

# HIV Prevention for Black Heterosexual Men: The Barbershop Talk with Brothers Cluster Randomized Trial

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**Objectives.** To identify the impact of a strengths-focused HIV prevention program among high-risk heterosexual Black men.

**Methods.** Barbershops in Brooklyn, New York, neighborhoods with high rates of heterosexually transmitted HIV were randomized to the intervention or an attention control program. Men were recruited from barbershops between 2012 and 2016 and participated in a single small group, peer-led session focused on HIV risk reduction skills and motivation, community health empowerment, and identification of personal strengths and communication skills. The outcome was defined as 1 or more acts of condomless anal or vaginal sex in the preceding 90 days at a 6-month interview.

**Results.** Fifty-three barbershops (24 intervention, 29 control) and 860 men (436 intervention, 424 control) were recruited; follow-up was completed by 657 participants (352 intervention, 305 control). Intervention exposure was associated with a greater likelihood of no condomless sex (64.4%) than control group participation (54.1%; adjusted odds ratio = 1.61; 95% confidence interval = 1.05, 2.47).

**Conclusions.** Program exposure resulted in reduced sexual risk behaviors, and the program was acceptable for administration in partnership with barbershops.

**Public Health Implications.** Dissemination of similar programs could improve public health in communities with high rates of HIV attributable to heterosexual transmission. (*Am J Public Health.* 2019;109:1131–1137. doi:10.2105/AJPH.2019.305121)

 See also Linnan, p. 1073.

In the United States, men who identify as Black or African American are at greater risk than are men from other racial and ethnic groups of becoming infected with HIV, of being diagnosed late in the course of infection, and of HIV-related mortality.<sup>1,2</sup> Although most infections among Black men are attributable to sex with other men, there exists an unacceptable burden of HIV transmission among Black heterosexual men, who are diagnosed at significantly higher rates than White heterosexual men and are more likely to be diagnosed with HIV concurrently with an AIDS-defining illness.<sup>3,4</sup>

Factors associated with HIV risk among heterosexual Black men include living in areas characterized by poor socioeconomic status, greater income inequality, and neighborhood

disorder<sup>5,6</sup>; an epidemic of incarceration that creates lower male-to-female ratios within these geographic areas and compounds risks of transmission<sup>5</sup>; and lower availability and use of prevention, screening, and treatment services targeting HIV and other sexually transmitted infections,<sup>7,8</sup> which can result in

lower motivation, skills, and self-efficacy for condom use.<sup>9,10</sup> At the interpersonal and individual levels, heterosexual HIV risk among Black men is driven in part by the impact of these social determinants on depression and on alcohol and substance use, which in turn are linked to condomless sex<sup>6,11</sup> and the impact of sex roles and conceptualizations of normative male and female behavior on partner concurrency, condom use,<sup>12,13</sup> and HIV stigma.<sup>14</sup> Such factors speak to the need to address these broad social determinants and, at a minimum, ensure that HIV prevention efforts are centered in geographically high-risk heterosexual areas.

Few interventions to our knowledge are designed specifically to support Black heterosexual men.<sup>15</sup> Responding to this need, we developed the Barbershop Talk with Brothers (BTWB) program. BTWB is a single-session, small group, peer-led intervention introduced to men through barber-shop partnerships; the program is located within areas of high risk for heterosexual HIV infection. BTWB is the result of a community-academic collaboration involving shared development, implementation, and program evaluation, with a focus on leveraging the strong connections and frequent interactions that barbers have with members of this

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priority population.<sup>16</sup> Barbershops represent a trusted community venue for Black men, and they are regular points of contact for men who might not have regular access to prevention education.<sup>17</sup> The primary objective of this study was to test the effectiveness of the BTWB intervention.

## METHODS

Participants were recruited from barbershops in Brooklyn, New York, located in neighborhoods with a high prevalence of HIV infection attributable to heterosexual behavior. Shops were randomly assigned to BTWB or to an attention control group focused on prostate cancer screening. Participants completed a baseline interview, engaged in intervention activities consistent with their group assignment, and completed a 6-month follow-up assessment. An intermediate 3-month assessment served as an intervention check but was not the intended focus of the outcome evaluation and is not discussed further. Program implementation and evaluation activities were informed by a 10-member steering committee consisting of barbers, barbershop owners and managers, and members of community organizations serving our priority population. Study investigators and outreach staff also participated on the steering committee.

### Barbershop Recruitment, Randomization, and Training

Partnerships were formed with barbershops located in several contiguous, geographically high-risk neighborhoods for heterosexually transmitted HIV infection. These neighborhoods included Flatbush, East Flatbush, Crown Heights, Brownsville, Bedford-Stuyvesant, and East New York. In 2015, 16.5% of all newly identified cases of HIV in New York City were attributed to heterosexual risk, and 22% of heterosexually transmitted new infections were diagnosed concurrently with AIDS. In the neighborhoods that are the focus of the project, between 18% and 25% of cases were attributed to heterosexual risk, and among these cases concurrent AIDS diagnoses ranged from 28% to 57%.<sup>18</sup> To identify barbershops, we used a zip code-based list from the Yellow Pages online directory as well as barbershops

referred to us by our steering committee. Shops were excluded if they had worked with us on BTWB program development or employed fewer than 3 barbers. Participating barbershop owners signed a memorandum of agreement outlining expectations and procedures.

To protect against contamination risks within barbershops, we used a cluster randomized study design. Permuted block randomization was conducted via a computerized number generator, with 1:1 allocation typically performed in block sizes of 4. Given the nature of the project, blinding was feasible only at the level of the statistical analyst; the allocation identifier was released upon completion of the data analysis.

Prior to intervention activities, all barbers, managers, and shop owners were offered the opportunity to participate in BTWB at their shop, with a supplemental module included focusing on strategies to promote referral of customers to the program. Barbers were provided with capes and T-shirts with the program logo, study referral business cards, and promotional cards that could be placed at each barber's station. Barbers in control shops were provided with the prostate cancer program materials along with similar coaching regarding customer referral. Barbershops received no remuneration for participating. However, barbershop personnel received \$40 for undergoing training.

### Participant Recruitment

Recruitment typically began within 2 weeks of barber training. Study staff were introduced to customers by their barber or staff members directly approached customers after project presence had been established in the barbershop. Research staff described the study, and interested customers were provided a set of screening questions administered on a laptop through audio computer-assisted self-interviewing (ACASI). Laptops were equipped with a privacy screen and headphones to ensure privacy in the barbershop setting during the question-and-answer process.

Inclusion criteria included reports of at least 2 sexual partners in the preceding 6 months and at least 1 episode of condomless sex during that time. In addition, men were eligible if they were 18 years or older and

identified as Black or African American. Further alignment with the Centers for Disease Control and Prevention's definition of high-risk heterosexuals was made by excluding those who reported using injection drugs or having sex with other men in the preceding 5 years<sup>3</sup> and those with an HIV-positive serostatus. Finally, men who were unable to understand spoken English were excluded.

### Intervention

Sessions were originally intended to also be held during off hours at volunteering barbershops; as a result of space and time constraints, however, sessions took place in private settings at SUNY Downstate and the Arthur Ashe Institute for Urban Health. Group facilitators for the project were Black men, most of whom lived or worked in the prioritized geographic area; minimal qualifications included holding a bachelor's degree in a health- or science-related field or having prior experience working in the field of HIV prevention. The study investigators implemented centralized training of the BTWB intervention protocol, included a checklist-guided review of audiotapes of intervention sessions to ensure that all core components were delivered, and provided ongoing individualized feedback to interventionists on delivery of content areas. Staff who conducted evaluation assessment activities did not administer intervention activities.

The BTWB program involved a combination of educational messages, role-play activities, self-evaluation activities, and a strengths-based lens on men and masculinity to support several goals on the pathway to sustained sexual risk reduction. These pathways were informed by social cognitive theory,<sup>19</sup> community- and individual-level empowerment theory,<sup>20,21</sup> and an assets- and strengths-based perspective on health promotion.<sup>22,23</sup> This strengths-based approach, emphasizing individual and environmental resources, capacities, values, and competencies, guided both our program planning process and the approach to how core messages and images in our intervention were framed.<sup>24</sup>

Core elements of the BTWB intervention focused on promoting attitudes, self-efficacy, and perceived norms supporting reduced

sexual risk behavior; increasing effective communication strategies for condom use with sexual partners; and developing increased personal responsibility and commitment to improving community health by empowering men with skills and motivation to co-educate men and women in their social networks about risk reduction. In addition, participants developed a set of achievable behavioral change goals associated with their own sexual behavior and in regard to with whom they planned to discuss core BTWB messages. Each participant received a workbook and supporting educational materials, including a pamphlet and information on sites where preexposure prophylaxis and HIV testing could be attained.

Finally, individuals interested in free HIV testing were offered the option of being escorted by one of the peer health educators. The BTWB program is the product of a multiyear, community-engaged development process that sought to ensure that program modules, messages, and graphics target risk and protective factors most directly associated with condomless sex, are culturally relevant and acceptable in our priority population, and explicitly seek to build on men's assets and strengths.<sup>25</sup>

Control group participants received a curriculum focused on prostate cancer screening and detection. The protocol for the control group activity, originally developed by the Arthur Ashe Institute for Urban Health,<sup>26</sup> was adapted early in the data collection process to be administered in a similar group format in the BTWB program, to be moderated by a staff member, and to involve a time commitment for participation similar to that associated with the BTWB intervention.

Participants, regardless of study condition, were provided \$20 for taking part in the program along with a roundtrip subway/bus fare card, a T-shirt with the project logo, and a referral guide for local free or low-cost health and social services. In addition, condoms were periodically distributed at all shops.

## Measures

ACASI was used in administering evaluation measures. Study staff were present while participants completed their evaluation activities, which were conducted either at the project administrative offices or in

community settings selected by the participants. As a means of promoting study retention, a standard, parallel reminder schedule was implemented for both groups that included regular telephone calls and text message contacts.

The primary outcome was HIV transmission risk behavior at the 6-month assessment. Risk behavior was defined as a self-report in the preceding 90 days of at least 1 episode of condomless anal or vaginal sex. Condom use questions were asked separately for main, casual, and one-time or anonymous partners and for vaginal and anal sex by partner type. Answers to the 6 questions were then collapsed into a single indicator reflecting reports of any condomless sex.<sup>27,28</sup> A 90-day period for behavioral recall, coupled with date cues, was used given that this period is short enough to ensure accurate recall but long enough to be sensitive to patterns of risk behavior.<sup>29–31</sup> Overall, our approach to measurement, when combined with the ACASI mode of administration, is a demonstrated approach to obtaining accurate estimates of HIV risk.<sup>31,32</sup>

Variables associated in past research with sexual risk behavior were assessed at baseline. They included age, split at the sample median (younger than 30 years or 30 years or older); nativity (US born or non-US born); lifetime history of criminal justice involvement (ever spent at least 1 night in jail or prison or never in jail or prison); health care coverage (yes or no); employment status (part- or full-time employment vs no employment); educational status (completed or did not complete a high school degree or equivalent); housing stability (living in one's own housing or that of a friend or family member vs living on the street, in a shelter, in a single-room occupancy hotel, or in a residential facility); currently living with a sexual partner (yes or no); and use of alcohol, marijuana, or other illicit substances excluding marijuana during the preceding 3 months (yes or no).

## Data Analysis

We conducted the  $\chi^2$  test (for categorical variables) and independent-samples *t* test (for group differences in continuous variables) to

**TABLE 1—Baseline and 6-Month Follow-Up Demographic and Behavioral Characteristics: Barbershop Talk with Brothers (BTWB) Program Participants, Brooklyn NY, 2012–2016**

	Baseline		Follow-Up	
	BTWB Intervention	Control	BTWB Intervention	Control
<b>Group characteristics</b>				
No. shops	24	29	24	28 <sup>a</sup>
No. customers per shop, median (range)	12 (1–68)	10 (1–90)	10 (1–53)	6 (1–82)
No. customers	436	424	352	305
<b>Individual characteristics, %</b>				
Aged $\geq 30$ y <sup>b,c</sup>	44.4	57.5	45.9	61.0
Living with a sexual partner	18.5	20.1	20.6	24.0
Current health insurance <sup>b,c</sup>	62.9	71.6	62.1	79.5
Currently employed <sup>b</sup>	46.5	54.3	63.3	63.3
High school degree or equivalent	77.4	76.2	78.5	76.7
Born in the United States <sup>b,c</sup>	53.4	76.4	51.7	79.0
In stable housing <sup>b,c</sup>	84.2	68.6	83.4	71.0
No substance use (excludes marijuana) <sup>b,c</sup>	90.5	82.8	91.1	84.9
No marijuana use	52.3	51.7	57.6	51.6
No alcohol use	25.7	22.5	24.9	25.7
No incarceration history <sup>b,c</sup>	45.3	58.9	41.4	54.6
<b>Outcome variable: no condomless vaginal/anal sex in last 90 d, %<sup>c</sup></b>	<b>55.0</b>	<b>48.7</b>	<b>64.8</b>	<b>53.8</b>

<sup>a</sup>The sole participant enrolled at a shop was lost to follow-up.

<sup>b</sup>Significant group difference at baseline ( $P < .05$ ).

<sup>c</sup>Significant group difference at follow-up ( $P < .05$ ).

assess study characteristics across experimental groups and in relation to condomless sex. Generalized linear mixed-effects models were used to estimate between-group differences at the participant level taking into account the hierarchical data structure, with men clustered by barbershop. Differences between the BTWB intervention and control groups in terms of changes in outcomes were analyzed on an intention-to-treat basis. We used a generalized linear mixed-effects model to examine nonreports of condomless sex in the preceding 90 days, with the 6-month value modeled as the outcome and the experimental group as the predictor, while controlling for barbershop site of recruitment (random effect), the baseline value of condomless sex in the preceding 90 days (fixed effect), and covariates (fixed effects). To assess differences in intervention effectiveness across covariates known to influence HIV risk, we created interaction terms between experimental group assignment and covariates and tested these terms for statistical significance in a stepwise approach. SAS PROC GLIMMIX version 9.4 (SAS Institute, Cary, NC) was used in analyzing the data.

## RESULTS

Sixty-two barbershop owners agreed to participate; 53 shops received training and were randomized (24 BTWB intervention, 29 control). Of the 9 excluded shops, 2 lost interest in participating and withdrew before study activities began, 1 went out of business, 2 did not have barbers willing or available to be trained, and the others yielded no recruits after 1 week of attempts. At participating barbershops, 191 barbers and barbershop managers/owners completed training (90 BTWB, 101 control).

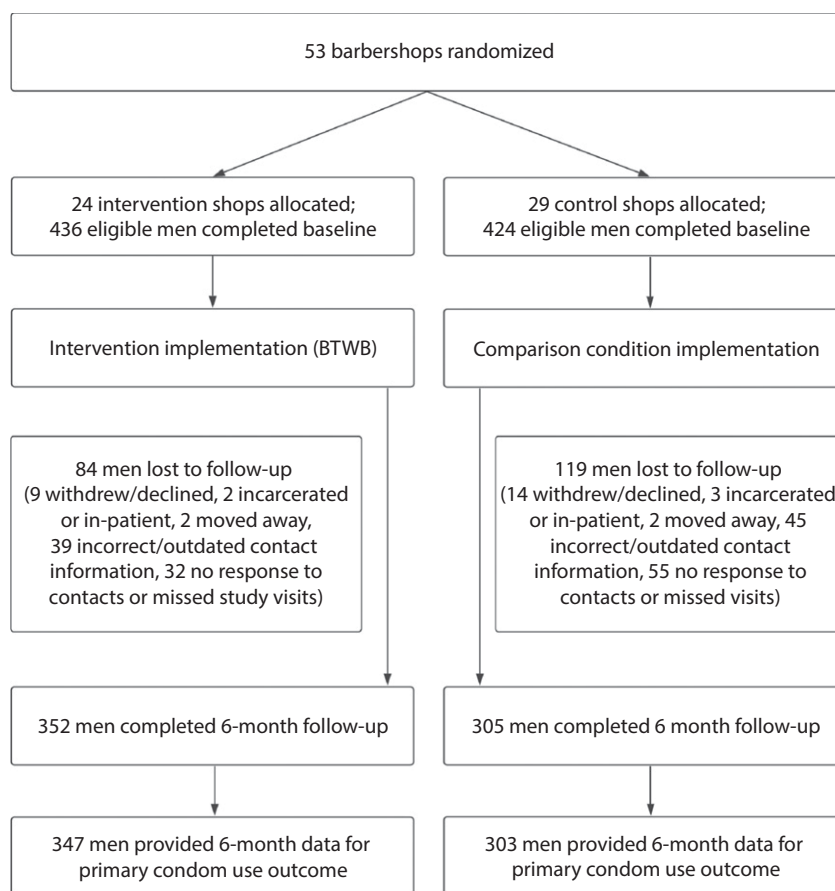
A total of 4119 men were screened between November 2012 and July 2016. Of these men, 1222 (29.7%) were eligible on the basis of reports of both multiple sexual partners and inconsistent condom use during anal or vaginal sex in the preceding 6 months. Among these 1222 men, 153 were excluded because they were younger than 18 years ( $n = 11$ ), they did not identify as Black ( $n = 23$ ), they were not able to answer questions in English ( $n = 2$ ), they reported having had oral or anal sex with another man

in the preceding 5 years ( $n = 53$ ), or they reported injection drug use in the preceding 5 years ( $n = 60$ ). Probably as a result of another preexposure prophylaxis health education initiative being conducted in several of the barbershops, 47 men reported participation in an HIV or substance use study in the preceding 6 months and were ineligible. Finally, 38 men were excluded as a result of self-reported HIV-positive serostatus on the screening form. Exclusions do not sum to 153 given concurrent ineligibility factors. Of the 1069 eligible men, 881 (82.4%) provided informed consent to participate.

Baseline interviews were completed with 876 men. Of these men, 16 who reported not having HIV on the screener were subsequently removed from the analytic data set because they reported baseline HIV-positive serostatus, resulting in 436 BTWB intervention and 424 control group men

( $n = 860$ ). Participants ranged in age from 18 to 76 years (mean = 33 years, SD = 11, median = 30), with 64.8% born in the United States. Men born outside of the United States were primarily from Haiti (47.9%), Jamaica (9.4%), Guyana (8.1%), Trinidad and Tobago (3.9%), another Caribbean country (5.9%), or Africa (8.8%). The remainder were from other countries (14.7%) or chose not to answer (1.3%).

Most of the men (52%) had a history of incarceration. A total of 23.5% were living in a shelter, a residential or treatment facility, on the street, or in other housing indicative of housing instability (e.g., single-room occupancy hotel), and 19.3% were living with a sexual partner. Most (76.8%) had completed high school or equivalent, 50.4% were working full or part time, and 67.2% reported having health insurance. Overall, 75.9% of men reported alcohol use in the preceding



**FIGURE 1—Flow Diagram for Barbershop Talk with Brothers (BTWB) Cluster Randomized Trial: Brooklyn, NY, 2012–2016**

90 days, 48% reported marijuana use, and 13% reported use of other illicit substances.

At baseline, men recruited from BTWB intervention shops were younger, more likely to be in stable housing, less likely to have health insurance, less likely to be currently employed, less likely to report illicit substance use, less likely to report lifetime criminal justice system involvement, and less likely to have been born in the United States than were men recruited from control shops (all  $P$ s < .05; Table 1). The intraclass correlation coefficient for the primary outcome variable was 0.07 (95% confidence interval [CI] = 0.01, 0.13).

Although baseline reports of living with a partner, marijuana use, and alcohol use did not differ as a function of group assignment, they did differ as a function of baseline condom use. Men living with a partner were less likely to report condomless sex (41.8%) than men who did not live with a partner (54.4%;  $P = .004$ ). Men who used marijuana were more likely to report condomless sex (56.0%) than men who did not use marijuana (47.4%;  $P = .012$ ). In addition, men who consumed alcohol were more likely to report condomless sex (60.6%) than men who did not consume alcohol (49.1%;  $P = .004$ ).

The 6-month assessment was completed by 657 men, 7 of whom had incomplete information on the outcome variable (Figure 1); follow-up was higher in the BTWB group (79.6%) than in the control group (71.5%;  $P = .006$ ). Among the 650 men with outcome data, there were no differences detected in baseline-reported condomless sex as a function of completing follow-up ( $P = .92$ ) or in the covariates of living with a partner, insurance status, nativity, housing stability, marijuana use, alcohol use, other drug use, incarceration history, or age (all  $P$ s > .05). Follow-up was higher among men who were not employed (79.7%) than among those who were working (71.4%;  $P = .005$ ); it was also higher among men with lower educational attainment (69.7%) than among those with at least the equivalent of a high school education (77.4%;  $P = .03$ ).

In the final adjusted model, which included 326 BTWB and 294 control group members, the relationship between intervention exposure and condomless sex was statistically significant (adjusted odds ratio [OR] = 1.61; 95% CI = 1.05, 2.47); 210 men (64.4%) assigned to the BTWB intervention

**TABLE 2—Odds Ratios of Reporting No Condomless Anal or Vaginal Sex at 6-Month Follow-Up: Barbershop Talk with Brothers (BTWB) Program, Brooklyn NY, 2012–2016**

Variable	Condomless Sex, No. (%)	No Condomless Sex, No. (%)	Adjusted OR (95% CI)
All	251 (100)	369 (100)	
<b>Intervention assignment</b>			
BTWB	116 (46.2)	210 (56.9)	1.61 (1.05, 2.47)
Control	135 (53.8)	159 (43.1)	1 (Ref)
<b>Age, y</b>			
< 30	125 (49.8)	200 (54.2)	1.28 (0.86, 1.89)
≥ 30	126 (50.2)	169 (45.8)	1 (Ref)
<b>Baseline condomless sex</b>			
No	99 (39.4)	222 (60.2)	2.17 (1.53, 3.07)
Yes	152 (60.6)	147 (39.8)	1 (Ref)
<b>Living with a sexual partner</b>			
Yes	58 (23.1)	58 (15.7)	0.56 (0.36, 0.89)
No	193 (76.9)	311 (84.3)	1 (Ref)
<b>Health insurance</b>			
Yes	163 (64.9)	256 (69.4)	1.34 (0.91, 1.97)
No	88 (35.1)	113 (30.6)	1 (Ref)
<b>Employment</b>			
Currently employed	127 (50.6)	169 (45.8)	1.09 (0.75, 1.59)
Not currently employed	124 (49.4)	200 (54.2)	1 (Ref)
<b>Education</b>			
High school degree or equivalent	211 (84.1)	281 (76.2)	0.61 (0.39, 0.98)
< high school	40 (15.9)	88 (23.8)	1 (Ref)
<b>Nativity</b>			
Born in the United States	173 (68.9)	228 (61.8)	0.83 (0.53, 1.28)
Not born in the United States	78 (31.1)	141 (38.2)	1 (Ref)
<b>Housing stability</b>			
In stable housing	193 (76.9)	282 (76.4)	1.16 (0.70, 1.92)
Not in stable housing	58 (23.1)	87 (23.6)	1 (Ref)
<b>Substance use</b>			
No substance use (excludes marijuana)	220 (87.6)	320 (86.7)	0.72 (0.42, 1.25)
Substance use (excludes marijuana)	31 (12.4)	49 (13.3)	1 (Ref)
<b>Marijuana use</b>			
No	127 (48.7)	214 (55.4)	1.32 (0.90, 1.94)
Yes	134 (51.3)	172 (44.6)	1 (Ref)
<b>Alcohol use</b>			
No	56 (22.3)	89 (24.1)	0.91 (0.59, 1.41)
Yes	195 (77.7)	280 (75.9)	1 (Ref)
<b>Incarceration history</b>			
No	134 (53.4)	186 (50.4)	1.03 (0.69, 1.56)
Yes	117 (46.6)	183 (49.6)	1 (Ref)

Note. CI = confidence interval; OR = odds ratio. The total sample size was 620 (of the 650 men who provided outcome data on condom use at follow-up, 30 were missing information on 1 or more covariates and were excluded from the analysis). All covariates were assessed at baseline.

reported no condomless sex, as compared with 159 control participants (54.1%). Additional baseline predictors of no condomless

sex included reporting no condomless sex at baseline, living with a sexual partner, and lower education (Table 2). No statistically

significant interactions were detected between experimental group and model covariates (all  $P$ s > .05).

## DISCUSSION

This BTWB evaluation reveals several important issues for public health promotion. The first involves the demonstration of barbershops as committed partners for implementation of HIV initiatives. By embedding the intervention into the existing barbershop community structure, the project successfully reached an underserved priority population. Second, our intervention approach was shown to be effective, with statistically significant increases in the proportion of men who reported no condomless sex at follow-up. This finding suggests that single-session interventions can be effective when implemented in settings, such as barbershops, that do not typically provide health services. Furthermore, tests of interactions between experimental group membership and model covariates suggest that our intervention findings are robust to differences related to nativity, living with a partner, and substance use as well as to social and structural factors such as incarceration history, housing stability, and employment.

## Limitations

Our findings should be considered in light of several limitations. We included patrons of barbershops situated in neighborhoods with large HIV disparities, and generalizability is limited to these populations. Concealment of treatment allocation was not plausible except at the level of data analysis. Although we blinded group membership in the data set, our inability to blind at other levels could have led to bias.

The primary outcome was self-reported given that more objective measures, such as testing for sexually transmitted infections, were not feasible in this research context. Although such self-reports have been shown to be valid indicators of sexual risk, it is expected that some bias is present in our data. There were shifts toward safer sex over time in both the experimental and control groups. These shifts could be due to a number of factors, including the potential intervention

effect of condom distribution at both experimental and control shops, regression to the mean, inflated baseline risks reported by participants to gain entry into the study, or a contamination effect across shop personnel or study participants.

The cluster randomization approach produced covariate imbalance on several variables. Although we controlled for these variables, unmeasured covariates may have contributed to observed study differences. For instance, imbalances in factors such as housing stability may be associated with characteristics, such as stress and depression, that can influence risk behavior.<sup>33</sup> Loss to follow-up differed as a function of baseline education and employment but not by condom use, experimental group, or other model covariates. These differences could have biased our findings, particularly given that education was associated with condom use at follow-up. Finally, our study began prior to widespread availability of preexposure prophylaxis. Although our intervention involved discussion of preexposure prophylaxis and provided resources for access, we did not assess this variable as an outcome.

## Conclusions

Our evaluation suggests several avenues for future research and practice. Although our approach was feasible and effective, it should be noted that barbershops are typically businesses with a small and regular customer base. This situation translates into considerable effort in developing and maintaining relationships with shops at levels large enough to affect public health outcomes. Future evaluations should consider the costs of this type of program in relation to the benefits gained from the work. In addition, public health findings from successful barbershop-focused trials focused on a range of health topics<sup>16,34</sup> may create increased demand for partnerships between small businesses and health agencies in high-need areas. Further research is needed to explore how barbershop and public health partnerships can balance and prioritize community health demands.

## Public Health Implications

Our study supports the feasibility of reaching Black heterosexual men at risk for HIV infection through the BTWB program

and provides evidence of the program's effectiveness. Expansion of programs such as BTWB holds promise for reducing HIV health inequities. **AJPH**

## CONTRIBUTORS

T. E. Wilson was responsible for conceptualizing the study and design; acquisition, analysis, and interpretation of data; and drafting of the article. Y. Gousse contributed to the study design, acquisition and interpretation of data, and drafting of the article. M. A. Joseph contributed to the study design and data analysis and interpretation. R. C. Browne, H. Brown, and M. Fraser contributed to the study design and interpretation of data. B. Camilien, D. McFarlane, S. Mitchell, N. Urraca, D. Romeo, and S. Johnson contributed to the study design and acquisition of data. M. Salifu and M. Stewart contributed to interpretation of data. P. Vavagiakis was responsible for data management. All of the authors contributed to critical revisions of the article.

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## CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

## HUMAN PARTICIPANT PROTECTION

All procedures were approved by the SUNY Downstate Medical Center institutional review board, and all participants provided written informed consent.

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