



Published in final edited form as:

AIDS. 2012 February 20; 26(4): 483–488. doi:10.1097/QAD.0b013e32834f9833.

## A randomized trial of a behavioral intervention for Black men who have sex with men: The DiSH Study

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### Abstract

**Objective**—To test a new behavioral intervention for Black men who have sex with men in reducing sexual risk and increasing social support and intentions to use condoms.

**Design**—A single site, unblinded randomized trial in New York City with 3-month follow-up.

**Methods**—Participants (n = 283) reporting at least 2 sexual partners and unprotected anal intercourse with a man in the past 3 months were enrolled and randomized to a social-cognitive theory based intervention or control comparison. Men in the intervention group participated in five 2-hour group sessions focused on creating a group environment with sexual risk-reduction information and exercises woven into joint meal preparation and sharing activities, while

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Author contributions: Agree with the manuscript's results and conclusions: BAK SB BP PM JEE JP GX DRH KG JC HVT PS. Designed the experiments/the study: BAK SB BP PM JEE JP DRH JC PS. Analyzed the data: GX DRH HVT BAK. Collected data/did experiments for the study: BAK KG JEE SB. Enrolled patients: BAK KG. Wrote the first draft of the paper: BAK. Contributed to the writing of the paper: BAK SB JP DRH JC HVT PS. Managed the project: BAK KG JP PS. Acquired funding: BAK SB. Interpreted data: BAK SB BP PM JP DRH JC PS. Wrote the report: BAK. Revised the report: BAK SB BP PM JEE JP DRH JC HVT PS.

#### Conflicts of Interest

No conflicts were declared.

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention

exploring self-efficacy perceptions and outcome expectancies. Intervention (n = 142) and control (n = 141) groups received standard HIV counseling and testing at baseline.

**Results**—No significant differences were found between study arms at 3 months in number of male partners, number of unprotected anal intercourse partners, proportion reporting unprotected sex, number of acts protected by condoms, self-efficacy, condom attitudes, condom intentions, social isolation and psychological distress. In both arms combined, declines from baseline to 3-months were observed in sexual risk behaviors, social isolation and psychological distress while self-efficacy, condom attitudes and condom intentions improved.

**Conclusions**—As the HIV epidemic continues to have a dramatic impact on Black MSM in the US, the urgency to design innovative interventions continues.

## Keywords

behavioral intervention; Black/African-American; gay men; HIV

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Men who have sex with men (MSM) continue to comprise the largest proportion of new HIV infections in the United States. Black MSM are affected at greatly disproportionately higher rates compared to other groups of MSM [1–5]. Few interventions have been developed for reducing sexual risk among Black MSM [6–8].

We tested a new intervention to reduce sexual risk and social isolation and increase condom intentions among Black MSM. The intervention created a group environment through joint meal preparation and sharing, sexual risk-reduction information and exercises while exploring self-efficacy perceptions and outcome expectancies [9–11].

## Methods

Between May 2008 and June 2009, Black MSM were recruited through outreach in New York City, referrals from organizations and study participants, recruitment flyers and advertisements [12]. Men were eligible if they: were 18+ years; were New York City area residents; understood and read English; self-identified as male and as African American, Black, Caribbean Black, or multiethnic Black; had 2+ sexual partners (male or female) and reported unprotected anal intercourse (UAI) with a man in the past 3 months; and were available for the study duration. Men were ineligible if they self-identified as a transgender woman, refused HIV testing or were newly diagnosed with HIV infection within the prior 6 months. The study was approved by the institutional review boards at the participating institutions.

## Baseline and follow-up visits

After written informed consent, participants completed a computer-administered behavioral assessment, and received HIV risk-reduction counseling [13]. Participants who did not report and document being HIV-positive were administered a rapid HIV antibody test. At the next visit, participants were randomized into intervention and control groups and intervention participants began their first session. Control participants did not attend group

sessions. A follow-up questionnaire was completed 3 months after completion of the intervention sessions or 3 months after the baseline visit for the control arm.

## Intervention

The intervention was based on Bandura's Social Cognitive Theory [14]. Teams of two trained facilitators conducted five two-hour group sessions over two weeks. In each session, participants jointly prepared healthy, low-cost meals with simple appliances that accommodated a range of living environments. For example, in session 1, participants chose from ingredients to make mini-pizzas and fruits to make smoothies. This emphasis on food choice was extended to participants choosing and describing condoms and lubricants types and preferences. Participants explored factors influencing eating and sexual behaviors (e.g., cultural history, racism and homophobia) and examined whether their eating and sexual behaviors were flexible and malleable. Parallels were drawn between planning ahead for healthy eating and healthy sex.

In subsequent sessions, participants continued to cook, eat and engage with each other over a range of nutrition and HIV-related health topics. Participants discussed obstacles to change regarding food and sex, feelings of self-worth, remorse/shame, and benefits/ramifications of disclosing sexual identity and HIV serostatus. They explored HIV risk-reduction decision making and condom use and what leads to overeating or unsafe sex. The men also examined environmental determinants of health behavior, including the size/quality of support networks, the impact of drug/alcohol use on health and decision making and developed strategies to grow support communities. The final session focused promoting commitment to change including proximal goal setting, utilizing friends for support, and self-evaluation of progress toward goals, strategy refinement, and self-rewards (Contact BAK for intervention description or manual).

For quality assurance purposes, sessions were audio recorded and scored for content and fidelity by two investigators (SB, JEE).

## Measures

*Sexual Risk Behavior Measures* included number of sexual partners and unprotected receptive and insertive anal intercourse male partners in the prior three months. Number of receptive and insertive anal intercourse episodes, condom use, and alcohol/drug use in conjunction with sex were asked for most recent partner and other partners by partner HIV serostatus.

Primary sexual risk behavior outcomes derived from these measures were: occurrence of unprotected insertive (UIA) or receptive (URA) anal intercourse and unknown or serodiscordant unprotected insertive (USDUIA) or receptive (USDURA) anal intercourse with most recent partner and any partner.

Secondary sexual risk behavior outcomes included number of unprotected receptive or insertive anal intercourse partners, proportion of anal sex acts protected by condoms and occurrence of unprotected anal intercourse with alcohol/drugs with most recent partner.

*Psychosocial outcome measures* were chosen based on the content of the intervention. *Social isolation (7 items)* [15]: Participants rated items such as “In the last three months, how often did you feel you lacked companionship?” on a 4-point scale from “never” to “always” ( $\alpha=0.91$ ). *Sexual self-efficacy (7 items)* [16]: Participants rated items such as “I can choose safer sex with a man I have sex with regularly” on a 5-point scale from “strongly disagree” to “strongly agree” ( $\alpha=0.87$ ). *Condom attitudes (5 items)* [17]: Participants rated items such as “Using a condom turns me off” using the same 5-point scale ( $\alpha=0.82$ ). *Condom intentions* [18] were measured with the statement “I intend to use condoms every time I have intercourse in the next three months” using the same 5-point scale. *Psychological distress (10 items)* [19]: Participants rated items such as “In the last month, how often did you feel everything was an effort?” using a 5-point scale from “none of the time” to “all the time” ( $\alpha = 0.91$ ).

### Statistical Analysis

Intent-to-treat comparisons were made between the participants randomized to the intervention and control arms. Binary behavioral outcomes at baseline were compared by study arm using contingency tables and exact tests. For continuous variables, baseline mean values were compared by study arm using Wilcoxon rank sum test. Changes in outcomes between baseline and three months were compared using McNemar discordant pair analysis (binary variables) or Wilcoxon signed-rank sum test (continuous variables). Differences between baseline and 3-month visit by study arm of binary outcomes were calculated and compared using Cochran-Armitage Trend Test. For continuous variables, Wilcoxon rank sum test was used. We did not present adjustment for teaching class effect as doing so does not qualitatively or quantitatively change the findings.

### Results

Among 828 men screened, 474 met the eligibility criteria, 328 completed the baseline visit and 283 were randomized. The mean age of the randomized participants was 39.3 years (range: 18–68); 24 (8.5%) identified as Latino, in addition to Black. About half (53.0%) had at least some college education, 24.5% were working and 61.4% had annual incomes below \$10,000. About two-thirds (67.5%) identified as gay and 62.5% were HIV-positive.

Mean and median numbers of male partners and unprotected anal intercourse partners in 3 months prior to baseline line were 6.7 and 4 and 4.2 and 2, respectively. The mean proportion of anal sex acts protected by condoms was 0.47. Over two-thirds (69.9%) reported UIA, 56.0% reported URA, 42.3% reported USDUIA and 31.9% reported USDURA with any partner type. With the most recent partner, 46.5% reported UIA, 39.0% reported URA, 20.4% reported USDUIA and 19.0% reported USDURA. About half (50.5%) reported UAI in conjunction with alcohol/drugs with their most recent partner. Intervention men were younger than controls; there were no other statistically significant differences in baseline demographics, sexual risk behaviors or psychosocial variables between study arms.

Adherence to the intervention manual was high. The mean adherence score for all sessions was 4.4 of 5 total points; 81.4% of sessions had a score of at least 4. A high percent (85.9%) of men completed at least 4 sessions. Three-month visits were completed by 128 (90.1%) of

intervention men and 130 (92.2%) of control men ( $p = 0.54$ ). Men retained were more likely to report USDUIA ( $p = 0.018$ ) and to have lower self-efficacy ( $p = 0.032$ ). No other significant differences in demographics or other characteristics were found.

Among all men who completed the 3-month visit ( $n = 258$ ), declines from baseline to the 3-month visit were observed for mean numbers of male partners (baseline: 7.0; 3-mo: 3.5) and mean numbers of unprotected anal intercourse partners (baseline: 4.3; 3 mo: 1.8) ( $p < 0.0001$  for both). Proportion of acts protected by condoms increased over the same time period (baseline: 0.46; 3 mo: 0.64) ( $p < 0.0001$ ). However, study arms did not statistically differ at 3 months for these outcomes. Likewise, declines from baseline to the 3-month visit were observed in the percentages reporting UIA, URA, USDUIA, USDURA and UAI in conjunction with alcohol/drugs with most recent partners ( $p < 0.0001$  for all) and UIA, URA, USDUIA, USDURA with any partner ( $p < 0.0001$  for all). Again, study arms did not statistically differ at 3 months for these outcomes (Table 2).

Self-efficacy, condom attitudes and condom intentions all improved from baseline to 3-months ( $p < 0.0001$ ). Social isolation declined ( $p = 0.0006$ ) as did psychological distress ( $p < 0.0001$ ) over the same time period. As with sexual risk behaviors, study arms did not statistically differ at 3 months for these outcomes (Table 2).

## Discussion

The DiSH intervention was innovative by integrating meal preparation with healthy sex skills building, and through shared social activities around food preparation and eating while exploring self-system factors that emerge in this new environment. Overall, men decreased their sexual risk, psychological distress and social isolation while increasing self-efficacy, condom attitudes and intentions. However, the intervention did not confer additional effect over counseling and testing which was delivered to both groups.

Risk behaviors often decrease in both intervention and controls arms but with no difference between arms [20–22]. This finding could be due to a number of factors. In New York City, HIV prevention messages for Black MSM have been disseminated in recent years and men in both arms could have been exposed to such messages during the trial. Men in this trial also may have been ready for change [23], regardless of study arm assignment and the baseline assessment and risk reduction counseling could have provided sufficient boost for behavior change in both arms. Participants in both arms received personal attention through enrollment and retention efforts. This could be an intervention through contact and support.

Conversely, the men may have demonstrated “regression to the mean” with regards to behavior change [24]. There also is the possibility of cross-contamination among participants as it is possible that the men knew each other in both arms. Finally, the intervention’s focus on strengthening social ties and increasing health consciousness may have benefits that are not measurable in the short term or may also have had a greater impact if the sessions were less condensed in time to allow for the evolution of behavior change.

Some limitations to the study should be acknowledged. Although computer interviewing can reduce socially desirable responding [25], the data reported by participants may not

accurately reflect actual risk behavior. The sample was too small for assessing whether subgroups of men benefited more from the intervention. Finally, the sample is not necessarily representative of Black MSM in New York City.

The HIV epidemic continues to have a dramatic impact on Black MSM in the US. Multilevel and combination interventions [26], centered in the needs of the men, have received attention for their potential to change social norms and structures that impede health and well-being and should be urgently pursued.

## Acknowledgments

The DiSH Study Team also acknowledges all of the study participants who volunteered for this project, the study staff and facilitators (George Bellinger, Randall Brown, Mark Kornegay, Donald Powell, Kiwan Stewart) and our Community Consulting Group (George Gates, Edwin Krales) for their commitment to the success of this project.

### Source of Funding

This study was supported by a cooperative agreement between the New York Blood Center and the Centers for Disease Control and Prevention (3UR6PS000437-03W1).

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**Table 1**  
 Characteristics of men in intervention and control conditions, DiSH Study, 2008–09, N = 283.

Characteristic	Intervention N = 142		Control N = 141		p-value
	N <sup>a</sup>	%	N <sup>a</sup>	%	
Age (years)					
18–30	40	28.2	24	17.0	0.04
31–40	30	21.1	34	24.1	
41–45	47	33.1	42	29.8	
46+	25	17.6	41	29.1	
Education					
< High school	24	16.9	19	13.5	0.13
High school or GED	51	35.9	39	27.7	
Some college	48	33.8	51	36.2	
College degree +	19	13.4	32	22.7	
Employment					
Full or part time	29	20.4	40	28.6	0.08
Not working	86	60.6	66	47.1	
On disability	27	19.0	34	24.3	
Income					
<\$10,000	91	64.5	81	58.3	0.56
\$10,000–29,999	33	23.4	39	28.1	
\$30,000+	17	12.1	19	13.7	
Sexual identity					
Gay	95	66.9	96	68.1	0.79
Bisexual	40	28.2	36	25.5	
Other	7	4.9	9	6.4	
HIV test by study					
Negative	57	40.1	49	34.8	0.35
Positive	85	59.9	92	65.3	

<sup>a</sup>N may not total due to missing data.



**Table 2**  
Sexual risk behaviors and psychosocial measures at baseline and 3-month follow-up, DiSH Study.

Sexual risk behaviors	Baseline N = 258		3-month follow-up N = 258		p-value <sup>a</sup>
	n	%	n	%	
With most recent partner					
UIA					
Intervention	60	46.9	33	25.8	0.80
Control	59	45.7	34	26.2	
URA					
Intervention	50	39.1	31	24.2	0.84
Control	51	39.5	30	23.1	
USDUIA					
Intervention	26	20.6	10	7.8	0.55
Control	29	22.7	8	6.3	
USDURA					
Intervention	22	17.5	10	7.8	0.55
Control	30	23.4	13	10.2	
UA with alcohol or drug use by partner or participant					
Intervention	60	47.2	29	22.7	0.78
Control	69	53.5	34	26.4	
With any partner					
UIA					
Intervention	89	69.5	56	39.4	0.51
Control	90	69.8	51	36.2	
URA					
Intervention	76	59.4	50	35.2	0.83
Control	70	54.3	42	29.8	
USDUIA					
Intervention	60	47.6	23	18.3	0.41
Control	53	41.4	22	17.3	
USDURA					

	Baseline N = 258		3-month follow-up N = 258		p-value <sup>a</sup>
	n	%	n	%	
<b>Sexual risk behaviors</b>					
Intervention	46	36.5	21	17.1	0.39
Control	38	29.7	20	15.8	
Psychosocial measures	Mean	SD	Mean	SD	p-value <sup>b</sup>
Social isolation (lower score = less isolation)					
Intervention	2.03	0.65	1.91	0.69	0.62
Control	1.97	0.73	1.81	0.66	
Sexual self-efficacy (higher score = higher self-efficacy)					
Intervention	3.31	1.06	3.58	0.93	0.90
Control	3.34	0.97	3.64	0.94	
Condom attitudes (lower score = better condom attitudes)					
Intervention	2.73	1.01	2.39	0.93	0.15
Control	2.64	0.92	2.44	0.89	
Condom intentions (higher score = better intentions)					
Intervention	3.50	1.29	3.86	1.25	0.85
Control	3.45	1.17	3.91	1.15	
Psychological distress (lower score = less distress)					
Intervention	2.03	0.71	1.83	0.76	0.20
Control	1.88	0.79	1.73	0.74	

<sup>a</sup> comparing change from baseline to 3-month follow-up by study arm (Cochrane-Armitage trend test).

<sup>b</sup> comparing change from baseline to 3-month follow-up by study arm (Wilcoxon rank sum).

UIA, unprotected insertive anal intercourse; URA, unprotected receptive anal intercourse; USDUIA, unknown/serodiscordant anal intercourse; USDURA, unknown/serodiscordant anal intercourse.