Effects of a Coping Intervention on Transmission Risk Behavior Among People Living With HIV/AIDS and a History of Childhood Sexual Abuse

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Objectives: To examine the effect of a 15-session coping group intervention compared with a 15-session therapeutic support group intervention among HIV-positive men and women with a history of childhood sexual abuse (CSA) on sexual transmission risk behavior.

Design: A randomized controlled behavioral intervention trial with 12-month follow-up.

Methods: A diverse sample of 247 HIV-positive men and women with histories of CSA was randomized to 1 of 2 time-matched group intervention conditions. Sexual behavior was assessed at baseline; immediately after the intervention; and at 4-, 8-, and 12-month follow-up periods (5 assessments). Changes in frequency of unprotected anal and vaginal intercourse by intervention condition were examined using generalized linear mixed models for all partners, and specifically for HIV-negative or serostatus unknown partners.

Results: Participants in the HIV and trauma coping intervention compared with a 15-session therapeutic support group immediately after the intervention; and at 4-, 8-, and 12-month follow-up periods (5 assessments). Changes in frequency of unprotected anal and vaginal intercourse by intervention condition were examined using generalized linear mixed models for all partners, and specifically for HIV-negative or serostatus unknown partners. Results: Participants in the HIV and trauma coping intervention condition decreased their frequency of unprotected sexual intercourse more than participants in the support intervention condition for all partners ($P < 0.001$; $d = 0.38, 0.32,$ and 0.38 at the 4-, 8-, and 12-month follow-up periods, respectively) and for HIV-negative and serostatus unknown partners ($P < 0.001$; $d = 0.48, 0.39,$ and 0.04 at the 4-, 8-, and 12-month follow-up periods, respectively).

Conclusion: A group intervention to address coping with HIV and CSA can be effective in reducing transmission risk behavior among HIV-positive men and women with histories of sexual trauma.

Key Words: coping, HIV/AIDS, prevention, randomized controlled trial, sexual abuse

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with HIV risk behavior. Additionally, HIV-positive adults with histories of CSA engage in more HIV risk behaviors than those without such histories.

Despite a large body of literature documenting the prevalence and negative consequences associated with CSA and HIV, there are few empirically supported treatments for adult survivors of CSA, and even fewer that specifically address CSA in the context of HIV.

We are aware of only 2 intervention trials for CSA and HIV, both reporting only immediate postintervention outcomes. Initial findings from an 11-session group intervention to reduce HIV risk and improve functioning in HIV-positive adult female CSA survivors found an impact on HIV risk behavior and medication adherence among women who attended 8 or more sessions in comparison to a no-treatment control. Another randomized controlled trial (RCT) compared a 15-session coping group intervention for women and men living with HIV and CSA with a 15-session support group intervention and a wait-list control. Although participants in both group conditions had reduced traumatic symptoms in relation to the control condition, the coping group condition achieved greater change in tests of statistical and clinical significance.

Given the well-established link between the psychologic and behavioral consequences of CSA and sexual risk behavior, there is potential for interventions that reduce these consequences also to reduce HIV risk. Thus, the current study extends the findings of the latter RCT by examining the efficacy of the coping group intervention for reducing sexual transmission risk behavior over a 1-year follow-up period in HIV-positive adults who experienced CSA. Specifically, it is hypothesized that the experimental group intervention, aimed at improving coping with the combined stressors of HIV infection and CSA, would reduce sexual transmission risk behavior in relation to a support group comparison condition. Additionally, it is hypothesized that these findings would persist over time and be equally efficacious for women and men.

METHODS

Participants and Procedures

HIV-positive adults with CSA histories were recruited from AIDS service organizations and community health care clinics in New York City between March 2002 and January 2004. Brochures were distributed, and providers referred clients to the study, Living in the Face of Trauma (LIFT). Figure 1 displays the participant flow through the study. Of 333 individuals screened to determine eligibility, 247 completed baseline assessments and were randomized to 1 of 2 study conditions and 187 (76%) completed at least 1 follow-up assessment. There was no difference in the proportion of non-completers between the experimental and comparison conditions. Participants were retained in the study regardless of intervention exposure for an intent-to-treat analysis of outcome data (see the article by Sikkema et al for additional methodologic details).

Participants completed a structured interview that assessed demographics, sexual abuse history, depression, posttraumatic stress, and risk to self or others. The interview included modified and expanded versions of the Traumatic Experiences Questionnaire (TEQ), which assesses exposure to traumatic events, including sexual abuse during childhood (0 to 12 years of age), adolescence (13 to 17 years of age), and adulthood (18 years of age and older). Inclusion criteria were (1) sexual abuse as a child and/or adolescent, defined as any unwanted touching of a sexual nature by an adult or by someone at least 5 years older than the participant when the

FIGURE 1. Study participant flow diagram.
incident occurred; (2) current age of 18 years or older; and (3) HIV-positive serostatus. Exclusion criteria were (1) acute distress attributable to sexual revictimization experienced within the past month; (2) presence of impaired mental status; and (3) extreme distress evidenced by suicidal intention or severe depressive symptomatology with a score of 30 or greater on the Beck Depression Inventory.46

Eligible participants were administered the baseline assessment using a computer-assisted personal interview, postassessment interviews were administered within 2 weeks after completion of group interventions, and 3 assessments (every 4 months) were conducted over the 12-month follow-up period. Participants received an average of $40 for each assessment. All participants provided informed consent, and all procedures were approved by an institutional review board.

Intervention Outcome Measure
Sexual Behavior
At each assessment, participants reported the number of times they had engaged in anal and vaginal intercourse in the past 4 months. Condom use and partner serostatus (HIV-positive, HIV-negative, or unknown serostatus) were assessed specific to intercourse occasions.18,47

Assignment to Condition
Recruitment was conducted in “waves,” with 10 participants allocated per condition within each wave. After completing the baseline assessment, participants were randomly assigned to 1 of 2 conditions: the HIV and trauma coping group experimental intervention or a time-matched HIV support group comparison condition. Because of possible differences in coping and trauma issues, randomization and group intervention were separate for men and women, although intervention protocol format and content were uniform across groups. Thus, each wave was homogeneous for gender.

Treatment Conditions
In both group conditions, cotherapists delivered the interventions in a community health center over a course of 15 weekly 90-minute sessions. Participants who experienced an extreme level of distress, including suicidal intention, were referred for evaluation and additional services.

HIV and Trauma Coping Group Intervention
The intervention model integrated the cognitive theory of stress and coping48 and effective cognitive-behavioral treatment strategies for sexual trauma49,50 within a transactional framework for understanding sexual abuse outcomes.51 The coping framework of Lazarus and Folkman48 was used to demonstrate appraisal of stressors related to HIV infection and sexual trauma and to apply appropriate coping strategies.52 Adaptive coping included problem-focused strategies for changeable stressors (eg, problem solving, communication skills) and emotion-focused strategies for unchangeable stressors (eg, cognitive restructuring, relaxation techniques). Participants identified stressors related to CSA and HIV. Parallels between these traumatic experiences in terms of stress response and coping strategies were addressed.

Other therapeutic activities included identification of individual triggers, selection of attainable goals, skill-building exercises, and exposure. Risk reduction skills were addressed in the context of elements necessary for healthy relationships (eg, safety, intimacy, power, self-esteem), including sexual relations after sexual abuse, revictimization, and HIV infection. Although skills building and exposure are central features of the intervention, these 2 elements cannot occur adequately without a safe and cohesive environment. Thus, participants shared experiences and offered mutual support and feedback.

HIV Support Group
The comparison group paralleled a standard therapeutic support group and was led by experienced cotherapists not trained on the coping intervention model. The purpose of the group was to provide a supportive environment for participants to address issues of HIV and trauma. Because group leaders were skilled clinicians with substantial experience, this treatment condition resembled an interpersonal process group model more than a standard community-based support group. Additionally, participants were aware that all group members shared the common experience of CSA (as a result of study inclusion), and this experience was frequently the first time participants had discussed their early sexual trauma in a group environment. Thus, despite the open format, the group content had a predominant focus on the connections between CSA, HIV/AIDS, current relationships, and life events.

Adherence to Protocol
After each session, group therapists independently completed quality assurance forms detailing themes, skills, and exercises covered within that group session. An independent coder estimated level of adherence to the protocol with 82.5% coverage specific to each session’s protocol and in sequence across all intervention groups and 99% of the coping intervention components covered over the course of each group.

Statistical Methods
To examine changes in the frequency of unprotected anal and vaginal intercourse by intervention condition, generalized linear mixed models (GLMMs) were employed, using the SAS macro PROC GLIMMIX (SAS Institute, Inc., Cary, NC).53 Using GLMMs allowed for longitudinal examination of random and fixed effects using counts of unprotected sexual intercourse modeled using a Poisson distribution. Two-level and 3-level random coefficients models were examined. The 2-level models utilized assessment occasions as level 1 measurement units (ie, the baseline, postintervention, and 3 follow-up assessments of unprotected vaginal and anal intercourse), and participants as level 2 units. In the 3-level models, the level 1 measurement units were assessment occasions, which were nested within the level 2 units, study participants, which, in turn, were nested within the level 3 units, the 26 specific intervention groups (ie, the distinct coping or support groups). The 3-level models were used to rule out differential group-level effects (eg, therapist, group dynamics), which could confound comparisons between
study conditions. Because results did not differ between 2- and 3-level models and there was no significant group level effect, only 2-level models are reported.

The GLMM approach allows the intercept and the rate of change in unprotected sexual intercourse over time to vary across participants and uses all data collected for each participant at each time point. Thus, the statistical analyses included all participants randomized into each condition, regardless of their level of intervention exposure. Analyses were conducted separately for unprotected intercourse occurring with all sexual partners and for unprotected intercourse with partners who were HIV-negative or whose HIV status was unknown. For the latter outcome, only participants who reported sexual activity with an HIV-negative or unknown serostatus partner were included. In all analyses, the effects of time, study condition, and the time by study condition interaction on unprotected sexual intercourse (anal and vaginal) were examined, with participant gender included as a covariate.

Effect sizes were computed to examine the relative impact of the coping group condition on unprotected sexual intercourse compared with the support group condition. Effect sizes were calculated using the Cohen $\alpha$. Estimated means and errors obtained from PROC GLIMMIX were used in these calculations. We examined effect sizes at the 4-, 8-, and 12-month follow-up assessment points. Effect sizes at the postassessment point are not reported because the behavioral retrospective period overlaps the intervention period. Only study participants who were sexually active during the study (ie, reported having at least 1 instance of vaginal or anal intercourse at 1 or more assessment points) were included in effect size calculations.

**RESULTS**

**Study Cohort**

The sample comprised 130 women and 117 men. All men reported having sex with men. Early attempts to recruit heterosexual men met with limited success and were discontinued. Four transgendered participants were categorized according to their self-identification (3 female and 1 male). The sample was ethnically diverse; participants had a mean age of 42.3 years (SD = 6.8) and 12.2 years (SD = 2.4) of education, and 92.3% earned <$20,000 per year. On average, participants were diagnosed with HIV for 10.0 years (SD = 5.8) and had an average CD4 cell count of 454.6 cells/mm$^3$ (SD = 308.7) (Table 1).

Study participants represented a highly distressed and multiply challenged population, with extensive sexual trauma histories (see Table 1). The average of age of first abuse was 8.8 years. Most (90%) experienced penetrative vaginal or anal sexual abuse as a child or adolescent; 87% experienced sexual revictimization, with more than half of those revictimized as children or adolescents. Only 10% of participants reported a single episode of abuse. On average, CSA lasted 4 years and participants had 2 abusers (only 39% of participants reported 1 abuser). Abusers were typically family members, with uncles and male cousins most frequently reported. Nearly 16% of participants (24 men and 16 women) reported female abusers, with aunts and female cousins most frequently reported. Additionally, 40% met diagnostic criteria for posttraumatic stress disorder (PTSD), 66% had been homeless, 43% had been incarcerated, and 49% had traded sex for money or drugs. Although equally distributed across study conditions, men were more likely than women to be better educated, to have been living with HIV longer, to be white, to be gay or bisexual, and to have experienced oral sexual abuse as a child or adolescent. Women were more likely than men to have been incarcerated.

**Effects of the Intervention on Transmission Risk Behavior**

Table 2 presents descriptive data on the 2 outcome variables: frequency of unprotected vaginal or anal intercourse with all sex partners and frequency of unprotected vaginal or anal intercourse with HIV-negative or serostatus unknown sex partners. Adjusted means and SEs were obtained from PROC GLIMMIX for each study assessment point. Figure 2 illustrates a decline in unprotected sexual intercourse for both conditions immediately after the interventions. Levels of unprotected sex remained relatively low from the postassess- ment point through the final follow-up assessment point for the coping group. Levels of unprotected sex at the 4-month and 8-month follow-up assessments returned to baseline levels for...
the support group, however, although less so at the 12-month follow-up assessment. This pattern emerged for unprotected sexual intercourse with all partners and with HIV-negative or serostatus unknown partners.

For participants in both study conditions, frequency of unprotected vaginal and anal intercourse with all partners and with HIV-negative or serostatus unknown partners decreased over time ($\beta = -0.024, F(1,540)=5.41, P=0.02$ and $\beta = -0.223, F(1,221)=130.15, P<0.001$, respectively). Significant time by condition interactions were found, however, indicating that participants in the coping condition decreased their frequency of unprotected intercourse more than participants in the support condition. This held true for the rate of reductions in unprotected sexual intercourse with all partners ($\beta = -0.233, F(1,540)=131.61, P<0.001$) and for HIV-negative or serostatus unknown partners ($\beta = -0.315, F(1,221)=57.22, P<0.001$). There were no significant differences by gender for unprotected sexual intercourse with all partners; however, findings indicated that male participants had significantly more unprotected sex with HIV-negative and serostatus unknown partners than female participants ($\beta = 0.904, F(1,221)=9.07, P=0.003$).

Effect size estimates for standardized differences in adjusted means between the experimental and comparison conditions were calculated at the 4-, 8-, and 12-month follow-up assessment points. Effect sizes were calculated using only data from study participants who reported having vaginal or anal intercourse during the duration of the study ($n=168$). In comparison to the support group, the coping intervention showed moderate effects$^{56}$ in reducing unprotected vaginal and anal intercourse with all partners at 4-, 8-, and 12-month follow-up assessments ($d=0.38, 0.32,$ and $0.38$, respectively). Similar effects were observed for unprotected intercourse with HIV-negative and serostatus unknown partners at 4- and 8-month follow-up assessments ($d=0.48$ and $0.39$, respectively). At the 12-month follow-up, however, the effect was diminished ($d=0.04$).

**DISCUSSION**

The Living in the Face of Trauma (LIFT) coping intervention was effective in reducing transmission risk behavior among HIV-positive men and women with extensive histories of CSA. Over a 12-month follow-up period, participants in the HIV and trauma coping group intervention had a greater reduction in frequency of unprotected intercourse with all partners, and with HIV-negative or serostatus unknown partners, in comparison to those in a therapeutic support group intervention. At the 12-month follow-up assessment, the coping intervention group had reduced unprotected anal and vaginal sex with all partners (HIV-positive, HIV-negative, and serostatus unknown) by an average of 54% compared with the support intervention group. A limited number of interventions targeting HIV-positive adults have demonstrated long-term efficacy in reducing sexual risk behavior, and this is the first trial to demonstrate behavioral effects over time after an intervention focused on coping with CSA and HIV.

A number of methodologic aspects of the study strengthen the findings and resulting conclusions. First, in addition to the randomized design and 12-month follow-up, the experimental intervention was compared with a time-matched professionally led therapeutic support group, which is a stringent evaluation of efficacy. With regard to methodology in secondary prevention trials, those with significant effects have often used attention-controlled comparison conditions that receive no HIV-related intervention or control conditions receiving no treatment. Second, the moderate effect sizes for risk reduction observed in this study ($d=0.32$ to $0.48$) double the average effect size ($d=0.16$) reported in a previous meta-analysis.$^{54}$ Third, this is one of the first intervention trials to address coping with HIV/AIDS and CSA, and the first to do so with both women and men. Finally, a 3-level GLMM was used to rule out differential group level effects, which most studies fail to do.$^{54}$

Our theoretically based coping intervention focused on psychological adjustment and the development of adaptive coping skills for confronting the combined stress and emotional sequelae of CSA and HIV rather than the behavioral risk reduction skills (eg, condom negotiation, self-regulatory skills) typical of most HIV prevention interventions. Study participants had experienced repetitive traumas and severe life stressors. Almost all participants had experienced penetrative abuse as a child or adolescent and later revictimization. They

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**TABLE 2. Adjusted Means for Counts of Unprotected Vaginal and Anal Intercourse From Baseline to 12-Month Follow-Up and Fixed Effect Estimates for Time by Intervention Condition Interactions**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Baseline</th>
<th>Post</th>
<th>4-Mo</th>
<th>8-Mo</th>
<th>12-Mo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SE)</td>
<td>Mean (SE)</td>
<td>Mean (SE)</td>
<td>Mean (SE)</td>
<td>Mean (SE)</td>
</tr>
<tr>
<td>Coping experimental</td>
<td>123</td>
<td>0.88 (0.21)</td>
<td>0.33 (0.08)</td>
<td>0.37 (0.09)</td>
<td>0.43 (0.11)</td>
</tr>
<tr>
<td>Support comparison</td>
<td>124</td>
<td>0.81 (0.19)</td>
<td>0.60 (0.13)</td>
<td>0.88 (0.21)</td>
<td>0.84 (1.33)</td>
</tr>
</tbody>
</table>

*Estimated means and SEs were generated by PROC GLIMMIX. All analyses were adjusted for gender.

†$P<0.001$. **
were primarily low socioeconomic status racial/ethnic minorities, and many had experienced homelessness, incarceration, and sex trade. These findings suggest that trauma-related stress and factors such as self-esteem, shame, avoidance, and relationship patterns must be addressed to reduce transmission risk behavior effectively among men and women living with HIV/AIDS and CSA and support recommendations to identify specific groups of HIV-positive individuals to determine tailored interventions that work best for them, including those that address multiple health and psychosocial problems. Without further research using treatment dismantling methods, the active therapeutic ingredients that could explain differences by condition cannot be stated with certainty. The major differences between the 2 conditions were that the coping intervention had (1) a structured manual-based approach, (2) coping skills-building elements, and (3) content on healthy sexuality that followed trauma-focused elements of treatment.

Limitations of this study should be noted. First, attrition was slightly higher than previous efficacious trials with HIV-positive adults yet similar to or lower than that of other related studies. Second, although a significant effect for reducing transmission risk behavior with HIV-negative or serostatus unknown partners over the long-term follow-up period was found for the coping intervention, the effect size at the 12-month follow-up assessment was diminished. We believe that this may be a statistical artifact related to study attrition. The effect size was based only on participants who reported any sexual activity with an HIV-negative or serostatus unknown partner at that assessment point. Because of attrition and a fewer number of participants engaging in sexual activity with HIV-negative or serostatus unknown partners at the
12-month follow-up, the estimates for transmission risk behavior with HIV-negative partners were based on a small subset of the sample that reported reductions in this activity in both conditions at this assessment point. Third, we were unable to enroll a sufficient number of heterosexual men to participate in the trial, and further efforts should be undertaken to understand better the impact of CSA and trauma among this subgroup of those with HIV/AIDS. Finally, although a computer-assisted assessment was used to improve internal consistency and increase reporting of stigmatized behaviors, the findings are based on self-reported sexual behaviors.

The association between CSA and sexual risk behavior is well documented, and the prevalence of CSA among adults living with HIV/AIDS is significantly higher than among the general population. Effective mental health and “prevention with positives” interventions are urgently needed to address HIV and trauma. This trial demonstrates the long-term efficacy of a group intervention addressing coping with HIV and CSA in reducing transmission risk behavior among HIV-positive women and men. This integrated intervention approach extends the limited number of effective interventions available for people living with HIV/AIDS, especially those facing multiple stressors, particularly sexual trauma. The HIV and trauma coping group intervention is an effective approach that should be incorporated into community-based mental health and prevention efforts to reduce the number of new HIV infections.

ACKNOWLEDGMENTS
The authors gratefully acknowledge their community collaboration with the Callen-Lorde Community Health Center in New York City.

REFERENCES


