in the Deep South, *AIDS Behav*, vol. 26, no. 7, pp. 2148–2158, Jul. 2022, <https://doi.org/10.1007/s10461-021-03560-x>
 10. Crepaz N. Racial and ethnic disparities in sustained viral suppression and transmission risk potential among persons receiving HIV Care — United States, 2014. *MMWR Morb Mortal Wkly Rep*. 2018;67. <https://doi.org/10.15585/mmwr.mm6704a2>.
 11. Deren S, et al. Substance use among older people living with HIV: challenges for health care providers. *Front Public Health*. Apr. 2019;7. <https://doi.org/10.3389/fpubh.2019.00094>.
 12. Reid R, Dale SK. Moderating effects of social support on the relationship between substance use disorders and HIV viral load and medication adherence among Black women living with HIV in the United States, *AIDS Care*, vol. 34, no. 10, pp. 1219–1228, Oct. 2022, <https://doi.org/10.1080/09540121.2021.2001415>
 13. Bradley ELP, Frazier EL, Carree T, Hubbard D, McCree, Sutton MY. Psychological and social determinants of health, antiretroviral therapy (ART) adherence, and viral suppression among HIV-positive black women in care, *AIDS Care*, vol. 31, no. 8, pp. 932–941, Aug. 2019, <https://doi.org/10.1080/09540121.2019.1612022>
 14. Health Resources and Services Administration. Ryan White HIV/AIDS Program Annual Client-Level Data Report 2020, Dec. 2021. [Online]. Available: www.hrsa.gov/data/data-reports
 15. Edwards LV, Perceived Social Support and HIV/AIDS Medication Adherence Among African American Women -, Edwards LV. 2006, *Qualitative Health Research*, vol. 16, no. 5, pp. 679–691, May 2006. <https://doi.org/10.1177/1049732305281597>
 16. Feist-Price S, Wright LB. African American women living with HIV/AIDS: mental health issues. *Women Therapy*. May 2003;26:1–2. https://doi.org/10.1300/J015v26n01_02.
 17. Israelski DM et al. Feb., Psychiatric co-morbidity in vulnerable populations receiving primary care for HIV/AIDS, *AIDS Care*, vol. 19, no. 2, pp. 220–225, 2007, <https://doi.org/10.1080/09540120600774230>
 18. Rice WS, et al. Perceptions of intersectional stigma among diverse women living with HIV in the United States. *Soc Sci Med*. Jul. 2018;208:9–17. <https://doi.org/10.1016/j.socscimed.2018.05.001>.
 19. Kennedy B, Jenkins CC. Promoting African American Women and Sexual Assertiveness in Reducing HIV/AIDS: An Analytical Review of the Research Literature, *Journal of Cultural Diversity*, vol. 18, pp. 1–17, Jan. 2013.
 20. Sophus AI, Mitchell JW. Reducing HIV Risk Behaviors Among Black Women Living With and Without HIV/AIDS in the U.S.: A Systematic Review, *AIDS Behav*, vol. 25, no. 3, pp. 732–747, Mar. 2021, <https://doi.org/10.1007/s10461-020-03029-3>
 21. Andersson GZ, et al. Stigma reduction interventions in people living with HIV to improve health-related quality of life. *Lancet HIV*. Feb. 2020;7(2):e129–40. [https://doi.org/10.1016/S2352-3018\(19\)30343-1](https://doi.org/10.1016/S2352-3018(19)30343-1).
 22. Crepaz N et al. Jan., Do prevention interventions reduce HIV risk behaviours among people living with HIV? A meta-analytic review of controlled trials, *AIDS*, vol. 20, no. 2, p. 143, 2006, <https://doi.org/10.1097/01.aids.0000196166.48518.a0>
 23. Moscou-Jackson G, Commodore-Mensah Y, Farley J, DiGiacomo M. Smoking-Cessation interventions in people living with HIV infection: A systematic review. *J Assoc Nurses AIDS Care*. Jan. 2014;25(1):32–45. <https://doi.org/10.1016/j.jana.2013.04.005>.
 24. Perazzo J, Reyes D, Webel A. A systematic review of health literacy interventions for people living with HIV. *AIDS Behav*. Mar. 2017;21(3):812–21. <https://doi.org/10.1007/s10461-016-1329-6>.
 25. Scott-Sheldon LAJ, Carey KB, Johnson BT, Carey MP, Team TMASHR. Behavioral Interventions Targeting Alcohol Use Among People Living with HIV/AIDS: A Systematic Review and Meta-Analysis, *AIDS Behav*, vol. 21, no. 2, pp. 126–143, Nov. 2017, <https://doi.org/10.1007/s10461-017-1886-3>
 26. van Luenen S, Garnefski N, Spinhoven P, Spaan P, Dusseldorp E, Kraaij V. The benefits of psychosocial interventions for mental health in people living with HIV: A systematic review and Meta-analysis. *AIDS Behav*. Jan. 2018;22(1):9–42. <https://doi.org/10.1007/s10461-017-1757-y>.
 27. HIV Undetectable=Untransmittable. (U=U), or Treatment as Prevention] NIAID: National Institute of Allergy and Infectious Diseases. Accessed: Jun. 18, 2024. [Online]. Available: <https://www.niaid.nih.gov/diseases-conditions/treatment-prevention>
 28. Fauci AS, Redfield RR, Sigounas G, Weahkee MD, Giroir BP. Ending the HIV Epidemic: A Plan for the United States, *JAMA*, vol. 321, no. 9, pp. 844–845, Mar. 2019, <https://doi.org/10.1001/jama.2019.1343>
 29. Okoli C, et al. Undetectable equals untransmittable (U=U): awareness and associations with health outcomes among people living with HIV in 25 countries. *Sex Transm Infect*. Feb. 2021;97(1):18–26. <https://doi.org/10.1136/sextrans-2020-054551>.
 30. Rivera DB, Brady JP, Blashill AJ. Traditional Machismo, Caballerismo, and the Pre-Exposure Prophylaxis (PrEP) Cascade Among a Sample of Latino Sexual Minority Men, *The Journal of Sex Research*, vol. 58, no. 1, pp. 21–28, Jan. 2021, <https://doi.org/10.1080/00224499.2020.1743961>
 31. Smith P, Buttenheim A, Schmucker L, Bekker L-G, Thirumurthy H, Davey DLJ. Undetectable=Untransmittable (U=U) Messaging Increases Uptake of HIV Testing Among Men: Results from a Pilot Cluster Randomized Trial, *AIDS Behav*, vol. 25, no. 10, pp. 3128–3136, Oct. 2021, <https://doi.org/10.1007/s10461-021-03284-y>
 32. Taggart T, Ritchwood TD, Nyhan K, Ransome Y. Messaging matters: achieving equity in the HIV response through public health

- communication. *Lancet HIV*. Jun. 2021;8(6):e376–86. [https://doi.org/10.1016/S2352-3018\(21\)00078-3](https://doi.org/10.1016/S2352-3018(21)00078-3).
33. Wright IA et al. Neighborhood Characteristics, Intersectional Discrimination, Mental Health, and HIV Outcomes Among Black Women Living With HIV, Southeastern United States, 2019–2020. *Am J Public Health*, vol. 112, no. S4, pp. S433–S443, Jun. 2022. <https://doi.org/10.2105/AJPH.2021.306675>
 34. Thomford NE, Mhandire D, Dandara C, Kyei GB. Promoting undetectable equals untransmittable in Sub-Saharan Africa: implication for clinical practice and ART adherence. *Int J Environ Res Public Health*. 2020;17. <https://doi.org/10.3390/ijerph17176163>. 17, Art. 17, Jan.
 35. Page MJ et al. Mar., The PRISMA 2020 statement: an updated guideline for reporting systematic reviews, *BMJ*, vol. 372, p. n71, 2021. <https://doi.org/10.1136/bmj.n71>
 36. Onoya D, et al. Designing effective U=U communication strategies considering the needs of PLHIV, their partners, and healthcare worker constraints in South African clinics. *PLoS ONE*. Dec. 2023;18(12):e0295920. <https://doi.org/10.1371/journal.pone.0295920>.
 37. Porritt K, Gomersall J, Lockwood C. JBI's systematic reviews: study selection and critical appraisal. *AJN Am J Nurs*. Jun. 2014;114(6). <https://doi.org/10.1097/01.NAJ.0000450430.97383.64>.
 38. Haberer JE et al. Dec., Real-Time Adherence Monitoring for HIV Antiretroviral Therapy, *AIDS Behav*, vol. 14, no. 6, pp. 1340–1346, 2010. <https://doi.org/10.1007/s10461-010-9799-4>
 39. Wilson IB, Lee Y, Michaud J, Fowler FJ, Rogers WH. Validation of a new Three-Item Self-Report measure for medication adherence. *AIDS Behav*. Nov. 2016;20(11):2700–8. <https://doi.org/10.1007/s10461-016-1406-x>.
 40. Badiee J et al. Jul., Approaches to Identifying Appropriate Medication Adherence Assessments for HIV Infected Individuals with Comorbid Bipolar Disorder, *AIDS Patient Care and STDs*, vol. 26, no. 7, pp. 388–394, 2012. <https://doi.org/10.1089/apc.2011.0447>
 41. Dale SK, Safren SA. Striving towards empowerment and medication adherence (STEP-AD): A tailored cognitive behavioral treatment approach for black women living with HIV. *Cogn Behav Pract*. Aug. 2018;25(3):361–76. <https://doi.org/10.1016/j.cbpra.2017.10.004>.
 42. Lucero R, Williams R, Esalomi T, Alexander-Delpech P, Cook C, Bjarnadottir RI. Using an electronic medication Event–Monitoring system for antiretroviral therapy Self-Management among African American women living with HIV in rural Florida: cohort study. *JMIR Formative Res*. Feb. 2020;4(2):e14888. <https://doi.org/10.2196/14888>.
 43. Bryant JV, Carcioppolo N, Lun D, Potter J. Entertainment-education to reduce internalized stigma, increase intimate partner status disclosure intentions, and increase antiretroviral medical adherence intentions: A randomized controlled trial targeting black women living with HIV in the Southern U.S. *Soc Sci Med*. Jun. 2023;327:115945. <https://doi.org/10.1016/j.socscimed.2023.115945>.
 44. Rao D, et al. Stigma reduction among African American women with HIV: UNITY health study. *Journal Acquir Immune Defic Syndr*. 2018;78(3):269–75. <https://doi.org/10.1097/QAI.0000000000001673>.
 45. Earnshaw VA, Chaudoir SR. From conceptualizing to measuring HIV stigma: A review of HIV stigma mechanism measures|AIDS and behavior. *AIDS Behav*. 2009;13:1160–77. <https://doi.org/10.1007/s10461-009-9593-3>.
 46. Davidson JRT et al. Jan., Assessment of a new self-rating scale for post-traumatic stress disorder, *Psychological Medicine*, vol. 27, no. 1, pp. 153–160, 1997. <https://doi.org/10.1017/S0033291796004229>
 47. Cook RL, et al. Reduction in drinking was associated with improved clinical outcomes in women with HIV infection and unhealthy alcohol use: results from a randomized clinical trial of oral Naltrexone versus placebo. *Alcoholism: Clin Experimental Res*. 2019;43(8):1790–800. <https://doi.org/10.1111/acer.14130>.
 48. Kim SS, Lee SA, Mejia J, Cooley ME, Demarco RF. Pilot randomized controlled trial of a digital storytelling intervention for smoking cessation in women living with HIV. *Ann Behav Med*. May 2020;54(6):447–54. <https://doi.org/10.1093/abm/kaz062>.
 49. Amutah-Onukagha N, Ibeziako N, Tibbitt C, Louis L, Amarnath A. Wisdom matters: honoring the wisdom and assessing the health literacy of black women living with HIV. *J Healthc Sci Humanit*. 2021;11(1):204–24.
 50. Junkins A, et al. Feasibility, acceptability, and preliminary impact of telemedicine-administered cognitive behavioral therapy for adherence and depression among African American women living with HIV in the rural South. *J Health Psychol*. 2021;26(14):2730–42. <https://doi.org/10.1177/1359105320926526>.
 51. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev*. 1977;84(2):191–215. <https://doi.org/10.1037/0033-295X.84.2.191>.
 52. Chaudoir SR, Fisher JD. The disclosure processes model: Understanding disclosure decision making and postdisclosure outcomes among people living with a concealable stigmatized identity. *Psychol Bull*. 2010;136(2):236–56. <https://doi.org/10.1037/a0018193>.
 53. McLeroy KR, Bibeau D, Glanz K. An Ecological Perspective on Health Promotion Programs, *Health Education & Behavior*, vol. 15, no. 4, pp. 351–377, Dec. 1988. <https://doi.org/10.1177/109019818801500401>
 54. Rivera AV, Carrillo SA, Braunstein SL. Prevalence of U=U Awareness and Its Association with Anticipated HIV Stigma Among Low-Income Heterosexually Active Black and Latino Adults in New York City, 2019, *AIDS Patient Care and STDs*, vol. 35, no. 9, pp. 370–376, Sep. 2021. <https://doi.org/10.1089/apc.2021.0070>
 55. Rutledge JD. Exploring the role of empowerment in black women's HIV and AIDS activism in the united States: an integrative literature review. *Am J Community Psychol*. 2023;71:3–4. <https://doi.org/10.1002/ajcp.12644>.
 56. Jennings Mayo-Wilson L et al. Dec., Microenterprise Intervention to Reduce Sexual Risk Behaviors and Increase Employment and HIV Preventive Practices Among Economically-Vulnerable African-American Young Adults (EMERGE): A Feasibility Randomized Clinical Trial, *AIDS Behav*, vol. 24, no. 12, pp. 3545–3561, 2020. <https://doi.org/10.1007/s10461-020-02931-0>
 57. Sherman S, Hunter K. Evidence-based structural interventions for HIV prevention: microenterprise and vulnerable populations. in *Structural interventions for HIV prevention: optimizing strategies for reducing new infections and improving care*. Oxford University Press; 2018. pp. 179–90.
 58. Walcott M, Kempf M-C, Merlin JS, Nunn A, Turan JM. Perceived Value of Microenterprise for Low-Income Women Living with HIV in Alabama, *AIDS Behav*, vol. 23, no. 3, pp. 276–286, Oct. 2019. <https://doi.org/10.1007/s10461-019-02656-9>
 59. Bowleg L, Malekzadeh AN, AuBuchon KE, Ghabrial MA, Bauer GR. Rare exemplars and missed opportunities: Intersectionality within current sexual and gender diversity research and scholarship in psychology, *Current Opinion in Psychology*, vol. 49, p. 101511, Feb. 2023. <https://doi.org/10.1016/j.copsyc.2022.101511>
 60. Hull SJ, Massie JS, Holt SL, Bowleg L. Intersectionality policy-making toolkit: key principles for an Intersectionality-Informed policymaking process to serve diverse women, children, and families. *Health Promot Pract*. 2023;24(4):623–35. <https://doi.org/10.1177/15248399231160447>.

61. Vaismoradi M, Fredriksen Moe C, Ursin G, Ingstad K. Looking through racism in the nurse–patient relationship from the lens of culturally congruent care: A scoping review. *J Adv Nurs*. 2022;78(9):2665–77. <https://doi.org/10.1111/jan.15267>.
62. Haldane V, et al. Community participation in health services development, implementation, and evaluation: A systematic review of empowerment, health, community, and process outcomes. *PLoS ONE*. May 2019;14(5):e0216112. <https://doi.org/10.1371/journal.pone.0216112>.
63. Wallerstein N, Duran B. Community-Based Participatory Research Contributions to Intervention Research. Apr.; The Intersection of Science and Practice to Improve Health Equity, *Am J Public Health*, vol. 100, no. S1, pp. S40–S46, 2010, <https://doi.org/10.2105/AJPH.2009.184036>
64. Ghasemi E, et al. Applying intersectionality in designing and implementing health interventions: a scoping review. *BMC Public Health*. Jul. 2021;21(1):1407. <https://doi.org/10.1186/s12889-021-11449-6>.
65. Collins SE, et al. Community-based participatory research (CBPR): towards equitable involvement of community in psychology research. *Am Psychol*. 2018;73(7):884–98. <https://doi.org/10.1037/amp0000167>.
66. Ortega S, McAlvain MS, Briant KJ, Hohl S, Thompson B. Perspectives of community advisory board members in a community-Academic partnership. *J Health Care Poor Underserved*. 2018;29(4):1529–43.
67. Castillo-Mancilla JR, Haberer JE. Adherence measurements in HIV: new advancements in Pharmacologic methods and Real-Time monitoring. *Curr HIV/AIDS Rep*. Feb. 2018;15(1):49–59. <https://doi.org/10.1007/s11904-018-0377-0>.
68. Veritas Health Innovation. Covidence systematic review software. Available at www.covidence.org.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.