ADAPTATION OF AN EVIDENCE-BASED INTERVENTION TO REDUCE HIV RISK IN AN UNDERSERVED POPULATION: YOUNG MINORITY MEN IN NEW YORK CITY JAILS

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To address HIV-risk among justice-involved minority men, New York City Health + Hospitals Correctional Health Services implemented a modified version of Choosing Life: Empowerment, Action Results (CLEAR), an evidence-based intervention to influence behavior. A total of 166 young (i.e., 20–29 years old) minority (e.g., non-Hispanic Black or Latinx) men at risk for HIV and incarcerated in New York City jails completed the adapted group-format intervention and corresponding evaluation assessments. Participants showed significantly improved HIV knowledge on the 18-item HIV-KQ-18 scale (mean increase = 3.11 correct, from 13.23 [*SD* = 3.80] pre-intervention to 16.34 [*SD* = 2.29] post-intervention). Similarly, participant summary scores for substance use risk, sexual risk, and health promotion improved significantly. At 90 days after jail release, participants reported improved "CLEAR thinking," reduced risk behaviors and improved health-promoting behaviors. Health and HIV-prevention education programs implemented in the jail setting may help reduce health inequities and improve health outcomes.

Keywords: health education/risk reduction, young minority men, small group intervention, evidence-based intervention, jail-based intervention, incarcerated populations

INTRODUCTION

Although the rate of HIV among people in state and federal prisons has decreased over the last 15 years, from 2,078 per 100,000 in 2000 to 1,297 per 100,000 in 2015 (U.S. Department of Justice, 2017), the rate of HIV is still much higher among people who are incarcerated, compared to those who are not incarcerated, and it is highest among people of color (Centers for Disease Control and Prevention [CDC], 2017). In jails, non-Hispanic Black men are five times as likely as white men, and twice as likely as Latinx men, to be living with HIV (CDC, 2017). Correctional settings, usually jails, are often the first place that people involved in the justice system are diagnosed with HIV (Altice et al., 2010). A 2006 blinded sero-study in New York City (NYC) jails showed a high burden of HIV with an overall prevalence rate of 5.2% (Begier et al., 2010), and recent data show that 3.8% of persons self-report living with HIV upon jail admission (NYC Health + Hospitals, 2016). The burden of HIV also continues to disproportionately impact men who have sex with men (MSM), especially those who are racial/ethnic minorities. The CDC estimates that if HIV diagnoses continue at the current rate, about one in six MSM overall, including one in two black MSM and one in four Latino MSM, will be diagnosed with HIV during their lifetime (Hess, Hu, Lansky, Mermin, & Hall, 2017).

Many people involved in the justice system engage in behaviors that put them at risk for HIV, including injection drug use and other substance use, sex with multiple partners, anal sex, and exchanging sex for drugs or money (Binswanger, Redmond, Steiner, & Hicks, 2012; Braithwaite & Arriola, 2008; CDC, 2017; Karberg & James, 2005; Mumola & Karberg, 2006). The justice-involved population largely consists of young minority men (Pettit & Western, 2004; Subramanian, Delaney, Roberts, Fishman, & McGarry, 2015), who often lack health services due to being uninsured or underinsured, having distrust of medical establishment, competing priorities, environmental stress, stoic attitudes, or a combination of the aforementioned (Braithwaite & Arriola, 2008; Eaton et al., 2015). Because many minority men are known to engage in HIV risk behaviors in the community, incarceration can offer an opportunity to deliver health education and risk reduction interventions that they may not otherwise receive. Participation in such interventions can change behaviors to decrease HIV transmission and facilitate engagement in care and treatment among those at risk for or living with HIV (Braithwaite & Arriola, 2008).

In 2015, NYC Health + Hospitals Correctional Health Services (CHS) was one of six organizations to be awarded a three-year grant from the U.S. Department of Health and Human Services' Office of Minority Health titled HIV/AIDS Initiative for Minority Men (AIMM). The purpose of AIMM was to address the unmet needs of young racial and ethnic minority MSM who are living with or at high-risk for HIV by using evidence-based disease management and preventive health programs and support services. AIMM objectives included reducing transmission of HIV, addressing gaps in HIV treatment, reducing HIV stigma, and improving clinical outcomes (U.S. Department of Health and Human Services Office of Minority Health, 2017).

NYC CHS oversees the provision of medical, mental health, dental, and discharge planning services for people in the NYC jail system, which includes nine facilities on Rikers Island and three borough jail facilities. In 2015, CHS served about 56,000 patients and conducted approximately 547,000 medical encounters and 280,000 mental health encounters (NYC Health + Hospitals, 2016; NYC Health + Hospitals, 2018). The majority of CHS patients are male (89%), and non-Hispanic Black (54%) or Latinx (33%) with an average age of 34 years. CHS employs physi-

cians, nurses, mental and behavioral health practitioners, social workers, care co-ordinators, and other administrative and operations staff to support the needs and well-being of those incarcerated in NYC jails.

The CHS AIMM project included implementation and evaluation of two evidence-based interventions (EBIs) that were modified for the jail setting and implemented in 2015, from May through December. We describe one of the interventions—the adapted Choosing Life: Empowerment, Action, Results! (CLEAR)—in this article. The other EBI was Personalized Cognitive Counseling (manuscript under development), which targeted justice-involved minority young MSM, about which there is scant research (Harawa et al., 2018). Objectives of the CHS CLEAR intervention described in this article were to improve HIV knowledge, reduce HIV risk related to condom and substance use, and to bolster health-promoting behaviors among young minority men with a particular emphasis on maintaining connection with a primary care provider even though most participants perceived themselves as healthy and not in need of care. We hypothesized that participants would demonstrate improved HIV knowledge and intentions to reduce risk after participation in the intervention and that participants would report reduced risk and improved primary healthcare access at 90 days after release from jail.

METHODS

CLEAR is an EBI endorsed by CDC aimed at eliciting positive behavioral (e.g., use of condoms, reduction in number of partners) and/or health outcomes primarily among people living with HIV, and secondarily, among high-risk HIV-negative individuals (e.g., reduction in the number of new sexually transmitted infections) (CDC, 2008, 2018; Lightfoot, Rotheram-Borus, & Tevendale, 2007; Lightfoot, Swendeman, Rotheram-Borus, Comulada, & Weiss, 2005; Lightfoot, Tevendale, Comulada, & Rotheram-Borus, 2007). CLEAR is based on social action theory, which asserts that a person's ability to change behaviors that endanger their health is influenced by the individual's self-change process (i.e., cognitive capability, information, self-efficacy, outcome expectancies, social skills, self-regulating skills, and rewards) and contextual factors (i.e., environmental factors and social interactions) that encourage or discourage the change process (Weber, 1991). CLEAR was designed to bolster participants' problem-solving and negotiation skills and increase their self-efficacy to change behaviors (Lightfoot, Rotheram-Borus, et al., 2007; Lightfoot, Tevendale, et al., 2007) to promote healthy living, effectively face the challenges of daily life, encourage positive feelings, thoughts, and actions, and develop daily routines to stay healthy.

CHS selected and modified CLEAR to target young men at risk for HIV because it emphasized the information and skills related to health education and risk reduction that CHS sought to address among this population. The authors recognize that adapting EBIs may alter fidelity and effectiveness of the intervention. Content specific to people living with HIV was deleted, and the intervention was reformulated as small group education and risk reduction intervention delivered via four 45-minute sessions. After initial rollout, the intervention was further modified by reducing the number of weeks and sessions from four 45-minute weekly sessions to two 1½ hour weekly sessions to allow for participation of men with shorter jail stays (average NYC jail stay = 51 days; median = 9 days; NYC Health + Hospitals, 2018) and due to competing priorities such as court, work, having a visitor, or being transferred

to another facility. The intervention was administered in jail meeting areas such as chapels, libraries, and gyms that were reserved for the groups and that allowed for confidential and open discussion.

The sessions were grounded in "CLEAR thinking," which emphasized positive thinking, reframing issues, and making connections between thoughts, feelings, and actions (CDC, 2008). During the sessions, participants were invited to discuss the processes and practice of goal setting, problem solving, condom use, substance use pros and cons, and recognizing their internal and external substance use triggers. Participants also took part in skills-based exercises to learn the proper way to use internal and external condoms and they conducted role plays to become more comfortable with negotiating condom use with a sexual partner and visiting a doctor's office. In addition, participants discussed topics such as taking pride in oneself, relaxation techniques, staying healthy, and maintaining new behaviors (CDC, 2008). Sessions incorporated time for self-reflection and sharing personal challenges and successes.

The adapted CLEAR intervention was implemented by trained CHS transitional care coordinators. These jail health staff routinely conduct needs assessments for patients with HIV and other chronic conditions, identify appropriate community-based service providers for patient referrals, make appointments and/or provide referrals for providers, follow up with patients after release, and provide program staff with documentation of patient connection to care in the community after incarceration (Jordan et al., 2013). Each transitional care coordinator received a full day of training on the CLEAR curriculum as well as training in working with lesbian, gay bisexual, transgender, and queer (LGBTQ) populations. Refresher training sessions were provided on an as-needed basis. Materials for group facilitation included role plays and other experiential activities.

Our goal was to enroll 100 men from three Rikers Island jail facilities during 2015–2016. Participants were identified using multiple methods including through voluntary health education/risk reduction sessions in jail housing areas that promoted the CLEAR groups, describing the program to residents in an existing substance use treatment readiness program titled A Road Not Taken (Selling, Lee, Solimo, & Venters, 2015), and running an electronic health record report to identify men who met eligibility criteria. Men who expressed interest were invited to meet with staff in a confidential setting to review their eligibility and learn about the intervention. Eligibility criteria included being young (i.e., 20–29 years old), minority (e.g., non-Hispanic Black or Latinx), male, and living with or at risk for HIV (e.g., reported engaging in risk behaviors such as unprotected sex with multiple partners, sex with men, or substance use prior to incarceration). Participants who met eligibility criteria and were interested in participating in the intervention completed an informed consent and HIPAA release form to enable sharing of health information with community partners. While the AIMM grant stipulated that the target population be young minority men, men of other races/ethnicities and ages were not excluded from the intervention as CHS wanted to offer the opportunity to participate to all young men, regardless of such factors. Also, the intervention was conducted in English. While English proficiency was not formally assessed, most persons in the NYC jails (including Latinx) speak English. The modified intervention was followed by a repeat offer of HIV testing (all patients are offered testing at intake to jail) and transitional care coordination services, which included a needs assessment, referrals to community providers, and assistance with obtaining Medicaid and other benefits or services. A community-based HIV services organization was engaged to offer sup-

port to men returning to the community after incarceration to provide assistance with community-based health care, substance use, and other services and to assist CHS with evaluation follow-up activities.

Participants completed a baseline survey prior to the first group session and a post-intervention survey a few days after the final group session. The baseline survey contained demographic, socioeconomic, and health-related questions, and questions to gauge HIV knowledge, HIV risk, and health-promoting behaviors. Demographic variables included age, race, ethnicity, and country of birth. Socioeconomic-related variables included education, employment status, housing status, and if participant was ever homeless. Health-related variables included current health insurance status, whether the participant ever had a mental health diagnosis, sexual activity in prior 90 days or prior year, and substance use history, including if one ever used substances, used them in prior 3 months, and/or ever tried controlling their use.

The post-intervention survey included some of the same questions as the baseline survey to allow for comparison from pre- to post-intervention. Questions on both the baseline and post-intervention surveys included those from the HIV-KQ-18 HIV Knowledge Scale (Carey & Schroder, 2002) and the CLEAR behavioral risk interview (CDC, 2008). The HIV-KQ-18 is a validated 18-item questionnaire that assesses a person's knowledge related to HIV prevention with response options of "true," "false," and "I don't know" (Carey & Schroder, 2002). For analyses, responses were recoded to a dichotomous variable of correct or not correct/don't know with higher scores indicative of better HIV knowledge. The CLEAR behavioral risk interview contained a series of scales to measure sexual risk (five topics), substance use risk (two topics), and health-promoting behaviors (three topics). Each sexual risk topic was followed by a set of nine statements, five of which were used in this evaluation. Four statements from each topic were excluded from analysis because they were about sexual behavior and substance use after the CLEAR sessions. Most participants did not answer these questions because they had not yet been released from jail and sexual activity and substance use are not allowed in jails. All statements in the CLEAR behavioral risk interview had three response options and a specified coding scheme: yes (2 points); somewhat (1 point); and no (0 points). Summary scores were calculated by adding the points corresponding to each response with higher scores indicating a reduced risk. The baseline and post-intervention surveys were administered by CHS transitional care coordinators in private offices to allow for confidentiality. Participants received personal care items and a $20 commissary deposit after completing all CLEAR sessions and post-intervention survey.

Participants who returned to the community after incarceration were contacted via phone, email, and/or in person approximately 90 days after release to schedule and complete a follow-up in-person interview by a trained peer educator from the aforementioned CHS community partner. The purpose of the 90-day post-incarceration follow-up interview was to investigate whether participants changed any of their behaviors (e.g., health care access, condom use) as a result of participating in the CLEAR groups. The interview contained both closed- and open-ended questions. Closed-ended questions were analyzed and compared to baseline measures when appropriate. Open-ended questions were categorized into themes and analyzed until thematic description was reached. Participants who were released to the community and subsequently reincarcerated completed the 90-day follow up interview in jail, provided that they were in the community at least 30 days prior to reincarceration to allow them sufficient opportunity to demonstrate behavior change and skills. Those who completed the 90-day follow-up interview received a $20 gift card to a
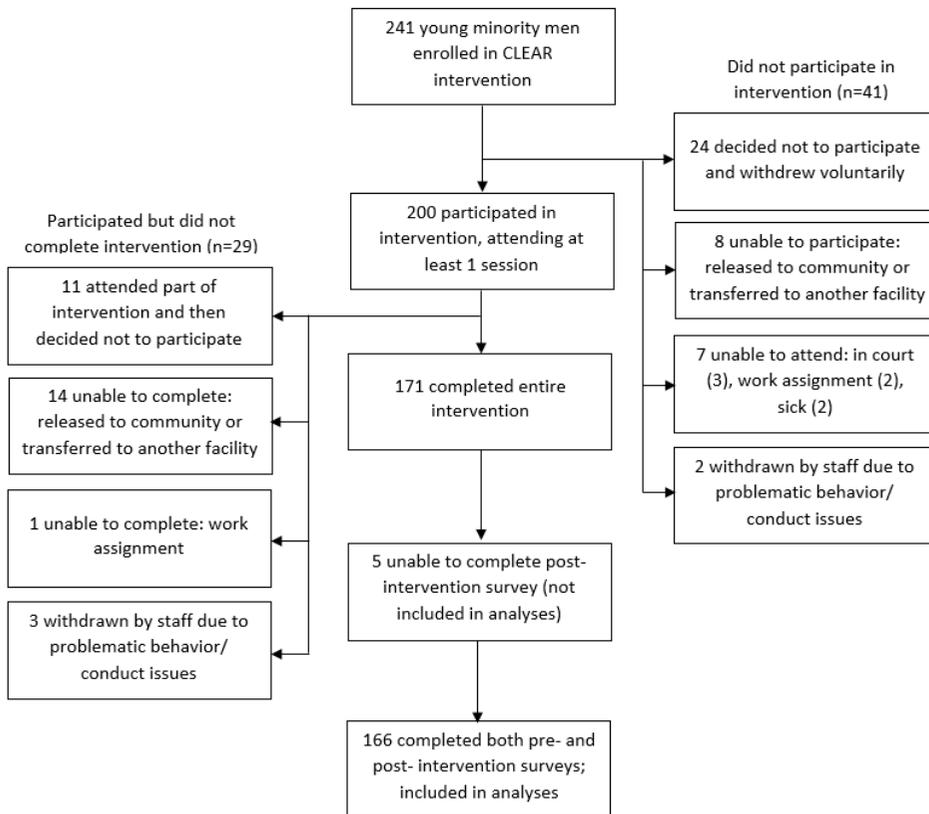
FIGURE 1. Study Population.

local pharmacy when completed in the community or a \$20 commissary deposit if completed in jail.

McNemar's test was used to compare individual HIV knowledge question responses (correct vs. not correct) from pre- to post-intervention, and a paired sample t test was conducted to compare participants' average number of correct HIV knowledge questions from pre- to post-intervention. Paired sample t tests were also used to compare the individual behavioral risk assessment scores and overall summary scores for the CLEAR interview assessment areas. Chi square analyses and independent sample t tests were used to compare those completing the 90-day follow-up interview to those who were eligible but did not complete it. Data were analyzed in SPSS, version 24. The AIMM/CLEAR protocol was deemed a program evaluation and thus exempt from human subjects research review by the New York City Department of Health and Mental Hygiene Institutional Review Board.

RESULTS

Two hundred forty-one young men initially enrolled in the CLEAR small group intervention. Of these, 200 men attended at least one group session (83.0%) (Figure 1). Of the 41 men who did not participate, 24 declined participation, eight were unable to participate because they were released to the community or transferred to prison or another jail facility, seven were unable to attend due to other factors (e.g.,

TABLE 1. Participant Demographics, Health Characteristics, and HIV Risk Factors Including Substance Use and Sexual Activity (*N* = 166)

	n	*%*		*n*	*%*
Demographics			**Health Characteristics**		
Race/Ethnicity			Has primary care provider	76	45.8
Non-Hispanic Black	87	52.7	Health insurance status (*n* = 162)		
Hispanic/Latinx	63	38.2	Medicaid, Medicare or other public insurance	108	66.9
Non-Hispanic White or Other	15	9.0	Private insurance	14	8.4
Education			No insurance	40	24.7
Less than high school	63	38.0	Mental health diagnosis	59	36.6
High school diploma/GED	76	45.8	**Substance Use***		
More than high school	27	16.3	Ever used		
Employment Status (*n* = 161)			Any drug (including marijuana)	148	89.2
Employed full-time	49	30.4	Any drug (excluding marijuana)	81	48.8
Employed part-time	26	16.1	Used in past 3 months		
Unemployed	81	50.3	Any drug (including marijuana) (*n* = 161)	124	74.7
Other	5	3.1	Any drug (excluding marijuana) (*n* = 160)	62	37.3
Country of Birth (*n* = 162)			Ever tried to control use of		
USA (including Puerto Rico)	143	88.3	Any drug (including marijuana) (*n* = 141)**	87	61.7
Other	19	11.7	Any drug (excluding marijuana) (*n* = 78)†	43	55.1
Average age at admission (*SD*) (range 19–30)	23.8 (2.9)		**Sexual Activity in Past 12 Months**		
Ever homeless or anticipates homelessness at release	47	31.5	Sex in past 12 months		
				154	92.8
			Average no. of partners (*n* = 140) (*SD*) (range 1–50)‡	4.77 (6.68)	
			Sex (vaginal or anal) without a condom (*n* = 137)‡	83	60.6

Notes. *Excludes alcohol and tobacco use. **Of the 148 participants indicating ever using any drug including marijuana, 141 responded to the question about whether they ever tried to control drug use. †Of the 81 participants indicating ever using any drug excluding marijuana, 78 responded to the question about whether they ever tried to control drug use. ‡Of the 154 participants having sex in the prior 12 months, 140 answered the question about number of sexual partners and 137 answered questions about condom use.

in court, work assignment, sick), and two were withdrawn by staff due to conduct issues. Of the 200 who participated in the sessions, 171 completed the entire intervention by attending all group sessions (85.1%), with 166 (82.6%) completing both the pre-and post- intervention surveys included in analyses.

Over half of the men participating in the intervention and comprising the evaluation cohort (*n* = 166) were non-Hispanic Black (52.7%) and 38.2% were Latinx (Table 1). The age of participants ranged from 19 to 30 years with the average age being 23.8 years. Nearly half of the participants (45.8%) completed a high school diploma, GED, or equivalent, while 38.0% had less than a high school education. Most (88.3%) were born in the United States and nearly a third (31.5%) indicated having a history of homelessness or anticipated being homeless upon release from jail. About two-thirds (66.9%) reported having public insurance such as Medicaid, while nearly 25% were uninsured. Thirty-seven percent reported having received a mental health diagnosis with 23.5% indicating they had been diagnosed with depression. Drug use was high among this population, with 89.2% reporting having ever used any drug (including marijuana), and 48.8% indicating they had used drugs other than marijuana. Of those ever using drugs (including marijuana), 61.7% re-

ported ever trying to control drug use and of those ever using drugs not including marijuana over a half of (55.1%) indicated ever trying to control drug use. In addition, the majority (88.0%) reported having had sex in the prior 12 months with an average of 4.77 partners and 60.6% reported having sex without a condom in the prior year.

Participants (n = 166) showed significant improvements in HIV knowledge from pre- to post-intervention. Responses for the 18 HIV knowledge questions improved by an average of 3.11 correct responses from 13.23 pre-intervention (standard deviation [SD] = 3.80) to 16.34 post-intervention (SD = 2.29; range = 0–18, t(165) = –10.32, p < .001) and significant improvements were noted for 17 of 18 questions (Table 2). Questions associated with lowest baseline knowledge, i.e., where less than two-thirds answered correctly, included whether a natural skin condom works better than a latex condom, whether people contract HIV by deep kissing, if a person can contract HIV from oral sex, and whether taking an HIV test one week after having sex will diagnose HIV. The areas of greatest baseline knowledge, i.e., where over 80% answered correctly, included knowing that having sex with multiple partners can increase risk of contracting HIV, that showering after sex will not prevent a person from getting HIV, that people who are infected with HIV do not quickly show serious signs of being infected, and that a woman can get HIV if she has sex during her menstrual period. The questions that participants showed the greatest improvements in knowledge, i.e., greater than 20% average improvement, included that a natural skin condom does not work better than a latex condom, that taking an HIV test one week after having sex will diagnose HIV, that people are not likely to contract HIV by deep kissing, and that a female condom helps decrease a woman's chance of contracting HIV.

Participants also showed improvements in their CLEAR behavioral risk assessment areas from pre- to post- intervention (Table 3). Summary scores for substance use risk, sexual risk, and health promotion improved significantly overall, and they improved in all but 3 of the 10 individual topic areas (p < 0.05). With a range of possible values from 0 to 50, the average summary score for sexual risk increased by 2.73 from pre-intervention (mean = 37.80, SD = 10.40) to post-intervention (M = 40.53, SD = 9.25); t(137) = 2.68, p < .01, with participants reporting improved comfort, confidence, self-efficacy, and intentions to use condoms, discuss condom use, and refuse to have unsafe sex even if pressured. Participants showed the greatest improvements in topics related to refusing to have unsafe sex, even if pressured, mean change = 1.07, t(137) = 2.78, p < .01, and using condoms with their sexual partner, mean change = 0.59, t(137) = 2.00, p < .01. Participants did not show improvements in topics related to having sex when drunk or high and to having fewer sex partners.

Participants also showed improvements in their substance use risk and health promotion assessments. For the substance use risk assessment (range of possible values = 0 to 20), participants improved by 1.99 average overall from pre- (M = 15.12, SD = 6.04) to post-intervention (M = 17.11, SD = 4.89); t(133) = 3.37, p < .01, and in both topics measured: knowing their substance use triggers (mean change = 1.18, t = 3.06, p < .01) and stopping themselves from using drugs (mean change = 0.81, t = 2.86, p < .01). With regard to the health promotion assessment (range of possible values = 0 to 30), participants improved in their overall summary score by 1.39 from pre- (M = 27.09, SD = 5.48) to post-intervention (M = 28.48, SD = 4.18); t(145) = 2.39, p < .05, and in two topics: attending health care appointments (mean change = 0.47, t = 2.02, p < .05) and developing relationships with health care providers (mean change = 0.63, t = 2.79, p < .01). Participants did not show improvements in

TABLE 2. Comparison of Participant HIV Knowledge From Pre- to Post-intervention ($N = 166$)

| | | Pre-intervention | | Post-intervention | | | | |
	Correct Response	n	%	n	%	Mean Change	X^2	p value*
							Correct Responses	
Statement								
1. Coughing and sneezing DO NOT spread HIV.	TRUE	120	72.3	136	81.9	9.6	4.7	.030
2. A person can get HIV by sharing a glass of water with someone who has HIV.	FALSE	131	78.9	158	95.2	16.3	20.5	.000
3. Pulling out the penis before a man climaxes keeps a woman away from getting HIV during sex.	FALSE	128	77.1	160	96.4	19.3	28.3	.000
4. A woman can get HIV if she has anal sex with a man.	TRUE	135	81.3	155	93.4	12.1	11.3	.001
5. Showering, or washing one's genitals/ private parts after sex keeps a person away from getting HIV.	FALSE	137	82.5	160	96.4	13.9	17.9	.001
6. All pregnant women infected with HIV will have babies born with AIDS.	FALSE	116	69.9	147	88.6	18.7	19.1	.000
7. People who have been infected with HIV quickly show serious signs of being infected.	FALSE	136	81.9	162	97.6	15.7	20.8	.000
8. There is a vaccine that can stop adults from getting HIV.	FALSE	117	70.5	150	90.4	19.9	25.0	.000
9. People are likely to get HIV by deep kissing, putting their tongue in their partner's mouth, if their partner has HIV.	FALSE	103	62.0	145	87.3	25.3	33.6	.000
10. A woman cannot get HIV if she has sex during her period.	FALSE	136	81.9	153	92.2	10.3	6.6	.010
11. There is a female condom that can help decrease a woman's chance of getting HIV.	TRUE	112	67.5	146	88.0	20.5	19.4	.000
12. A natural skin condom works better against HIV than does a latex condom.	FALSE	87	52.4	151	91.0	38.6	52.2	.000
13. A person will NOT get HIV if he or she is taking antibiotics.	FALSE	120	72.3	153	92.2	19.9	22.8	.000
14. Having sex with more than one partner can increase a person's chance of being infected with HIV.	TRUE	151	91.0	155	93.4	2.4	N/A	.523
15. Taking a test for HIV one week after having sex will tell a person if he or she has HIV.	FALSE	99	59.6	145	87.3	27.7	33.8	.000
16. A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV.	FALSE	135	81.3	157	94.6	13.3	14.7	.000
17. A person can get HIV from oral sex.	TRUE	108	65.1	126	75.9	10.8	5.4	.021
18. Using Vaseline or baby oil with a condom lowers the chance of getting HIV.	FALSE	126	75.9	153	92.2	16.3	16.5	.000

| | Pre-Intervention | | Post-Intervention | | | | |
	Mean	SD	Mean	SD	Mean Difference	t	p value**
Total average number correct***	13.23	3.80	16.34	2.29	3.11	−10.32	.000

Notes. HIV: human immunodeficiency virus; AIDS: acquired immunodeficiency syndrome. X^2: chi-square value.
*McNemar's. test of significance. **Paired sample t test. ***Pre-intervention range = 0 to 18; post-intervention range = 5 to 18; mean difference range = −6 to 18.

TABLE 3. Comparison of Participant Average Behavioral Risk Assessment Scale Scores† From
Pre- to Post-intervention, Regardless of Jail Discharge Status

Topic‡	Pre-intervention		Post-intervention		Mean Difference	t**	p value
	Mean*	SD	Mean*	SD			
Sexual Risk (*n* = 138)							
Using condoms with my sexual partner	8.66	2.36	9.25	1.77	0.59	2.61	.010
Discussing condom use with my sexual partner	8.59	2.46	9.11	2.05	0.52	2.00	.048
Refusing to have unsafe sex, even if I am pressured	7.69	3.47	8.76	2.63	1.07	2.78	.006
Having fewer sex partners	8.45	2.71	8.92	2.13	0.47	1.85	.066
Having sex when drunk or high	4.41	4.57	4.48	4.65	0.07	0.19	.852
Summary Score	*37.80*	*10.40*	*40.53*	*9.25*	*2.73*	*2.68*	*.008*
Substance Use Risk (*n* = 134)							
Knowing what triggers my drug use	7.05	3.88	8.23	3.36	1.18	3.06	.003
Stopping myself from using drugs	8.07	2.82	8.88	2.16	0.81	2.86	.005
Summary Score	*15.12*	*6.04*	*17.11*	*4.89*	*1.99*	*3.37*	*.001*
Health Promotion (*n* = 146)							
Attending health care appointments	8.92	2.23	9.39	1.69	0.47	2.02	.045
Developing relationships with health care providers	8.95	2.25	9.57	1.33	0.62	2.79	.006
Overall staying motivated and dedicated to my health	9.23	1.71	9.52	1.49	0.29	1.56	.120
Summary Score	*27.09*	*5.48*	*28.48*	*4.18*	*1.39*	*2.39*	*.018*

Note. †The behavioral risk assessment scales included five items. ‡Range of possible values for each topic is 0 to 10. Range of possible values for summary scores: sexual risk = 0 to 50, substance use risk = 0 to 20, and health promotion = 0 to 30. *Higher scores indicate reduced risk. **Paired sample t test statistic.

the topic related to staying motivated and dedicated to their health, however, their pre-intervention average was relatively high (9.23), so there was less room for substantial improvements.

Of the 166 participants who completed the entire intervention, 73 were eligible for follow up after returning to the community (44.0%). Most individuals (56.0%) were not eligible for follow up because they were subsequently sentenced to prison (*n* = 76), transferred to another local correctional jurisdiction (*n* = 6), were still in jail (n = 4), reincarcerated within 30 days (*n* = 4), did not live in NYC after incarceration (*n* = 2), or were released after the follow-up period ended (*n* = 1). Of those eligible, 25 participants (34.2%) completed the 90-day follow up interviews after returning to the community through 2016. Thirty interviews were not attempted because a change in the community partner agency responsible for conducting interviews left some interviews past due (*n* = 9) and others without appropriate HIPAA consents or unable to meet the new community partner during incarceration due to logistical issues (*n* = 21). The remaining individuals (*n* = 18, 24.7%) were lost to follow up. The 25 individuals completing the 90-day follow up interview were not statistically different from those that did not with respect to demographic and socioeconomic factors (e.g., race/ethnicity, education, homeless status), health characteristics (e.g., health insurance status, having a regular primary care provider in community), or prior behaviors (e.g., number of sexual partners, condom use, substance use, trying to control substance use).

A comparison of the baseline to follow-up responses for those completing both instruments ($n = 25$) showed that six people (24.0%) indicated having a primary care provider at baseline, compared to 14 persons (56.0%) who reported visiting a primary care provider after returning to the community, most of which ($n = 13$) were for a routine visit (e.g., checkup, physical, follow up) or minor issue. Seventeen people (68.0%) reported receiving an HIV test after incarceration, with 16 reporting a negative test result and one person unsure of his results. Other health care utilization among respondents after incarceration included five people (20.0%) visiting an emergency room and two persons being hospitalized for 1 and 5 nights, respectively. Respondents reported using condoms nearly three quarters of the time since returning to the community (average = 71.8%, SD = 41.0%, range 0% to 100%).

Twenty-two respondents (88.0%) reported applying the information and skills they learned during the sessions always ($n = 9$) or sometimes ($n = 13$) and 23 respondents (92.0%) said the intervention was very useful ($n = 15$) or somewhat useful ($n = 8$). When asked how they applied the lessons learned, respondents mentioned applying their new skills in different areas related to the CLEAR groups. Several respondents reported applying "CLEAR thinking" to improve self-regulation and identify the link among feelings, thoughts, and actions. For example, a few respondents said that the groups helped them deal with conflict and to keep out of trouble. Another respondent said he learned to stay positive in character and another replied that the groups helped him "understand myself, understand everyone around me including those in jail, understand how we got here, and who and what we really are." Some respondents reported that they learned how to stay healthy in general, including keeping doctors' appointments. Several respondents mentioned that they used the information learned around sexual-risk reduction by using condoms more often and one participant mentioned getting tested for HIV after engaging in risky behavior. Several respondents found the information about substance use and internal/external triggers to be useful and said that they used drugs less frequently or not all while in the community. A few respondents said they shared the information they learned with others, both in the jail and afterwards in the community. In addition, one respondent said that the groups helped him with goal setting and he stated that it prompted him to want to go back to college. Another individual said the groups helped him to open up and share his experiences more freely with others while participating in a community-based group. Finally, many respondents appreciated the ancillary services that were provided, such as receiving assistance with getting Medicaid and referrals for health care, housing, or legal issues. At follow up, several respondents reported using their Medicaid benefits since release.

DISCUSSION

After participation in the adapted CLEAR intervention, young men at risk for HIV in NYC jails significantly improved their HIV knowledge and indicated having greater comfort, confidence, and self-efficacy to reduce sexual and substance use risk and engage in health promoting behaviors. At 90 days after community return, a subset of participants also reported having changed their attitudes, beliefs, and behaviors as a result of their participation. Respondents showed signs of developing "CLEAR thinking" to identify links between feelings, thoughts, and actions; goal setting; and behaviors to live a more healthy life. This finding is encouraging and shows that some participants were making mental and emotional changes to better deal with

adversity and the challenges of daily living, including being in jail, returning to the community, planning for the future, condom negotiation, and substance use. After incarceration, many respondents visited a primary care provider, received an HIV test, and reported using condoms more frequently and/or using drugs less frequently. Returning to the community after incarceration in jail can be a trying time for people as they must navigate life on the outside, including employment, school, family issues, housing, and substance use, while at the same time, facing structural barriers that come with having a criminal record, and if appropriate, being a minority (Arditti & Parkman, 2011; Binswanger et al., 2012; Daniels, Crum, Ramaswamy, & Freudenberg, 2011; Subramanian, 2015). Learning skills, such as those included in the CLEAR intervention can potentially ameliorate some of these challenges.

While there are no known published studies using the HIV-KQ-18 in the jail or prison setting, the tool has been used in studies of HIV-negative persons or those with unknown HIV status who are similar in certain respects to the NYC jail population. In a Canadian study of 589 young, urban individuals who use drugs, the median HIV-KQ-18 score was 15 (interquartile range: 12–16; Johnston et al., 2011). In another study of 197 Black MSM, scores varied slightly by sexual behavior. Those who engaged in unprotected anal sex averaged 15.4 (SD = 2.8) vs. those with no unprotected anal sex averaged 15.7 (SD = 2.1), and those who only performed oral sex scored on average 15.6 (SD = 2.2; Mimiaga et al., 2009). In a study of 400 Latinx adolescents, the average score was 44% correct answers (SD = 4) (or an average of 7.92 questions correct out of 18 total) and less than 10% of the sample had comprehensive HIV/AIDS knowledge (≥75% correct answers; Míguez, 2015). The participants in the current study had an average baseline knowledge comparable to or less than these other study populations.

There were many lessons learned as a result of adapting and implementing the CLEAR intervention in NYC jails. By modifying CLEAR from an individual to a group-level intervention, facilitators noted anecdotally that some of the tools created for individual use were not as useful or well-received by groups. For instance, some participants expressed displeasure with spending time reading and writing, as though they were in school. So, instead, many of the individual worksheets were used as a launching off point to guide group discussion and more time was spent discussing the content of the worksheets in groups rather than completing them individually. In addition, facilitators made a point of reading worksheet content to participants in order to mitigate any low literacy levels. The relaxation and visualization scripts were not well received in the jail-based groups and instead, group facilitators often used inspirational readings or song lyrics to end the group on a positive note. Facilitators often incorporated popular culture references, such as songs, public figures, and current news, which they said enhanced the curriculum. The facilitator teams in the three jails communicated with each other, program managers, and evaluators about what worked or did not work well and to discuss and trouble-shoot any implementation issues, as necessary.

We found many challenges to implementing a group level HIV risk-reduction intervention in the jail setting. Due to the prevalence of homophobia and HIV stigma, a group-level intervention for MSM was not feasible because of safety and confidentiality concerns. Therefore, CHS offered the intervention to all young men at risk for HIV, including MSM. Also, individuals often had unpredictable lengths of stay in the jails. Many were released from court and did not return to jail, others were transferred to another jail or to prison, which made the initial four week inter-

vention challenging. To address these challenges and to allow for greater participation, CHS decreased the number of sessions to two and increased the duration of the sessions so that the intervention would still include all of the intended content. Additional challenges included participant unavailability due to being in court or at work assignments and alarms that restricted inmate movement due to jail violence or emergencies. In addition, the intervention had to be organized to avoid rival gang members' presence in the groups to prevent conflict, and addressing stigma related to HIV-risk behaviors, especially MSM behavior, was often difficult.

Other researchers have documented the above challenges including HIV and MSM stigma (Braithwaite & Arriola, 2008; De Groot, Dilorenzo, Sylla, & Bick, 2006) and a short length of stay (Draine et al., 2011; Spaulding et al., 2007). CHS faced additional challenges also documented by others including concerns about participant confidentiality and in particular, finding appropriate meeting spaces to ensure open and honest discussions about sensitive subjects (Braithwaite & Arriola, 2008; Rapp et al., 2013; Spaulding et al., 2007). Fortunately, CHS transitional care coordinators were able to use private offices with auditory privacy to meet individually with participants to discuss the intervention and to complete the baseline and post-intervention questionnaires. Also, CHS obtained permission from NYC Department of Correction to use jail spaces that would allow for confidential group discussions such as a chapel, library, or gym. However, despite the challenges, implementing small group interventions in jails is a viable strategy to reach populations at risk for HIV and to improve their knowledge, self-efficacy, and intentions to reduce risk.

The implementation and evaluation of this adapted evidence-based CLEAR intervention had several limitations. First, the CLEAR intervention was modified substantially to be used in the jail setting and among groups of people at risk for HIV. These adaptations may have changed components of the intervention that led to its documented effectiveness. We realize that adapting an EBI in such a way will alter fidelity to the original model and may also change its effectiveness. Second, there was a large proportion of men who were lost to follow up, due partly to procurement processing delays in hiring a community partner contracted to support participants after incarceration and to conduct the 90-day post-incarceration interviews. We would have likely had a greater 90-day interview response rate had this delay not occurred. Additionally, many participants were simply lost to follow up as they could not be found after incarceration. However, a comparison of the 25 participants completing the interview to those lost to follow up showed that there were no statistical differences between the two groups with respect to key demographic, socioeconomic, health, and behavioral characteristics. Therefore, it is possible that those individuals lost to follow up may have similarly benefited from participation in the intervention. Ultimately, however, having completed a greater number of follow-up interviews would have better informed the effectiveness of this intervention in terms of behavioral changes, and we cannot be sure that the results of these interviews, had they been conducted, would be consistent with those of the 25 respondents who did complete them.

The change in community partner due to procurement processing delays may have also impacted participant outcomes. The community partner role was to provide individualized assistance to meet the needs of the CLEAR participants as they returned to the community, including linkages to health care and to other needed services including housing, substance use treatment, health education/risk reduction

activities, and HIV testing. Some participants who did not meet with the community partner may have benefited from these services. Therefore, participant outcomes may have also been different, and perhaps even improved, if a community partner was available throughout intervention implementation.

This study did not include a comparison group so it is not possible to reach causal inferences about the effect of the intervention on the outcomes measured. We also do not know how these participants may have changed in the absence of an intervention. Study design would therefore be improved by including a comparison group. Study design would also be improved by including the CLEAR behavioral risk interview on the 90-day follow up survey that participants completed after release from jail. Doing so would allow better measurement of participant behavior changes in areas related to condom use, substance use, and health promoting behaviors after incarceration. Finally, responses to questions may not mirror actual practices. For example, HIV knowledge may have increased and patients may have expressed greater intentions to reduce risk, but these changes may not reflect participants' actual behavior change in the community. Similarly, the 90-day follow up interviews were generally conducted as a one-on-one interview and participants may have been reluctant to disclose sensitive information and/or may have anticipated socially desirable answers or overstated actual risk reduction or health promoting behaviors.

Despite these limitations, there were also several strengths. Administering CLEAR in groups allowed CHS to reach a greater number of young minority men than it would have if it was administered as an individual-level intervention given the number of staff hours and resources available for this project. In fact, CHS surpassed its recruitment goal of 100 men as over 170 men actually completed the intervention. CHS decided to continue program enrollment after reaching initial targets because reducing the group sessions from four to two sessions allowed for additional rounds of the intervention and thus freed up resources to reach more people. Although CLEAR was designed as an individual-level intervention, the group discussions around "CLEAR thinking," sexual and substance use risk, and health promoting behaviors were reported to be interesting, lively, informative, and thought-provoking. And, as demonstrated in research, learning is often enhanced when done in a group setting (Johnson, Johnson, & Stanne, 2000).

CONCLUSIONS

People involved in the justice system often have histories of high-risk behaviors that place them in danger of contracting HIV, and rates of HIV tend to be much higher in this population. Therefore, jail and prison-based health education and promotion interventions may be useful in curbing the HIV epidemic (Bryan, Robbins, Ruiz, & O'Neill, 2006). The fluid nature of jail populations increases the likelihood that effective interventions will be felt not only in the jails but also in communities to which people return after incarceration. As such, health and HIV-prevention education programs in the jail setting may help reduce health inequities by reducing HIV transmission, decreasing community viral load, and facilitating engagement in health care. CHS was able to reach young men at risk for HIV in the jail setting through the adapted CLEAR intervention and participants demonstrated increased HIV knowledge and intentions to reduce HIV risk after participation. At 90 days post-incarceration, a subset of participants reported utilizing "CLEAR thinking"

techniques, reduced condom and substance use risk, and improved health promoting behaviors based on information and skills gained during the intervention. Although implementing interventions in jails is an important and much needed public health strategy, special attention must be paid to challenges inherent in the jail setting for implementation to be successful.

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