

# Efficacy of a Single-Session HIV Prevention Intervention for Black Women: A Group Randomized Controlled Trial

Dázon Dixon Diallo · Trent Wade Moore ·  
Paulyne M. Ngalame · Lisa Diane White ·  
Jeffrey H. Herbst · Thomas M. Painter

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**Abstract** SisterLove Inc., a community-based organization (CBO) in Atlanta, Georgia, evaluated the efficacy of its highly interactive, single-session HIV prevention intervention for black women, the Healthy Love Workshop (HLW). HLW is delivered to pre-existing groups of women (e.g., friends, sororities) in settings of their choosing. Eligible groups of women were randomly assigned to receive the intervention (15 groups; 161 women) or a comparison workshop (15 groups; 152 women). Behavioral assessments were conducted at baseline and at 3- and 6-month follow-ups. Among sexually active women at the 3-month follow-up, HLW participants were more likely than comparison participants to report having used condoms during vaginal sex with any male partner or with a primary male partner, and to have used condoms at last vaginal, anal or oral sex with any male partner. At the 6-month follow-up, HLW participants were more likely to report condom use at last vaginal, anal or oral sex with any male partner, and having an HIV test and receiving their test results. The study findings suggest that a single-session intervention delivered to pre-existing groups of black women is an efficacious approach to HIV prevention. This study also demonstrates that a CBO can develop and deliver a culturally appropriate, effective HIV prevention intervention for the population it serves and, with adequate

resources and technical assistance, rigorously evaluate its intervention.

**Keywords** HIV prevention intervention · Black women · African American · Condom use · Sex risk behavior · HIV testing

## Introduction

Black women in the United States are severely affected by HIV/AIDS. Although black/African American female adults and adolescents represent only 12.8% of the U.S. female population [1], they accounted for 61% of all females living with HIV/AIDS in 2007 [2]. Further, the HIV incidence rate among black females in 2007 was almost 15 times the rate for white females and nearly 4 times the rate for Hispanic/Latino females [2]. These disparities result from the longer-term effects of HIV/AIDS on black women. HIV seroprevalence rates among black women increased nearly three-fold, from 0.55% in 1988 to 1.49% in 2006 [3, 4]. These increases contributed to a near-doubling—from 19% in 1989 to 35% in 2007—of new AIDS cases reported yearly among black women as a proportion of new cases reported among all Blacks [2, 5]. Further, one black woman in 30 is expected to be diagnosed with HIV during her lifetime [6], and HIV disease was one of the three leading causes of death among black women aged 25–34 years from 1991 to 2004 [7–10]. For the vast majority of black women, the reported source of HIV infection is unprotected sex with an infected male partner [2].

More than one-third of the nearly 37 million black Americans live in the South, and black women in this region are particularly affected by HIV/AIDS [11, 12]. As

D. D. Diallo (✉) · P. M. Ngalame · L. D. White  
SisterLove Inc., P.O. Box 10558, Atlanta, GA 30310, USA  
e-mail: ddiallo@sisterlove.org

T. W. Moore · J. H. Herbst · T. M. Painter  
Division of HIV/AIDS Prevention, National Center for  
HIV/AIDS, Viral Hepatitis, STD and TB Prevention, CDC,  
Atlanta, GA, USA  
e-mail: tcp2@cdc.gov

of December 2006, the state of Georgia had the eighth highest number of cumulative AIDS cases reported in the U.S. [13], and black women accounted for 84% of all women in the state diagnosed with AIDS from 1981 through 2006. In 2007, the Atlanta metropolitan area had the eleventh highest rate of reported AIDS cases among 101 metropolitan statistical areas in the nation [2].

Six HIV prevention interventions that were either designed for black women [14–16], or evaluated with a majority of black women [17–19] have been classified by the Centers for Disease Control and Prevention (CDC) as demonstrating best-evidence of intervention efficacy [20, 21]. However, these interventions target specific high-risk groups of black women, including clinic patients [14, 17, 18], crack cocaine users [15, 16], and women living with HIV/AIDS [19]. Only one intervention [22] is currently disseminated by the CDC's Diffusion of Effective Behavioral Interventions project [23] for the general population of sexually active black women. Given the disproportionate impact of HIV/AIDS on black women in general and the limited availability of culturally appropriate, evidence-based interventions for delivery to this population, there is an urgent need for innovative approaches to prevent HIV designed by and for black women.

During the mid to late 1980s, much of the available HIV/AIDS-related information and services focused on white gay men, and were less accessible or relevant to the circumstances of women, and black women in particular. Concerned about the growing evidence of AIDS' impact on black women and the absence of prevention interventions for this population, a small group of black women's health and reproductive health advocates in Atlanta, including founding members of the community-based organization (CBO) SisterLove Inc., took action. Through numerous informal meetings, they endeavored to create approaches for providing information about HIV/AIDS risks, prevention, sex, and AIDS-related death to women in the black community. The aim was to inform the women, but also to empower them to share their personal stories about heterosexual relationships and HIV risks, and increase their capacity to take protective actions.

Based on these initial efforts, and building on principles of self-help developed by the National Black Women's Health Project [24], SisterLove developed the Healthy Love Party HIV prevention intervention in 1989. The intervention, which also incorporates principles of social-behavioral theories, delivers HIV prevention information and teaches condom-use skills in a highly interactive, festive, and non-judgmental manner. It eroticizes safer sex and aims to create a safe space in which black women can connect with their sexuality in ways that are positive and self-loving rather than shameful or degrading. The intervention is delivered to intact, pre-existing groups of women

from, for example, sororities, churches, and friendship circles. Because the Healthy Love Party is delivered to women at locations they select, including the homes of group members, SisterLove describes it as an intervention that makes house calls. To our knowledge, no other HIV prevention intervention for black women is delivered to pre-existing groups of women, or does so in settings of their choosing. During the nearly two decades that SisterLove has been delivering the Healthy Love Party, the intervention curriculum has been updated to address a changing HIV/AIDS epidemic that has increasingly impacted black women in the U.S.

This paper reports the results of a randomized controlled trial to evaluate the efficacy of the single-session intervention, renamed as the Healthy Love Workshop (HLW) for purposes of the study, for increasing HIV-related protective behaviors and reducing sexual risk behaviors of black women. The study was supported by the CDC's Innovative Interventions project that funded efforts by CBOs to rigorously evaluate their locally-developed, innovative HIV prevention interventions for high-risk minority populations, and to use evaluation findings to improve the effectiveness of their interventions [25].

## Methods

### Procedures

The study was conducted from March 2006 through June 2007 with pre-existing groups of women in the metropolitan Atlanta area. Intervention workshops took place at locations that were typical of those where SisterLove had delivered the intervention in the past, including college campuses, churches, participants' homes, and community centers. A group-randomized trial design was used to assess intervention efficacy. Groups of women—including university dormitory residents, church groups, friendship groups, social support groups, neighbors, and other affinity groups—were pair-matched according to group type. One group from each pair was randomly assigned to receive the HLW or a comparison workshop.

### Eligibility Criteria

Eligible women self-identified as Black (i.e., African American, African, or Caribbean), were at least 18 years of age, not pregnant or planning to become pregnant during the next 6 months, and English speakers. Ineligible women included those who had participated in a group-level HIV prevention intervention during the past 6 months, or whose religious beliefs prohibited the use of male or female condoms.

## Recruitment

Information about the HIV prevention study was disseminated through the use of print media, public service announcements on local radio stations, electronic communication (e.g., e-mail, listservs and social network sites), and informational mailings to local AIDS service organizations, county health departments, medical clinics, and community centers. Outreach was used to recruit groups of women affiliated with faith-based organizations and CBOs serving African immigrants, at college health fairs and community events, and at SisterLove-sponsored activities.

A two-step process was used to screen for eligibility. Groups responded to the recruitment efforts described above, typically through a member who contacted SisterLove and indicated that her group was interested in participating. During these initial contacts, evaluation staff broadly determined if groups met the eligibility criteria, matched them to another similar group, randomly assigned groups by coin toss to the HLW or comparison workshop, and arranged a date and preferred workshop location. Immediately before each workshop, women were individually screened to ensure they met the study inclusion criteria. All eligible women who agreed to participate provided written informed consent, completed a baseline survey, and then participated in the HLW or comparison workshop. Ineligible women, or those who did not wish to participate in the evaluation, were allowed to attend the workshop.

Fifty-eight groups of women were identified, contacted through one or more group members, screened for eligibility, and initially agreed to participate in the study (Fig. 1). Of this number, 30 groups were randomized to receive either the HLW (15 groups totaling 161 women) or the comparison workshop (15 groups totaling 152 women). The remaining 28 groups that were initially contacted did not participate for logistical reasons, including a lack of follow-up by group contact persons to finalize arrangements (10 groups), failure of group members to arrive for the workshop (7 groups), and too few women to meet the minimum workshop size (6 groups). Five groups did not participate because of insufficient interest by their members in receiving either workshop.

## Interventions

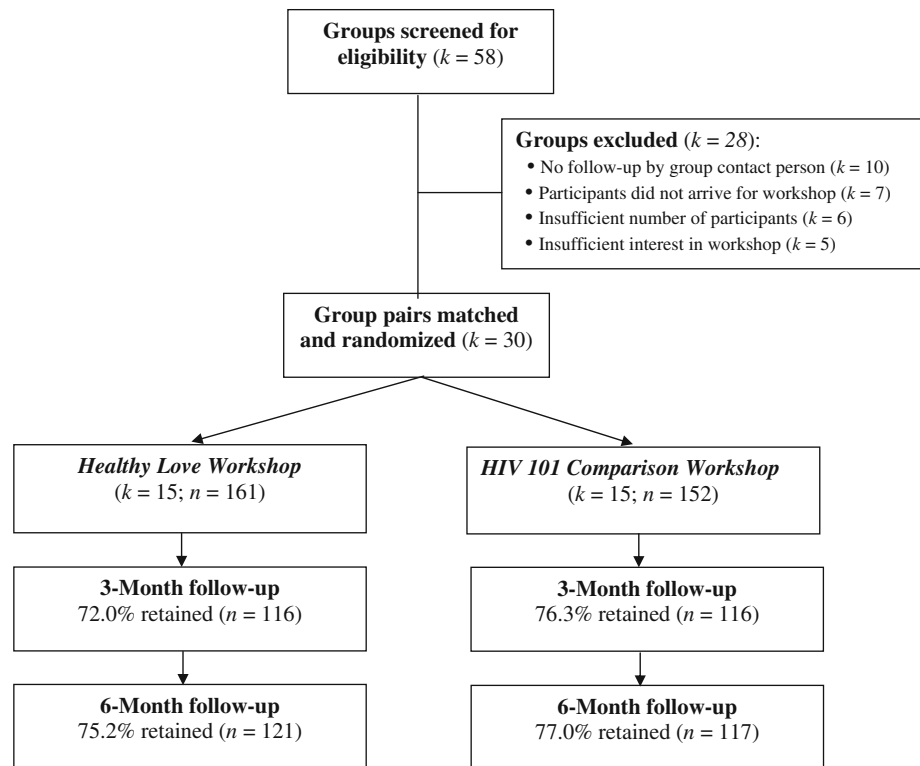
The Healthy Love Workshop is a single-session intervention lasting 3–4 h that is typically delivered to groups of 4–15 women; however, SisterLove facilitators can accommodate larger groups if needed. The intervention is designed to increase consistent use of condoms and other latex barriers, reduce unprotected sex with male partners, and reduce the number of sex partners. HLW also promotes

sexual abstinence, HIV testing, and receipt of test results. The intervention is based on principles of the Health Belief Model [26], the Transtheoretical Model [27], and Social Cognitive Theory [28], and uses approaches that are respectful of women's abilities to empower themselves. The HLW reflects the belief that black women's collective wisdom and lived experiences provide important learning opportunities, and encourages them to demand safer sexual behaviors for themselves and their partners.

The HLW is designed to change participants' behaviors by improving their knowledge about the transmission and prevention of sexually transmitted infections (STI) including HIV; their ability to assess personal risk of contracting HIV; their attitudes about condom use and HIV testing; and their self-efficacy to engage in protective behaviors, including condom use. HLW activities build skills for correct condom use, encourage women to negotiate condom use with partners, and address women's reproductive and sexual health. The HLW consists of three modules (Setting the Tone, The Facts, and Safer Sex). Together, these modules contain an opening, 11 content-focused components, and a closing. Three components provide basic information on HIV/AIDS and STIs (HIV/AIDS Facts, STI Facts, and The Look of HIV). The remaining eight components are activities that involve the participants in interactions with the facilitators and one another, and engage them on topics such as rating their personal risks for contracting HIV and other STIs, practicing correct use of male and female condoms, negotiating condom use with male partners, and demonstrating their increased knowledge concerning HIV infection risks and protective actions. All intervention modules and components are described in Table 1.

Examples of HLW features that address the shared, cultural aspects of black women's experiences that can shape their social vulnerability and HIV risks include a keen sensitivity to women's unequal treatment and status as females and Blacks in the South, and the synonym activity, which highlights how language can either emphasize the potential for women's internalized sexual oppression [29] or their empowerment and their rights relative to male partners. Through the risk identification exercise, the intervention makes the potentially abstract notion of HIV risk more concrete by teaching black women how to assess their own risks, based on their past or current sexual behaviors, and through group discussions of those behaviors that are considered to be high, low or no risk. The intervention provides current information concerning the impacts of HIV/AIDS on black women in a way that helps participants situate known risk factors in their lives and communities, while maintaining an affirming, black woman-centered, sex-positive focus on ways of avoiding or eliminating some of those risks. The approach used by

**Fig. 1** Flow diagram of participant recruitment, allocation and retention in an evaluation of the Healthy Love Workshop, Atlanta, Georgia, 2006–2007 (Note: *k* refers to number of groups; *n* refers to number of women)



SisterLove to deliver all components of the HLW requires the facilitator to engage, interact with, and promote interaction and dialogue among workshop participants.

The comparison workshop (named HIV101) was also delivered as a single session lasting 2–3 h, to groups of women about the same size and in settings similar to those used for the HLW. The HIV101 workshop consists of an opening, one module containing the same three HIV/STD-related components as the HLW (HIV/AIDS facts, STI facts, and the Look of HIV) and a closing (see Table 1). However, the presentation of this information used a didactic, lecture-style format, as opposed to the interactive approach used to deliver the HLW.

Each HLW and comparison workshop was delivered by a trained black female facilitator. During the study, a total of three different facilitators were used, and all facilitators delivered both workshops at various times. At the termination of both workshops, all participants received male and female condoms, dental dams, HIV risk reduction brochures, and information on where to obtain HIV counseling and testing services.

#### Data Collection

Women completed self-administered surveys at baseline, immediately after the workshop (for assessment of psychosocial outcomes only), and at 3- and 6-month follow-ups. Incentives used to retain women in the study included \$20 for completing the baseline survey, \$25 for the 3-month

follow-up survey, and \$30 for the 6-month follow-up survey. Staff observed all workshops to ensure conformity to the guidelines and content of the curricula, and collected process data on workshop delivery. The study was approved by the institutional review boards of the AIDS Research Consortium of Atlanta and the CDC, and was registered on ClinicalTrials.gov (number NCT00362375).

#### Measures

All outcomes were self-reported behaviors, and all measures, except HIV testing (see details below), referred to behaviors during the 3 months prior to data collection. Behavioral outcomes included condom use during vaginal sex with male partners, unprotected vaginal and anal sex with male partners, sexual abstinence, number of sex partners, and testing for HIV and receipt of test results. Questions about sexual activity were derived from a survey developed by the CDC's HIV/STD behavioral surveillance working group [30]. Responses to two questions provided measures of sexual abstinence: "In the past 3 months, have you had sex with another person?" and "In the past 3 months, how many partners have you had sex with?" Participants were classified as sexually abstinent if they indicated no sex with another person during the past 3 months. Responses to the second question were used to compute the total number of sex partners. Unprotected sex was assessed for the entire study sample based on self-reports of vaginal or anal sex without a condom with primary and non-primary male partners.

**Table 1** Description of the Healthy Love Workshop

Module (duration)	Components	Description
Setting the tone (60 min)	Opening*	Introduces facilitator, describes workshop purpose, identifies participants' expectations, establishes ground rules
	Fantasy name	Participants select sexy name for use during the remainder of intervention; shows that the HLW will be casual and fun Makes participants feel comfortable about discussing their sexuality and risk behavior
	Synonyms	Decreases participants' inhibitions about discussing HIV, AIDS, and STIs Helps participants recall and acknowledge positive and negative feelings, attitudes and beliefs concerning words associated with sex and sexuality Helps participants appreciate the societal influences that can trivialize or denigrate women's sexuality Promotes agreement by participants to use only positive words when discussing sex and sexuality for remainder of the intervention
The facts (60 min)	HIV/AIDS facts*	Defines the acronyms HIV and AIDS, provides basic information on behaviors and circumstances that can increase a woman's risk of contracting or transmitting HIV, and the relationship between HIV and AIDS
	STI facts*	Provides basic information about common STIs: their names, how they are spread, symptoms, protective actions Elicits discussion; gives participants an opportunity to share what they know
	The look of HIV*	Dispels myth that one can visually tell if someone is living with HIV or AIDS Describes HIV testing options, encourages testing for HIV and knowledge of serostatus Provides information about prevalence of HIV/AIDS in the U.S. and among women of color
Safer sex (120 min)	Risk assessment	Participants rate their personal risk for HIV and other STIs based on past and current sexual behaviors
	Condom demonstration	Demonstrates correct application of male condom to penis model, and disposal of male condoms after ejaculation Promotes discussion of how to negotiate condom use with a male partner
	Condom race	Competitive game gives participants opportunity to practice placing a condom on a penis model "under pressure" (under conditions resembling a romantic situation, with lights out and music playing)
	Female condom demonstration	Provides basic information on the female condom as a means of preventing HIV and STIs Demonstrates correct use of female condom with vagina model Participants practice inserting female condom in vagina model
	Oral sex	Demonstrates use of dental dams, plastic wrap, and the oral application of a male condom to a penis model as methods for reducing HIV and STI risks
	High–low–no risk	Participants discuss high, low, and no risk activities and demonstrate their increased knowledge of HIV transmission risk by assessing and ranking various behaviors based on their associated risk levels
	Close*	Gives participants opportunities to ask lingering questions and to provide feedback on the relevance and usefulness of the workshop

\* Denotes components that are included in the HIV101 intervention

Condom use during vaginal sex was assessed only among those women who were sexually active. Women were asked to report the frequency of condom use with primary and non-primary male partners as "each and every time," "almost every time," "sometimes," "almost never," or "never." Sexually active women were also asked whether they had used a condom the last time they had vaginal, anal or oral sex with a male partner.

Women were asked at baseline whether they had ever been tested for HIV, the length of time since their most recent HIV test, whether they received the test result, and, if tested, their HIV serostatus. The 3- and 6-month follow-

up assessments asked whether women had been tested for HIV during the past 3 months, whether they received the test result, and their HIV serostatus.

The impact of the intervention on HIV and STI knowledge, and condom attitudes, self-efficacy, and intention to use condoms was assessed using psychosocial scales. HIV knowledge was assessed by a 16-item scale [31] containing "true" or "false" response options. Sample items included "A woman can get HIV if she has anal sex with a man" and "There is a vaccine that can stop adults from getting HIV." A scale to assess STI knowledge was developed for this study, and included 5 questions about ways to prevent STI

acquisition. Sample items included “If an STI is not treated, it will probably go away by itself” and “If you use a condom, it is impossible to get an STI.” Participants were asked 12 questions about their attitudes toward condoms [32], and responded to questions such as “Using condoms interrupts sex play” and “Generally, I am in favor of condoms” (Cronbach  $\alpha = 0.78$ ). Condom use self-efficacy was assessed using a 22-item scale [33] (Cronbach  $\alpha = 0.87$ ). Sample items included “I feel confident in my ability to discuss condom use with any partner I might have” and “I feel confident in my ability to use a condom correctly.” The condom attitudes and condom-use self-efficacy scales were measured using Likert responses including “Strongly Agree,” “Agree,” “Neutral,” “Disagree,” and “Strongly Disagree.” Intention to use condoms was measured by 5 questions concerning participants’ consistent use of condoms with primary and non-primary male partners [34]. Participants’ responses were recoded to correspond to the pre-contemplation, contemplation, preparation, action, or maintenance stages of behavior change.

### Statistical Analysis

All analyses controlled for clustering that could result from the group-level randomization process [35]. Initial analyses compared women in the intervention and comparison workshops on baseline characteristics, and examined differential attrition by comparing women who did and did not complete 3- or 6-month follow-ups. These analyses used cluster-adjusted chi-squares and *t* tests. Intervention effects on behavioral and psychosocial outcomes were analyzed by comparing proportions or mean values from HLW and comparison participants at the 3- and 6-month follow-up assessments.

Multivariate analyses used generalized estimating equations (GEE) to assess intervention efficacy, and adjusted the standard errors of coefficients to account for intra-cluster correlations of data. Each GEE model controlled for baseline levels of the outcome variable. Dichotomous outcomes (e.g., condom use, sexual abstinence, and unprotected vaginal sex) were assessed using a logit link function with a binomial distribution to derive robust estimates of odds ratios (OR). Because responses concerning the number of sex partners were skewed, these data were assessed using Poisson regression with a log link function to derive incident rate ratios. Data on number of sex partners were also analyzed using negative binomial regression. The results were comparable. Condom use at last sex was assessed using cluster-adjusted chi-squared analyses. Psychosocial outcomes were assessed using an identity link function with a Gaussian distribution to derive robust estimates of regression coefficients. The analysis of behavioral outcomes was conducted based on the initial random assignment of participants’ groups to the HLW or HIV101 comparison condition, and

regardless of whether individual participants actually completed their respective workshops [36]. Forty women from 5 groups (3 HLW and 2 HIV101) were excluded from the analysis of behavioral outcomes at the 3-month follow-up because they provided incomplete responses. Significance tests were based on  $\alpha = 0.05$ , and analyses were performed using STATA statistical software [37].

## Results

### Sample Characteristics

A total of 313 black women in 30 groups were enrolled in the study and provided baseline data. Enrolled groups included women from friendship circles ( $k=16$ ), college-based classes/dormitories ( $k = 6$ ), residential housing units ( $k = 2$ ), churches ( $k = 2$ ), social support groups ( $k = 2$ ), and African immigrant communities ( $k = 2$ ). The median number of women in each group was 9.5 (range 4–24). The mean age of all women was 31.3 years (SD = 11.6; range 18–69 years). The majority (91%) were born in the United States, 6% in African countries, and 3% in Caribbean, Central or South American countries. Twenty-three (7.3%) reported being HIV-positive at baseline; two women reported receiving an HIV-positive test result during the 6-month follow-up period. There were no statistically significant differences between women in the HLW and comparison workshops on demographic and other key variables assessed at baseline (Table 2).

### Retention

Retention rates at the 3- and 6-month follow-up assessments were comparable for women in the HLW and comparison conditions (Fig. 1). Analyses of attrition indicated that women who did not return for the 3-month follow-up assessment were more likely to have children than women who completed the 3-month follow-up ( $P < .05$ ). Those women who did not return for the 6-month follow-up assessment were more likely to report being sexually active, engaging in sex while under the influence of drugs or alcohol, and having spent 30 or more days in jail than women who completed the 6-month follow-up ( $P$ 's  $< .05$ ). There were no significant differences in attrition between women in the two study conditions on other baseline demographics or outcome measures.

### Intervention Effects on Behavioral Outcomes

Table 3 presents data on health protective and sexual risk behaviors by study condition. Intra-cluster correlations ranged from 0.00 to 0.09. Among sexually active women at

**Table 2** Demographic and other baseline characteristics of participants in an evaluation of the Healthy Love Workshop (HLW), Atlanta, Georgia, 2006–2007

	Workshop			Cluster-Adj. <i>t</i> -test/ $\chi^2$ ( <i>P</i> -value) <sup>a</sup>
	Total No. (%)	HLW No. (%)	Comparison No. (%)	
<b>Demographics</b>				
Age (years)	Mean = 31.3 (SD = 11.6)	Mean = 29.1 (SD = 10.1)	Mean = 33.7 (SD = 12.7)	1.28 (0.21)
Born outside United States	29 (9.3)	13 (8.2)	16 (10.5)	0.09 (0.76)
African American	301 (96.5)	155 (96.9)	146 (96.1)	0.15 (0.69)
HIV-positive	23 (7.3)	13 (8.1)	10 (6.6)	0.04 (0.84)
Christian religion	281 (89.8)	147 (91.3)	134 (88.2)	0.47 (0.49)
Married	98 (31.3)	42 (26.1)	56 (36.8)	1.15 (0.28)
Live alone <sup>b</sup>	118 (37.7)	61 (37.9)	57 (37.5)	0.00 (0.96)
H.S. Diploma/GED or less	137 (43.8)	77 (47.8)	60 (39.5)	0.30 (0.58)
Annual income <\$15,000	129 (45.4)	66 (45.5)	63 (45.3)	0.01 (0.99)
Unemployed	135 (43.3)	72 (45.0)	63 (41.4)	0.27 (0.88)
Any children	133 (42.5)	65 (40.4)	68 (44.7)	0.10 (0.75)
Single parent	78 (24.9)	42 (26.0)	36 (23.6)	0.05 (0.82)
Receiving public assistance	47 (15.0)	25 (15.5)	22 (14.5)	0.02 (0.89)
Ever in jail for >30 days	21 (6.7)	11 (6.8)	10 (6.6)	0.01 (0.93)
<b>Substance use</b>				
Any alcohol use (past 3 month)	95 (30.5)	54 (33.8)	41 (27.2)	0.58 (0.45)
Any illicit drug use (past 3 month)	18 (5.8)	9 (5.6)	9 (6.0)	0.02 (0.90)
<b>Psychosocial measures</b>				
Condom use attitudes (12 items)	Mean = 39.3 (SD = 6.65)	Mean = 39.3 (SD = 5.84)	Mean = 39.4 (SD = 7.45)	0.11 (0.91)
Condom use self-efficacy (22 items)	Mean = 56.9 (SD = 8.88)	Mean = 57.2 (SD = 8.06)	Mean = 56.7 (SD = 9.69)	-0.41 (0.68)
HIV knowledge <sup>c</sup> (16 items)	Mean = 81.8 (SD = 18.1)	Mean = 83.7 (SD = 16.9)	Mean = 79.7 (SD = 19.1)	-1.18 (0.25)
STI knowledge <sup>c</sup> (5 items)	Mean = 74.7 (SD=22.4)	Mean = 76.9 (SD=22.3)	Mean=72.3 (SD=22.4)	-1.78 (0.09)
Intentions to use condoms with primary male partner <sup>d</sup>	Mean=3.97 (SD = 0.07)	Mean = 3.88 (SD = 0.11)	Mean = 4.07 (SD = 0.07)	1.46 (0.16)

Note: STI sexually transmitted infection, SD standard deviation

<sup>a</sup> Chi-square tests (for proportions) and *t*-tests (for means and SDs) are adjusted for clustering by group

<sup>b</sup> “Living with others” includes parents, roommates, friends, spouse/partner, or some other person

<sup>c</sup> Values expressed as percent of responses that were correct

<sup>d</sup> Based on 5-level scale: 1 pre-contemplation, 2 contemplation, 3 preparation, 4 action, 5 maintenance

the 3-month follow-up, HLW participants reported significantly greater rates of condom use during vaginal sex with any male partner (adjusted odds ratio [AOR] = 2.40; 95% CI = 1.28, 4.50) and with a primary male partner (AOR = 2.87; 95% CI = 1.18, 6.95) than comparison participants. Although significant intervention effects on these condom-use outcomes were not sustained at the 6-month follow-up, the intervention effects remained protective and favored HLW participants. Among women who were sexually active, rates of condom use at last episode of

vaginal, anal or oral sex with any male partner, when measured at baseline, were similar for both study groups (54.7 and 50.5% for the intervention and comparison conditions, respectively; see Fig. 2). Relative to comparison participants, HLW participants reported significantly greater condom use at last vaginal, anal or oral sex with any male partner at both the 3-month (71 vs. 49.5%; cluster-adjusted  $\chi^2$  [*N* = 181] = 6.66, *P* = 0.01) and 6-month (67.8 vs. 48.6%; cluster-adjusted  $\chi^2$  [*N* = 229] = 4.62, *P* = 0.03) follow-up assessments. At the

**Table 3** Intervention effects on health protective and sexual risk behaviors in an evaluation of the Healthy Love Workshop (HLW), Atlanta, Georgia, 2006–2007

Outcome	ICC Baseline		Cluster adj. <i>t</i> -test/ $\chi^2$ ( <i>P</i> -value)	ICC 3 Month <sup>a</sup>		ICC	GEE Model adjusted OR (95% CI) <sup>c</sup>		ICC 6 Month <sup>b</sup>		GEE Model Adjusted OR (95% CI) <sup>c</sup>	
	HLW %	HIV101 %		HLW %	HIV101 %		HLW %	HIV101 %				
Health protective behaviors (past 3 months)												
Condom use during vaginal sex with any male partner <sup>d</sup>	0.05	50.9	0.20 (0.65)	0.00	59.3	0.00	2.40** (1.28, 4.50)	0.00	54.3	44.1	1.50 (0.83, 2.72)	
Condom use during vaginal sex with primary male partner <sup>d</sup>	0.09	41.7	0.01 (0.92)	0.03	55.9	0.00	2.87* (1.18, 6.95)	0.00	52.9	41.2	1.69 (0.90, 3.18)	
Sexually abstinent	0.01	33.5	0.72 (0.40)	0.09	36.6	0.01	0.48 (0.20, 1.16)	0.01	41.7	42.6	0.80 (0.43, 1.49)	
HIV tested and received results	0.06	15.5	1.15 (0.28)	0.00	20.2	0.09	1.44 (0.76, 2.71)	0.09	27.0	13.8	2.30* (1.10, 4.81)	
Sexual risk behaviors (past 3 months)												
Unprotected vaginal sex with any male partner	0.07	36.3	1.07 (0.30)	0.05	37.6	0.00	1.39 (0.99, 1.95)	0.00	30.8	31.6	0.97 (0.59, 1.59)	
Unprotected vaginal sex with a primary male partner	0.09	34.8	0.99 (0.32)	0.07	34.4	0.00	1.45 (0.82, 2.56)	0.00	28.3	29.9	1.03 (0.60, 1.75)	
Number of sex partners <sup>e</sup>	0.01	0.95 (1.11)	1.18 (0.97)	0.01	0.70 (0.60)	0.04	1.07 (0.80, 1.44)	0.04	0.70 (0.75)	0.61 (0.57)	1.19 (0.95, 1.49)	

Note: GEE generalized estimating equations, ICC intra-cluster correlation, OR odds ratio, CI confidence interval. \*  $P \leq .05$ , \*\*  $P \leq .01$

<sup>a</sup> Based on 187 cases (HLW,  $n = 93$ ; HIV 101,  $n = 94$ ) at 3 months, unless otherwise specified

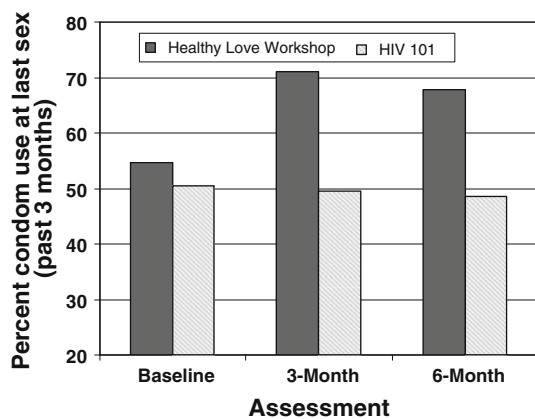
<sup>b</sup> Based on 237 cases (HLW,  $n = 120$ ; HIV 101,  $n = 117$ ) at 6 months, unless otherwise specified

<sup>c</sup> Odds ratios derived from GEE models adjusted for clustering by group and baseline outcome value; reference category is HIV101 comparison workshop

<sup>d</sup> Analyses of condom use restricted to women who were sexually active at follow-ups ( $N = 216$  at baseline;  $N = 112$  at 3 months;  $N = 138$  at 6 months)

<sup>e</sup> Means and standard deviations are reported. Parameter estimates are GEE-produced incident rate ratios





**Fig. 2** Intervention effects on condom use by sexually active black women at time of last vaginal, anal or oral sex with any male partner: Evaluation of the Healthy Love Workshop, Atlanta, GA, 2006–2007

6-month follow-up, HLW participants reported significantly higher rates of HIV testing and receipt of test results than comparison participants (AOR = 2.30; 95% CI = 1.10, 4.81; Table 3). There was no significant intervention effect on sexual abstinence.

Although intervention effects on unprotected vaginal sex with any male partner, unprotected vaginal sex with primary male partner, and number of sex partners were not statistically significant at either follow-up, women in both workshops reported reductions on each of these outcomes at the 3- and 6-month follow-up assessments (Table 3). Too few women reported engaging in vaginal sex with a non-primary male partner or anal sex with any partner to yield stable statistical estimates for analysis.

#### Intervention Effects on Psychosocial Outcomes

At the immediate post-workshop assessment, HLW participants reported significantly greater improvements in condom-use self-efficacy (adjusted mean difference [AMD] = 2.93; 95% CI = 0.14, 5.72,  $P = 0.04$ ) and HIV knowledge (AMD = 2.88; 95% CI = 0.10, 5.66,  $P = 0.04$ ) than comparison participants. There were no significant intervention effects on attitudes toward using condoms or STI knowledge at the immediate post-workshop assessment. At the 3-month follow-up assessment, HLW participants reported significantly greater improvements in intentions to use condoms with a primary male partner than comparison participants (AMD = 0.65; 95% CI = 0.02, 1.28,  $P = 0.04$ ). At the 6-month follow-up assessment, HLW participants reported significantly greater levels of HIV knowledge (AMD = 3.51; 95% CI = 0.81, 6.20,  $P = 0.01$ ) and greater improvements in attitudes toward condom use (AMD = 2.05; 95% CI = -0.39, 4.13,  $P = 0.054$ ) than comparison participants.

#### Discussion

This study demonstrates the efficacy of a single-session HIV prevention intervention delivered to pre-existing groups of sexually active black women. Compared to women who received prevention information in the didactic HIV101 workshop, participants in the highly interactive, skill-enhancing HLW reported greater improvements in self-efficacy for condom use and HIV knowledge immediately after the intervention, greater intentions to use condoms with their primary male partners at 3 months post-intervention, and greater improvements in attitudes toward using condoms and HIV knowledge at 6 months post-intervention. These intervention effects were accompanied by reports from women in the HLW condition of significantly greater use of condoms during vaginal sex with all male partners, particularly with primary male partners, at the 3-month follow-up, and greater use of condoms at last vaginal, anal or oral sex with any male partner at both 3- and 6-month follow-ups. Further, at the 6-month follow-up, HLW participants were more than twice as likely as comparison participants to report HIV testing and receipt of test results during the previous 3 months.

The greater magnitude of intervention effects on condom-use outcomes may be attributed to the content of the HLW, which encourages women to develop favorable attitudes toward condoms, improve their self-efficacy for condom use, and build skills for correct and consistent condom use with their sex partners. While a mediation analysis could potentially clarify these relationships, these elements are consistent with HIV prevention interventions for black females that have been shown to be efficacious in reducing HIV sexual risk behaviors [38, 39]. Several features of standard HLW delivery—the targeting of black females, the use of black females to deliver the intervention, the incorporation of gender and culturally appropriate materials, and attention to empowerment issues—have also been associated with the efficacy of HIV prevention interventions for black females [38–40]. The highly interactive approach used to deliver HLW, relative to the comparison intervention, may more readily engage participants and explain the magnitude of the HLW effects.

Reviews of HIV prevention interventions for Blacks have also observed that multiple-session interventions are often more efficacious than single-session interventions [38, 39, 41, 42]. However, the success of the HLW suggests that a single-session approach can provide a feasible alternative for use by community-based service providers. The Healthy Love Workshop addresses an urgent need for efficacious interventions that support risk-reduction efforts by black women for whom the most likely source of HIV infection is unprotected sex with an infected male partner [12].

The findings of this study should be viewed within the context of several limitations. First, as is common in most studies of interventions designed to reduce sexual risk behaviors, findings are based on self-reported risk and protective behaviors. Although it would have been preferable to also collect data from participants on biological outcomes (e.g., incident STD infections), this was not feasible for SisterLove at the time of the study due to funding limitations. Second, the choice of a comparison condition that also provided HIV prevention information rather than a general health promotion condition may have reduced the magnitude of observed differences between the HLW and comparison workshops [39]. In fact, the lack of expected intervention effects in reducing unprotected vaginal sex and number of sex partners among HLW participants relative to comparison participants may reflect the effects of the shared HIV prevention content of the HLW and HIV101 workshops. Third, the relatively small number of groups in this study may have reduced the statistical power needed to detect significant intervention effects on certain outcomes [35]. Fourth, intervention efficacy was evaluated based on a non-probability sample of groups of black women that may limit the generalizability of our study findings [43]. Further, the women enrolled in this study reported fairly low levels of behavioral risk at baseline. This included low rates of alcohol and drug use, and high rates of condom use and abstinence. As noted earlier, the HLW was designed for and is routinely delivered by SisterLove to members of the general population of sexually active black women. Thus the findings of this study may not be generalizable to black women who are at higher risk of HIV infection, for whom several efficacious interventions exist [14–19]. There is plentiful evidence, however, that a host of structural, circumstantial, and sociocultural factors contribute to the extreme vulnerability of black women to HIV infection even when their levels of risk behaviors are relatively low [41, 44–47].

The findings of this study suggest several areas where research is needed to identify strategies for improving the Healthy Love Workshop. The lack of statistically significant intervention effects on several observed outcomes at the 6-month follow-up indicates a need to identify viable options for reinforcing intervention effectiveness over time [42]. Additional research is also needed to determine whether and how a greater emphasis on including women's male partners in the intervention can produce greater, sustained changes in behaviors that reduce the risks of HIV infection. Examples of issues that could be addressed by an increased focus on couple relationships include the need for increased support from partners for women's efforts to successfully negotiate and use condoms [48, 49], and efforts by both couple members to reduce sex partner concurrency [44, 50]. Although HLW participants were

more than twice as likely as comparison participants to report testing for HIV at the 6-month follow-up, most women in the study did not have an HIV test during this period of time. Future research is needed to determine and evaluate effective approaches to enhance the promising effects of the HLW on HIV testing and receipt of results [51].

The study findings suggest that a single-session intervention delivered to pre-existing groups of black women is an efficacious approach to HIV prevention. This study also demonstrates that a CBO can develop and deliver a culturally appropriate, effective HIV prevention intervention for the population it serves and, with adequate resources and technical assistance, rigorously evaluate its intervention. We encourage CBOs to develop and evaluate innovative HIV prevention interventions for their communities. We also encourage funding agencies to support CBO efforts to develop innovative approaches for HIV prevention, and to develop partnerships with CBOs for purposes of assessing the efficacy of their interventions.

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## References

1. U.S. Census Bureau. Table DP-1 General Demographic Characteristics, Data set 2007 Population Estimates. Washington, DC: U.S. Census Bureau, Population Estimates Program; 2007.
2. Centers for Disease Control and Prevention. Cases of HIV infection and AIDS in the United States and dependent areas, 2007, vol 19. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2009. Available at: <http://www.cdc.gov/hiv/topics/surveillance/resources/reports/2007report/default.htm>. Accessed April 24, 2009.
3. McQuillan GM, Khare M, Karon JM, Schable CA, Vlahov D. Update on the seroepidemiology of human immunodeficiency virus in the United States household population: NHANES III, 1988–1994. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1997;14:355–60.
4. McQuillan GM, Kruszon-Moran D. HIV infection in the United States household population aged 18–49 years: results from 1999–2006. NCHS Data Brief No. 4. Hyattsville: National Center for Health Statistics, Centers for Disease Control and Prevention; 2008.

5. Centers for Disease Control and Prevention. HIV/AIDS surveillance, year-end edition. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 1990.
6. Hall HI, An Q, Hutchinson AB, Sansom S. Estimating the lifetime risk of a diagnosis of the HIV infection in 33 states, 2004–2005. *J Acquir Immune Defic Syndr*. 2008;49(3):294–7.
7. Centers for Disease Control and Prevention. Deaths: leading causes for 1999. Hyattsville: National Center for Health Statistics, Centers for Disease Control and Prevention; 1999.
8. Centers for Disease Control and Prevention. Leading causes of death in females, United States 2004. Available at: <http://www.cdc.gov/women/lcod/04black.pdf>. Accessed March 16, 2009.
9. Anderson RN, Smith BL. Deaths: leading causes for 2001. *Natl Vital Stat Rep*. 2003;52(9):1–85.
10. Anderson RN, Smith BL. Leading causes of death in females, deaths: leading causes for 2002. *Natl Vital Stat Rep*. 2005;53(17):1–89.
11. Reif S, Geonnotti KL, Whetten K. HIV infection and AIDS in the Deep South. *Am J Public Health*. 2006;96(6):970–3.
12. Adimora AA, Schoenbach VJ, Doherty IA. HIV and African Americans in the southern United States: sexual networks and social context. *Sex Transm Dis*. 2006;33(Suppl. 7):S39–45.
13. Georgia Department of Human Resources. Women and AIDS in Georgia. Available at: [http://dhr.georgia.gov/DHR/DHR\\_FactSheets/2008%20Women%20and%20AIDS%20In%20GA%20Fact%20Sheet.pdf](http://dhr.georgia.gov/DHR/DHR_FactSheets/2008%20Women%20and%20AIDS%20In%20GA%20Fact%20Sheet.pdf). Accessed April 17, 2009.
14. Jemmott LS, Jemmott JB III, O'Leary A. Effects on sexual risk behavior and STD rate of brief HIV/STD prevention interventions for African American women in primary care settings. *Am J Public Health*. 2007;97:1034–40.
15. Sterk CE, Theall KP, Elifson KW. Effectiveness of a risk reduction intervention among African American women who use crack cocaine. *AIDS Educ Prev*. 2003;15(1):15–32.
16. Wechsberg WM, Lam WK, Zule WA, Bobashev G. Efficacy of a woman-focused intervention to reduce HIV risk and increase self-sufficiency among African American crack abusers. *Am J Public Health*. 2004;94:165–73.
17. Ehrhardt AA, Exner TM, Hoffman S, et al. A gender-specific HIV/STD risk reduction intervention for women in a health care setting: short- and long-term results of a randomized clinical trial. *AIDS Care*. 2002;14:147–61.
18. Hobfoll SE, Jackson AP, Lavin J, Johnson RJ, Schroder KEE. Effects and generalizability of communally oriented HIV-AIDS prevention versus general health promotion groups for single, inner-city women in urban clinics. *J Consult Clin Psychol*. 2002;70(4):950–60.
19. Wingood GM, DiClemente RJ, Mikhail I, et al. A randomized controlled trial to reduce HIV transmission risk behaviors and sexually transmitted diseases among women living with HIV: the WiLLOW program. *J Acquir Immune Defic Syndr*. 2004;37: S58–67.
20. Centers for Disease Control and Prevention. 2009 Compendium of evidence-based HIV prevention interventions. Available at <http://www.cdc.gov/hiv/topics/research/prs/evidence-based-interventions.htm>. Accessed May 12, 2009.
21. Lyles CM, Kay LS, Crepaz N, et al. Best-evidence interventions: findings from a systematic review of HIV behavioral interventions for US populations at high risk, 2000–2004. *Am J Public Health*. 2007;97:133–43.
22. DiClemente RJ, Wingood GM. A randomized controlled trial of an HIV sexual risk reduction intervention for young African American women. *JAMA*. 1995;274(16):1271–6.
23. Collins C, Harshbarger C, Sawyer R, Hamdallah M. The diffusion of effective behavioral interventions project: development, implementation, and lessons learned. *AIDS Educ Prev*. 2006; 18(Suppl. A): 5–20.
24. White LD. Women of color helping ourselves: self-help methodology for wellness. Atlanta: SisterSong Women of Color Reproductive Health Collective; 2005. Available from: [http://www.sistersong.net/publications\\_and\\_articles/self\\_help.pdf](http://www.sistersong.net/publications_and_articles/self_help.pdf). Accessed September 29, 2009.
25. Centers for Disease Control and Prevention. Evaluation of innovative human immunodeficiency virus (HIV) prevention interventions for high-risk minority populations. *Fed Register* 2004;69(134): 42183–190.
26. Becker MH. The health belief model and personal health behavior. *Health Educ Monographs*. 1974;2:324–473.
27. Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. *Am J Health Promot*. 1997;12:38–48.
28. Bandura A. Social cognitive theory in cultural context. *Appl Psychol Int Rev*. 2003;51:269–91.
29. Sillman J, Fried MG, Ross L, Gutiérrez ER. Undivided rights: women of color organize for reproductive justice. Cambridge: South End Press; 2004.
30. Rietmeijer CA, Fichtner RR. Toward a behavioral surveillance system for HIV/STD prevention. Atlanta: National HIV Prevention Conference; 1999.
31. Carey MP, Schroder KEE. Development and psychometric evaluation of a brief HIV knowledge questionnaire. *AIDS Educ Prev*. 2002;14:174–84.
32. DeHart DD, Birkimer JC. Trying to practice safer sex: development of the sexual risks scale. *J Sex Research*. 1997;34:11–25.
33. Brafford LJ, Beck KH. Development and validation of a condom self-efficacy scale for college students. *J Am Coll Health*. 1991;39:219–25.
34. Grimley DM, Prochaska JO, Velicer WF, Prochaska GE. Contraception and condom use adoption and maintenance: a stage paradigm approach. *Health Educ Q*. 1995;22(1):20–35.
35. Varnell SP, Murray DM, Janega JB, Blitstein JL. Design and analysis of group-randomized trials: a review of recent practices. *Am J Public Health*. 2004;94:393–9.
36. Lyles CM, Crepaz N, Herbst JH, Kay LS. Evidence-based HIV behavioral prevention from the perspective of CDC's HIV/AIDS Prevention Research Synthesis Team. *AIDS Educ Prev*. 2006; 18(Suppl. A): 21–31.
37. StataCorp. Stata Statistical Software, Release 8. In: College Station: StataCorp LP; 2003.
38. Crepaz N, Marshall KJ, Aupont LW, et al. The efficacy of HIV/STI behavioral interventions for African-American females in the United States: a meta-analysis. *Am J Public Health*. 2009; 99(11):2069–78.
39. Darbes L, Crepaz N, Lyles C, Kennedy G, Rutherford G. The efficacy of behavioral interventions in reducing HIV risk behaviors and incident sexually transmitted diseases in heterosexual African Americans. *AIDS*. 2008;22:1177–94.
40. Wingood GM, DiClemente RJ. HIV sexual risk reduction interventions for women: a review. *Am J Prev Med*. 1996;12(3): 209–17.
41. Beatty LA, Wheeler D, Gaiter J. HIV prevention research for African Americans: current and future directions. *J Black Psychol*. 2004;30(1):40–58.
42. Johnson BT, Scott-Sheldon LAJ, Smoak ND, LaCroix JM, Anderson JR, Carey MP. Behavioral interventions for African Americans to reduce sexual risk of HIV: a meta-analysis of randomized controlled trials. *J Acquir Immune Defic Syndr*. 2009;51(4):492–501.
43. Eldridge S, Ashby D, Bennett C, Wakelin M, Feder G. Internal and external validity of cluster randomised trials: systematic review of recent trials. *BMJ*. 2008;336(7649):876–80.

44. Adimora AA, Schoenbach VJ. Social context, sexual networks, and racial disparities in rates of sexually transmitted infections. *J Infect Dis.* 2005;191(Suppl. 1):S115–22.
45. Farley TA. Sexually transmitted diseases in the Southeastern United States: Location, race, and social context. *Sex Transm Dis.* 2006;33(Suppl. 7):S58–64.
46. Friedman SR, Cooper HLF, Osborne AH. Structural and social contexts of HIV risk among African Americans. *Am J Public Health.* 2009;99(6):1002–8.
47. Hallfors DD, Iritani BJ, Miller WC, Bauer DJ. Sexual and drug behavior patterns and HIV and STD racial disparities: the need for new directions. *Am J Public Health.* 2007;97(1):125–32.
48. Burton J, Darbes LA, Operario D. Couples-focused behavioral interventions for prevention of HIV: systematic review of the state of evidence. *AIDS Behav* 2009; E-published. doi:[10.1007/s10461-008-9471-4](https://doi.org/10.1007/s10461-008-9471-4).
49. El-Bassel N, Caldeira NA, Ruglass LM, Gilbert L. Addressing the unique needs of African American women in HIV prevention. *Am J Public Health.* 2009;99(6):996–1001.
50. Morris M, Kurth AE, Hamilton DT, Moody J, Wakefield S. Concurrent partnerships and HIV prevalence disparities by race: linking science and public health practice. *Am J Public Health.* 2009;99(6):1023–31.
51. Purcell DW, McCree DH. Recommendations from a research consultation to address intervention strategies for HIV/AIDS prevention focused on African Americans. *Am J Public Health.* 2009;99(11):1937–40.