



California Collaborations
in HIV Prevention Research
Dissemination Project



RESEARCH SUMMARY

Systematic Review of
HIV Behavioral Prevention
among Women of Color

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Systematic Review of HIV Behavioral Prevention among Women of Color

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The Dissemination Project and the Research Summary Series

The *California Collaborations in HIV Prevention Research: Dissemination Project* is designed to disseminate information about prevention intervention projects and to serve as a resource for California local health jurisdictions (LHJs) and community-based organizations (CBOs). To support these efforts, the California Department of Public Health, Office of AIDS (CDPH/OA), and the California HIV/AIDS Research Program (CHRP) (formerly the Universitywide AIDS Research Program), in the University of California, Office of the President, joined forces in 1998 to provide funding for HIV/AIDS community research collaborations and to foster partnerships among researchers, community-based AIDS service organizations, and LHJs.

The Research Summary series is part of a larger set of resources developed as a response to the statewide public health need to support evidence-based planning, design, and evaluation; to build community research capacity; and to disseminate information on HIV/AIDS prevention interventions. This series is composed of three systematic reviews of HIV/AIDS prevention interventions for people of color throughout the United States, of which this publication is the third. The target populations include African American heterosexual people, men of color who have sex with men, and women of color. These comprehensive appraisals of existing prevention interventions are valuable contributions to the information available to California providers of HIV/AIDS prevention services. Materials are disseminated in portable document format on CHRP's website: <http://chrp.ucop.edu>.

Introduction

This Research Summary focuses on HIV prevention interventions specifically designed for and conducted among women of color in the United States. It also provides recommendations for LHJs and CBOs that may be interested in designing and implementing interventions aimed towards stemming HIV infection among these groups, as well as for researchers working with these populations. This publication is based on evaluated research literature and therefore does not claim to represent formative research or programmatic work currently ongoing at CBOs. The authors acknowledge that many women of color are being reached by such local programs; however, the goal of this project is to summarize

and systematically review rigorous evaluative research conducted within these populations.

The structure of the report is as follows: First, a summary of epidemiological information on HIV/AIDS in the United States among women who are African American, Latina/Hispanic, Asian American and Pacific Islander, and Native American and Alaskan Native is presented. This information is followed by a summary and critical analysis of the body of published research focusing on HIV prevention interventions tailored for and targeted towards these groups of women. Based on the findings of the review, this report provides a set of recommendations for developing and implementing HIV prevention programs for women of color.

Background

Although we are currently in the third decade of the HIV pandemic, there is still no cure or vaccine for this disease. Therefore, behavioral prevention programs are of utmost importance in halting the spread of HIV. HIV has permeated into almost all sectors of society in the United States, however its effect is disproportionately felt among certain communities. Statistics now indicate that people of color in the United States, for example, are disproportionately affected by HIV/AIDS. Although the overall incidence rate of AIDS was 20.2 per 100,000 population in 2005, the rate in the white (non-Hispanic) community was estimated at 6.3 per 100,000 people,¹ illustrating that the burden of disease primarily falls on populations of color.

HIV Prevalence among Racial/Ethnic Groups

The African American population has been affected most severely by the HIV/AIDS epidemic. African Americans had the highest HIV/AIDS incidence rate of all races in 2005 at 72.8 per 100,000 persons—roughly 12 times higher than the rate among whites and more than three times the total rate in the United States.¹ They make up only 13 percent of the total U.S. population,² but African Americans accounted for 50 percent of all newly diagnosed HIV/AIDS cases in 2005 and cumulatively account for 40 percent of all AIDS cases diagnosed since the beginning of the epidemic in the United States. In addition, between 2001 and 2004, African Americans made up 61 percent of all HIV/AIDS cases diagnosed in young people under the age of 25.³

This population appears to be at increased risk for HIV infection due to multiple factors. African Americans have markedly higher rates of sexually transmitted infec-

tions (STIs) than do white people, and the presence of certain infections can increase one's chances of contracting HIV infection. In addition, approximately one quarter of African Americans are living below the poverty line, and African Americans make up 40 percent of the incarcerated population in the United States.⁴ Socioeconomic problems associated with poverty include exchange of sex for drugs or money, increased rates of substance use, and decreased access to health care. Incarcerated populations are at high risk for HIV infection due to risky sexual behaviors, drug use, and tattooing. All of these factors in turn can increase the risk of contracting HIV infection.⁵

Latinos currently have the second highest HIV/AIDS rate in the country at 28.5 per 100,000 persons. They make up only 14.4 percent⁴ of the population, but they accounted for

20 percent of new AIDS diagnoses in 2004 and 19 percent of all cases of HIV diagnosed since the beginning of the epidemic. Latinos may be at particular risk for HIV infection due to increased rates of STIs and substance use, a high percentage of people living in poverty (22 percent), and a host of cultural and language barriers that may impede their access to prevention messages and ongoing health care.⁶ It should be noted that *Latino* is an umbrella

term used to refer to a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish descent or country of origin, and includes recent immigrants to the United States. As a result, rates of infection and risk factors for HIV infection may vary from group to group depending on country of birth and immigration history.

Asian Americans and Pacific Islanders currently make up 4.5 percent of the total U.S. population. Among all of the racial/ethnic groups identified by the Centers for Disease Control and Prevention (CDC), they have the second lowest rate of HIV/AIDS at 7.6 per 100,000 persons (whites had a rate of 6.3 per 100,000 persons) and account for approximately one percent of HIV/AIDS cases in the United States. It is important to note, however, that surveillance data is subject to underestimation of true infection rates as a result of under-reporting. This may be especially true for harder-to-reach populations. This population may be especially vulnerable to HIV infection as a result of cultural and language barriers to care and prevention messages.⁷

Native Americans and Alaskan Natives make up only 1.5 percent of the U.S. population and account for less than one percent of the total number of HIV/AIDS cases reported to CDC. Their HIV/AIDS rate, however, is the third highest in the country at 10.6 per 100,000 persons, and this population remains subject to many of the risk factors associated with increased HIV transmission, including high rates of sexually transmitted infections (STIs), substance use, and poverty.⁸

HIV Prevalence among Women

Although AIDS primarily affected men at the beginning of the epidemic (women accounted for 15 percent of all AIDS cases between 1981 and 1995), the picture has shifted in recent years. Females now make up 27 percent of AIDS cases in the United States, and that number appears to be

growing.⁹ Most (80 percent) newly diagnosed HIV/AIDS infections among women are a result of high-risk heterosexual contact (e.g., unprotected sex, sex involving drug use). This high percentage is due to a combination of factors: biological susceptibility, limited HIV knowledge, decreased perception of risk, lack of awareness of sexual partner's risk factors, and substance use. The remaining 20 percent of newly diagnosed HIV/AIDS cases are related

African American and Latina women together represent only 24 percent of U.S. women, but they accounted for 82 percent of all estimated AIDS diagnoses among women.

to injection drug use. The sharing of injection equipment is the primary risk associated with substance use, yet women who use non-injection drugs may also be at an increased risk for HIV because they may exchange sex for money or drugs and/or may have sex without a condom.¹⁰

The growing problem of HIV infection among women is starkly exposed when one considers the disease's effect on women of color. African American and Latina women together represent only 24 percent of U.S. women, but they accounted for 82 percent of all estimated AIDS diagnoses among women in 2005.¹

The incidence rate of AIDS among African American women (45.5 per 100,000 women) is 23 times the rate among white women and four times the rate among Latina women; HIV infection is now the leading cause of death for African American women aged 25–34 years.¹⁰ Heterosexual contact is the most common mode of transmission among African American women.¹¹ Seventy-four percent of all African American women living with HIV/AIDS at the end

of 2005 are believed to have contracted the disease through heterosexual sexual contact. This rate is in contrast to the 65 percent of white women living with HIV/AIDS who were infected through heterosexual contact.¹⁰ Evidence suggests that this somewhat elevated percentage may be because: (1) compared with white women, it is more common for African American women to have sexual contact with men who, unknown to the women, also have sex with men, and (2) to have higher rates of STIs and substance use.³

Latina women are similarly over-represented among AIDS cases in women, although less dramatically than their African American counterparts. The AIDS rate among Hispanic women is currently six times the rate among white women² and it is estimated that

70 percent of all Latino women living with HIV/AIDS contracted the virus through heterosexual contact.¹¹

The picture in California differs from that in the rest of the nation. African Americans and Latinos currently make up 42 percent of the Californian population and account for 44 percent of cumulative AIDS cases in the state (through January 2007). Latinos specifically represent 35 percent of the Californian population and made up 39 percent of diagnosed AIDS cases in 2004.¹²

Also in contrast to the rest of the United States, women in California account for only eight percent of cumulative AIDS cases in the state. However, African American women continue to be infected with HIV at rates disproportionate to their percentage of the population. They make up less than seven percent of the Californian female population, but they account for 36 percent of cumulative AIDS cases. Latina women, on the other hand, currently represent 29 percent of reported HIV infections in women living in California.¹²

Modes of transmission for Californian women are also different from the national data. Forty-six percent of cumulative AIDS cases among these women were due to heterosexual contact and 36 percent due to injection drug use; the remaining 18 percent is from exposure through blood/blood products and unclassified modes.¹³ These data are in contrast to the national percentages of 80 percent of cases due to heterosexual contact and 20 percent to injection drug use.¹³

There are several types of behavioral prevention interventions focusing on women of color. The more basic types are often information-only interventions, in which women watch a video, are given informational materials, or receive

information from a facilitator on how to reduce their risk. Interventions that are more resource intensive usually involve some level of skill building, where a health provider or facilitator discusses HIV prevention and shows their clients how to put on condoms and how to negotiate the use of condoms with their partners. Clients may be asked to participate in role plays where they build their negotiation and condom-use skills. Other interventions use one-on-one counseling with clients to discuss issues that are needs specific. Some

interventions consist of multiple group sessions over an extended time, and others are one-time-only interventions. The use of all of these interventions depends on a variety of factors, such as the needs and acceptance of the population, cultural appropriateness, stigma

surrounding HIV in the population of interest, the resources available, and the proven success of these interventions.

As the statistics indicate, great strides remain to be made in the fight against HIV/AIDS among women of color, and behavioral interventions will continue to be vital in this fight. This document explores studies and findings relevant to this topic.

Objectives

The objectives of this review were threefold:

- To locate and describe rigorously designed outcome studies evaluating the effects of behavioral interventions for primary prevention of HIV among women of color in the United States.
- To undertake a critical review of these studies, including assessing the methodological quality of their research design.
- To summarize the effectiveness of these interventions among women of color; identify the best evidence of effective interventions for program implementation; and identify research, policy, and practice priorities and directions.

Study Selection Criteria

Types of Studies

Only randomized, controlled trials (RCTs) were included because of their methodological rigor. Other less rigorous evaluation designs that we did not include in this review are quasi-experimental, non-randomized designs, pre-post designs, cross-sectional designs, and longitudinal designs.

**The picture in California
differs from that in
the rest of the nation.**

We included RCTs that evaluated the effects of behavioral interventions on primary prevention of HIV among women of color in the United States.

Types of Outcome Measures

Studies were included that reported any type of outcome measure related to HIV transmission. The primary outcomes included sexual behavior, drug behavior, and biological outcomes. The biological outcomes included HIV infection, STIs, or pregnancy. Secondary outcomes included skills-based outcomes such as negotiation skills and condom use skills. As it is difficult to link outcomes such as changes in knowledge, attitudes, and intentions to behavior change,¹⁴ studies that included only these outcomes were not included in the analysis. Secondary HIV prevention studies among HIV-infected individuals were excluded from this review.

Methods of the Review

Search Strategy for Identification of Studies

A comprehensive database search of PubMed and PsycInfo was conducted using the time frame 1980–May 2006, with keywords “women,” “HIV prevention,” “women of color,” “African American,” “Latina,” and “Native American.”

In addition, references from the following previously published reviews on HIV prevention in persons of color were crosschecked to be sure that all studies were captured in the database search:

- *Systematic Review of HIV Behavioral Prevention Research in Asian Americans and Pacific Islanders* (April 2002), Lynae A. Darbes, Gail E. Kennedy, Greet Peersman, Lev Zohrabyan, George Rutherford.
- *Systematic Review of HIV Behavioral Prevention Research in African Americans* (March 2002), Lynae A. Darbes, Gail E. Kennedy, Greet Peersman, Lev Zohrabyan, George Rutherford.
- *Systematic Review of HIV Behavioral Prevention Research in Latinos* (April 2002) Lynae A. Darbes, Gail E. Kennedy, Greet Peersman, Lev Zohrabyan, George Rutherford.

In addition, CDC’s HIV/AIDS Prevention Research Synthesis database was searched from the time period 1981–May 2006 for HIV prevention interventions on women only. Three separate searches with the following selection criteria were performed (search words in quotations):

- **Search 1:** all “interventions” between 1981–May 2006 that were on “women” and were “not international.”

- **Search 2:** all “interventions” between 1981–May 2006 that were on “women” in the “U.S. only” and included “American Indian/Alaskan Native,” “Asian,” “Black or African American,” “Native Hawaiian or other Pacific Islander,” or “Spanish/Hispanic/Latino.”
- **Search 3:** all “interventions” between 1981–May 2006 on “minorities” and “females.”

Inclusion/Exclusion of Studies

Abstracts of the database search results were screened for relevance. For all abstracts deemed relevant, full text articles were obtained. For abstracts in which relevance was unclear, full text articles were obtained. Inclusion and exclusion criteria were applied to all full text articles (Figure 1).

Figure 1: Inclusion and Exclusion Criteria

Inclusion

- The study had 100 percent women as the study population or, for studies that included male partners, stratified the analysis by gender;
- AND
- The study was comprised of 100 percent of one ethnic/racial group (excluding whites);
- OR
- The study was comprised of at least 80 percent multiple ethnic/racial groups, and the analysis was stratified so that results for women of color could be determined.
- OR
- The study had at least 100 women of color, and the analysis was stratified so that results for women of color could be determined.

Exclusion

- Studies with no HIV or proxy outcomes;
- Studies with an STI prevention intervention that did not specifically address HIV prevention; and
- Studies that focused on secondary prevention among women who were HIV infected (Prevention with Positives).

Data Extraction of Selected Studies

Data extraction forms were adapted from a previous systematic review on HIV prevention among African American men who have sex with men.¹⁵ Two groups of two reviewers coded the articles. Each article was double-coded using the data extraction form. Coding results were entered into an Excel spreadsheet, and discrepancies were flagged. The reviewers discussed and attempted to resolve differences in data extraction results. If differences could not be resolved by the two coders, a third party intervened to make a decision. The data extraction form was pilot-tested by double coding three to five articles, and the extraction form was revised accordingly.

Data extracted in the first round of review included:

- Study location
- Urban/rural
- Race/ethnicity (n and percent) of study population
- Target population
- Age of study participants
- Intervention category (behavioral, social)
- Recruitment sites
- Intervention setting
- Targeted risk behaviors
- Formative research done
- Theoretical basis for the intervention
- Outcome types
- Study quality using the Jadad criteria, a 5-point scale based on randomization, blinding, and reporting of loss to follow-up and withdrawals¹⁶
- Intervention specifics:
 - Components of the intervention
 - Cultural adaptation
 - Gender adaptation
 - Ethnic-matched facilitator.

The first round of coding resulted in the exclusion of several articles (see below). The second round involved coding for results. Two reviewers read all of the included articles and extracted data on all reported results. For studies comprised of multiple ethnic/racial groups, the reviewers assessed whether the results were stratified by race or ethnicity. For those that were stratified, the results for each outcome type were extracted.

We assessed the quality of the studies using the following criteria: allocation/randomization, blinding, and loss to follow-up. These criteria evaluate whether the study discusses the type

of randomization used, whether the participant recruiters and intervention implementers were blinded to randomized group assignment, whether the participants were blinded to which study group they were in, and whether the authors discuss loss to follow-up and perform an attrition analysis. Studies were given an overall quality score of “good,” “adequate,” or “poor” based on these three criteria. A quality rating of “good” was defined as documenting all three criteria listed above in the published manuscript. A rating of “adequate” was defined as addressing and documenting two out of three criteria, and “poor” was defined as addressing and documenting only one or none of the criteria. Other potential sources of bias were also considered, including how the participants were recruited to enroll in the study, and the time post-intervention at which outcomes were measured. These other sources of potential bias are addressed in the results section of this report.

Findings

Study Selection

The database search identified 236 studies. After the initial screening, 93 studies were selected for inclusion. After the first round of coding, 77 studies were excluded (Figure 2) because of methodological issues (i.e., not an RCT, no HIV component in the intervention, no HIV-related outcome measured) or because of missing information (i.e., no stratification by race/ethnicity or gender). The bulk of these studies were excluded because it is impossible to interpret the effect that the interventions had on women of color if the data were presented only in aggregate and not stratified by racial/ethnic group in the analysis. Additionally, one study was excluded because it was found to be a sub-study of an already included study, and another study was excluded because it only reported on knowledge, attitudes, and intentions.

Figure 2: Studies Excluded Due to Study Design

- No HIV component in intervention.
- No HIV-related outcome.
- Not stratified by gender or race/ethnicity.
- Results not reported by race/ethnicity.
- Duplicate reports from same study.
- Only reported on soft outcomes: knowledge, attitude, intentions.

Study Participants

Overall, 14 studies with ethnic or racial minority women participants met the inclusion criteria. Thirteen studies consisted of all women participants, and one study included men and women but stratified its results for Latina women.¹⁷ Ten studies consisted of 100 percent African American participants, and one study consisted of 100 percent Latina participants. Two studies consisted of both African American and Latina participants (one of which reported stratified results).^{18,19} The study that did not stratify its results in the published paper mentioned that the results were stratified during analysis and no differences were found between African Americans and Latinas. We identified no studies with results reported for Asian American and Pacific Islander women or for Native American and Alaskan Native women. Of the 14 studies, four studies targeted drug users, four studies targeted low-income women, three studies recruited only adolescents, and nine studies specifically recruited heterosexually active participants. Figure 3 lists characteristics of all the included studies. The number of participants in each study varied from 60 to 682 participants. A total of 4,099 participants were included in all of the studies. (See Appendix A for descriptions of included studies.)

Figure 3: Characteristics of Included Studies

Participants	% (n)
100% African American	71% (10)
100% Latina	7% (1)
Targeted drug users	29% (4)
Targeted low-income women	29% (4)
Targeted adolescents	21% (3)
Settings	
Community	33% (5)
School	7% (1)
Health clinic	27% (4)

Study Settings

Of the 14 studies, five of the interventions were conducted in community settings, one was conducted in a school, three were conducted in health settings, and five studies did not specify the intervention location.

Interventions

All 14 studies were randomized controlled trials with a total of 22 interventions; many studies consisted of one or more interventions. The interventions implemented in these studies can be broadly categorized into three main types:

- Cultural and/or gender adaptation of a standard intervention (one intervention);
- Addition of a skills-training component to a standard intervention, such as the National Institute for Drug Abuse interventions (two interventions); and
- Combination of both (19 interventions).

A range of interventions were offered as comparison or control groups and included comparisons to no intervention, basic health education interventions, and variations of the study intervention under investigation. All but two^{18,20} interventions used multiple sessions over an extended time. Additionally, 11 of the interventions were conducted in group sessions rather than individual sessions. The three²¹⁻²³ studies that had individual sessions focused on drug outcomes. Lastly, nine of the 14 studies had follow-up periods of six months or longer.

Cultural and/or Gender Adaptation

Studies were coded by whether the intervention was culturally and/or gender-adapted for the participants. If the author identified interventions, such as skills training, or HIV/AIDS as “culturally adapted,” the reviewers coded the study as such, thus removing any means of interpretation for the reviewers. Most authors often did not state whether a study was “gender-adapted”; therefore, the reviewers decided that a study was gender-adapted based on whether the paper discussed how an intervention was tailored towards women, such as using only women counselors or discussing issues of women’s empowerment. Interventions that were identified as gender-adapted specifically addressed issues pertaining to women and were modeled on the results of focus

Figure 4: Cultural/Gender-Adapted Interventions

Characteristic	% (n)
Ethnic-matched facilitator	86% (19)
Culturally adapted	59% (13)
Gender-adapted	77% (17)
Culturally adapted and gender-focused	41% (9)

groups or pilot studies with women as the target population. Interventions conducted by women were not necessarily considered gender-adapted if they did not address issues that women face. Interventions also were coded based on ethnic matching of the intervention facilitator.

Figure 4 (on the previous page) shows the cultural and gender adaption of the 22 interventions (control interventions are not included in this count). Nine interventions were both culturally adapted and gender-adapted; 11 interventions were culturally adapted, gender-adapted, and ethnically matched in their facilitators. Thirteen interventions were exclusively culturally adapted. Seventeen interventions were gender-adapted, and two interventions were neither culturally nor gender-adapted. Nineteen interventions had an ethnic-matched facilitator.

Risk Behaviors and Outcome Types

The interventions primarily targeted sex and/or substance use HIV risk behaviors. Although several outcomes may have been evaluated by the researchers, only outcomes relating to sexual behavior, biological markers, skills, and substance use are discussed in the results section of the review (Figure 5).

Results of Studies

The results of the studies are summarized by outcome type. Sexual behavior outcomes included condom use and the number of sex partners. Biological outcomes included presence of STIs and pregnancy. There were no studies that examined HIV infection as an outcome. Skill outcomes included communication/negotiation skills and condom-use skills. Drug behavior outcomes included use of drugs, use of drugs while having sex, and exchanging sex for drugs. Knowledge, attitudes, and intentions outcomes are not categorized because they are not defined as behavior-change or skill-acquired outcomes. All of the outcomes are listed in Appendix A.

Table 1 shows all included studies and their respective interventions characterized by “success.” Here, success refers to a significant change (at the $p \leq 0.05$ level) in the outcome being measured. Outcomes that changed significantly in the intervention group(s) compared to controls are highlighted in Table 1. Ten of the 14 included studies showed a significant change in at least one of the outcomes that were measured. Interventions that were successful in improving more than one measured outcome tended to be multi-component interventions that included a skills component and were adapted

Figure 5: Study Outcomes

- Sexual behavior outcomes:
 - Condom use in last 30 days
 - Number of sex partners
- Biological marker outcomes:
 - STIs/pregnancy
- Skills Outcomes
 - Condom-use skills
 - Communication/negotiation skills
- Substance use outcomes:
 - Drug use in last 30 days
 - Exchanging sex for drugs or money
 - Using drugs while having sex

for gender, culture, or race/ethnicity. The following sections describe in detail the results of the studies and the impact of the interventions by outcome type.

Sexual Behavior Outcomes

This outcome category includes condom use and number of sex partners. Thirteen studies had outcomes pertaining to condom use[†] or unprotected sex over a specific time period (usually the previous 30 days), and four studies measured the number of sex partners.[‡]

Tables 2 and 3 provide a summary of the studies that had significant and non-significant results for condom use, number of sex partners, and biomarkers. A comparison of the tables indicates that there is not much difference between the interventions with significant results and those with non-significant results in that nearly all studies were gender and culturally adapted, used ethnically-matched facilitators and role-play, and were led by peer educators. However, there are a few intervention components worth discussing. The interventions with significant results

[†] Condom use was identified by the following: ever used a condom during intercourse, consistent condom use (condom use during every episode of vaginal intercourse over a specific period of time), condom use during last sex, percentage of vaginal intercourse protected by a condom, any unprotected sex over specific period of time, percentage of sex using a condom over specific period of time, number of days of sex without a condom over a specific period of time.

[‡] Number of sex partners includes new vaginal sex partners, sexual behavior with a new partner, number of paying vaginal sex partners, number of paying oral sex partners, and number of times having sex with paying partners (over a specific period of time).

Table 1: Interventions by Successful Outcome Type (highlighted)

Author	Intervention	Adaptation	Sexual Behavior	Biological Markers	Skills	Substance Use
DiClemente (1995)	<ul style="list-style-type: none"> Social skills intervention and single-session HIV education condition compared to delayed HIV education control Skills Training: communication and condom-use skills, role-play Led by peer educators Multi-session (5 2-hour weekly sessions) 	<ul style="list-style-type: none"> Cultural Gender Ethnicity 	Yes Condom use	N/A	Yes Communication and negotiation	N/A
DiClemente (2004)	<ul style="list-style-type: none"> HIV risk reduction intervention compared to exercise/nutrition control intervention Skills Training: communication and condom-use skills, role-play Led by peer educators Multi-session: 4 4-hour group sessions 	<ul style="list-style-type: none"> Cultural Gender Ethnicity 	Yes Condom use, sex partners	No STIs, pregnancy	Yes Condom use skills, communication and negotiation	N/A
Harris (1998)	<ul style="list-style-type: none"> Two conditions: 1) peer counseling and leadership training (PCLT), or 2) control group Information Skills Training PCLT: 16-week program; 1st 8 weeks (2 hr/day, 1 day/week), 2nd 8 weeks (1 hr/week) 	<ul style="list-style-type: none"> Cultural Gender 	Yes Condom use	N/A	N/A	N/A
Jemmott (2005)	<ul style="list-style-type: none"> Skill-based HIV risk reduction intervention compared to information-based intervention (A) Skill-based intervention compared to health promotion control group (B) Information Skills Training, role-play 250-minute single-session intervention 	<ul style="list-style-type: none"> Cultural Ethnicity 	Yes Condom use	Yes STIs	N/A	Yes Unprotected sex in combination with drug/alcohol use
Kalichman (1993)	<ul style="list-style-type: none"> 3 interventions (videos): 1) standard public health message (control), 2) ethnicity and sex control, 3) cultural context condition Information Single-session 20-minute videotapes 	<ul style="list-style-type: none"> Cultural Gender Ethnicity 	No Condom use	N/A	Yes Communication and negotiation	N/A
Kalichman (1996)	<ul style="list-style-type: none"> 4 interventions (facilitated groups): 1) 1 education sensitization + 3 sessions of sexual comm.; 2) 1 session covering basic HIV risk educ-sensitization + 3 sessions of behav self mngmt; 3) 1 session of educ-sens, 1.5 session of behav self-mngmt, 1.5 sessions of sex comm.; 4) 4 sessions of risk educ-sens w/o skills training (control) Information Skills Training, role-play 4 sessions that met 2x/week 	<ul style="list-style-type: none"> Cultural Gender Ethnicity 	Yes Condom use	N/A	Yes Communication and negotiation	No Drug use during sex
Peragallo (2005)	<ul style="list-style-type: none"> Condom use, communication and assertiveness skills-based intervention compared to control Skills Training, role-play 6 sessions per week 	<ul style="list-style-type: none"> Cultural Ethnicity 	Yes Condom use	N/A	N/A	N/A
St.Lawrence (2001)	<ul style="list-style-type: none"> Three interventions compared to each other and to a wait-list control condition Intervention on Theory of Gender and Power, TGP (info) Intervention on Social Learning Theory, SLT (skills observation) Intervention on Cognitive Behavior Modification, CBM (skills training) Information Skills Training, role-play in CBM Led by peer educators Multiple sessions: one 90-120 minute session per week for 6 weeks 	<ul style="list-style-type: none"> Cultural Gender Ethnicity 	No Condom use	Yes Condom use skills	N/A	N/A
Sterk (crack cocaine) (2003a)	<ul style="list-style-type: none"> 1) 4 one-on-one session enhanced motivation intervention (MI); 2) 4 one-on-one session enhanced negotiation intervention (NI); 3) a 2-session NIDA standard intervention for drug users (SI: control) Information Counseling Skills Training Individual sessions held once per week, over period of 4 weeks 	<ul style="list-style-type: none"> Gender Ethnicity 	Yes Condom use Sex partners	N/A	N/A	Yes Drug use in past 30 days
Sterk (Indus) (2003b)	<ul style="list-style-type: none"> 1) 4 one-on-one session enhanced motivation intervention (MI); 2) 4 one-on-one session enhanced negotiation intervention (NI); 3) a 2-session NIDA standard intervention for drug users (SI: control) Information Counseling Skills Training Individual sessions held once per week, over period of 4 weeks 	<ul style="list-style-type: none"> Gender Ethnicity 	No Sex partners	N/A	N/A	Yes Drug use in past 30 days, exchange sex for drugs/money

Table 2: Studies with Significant Results for Sexual Behaviors

Author	Culturally adapted	Gender-adapted	Ethnic-matched facilitator	Skills training	Role-play	Led by peer educators	# of sessions	Quality (Jadad Scale)	Type of control	Follow-up time	Target pop	Outcomes
DiClemente (1995)	X	X	X	X	X	X	5 2-hr sessions; once/wk	good	Delayed HIV education	3 months	African American	Condom use
DiClemente (2004)	X	X	X	X	X	X	4 4-hr sessions; once/wk	good	Exercise/nutrition	6 & 12 months	African American adolescents	Condom use, Sex partners
Harris (1998)	X	X		X			8 2-hr sessions; once/wk; 8 1-hr sessions; once/wk	adequate	No intervention	2, 4, 7 months	African American drug-dependent	Condom use
Jemmott (2005)	X		X	X	X		250-min session	poor	Health promotion	3, 6, 12 months	African American and Latina adolescents	Condom use, STI
Kalichman (1996)	X	X	X	X	X		4 sessions; twice/wk	poor	Education w/o skills	3 months	African American	Condom use
Peragallo (2005)	X		X	X	X		6 sessions; once/wk	poor	No intervention	3 & 6 months	Latinas	Condom use
Sterk (2003) Crack		X	X	X			4 sessions; once/wk	good	NIDA standard intervention	6 months	African American crack users	Condom use, Sex partners

for condom use and sex partners were more often led by peer educators than the interventions with non-significant results. Interventions such as those conducted by DiClemente^{24,25} involved African American female health educators and peer educators to conduct the interventions. Yet the Dancy²⁶ and St. Lawrence²⁷ studies, which were also led by peer educators, did not have significant results for condom use. A difference between these interventions and DiClemente's is that DiClemente collaborated with African American adolescent girls in the community to develop the study conditions. Neither Dancy nor St. Lawrence mentions the use of formative research and active community collaboration with their target population.

Studies with extremely short follow-up times^{19,20} had non-significant results for condom use. While this appears counterintuitive because a shorter follow-up time usually captures behavior change that happens immediately after the intervention, these results could be due to the time it takes to establish new behaviors in sexual relationships. As another example, all of the studies with significant results for increased condom use and reduced number of sex partners

had a follow-up time of at least three months. In fact, five (71 percent) out of the seven studies with significant results had a follow-up time of six months or more (results were reported for the longest follow-up period),^{19, 23–25,28} indicating the strength of those particular interventions and perhaps confirming that sexual behavior change does not happen immediately.

Of the 14 studies that had sexual behavior outcomes, only one study²⁰ did not specify a theoretical basis for the intervention, thus showing the importance and prevalence of theory-driven behavioral interventions. The social theories behind the interventions may have influenced the impact that the interventions had on the primary outcomes. For example, three of the studies^{23,25,26} with significant results for condom use were based on the theory of gender and power (a gender-appropriate model used for understanding relationship dynamics), and all of the studies with significant results for number of sex partners used the theory of gender and power. Yet, in Table 2 the theory of gender and power was used for three studies each exhibiting non-significant results for either condom use, or number of partners.^{22,27} Social cognitive

Table 3: Studies with Non-Significant Results for Sexual Behaviors

Author	Culturally adapted	Gender-adapted	Ethnic-matched facilitator	Skills training	Role-play	Led by peer educators	# of sessions	Quality (Jadad scale)	Compared to control	Follow-up time	Target pop	Outcomes
Dancy (2000)	X	X	X	X	X	X	6 90-min sessions; once/wk; 3-, 6-, 9-month boosters	adequate	Health maintenance	3, 6, 9 months	African American	Condom use
DiClemente (2004)	X	X	X	X	X	X	4 4-hr sessions; once/wk	good	Exercise/nutrition	6 & 12 months	African American adolescents	STI, pregnancy
Jemmott (2005)	X		X	X	X		250-min session	adequate	Health promotion	3, 6, 12 months	African American and Latina adolescents	Sex partners
Kalichman (1993)	X	X	X				20-min session	poor	Standard public health message	2 weeks	African American	Condom use
St. Lawrence (2001)	X	X	X	X	X	X	6 90-120-min sessions; once/wk	adequate	Wait list	6 & 12 months	African American	Condom use
Sterk (2003) IDUs		X	X	X			4 sessions; once/wk	good	NIDA standard intervention	6 months	African American IDUs	Sex partners
Suarez Al-Adam (2000)				X			7 90-120-min sessions; twice/wk	poor	Health promotion	3 months	Latinas	Condom use
Wechsberg (2004)	X	X	X	X			4 sessions, once/2 wks	good	Delayed treatment	6 months	African American	Condom use
Workman (1996)				X	X		12 30-min sessions; once/wk	poor	Womanhood development	1 week	African American and Latina adolescents	Condom use

theory is used in many of the studies (n=11). Five of the seven studies (71 percent) with significant results for sexual behavior outcomes were based on this theory, in comparison to six of the nine studies (67 percent) with non-significant results. Social cognitive theory is used for predicting individual and group behaviors and identifying methods in which behavior can be modified or changed.³⁰ Most of the studies that use social cognitive theory involved group interventions where participants interact with each other and the facilitators in a learning environment. Using a theoretical basis to develop interventions is common among rigorously designed HIV behavioral prevention interventions focusing on women of color. However, the use of theory does not alone impact behavior changes, as exemplified in the range of results of these 14 studies that focused on sexual behaviors.

Most of the interventions were either culturally adapted, gender-adapted, or used ethnic-matched facilitators for the intervention. Three studies (43 percent) out of the seven with significant results for sexual behaviors were adapted for all three elements, and four studies (44 percent) out of the nine with non-significant results were similarly adapted. Looking at these studies it is difficult to conclude that any one particular adaptation resulted in improved sexual risk behaviors. This may be due to the fact that many of the interventions had several elements such as condom use skills, peer education, role-play, motivational skills, and negotiation skills, which were often associated with gender, cultural, or ethnic adaptations of the interventions. For example, all of the studies that were led by peer educators were culturally adapted, gender-adapted and had ethnic-matched facilitators. An

intervention led by peer educators most often means that the peers are of the same ethnic group as the participants, and the peer-led sessions are often culturally and gender-adapted towards their own peer group. Therefore, it is difficult to conclude that the interventions with significant results were successful because they were adapted for culture, gender, and ethnicity; these interventions had several other components linked to culture, gender, and ethnicity that may have influenced the outcomes and led to a dilution of the effect of cultural, gender, or ethnic adaptation.

In summary, the studies that were most successful in changing sexual risk behaviors had long-term follow-up periods (of up to six months) and were led by peer educators. The more successful peer educator programs involved the use of formative research and active collaboration with the community of interest.

Biological Marker Outcomes

None of the studies included measured HIV incidence as an outcome. However, several studies measured biological markers for HIV risk, including STIs and pregnancy. Measuring biological markers allows researchers to determine whether the intervention impacts the target populations' sexual behaviors outcomes, not just self-reported behaviors. Two studies^{18,24} measured STI or pregnancy incidence. The Jemmott study had significant results for STI incidence, but it did not have significant results for other sexual behavior outcomes (number of sex partners). The DiClemente study²⁴ showed non-significant results for STI and pregnancy incidence, although it had significant results for increased condom use and decreased number of sex partners.

In the Jemmott study, the skills intervention did not reduce the STI rate (for *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, and *Trichomonas vaginalis*) at the six-month follow-up. However, at the 12-month follow-up, adolescents who received the skills-based intervention were significantly less likely to have an STI (10.5 percent) than those in the health promotion control intervention (18.2 percent). It is interesting to note that the interventions in this study were 250-minute single-session interventions, thus showing that

a single-session skills-based intervention can have an impact on sexual behavior outcomes. As noted above in the section on Sexual Behavior Outcomes, significant results for sexual behaviors were often not seen until a later follow-up period. In this case, a difference in STI rate was not apparent until the 12-month follow-up period. This may be due to the difficulty people have in introducing safer-sex practices into existing relationships. It may take more time to establish new behaviors in sexual relationships, thus showing a difference in STI rates at the 12-month follow-up rather than the 6-month follow-up period.

The DiClemente study²⁴ consisted of multiple group sessions focusing on skill-building. The biological markers assessed were incident STIs and self-reported pregnancy at the 6- and 12-month follow-up periods. There was a significant difference in self-reported pregnancy between the intervention (3.6 percent) and comparison (7.0 percent) at the 6-month follow-up, however this changed by the 12-month follow-up period, resulting in a non-significant difference between the intervention and comparison groups. Results

for the 12-month follow-up period suggest a treatment advantage in reducing Chlamydia infections. Intervention effects were not observed for trichomonas or gonorrhea. The authors suggest that the statistical power and precision of the effect estimates may have been limited by the small sample size, missing data, or the small number of incident infections.

There are similarities in the interventions used in both studies.

DiClemente²⁴ and Jemmott¹⁸ conducted formative research prior to implementing the intervention in order to gain insight and expertise from community members. Both interventions focused on skill-building, in which role-play activities were used to develop the skills of participants.

Only two studies reported on biological outcomes, making it difficult to draw any strong conclusions. Nevertheless, the results in this section indicate that skills-based interventions using techniques such as role-plays that are grounded in formative research have a positive impact on sexual behaviors and may result in decreased STI incidence among participants.

Skills-based interventions using techniques such as role-plays that are grounded in formative research have a positive impact on sexual behaviors and may result in decreased STI incidence.

Table 4: Studies with Significant Results for Skills Outcomes

Author	Culturally adapted	Gender-adapted	Ethnic-matched facilitator	Skills training	Role-play	Led by peer educators	# of sessions	Quality (Jadad scale)	Type of control	Follow-up time	Target pop	Outcomes
DiClemente (1995)	X	X	X	X	X	X	5 2-hr sessions; once/wk	good	Delayed HIV education	3 months	African American	Communication/negotiation
DiClemente (2004)	X	X	X	X	X	X	4 4-hr sessions; once/wk	good	Exercise/nutrition	6 & 12 months	African American adolescents	Condom use skills, Communication/negotiation
Kalichman (1993)	X	X	X				20-min session	poor	Standard public health message	2 weeks	African American	Communication/negotiation
Kalichman (1996)	X	X	X	X	X		4 sessions; twice/wk	poor	Education w/o skills	3 months	African American	Communication/negotiation
St. Lawrence (2001)	X	X	X	X	X	X	6 90-120-min sessions; once/wk	adequate	Wait list	6 & 12 months	African American	Condom use skills

Skills Outcomes

Condom-use skills and communication/negotiations skills were the primary outcomes for skill-based interventions. Condom-use skills included a demonstrated ability to put on a condom. Communication/negotiation skills included talking with friends/family about AIDS, discussing condom use with sex partner, and sexual assertion skills. Seven studies measured these outcomes.

Tables 4 and 5 provide a summary of the studies that evaluated skill-based outcomes. Three studies evaluated condom-use skills. Condom-use skills were assessed by the facilitators or interviewers who viewed the actual hands-on application of condoms and scored the participants' abilities using a rating system. Communication/negotiation skills were assessed using self-reports.

Looking closely at the significant and non-significant results in the tables, some patterns can be identified. For example, three out of the five (60 percent) studies with significant results for condom-use skills and communication/negotiation skills were led by peer educators. Peer educators are often more effective at facilitating the acquisition of social skills through modeling exercises that emphasize skill-building, such as sexual communication and assertiveness.²⁵ Additionally, all five studies with significant results were culturally adapted, gender-adapted, and had ethnic-matched facilitators.

The studies with non-significant results for communication/negotiation skills were not culturally adapted and were not led

by peer educators, with the exception of DiClemente's 1995 study,²⁵ which had some significant results and some non-significant results. The intervention in Suarez Al-Adam¹⁷ was not specifically targeted towards Latinas; rather Latinas were one of the populations included in the study. In fact, it was a large study conducted by the National Institutes for Mental Health (NIMH) that included both men and women, who were predominantly African American and Latino. In this study, none of the sexual behavior or skills outcomes were significant for Latinas. The intervention was not culturally or gender-adapted and did not use ethnic-matched facilitators, which is similar to Workman,¹⁹ which also did not have significant results for communication/negotiation skills. Many different cultural and ethnic groups have their own cultural norms with regards to discussing sex and communicating with sexual partners. Therefore, it is critical to adapt interventions to the target group when specifically addressing communication and negotiation skills.

It is interesting to note that the DiClemente 2004 study²⁴ significantly increased condom-use skills, but the DiClemente 1995 study²⁵ did not. Both of these studies had very similar interventions working with similar target populations. One reason could be that it may take longer to acquire the confidence of applying condoms correctly.²⁵ This may explain the difference in condom-use skills between the 1995 DiClemente study,²⁵ which had a follow-up period of three months, and the more recent DiClemente study,²⁴

Table 5: Studies with Non-Significant Results for Skills Outcomes

Author	Culturally adapted	Gender-adapted	Ethnic-matched facilitator	Skills training	Role-play	Led by peer educators	# of sessions	Quality (Jadad scale)	Type of control	Follow-up time	Target pop	Outcomes
DiClemente (1995)	X	X	X	X	X	X	5 2-hr sessions; once/wk	good	Delayed HIV education	3 months	African American	Condom-use skills
Suarez Al-Adam (2000)				X			7 90-120-min sessions; twice/wk	poor	Health promotion	3 months	Women of color	Communication/negotiation
Workman (1996)				X	X		12 30-min sessions; once/wk	poor	Womanhood development	1 week	African American and Latina adolescents	Communication/negotiation

which had a follow-up period of 12 months and showed significant results. Thus, studies with a longer follow-up period may be able to capture this change in confidence and ability. Another reason could be that the 1995 study had a much smaller sample size ($n=128$) in comparison to the 2004 study ($n=522$) and may not have had sufficient statistical power to show significant effects.

All of the studies with significant results, with one exception, used role-play as a technique for building skills among the participants. All of these studies were also culturally and gender-adapted and used ethnic-matched facilitators. Role-play is also used in two studies that had non-significant results. Workman¹⁹ did not adapt the study for gender or culture and did not use ethnic-matched facilitators. As discussed above, the non-significant results for condom-use skills in DiClemente²⁵ may have been due to the short follow-up period of three months, which may not have been long enough to capture a change in condom-use skills. Therefore, the use of role-play is an important intervention component when trying to develop the communication/negotiations skills and condom-use skills of participants.

The one study that had significant results but did not use skills training, peer educators, or role-play is the Kalichman study.²⁰ This study used a single-session intervention using 20-minute videotapes. The intervention provided information but no skills-based training. However, at the two-week follow-up, those who participated in the cultural context condition and the ethnicity and sex condition were more likely to talk with their friends about AIDS ($p<0.05$) than those participating in the standard public health message condition.

It is important to note that participants in the cultural condition and ethnicity/sex condition did not increase conversations with sex partners about condom use. Although these interventions may have resulted in an increased ability and confidence for participants to discuss AIDS with their friends, they still did not discuss condoms with their sex partners, which is of utmost importance when evaluating the impact of communications skills on sexual behaviors. Additionally, this study had a very short follow-up period of two weeks, which is not able to capture any long-term impacts of the intervention. Therefore, this study should be considered with caution when looking at the other studies in Table 3.

All of the studies that reported on condom-use skills had interventions based on the theory of gender and power and the social cognitive theory. Interventions that had significant results for communication/negotiation skills were predominantly based (two studies) on the theory of gender and power and the social cognitive theory. Interventions based on the theory of gender and power focus on understanding gender dynamics and on using this knowledge to build skills to counter gender imbalances in sexual negotiations.

In summary, interventions that were successful in developing communication/negotiation skills and condom-use skills among participants were most often led by peer educators and incorporated the use of role-play in the intervention activities. Successful interventions were adapted for gender and culture and used ethnic-matched facilitators. Lastly, most of the interventions that showed significant results were based on the theory of gender and power and the social cognitive theory.

Table 6: Studies with Significant Results for Substance Use Outcomes

Author	Culturally adapted	Gender-adapted	Ethnic-matched facilitator	Skills training	Role-play	Led by peer educators	# of sessions	Quality (Jadad scale)	Compared to control	Follow-up time	Target pop	Outcomes
Sterk (2003) Crack		X	X	X			4 sessions; once/wk	good	NIDA standard intervention	6 months	African American crack users	Drug use in last 30 days
Sterk (2003) IDUs		X	X	X			4 sessions; once/wk	good	NIDA standard intervention	6 months	African American IDUs	Drug use in last 30 days; Exchanging sex for drugs/ money

Substance Use Outcomes

There were five studies included in the review that evaluated HIV prevention interventions among drug-using populations (Tables 6 and 7). Among these studies, three drug-related outcomes were measured to determine the effectiveness of the interventions. These outcomes were:

- Reducing drug use in the past 30 days;
- Reducing use of drugs while having sex in the past 30 days; and
- Reducing the amount of sex in exchange for drugs or money in the past 30 days.

Across all of the drug related outcomes, there did not seem to be any distinguishing intervention characteristic that set the studies or interventions that resulted in significant change apart from those that did not. Tailoring the intervention to a specific gender or culture did not seem to impact the results. Of note, all of these studies used ethnic-matched facilitators; however none used peer educators to lead the interventions.

The studies with substance use-related outcomes employed interventions that were based on a range of theoretical frameworks, including social cognitive theory, cognitive behavior modification, social learning theory, theory of reasoned action, theory of planned behavior, the trans-theoretical model of change, theory of gender and power, and empowerment theory. While significant outcomes for substance use-related behaviors did not seem to be the result of any specific set of conceptual frameworks underlying the interventions, several of the authors note that interventions designed with these frameworks as a basis do seem to be more effective than packaged interventions such as the National Institute of Drug Abuse standard intervention.

Among these studies, none were successful in reducing the use of drugs while having sex. While two studies did have significant results in reducing sex with paying partners (either in money or drugs), generally, the sexual behavior-substance use behaviors seemed to be more difficult to change.³¹ This difficulty likely stems from the control dynamic that exists in many heterosexual sexual relationships, resulting in constraints on the ability of women to effect risk-reduction behavior change. Success in reduction of these behaviors often depends in large part on the receptivity of the male partner to such changes.

Despite this difficulty, a few studies were successful in reducing risky drug-related behaviors. The two studies described by Sterk^{21,22} seem to indicate that although the result was not significant, negotiation skills training seemed to reduce the use of drugs or alcohol during sex as compared to standard or control groups and compared to motivation skills training interventions. Motivation skills training interventions were more effective in increasing self-initiated drug treatment and reducing the likelihood of having a paying sex partner. The Sterk studies also found that introducing various types of communication during negotiation skills training sessions and introducing the concept of conflict resolution helped women in effectively negotiating sexual interactions with partners. It may be that the added conflict resolution and communication skills components were the drivers of behavior change. Jemmott¹⁸ also implemented a negotiation skills intervention which included condom-use skills and found that at 12-month follow-up, while the number of days of sex while high in the past 30 days was not significantly reduced compared to the control, the number of days of unprotected sex while high in the past 30 days did decrease.

Table 7: Studies with Non-significant Results for Substance Use Outcomes

Author	Culturally adapted	Gender-adapted	Ethnic-matched facilitator	Skills training	Role-play	Led by peer educators	# of sessions	Quality (Jadad scale)	Compared to control	Follow-up time	Target pop	Outcomes
Jemmott (2005)*	X		X	X	X		250-min session	adequate	Health promotion	3, 6, 12 months	African American and Latina adolescents	Drug use while having sex
Kalichman (1996)	X	X	X	X	X		4 sessions; twice/wk	poor	Education w/o skills	3 months	African American	Drug use while having sex
Sterk (2003) Crack		X	X	X			4 sessions; once/wk	good	NIDA standard intervention	6 months	African American crack users	Drug use while having sex
Sterk (2003) IDUs		X	X	X			4 sessions; once/wk	good	NIDA standard intervention	6 months	African American IDUs	Drug use while having sex
Wechsberg (2004)	X	X	X	X			4 sessions; once/2 wks	good	Delayed-treatment	6 months	African American	Drug use in last 30 days; Exchanging sex for drugs/ money

*Jemmott¹⁸ had significant results for reducing unprotected sex in combination with the use of drugs or alcohol.

significantly compared to the control group. The authors conclude from this that interventions that focus on skills training, in this case negotiation and condom-use skills, may be helpful in reducing unprotected sex among adolescents, even in high-risk, substance use situations.

While Wechsberg, et al.,²³ did not have any significant findings at the six-month follow up, they found that a tailored educational and skill-building intervention resulted in decreased sex trading and greater improvement in employment and housing status, both factors that are associated with improved health outcomes, at the three-month follow-up. The authors attribute this success to the personalized nature of the enhanced intervention; however, the effects of the intervention waned significantly after three months of follow-up.

Overall, it appears that multi-component skills training programs may be most likely to reduce difficult-to-change high-risk sexual and substance use practices, but research is still needed to tease apart the elements of these skills-based interventions that promote long-term behavior change in substance use alone and substance use in combination with risky sexual behavior. Specifically, promising pieces of interventions mentioned in the above study that seemed to be successful in reducing risky drug-related behaviors, such

as communication and conflict resolution skills, should be isolated and tested in their efficacy to reduce risky drug/sex combination behaviors. In addition, this review found only five RCT studies focusing on behavior change in drug-using populations. Given the burden of HIV infection that falls on this population, more research needs to be done, especially research using biological outcomes, to determine which intervention components are effective in changing risky sexual behaviors in drug-using populations. The range of skills-based interventions employed in these studies with substance use outcomes included behavioral self-management skills training, sexual communication skills training, condom-use skills training, and motivation skills training. In general, the findings of these studies suggest that gender-tailored, culturally appropriate, and theoretically based skills-training interventions may be effective in preventing substance use-related risk behaviors, especially reduction of drug use within the past 30 days, among women of color, but several challenges remain in terms of isolating the effective pieces of these interventions and in terms of bringing about sexual behavior change in a substance use context.

Quality of Studies

Of the 14 included studies, five were of “good” quality, four were of “adequate” quality, and five were of “poor” quality based on the Jadad Rating system for RCTs (Appendix B). The five “good” studies gave detailed descriptions of how randomization took place and discussed efforts to blind the researchers or used separate staff to conduct the intervention and control groups to prevent contamination. They also discussed attrition and potential bias attributable to loss to follow-up. All of the “adequate” studies described methods of randomization and attrition and loss to follow-up, but they did not discuss any efforts made to blind the researchers or to prevent contamination between control and intervention groups. Of the five “poor” quality studies, none of them discuss randomization or blinding. However, three out of five discussed attrition and loss to follow-up.

In combination with these ratings based on the Jadad criteria, additional limitations to the studies included other potential sources of bias, such as response bias, self-selection bias, and recall bias. Additionally, small sample size of some of the studies limited generalizability. For more detail on study limitations see Appendix B.

Effectiveness of Interventions Over Time

Four studies reported results for outcomes measured at different follow-up periods. Two of the four had non-significant results at all of the follow-up periods.^{26,28,31} One study²⁴ had significant results at both the six- and 12-month follow-up periods. Another study¹⁸ showed differences in results at three-, six-, and 12-month follow-up periods. The number of days of sex without a condom was not significant at three and six months, but was significant at 12 months. The authors hypothesize that the delayed behavioral change may be due to time needed in negotiating condom use with a partner. Two outcomes that were combined sex and drug behavior measures (number of days of sex while high and number of days unprotected sex while high) were significant and nearly significant ($p=0.03$, $p=0.07$, respectively) at three months. Neither of these outcomes was significant at 6- and 12-month follow-up times. These results indicate that interventions attempting to change compound behaviors (behaviors that combine sex and drug use) have an impact shortly after the intervention but lose effectiveness over time.

Discussion

Women of color are at an increased risk of HIV infection, particularly African American and Latina women. We reviewed 14 RCTs that specifically addressed HIV risk among women of color. Of the 14 studies, 11 studies had significant results for either sexual behavior, drug-related, or skills outcomes. These findings demonstrate that behavioral prevention interventions can have a positive impact on behavior change among women of color.

Of the 14 RCTs included in this review, almost all of them focused on African American women. Only one study focused completely on Latina women, and three studies focused on both groups. There were no studies that fit the inclusion criteria that focused on Asian Americans and Pacific Islanders or Native Americans and Alaskan Natives. Looking at the data presented in the Background section (see pages 3–5), it is apparent that much of the epidemic is concentrated among African American women and Latina women, thus it is not surprising

Behavioral prevention interventions can have a positive impact on behavior change among women of color.

that most of the studies focused on these two groups. This is not to say that there is no research on the other two groups; however, we did not identify any studies which met the rigorous inclusion criteria of this review.

Certain components in the studies deserve attention. Specifically, these components are cultural and gender tailoring, skills training, use of peer educators, group sessions, multiple sessions, long follow-up periods, and the theoretical basis for the intervention. Ten studies included interventions that were culturally adapted, 11 studies included interventions that were gender-adapted, and 12 studies used ethnic-matched facilitators in the interventions, showing that, for the most part, research focusing on women of color uses interventions that are adapted towards the target population. Many components of interventions combined gender and cultural adaptation with skills training and use of peer educators. For instance, all of the interventions that were led by peer educators were adapted for culture and gender.

Almost all of the interventions involved multiple group sessions. Group interactions among participants often facilitated skills-based learning. The use of multiple sessions allowed time for participants to learn and practice the skills and knowledge they gained in the intervention. Only one study²⁶ provided booster sessions at the three, six, and nine-

Elements of Successful Interventions

Women of color face a myriad of challenges such as lack of access to culturally appropriate health care and an increased burden of disease. The studies included in this analysis focus on various populations at risk of acquiring HIV. Many of the successful interventions were culturally and gender-adapted, involved ethnic-matched facilitators, and used peer educators to conduct multiple-group skills training sessions about sexual risk-reduction behaviors and drug risk behaviors.

month follow-up intervals, however most outcomes were not significant. Therefore, the included studies provide very little information on whether booster sessions impact behavior or skills among participants. Individual sessions, particularly in studies focusing on substance use outcomes, allowed participants to receive personalized counseling sessions that focused on strategies such as conflict resolution^{21,22} that may have influenced participants' drug use or sexual behavior.

All of the studies, except for Kalichman,²⁰ used some type of skills-based training in the interventions being tested. It is a well-established finding from the literature that information alone may not be enough to change sexual behaviors and build skills among women of color.³² Eight studies used role-play as a method of improving participants' communication skills. Many of the studies that had significant results for condom-use behavior and communication/negotiation skills used role-play in their interventions. Additionally, most interventions had long follow-up periods ranging from three to 12 months. These follow-up periods are critical to understand the long-term impact of the interventions on behavioral outcomes.

All of the studies, except for Kalichman,²⁰ used a theoretical approach to developing the interventions. Some studies used multiple theories as a basis for the intervention, and some studies only focused on one or two. By far, the most predominantly used theory was the social cognitive theory, which was used in nine of the studies. The theory of gender and power was also used in five studies, along with the social cognitive theory. Most other studies used similar cognitive behavioral theories or social empowerment theories. Therefore, the body of literature examined in this review show agreement on the theories used for behavioral interventions focusing on women of color and demonstrates that suc-

cessful interventions are theory-based, which confirms what has been shown in other research.³²

Lastly, it is important to note that CDC's Diffusion of Effective Behavioral Interventions (DEBI) includes a project called SISTA: Sisters Informing Sisters on Topics about AIDS,³³ it is based on DiClemente's.²⁵ This study was rated as one of the few "good" quality studies in this review and had significant results for communication/negotiation skills. SISTA intervention is a group-level, gender and culturally relevant intervention designed to increase condom use among African American women. Five peer-led group sessions are conducted that focus on ethnic and gender pride, HIV knowledge, and skills training around sexual risk-reduction behaviors and decision making.

Limitations

In this review, we chose to focus only on RCTs, as they are the most rigorous study design. Because RCTs control for potential confounders, these studies can theoretically attribute differences in the intervention group (as compared to the control group) to the intervention with increased certainty. That stated, because we decided to only include these vigorous types of studies, we may have missed some relevant, innovative studies that were not RCTs. Also, many studies (n=29) were excluded because they did not stratify their results by ethnicity or race. Additionally, this review included studies up until May 2006, which may have resulted in missing literature that was published after that date prior to this publication. There are many other ongoing studies that are worth examining to determine the current field of knowledge. Appendix C identifies current or recently completed trials primarily funded by the National Institute of Health that focus on women of color in the United States. Many of these studies are focusing on ways to maintain HIV prevention gains and ways to replicate effective studies in cost-effective and feasible scenarios.

Many of the studies mixed several components, such as skills-based training, gender and culture adaptation, and ethnic-matched facilitators, which often made it difficult to determine which components were most effective. Another limitation may have been that the comparison intervention provided enough information to positively impact behaviors, therefore making it difficult to determine the effectiveness of the enhanced intervention.

Another limitation of the studies focusing on sexual risk behaviors, specifically the increase of condom use among

women, is that condom use is a male-controlled method. Therefore, studies that were of good quality and were implemented well may not have had positive results because the use of condoms is ultimately under the control of men. Empowering women with knowledge and skills may not be able to impact the actual use of condoms during sexual intercourse with their partners. Therefore, more studies focusing on women-controlled methods, or partner behaviors (where male partners are involved) may result in improved sexual behavior outcomes.

Lastly, this review is limited by the existing gaps in research. There were no rigorous studies that met the inclusion criteria which focused on Asian Americans and Pacific Islanders and Native Americans and Alaskan Natives. There were very few studies that focused on Latinas/Hispanics. In addition, no studies were found that focused on older women of color, incarcerated women of color, or women of color with high-risk partners; and only four studies focused on drug-using populations. Information on such populations is extremely important to understanding the dynamics of behavioral prevention interventions on other high-risk groups.

Recommendations

On the basis of our review, we are able to make some recommendations for researchers and CBOs that target women of color populations.

For Program Planning

- **Skills training:** CBOs should provide skills-based training to their target populations in order to enhance their confidence and abilities in condom application and in communication and negotiation with their sex partners.
- **Role-play:** Based on the results of this review, role-play is a very effective technique to use in an intervention in order to engage women and impact their sexual behavior, condom-use skills, and communication and negotiation skills.
- **Peer educators:** Interventions led by peer educators, recruited from the community, showed significant results for sexual behavior outcomes as well as skills outcomes. Therefore, CBOs should consider recruiting and training community members to facilitate part or all of an HIV prevention intervention.
- **Community appropriateness:** CBOs are usually well aware of the needs of their target populations; however specific attention should be given to any unique needs of this population. Therefore, CBOs may want to conduct

focus groups or recruit community members to help develop the intervention. This will encourage community buy-in and ensure that the intervention is appropriate for the target population.

- **Cultural, gender, ethnic-matched:** Almost all of the studies included in this review were either adapted for culture or gender or used ethnic-matched facilitators. CBOs should attempt to do similar adaptations with their interventions. Using ethnic-matched facilitators and/or facilitators that speak the main language of the participants will give participants a comfort level that is important for such interventions. Additionally, interventions should be tailored as much as possible to the target population so as to encourage their involvement and understanding of the subject matter.
- **Theoretically based:** Most of the studies included in this review were theoretically based. CBOs should consider adapting interventions that are based on particular behavioral, gender, or empowerment theories.

For Researchers

- **Community appropriateness:** Interventions should take the needs of the target community into account. This can best be done by conducting formative research, involving the target population in the development of the intervention, and providing mechanisms for participants to provide feedback about the intervention.
- **Stratify results:** Researchers who conduct interventions that include various ethnic or cultural groups should stratify their results by each group in order to assess any variations in impact on each group. Such stratification can help researchers identify differences between groups and thus identify intervention components that address these differences.
- **Use focused/coordinated outcomes:** It is often difficult to interpret results for studies that include a huge range of outcomes. Due to the heterogeneity in behavioral research, focused outcomes should be used that are ideally directly linked to transmission. Using such outcomes will lead to a more strategic/coordinated approach to behavioral interventions.
- **Standardized measures:** Many studies measured similar outcomes, however there was no clear consistency regarding the exact measures. For example, some studies measured consistent condom use over the past 30 days, and other studies measured condom use during last sexual encounter or number of days of having sex without a

condom. These differences in outcome measures make it difficult to compare the impacts of various interventions, which make it challenging to further the field of research when so many variations on outcomes are being assessed. Therefore, we suggest that researchers come to a consensus on what outcomes are of most importance and how specifically these should be measured.

- **Booster sessions:** Although other HIV prevention trials have examined the use of booster sessions and found them to be successful,³⁴ very little information was gained regarding the value of providing booster sessions to women of color in the interventions included in this review. Researchers should study this component in more detail, especially when it comes to long-term impacts on women of color populations.
- **Individual versus group sessions:** Most of the studies in this review included group intervention sessions. The only studies that included individual sessions were those that were specifically targeting substance users. It would be interesting to know whether individual counseling sessions for non-drug users would lead to improved sexual behaviors and skills. This is an issue that researchers can examine in further detail.
- **Multiple follow-up periods:** Almost all of the studies included in this review used multiple follow-up periods ranging from three to 12 months. Researchers should continue such follow up in order to determine the long-term impact of the interventions.
- **Cultural, gender, ethnic-matched:** Most of the interventions were adapted for culture and/or gender and used ethnic-matched facilitators. Although we were unable to conclude that any or all of these elements directly impact outcomes, it is clear that such adaptations are important when focusing on specific cultural or ethnic groups. Researchers should continue to tailor and modify interventions according to their target population.
- **Focus on injection drug-using population:** In California, more research needs to focus on female substance-using populations, especially injection drug users (IDUs), since the state figures of cumulative AIDS cases are much higher among IDUs than the national figures.
- **Focus on biomarkers:** Researchers should look at STI incidence and pregnancy incidence, when applicable, in order to strengthen sexual behavior findings.
- **Interventions targeting Latinas/Hispanics, Asian Americans and Pacific Islanders, and Native American**

and Alaskan Native women: More studies need to focus on these groups in order to develop interventions that have a positive impact on their risk behaviors.

- **Female-controlled methods:** The primary sexual behavior outcome is the self-reported use of condoms. However, condom use is controlled by the male partner, and regardless of the quality of the intervention, some women may not be able to negotiate its use. Therefore, more studies are needed that focus on women-controlled methods such as female condoms and microbicides.
- **Gaps in research:** Researchers need to broaden their target populations to include older women, incarcerated women, and women with high-risk partners.

Conclusions

As we enter the third decade of the AIDS epidemic, women of color continue to be at high risk for HIV infection. This review illustrates that certain approaches and techniques have been effective in reducing HIV risk behaviors among these groups. Interventions targeting women of color were more successful when formative or pilot research was conducted in their community. This kind of tailoring, in combination with the use of peer educators to facilitate intervention sessions, appears to have the strongest behavioral impact on women at risk for HIV infection.

Armed with an improved understanding of what works to change risky behaviors among women of color, CBOs can work to implement more effective programs tailored to their relevant populations and focused on concerns relevant to women in their community. Researchers can work to tease apart aspects of these interventions that seem to have a greater impact than others, to expand study populations to include other women of color not represented in this review, and to stratify study results so that intervention effects can be delineated across racial/ethnic groups.

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