Telephone-Administered Motivational Interviewing to Reduce Risky Sexual Behavior in HIV-Infected Rural Persons: A Pilot Randomized Clinical Trial

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Background: Although several studies have characterized patterns and predictors of continued risky sexual behavior in HIV-infected rural persons, far less research has evaluated interventions to reduce risky sex in this group. This pilot randomized clinical trial compared 2 brief telephone-administered interventions designed to reduce continued risky sexual behaviors in HIV-infected rural persons.

Methods: Participants were 79 HIV-infected rural persons who reported 1 or more occasions of unprotected anal, vaginal, or oral sex in the past 2 months. Participants were recruited through AIDS service organizations in rural areas of 27 states and assigned randomly to either a 2-session, motivational interviewing plus skills-building intervention (i.e., integrated intervention; n = 48) or a 2-session, skills-building only comparison intervention (n = 31). Participants completed self-report measures of sexual behaviors and factors related to risky sex at preintervention and 2-month follow-up.

Results: Before enrolling into the intervention, 37% of participants had 2 or more sexual partners in the past 2 months, 29% had sex with 1 or more partners without knowing their partners' HIV serostatus, and almost one-third of participants located sex partners in high-risk environments (e.g., public parks, roadside rest areas). A 2 × 2 repeated measures multivariate analyses of variance found that integrated intervention participants reported greater increases in risk-reduction motivation and greater increases in condom-protected vaginal and oral intercourse occasions at follow-up compared to skills-building only participants.

Conclusions: Brief telephone-administered interventions that integrate motivational interviewing with skills-building show potential to reduce risky sexual behaviors in HIV-infected rural persons. Additional and large-scale evaluations of this intervention approach appear warranted.

Recent epidemiologic data clearly show that HIV is a serious public health concern in nonmetropolitan areas of the United States (i.e., communities of 50,000 residents or fewer; hereafter referred to as "rural"). Through 2007, more than 57,000 individuals were living in rural areas when they were diagnosed with AIDS, accounting for approximately 6% of all AIDS cases in the United States.[1]

The number of rural AIDS cases will continue to increase for 2 reasons. First, improved clinical care and highly active antiretroviral therapy (HAART) will enable many HIV-infected rural persons to experience extended periods of survival.[2] Second, 33% to 50% of sexually active HIV-infected rural persons continue to engage in high HIV-transmission risk behaviors,[3–6] rates that are consistent with those found in urban areas.

The Information-Motivation-Behavioral Skills (IMB) model[7] provides a theoretical framework that can inform risk-reduction interventions for sexually-active, HIV-infected rural persons. The IMB model posits that information which is directly relevant to safer sex, motivation to engage in risk-reduction practices, and effective behavioral skills are requisite for behavior change. Interventions that increase information, motivation, and behavioral skills have promoted significant decreases in risky sexual behaviors in a variety of diverse populations living with, or at risk for, HIV infection.[8–11]

Although many HIV-infected rural persons are in need of sexual risk-reduction services, geographic isolation, confidentiality concerns, and physical limitations preclude many from accessing potentially beneficial risk-reduction resources (e.g., support groups, case management services, etc). Telephone-administered interventions constitute a potentially cost-effective and confidential way to reach large numbers of HIV-infected persons who cannot access services needed to facilitate their sexual risk-reduction efforts.[12–14]

To date, no sexual-risk reduction, telephone-delivered intervention guided by the empirically-validated IMB model has been tested with HIV-infected rural persons. The current study examined if a 2-session, telephone-administered motivational interviewing plus skills-building intervention (i.e., the "integrated intervention") reduced risky sexual behavior in HIV-infected rural persons compared to an attention-equivalent skills-building only intervention. The skills-building only intervention was intended to represent current "treatment as usual" interventions offered to HIV-infected persons through AIDS telephone hotlines, internet-based safer-sex websites, and AIDS service organizations. The current study tested the hypotheses that, compared to the skills-building only intervention, integrated intervention participants would report greater increases in: (1) motivation to avoid risky sexual behaviors; (2) risk reduction behavioral skills; and (3) the proportion of intercourse occasions that were condom-protected.

MATERIALS AND METHODS

Participants and Procedures

Eighty-three HIV-infected rural persons enrolled into the study between March 2007 and November 2007. Participants

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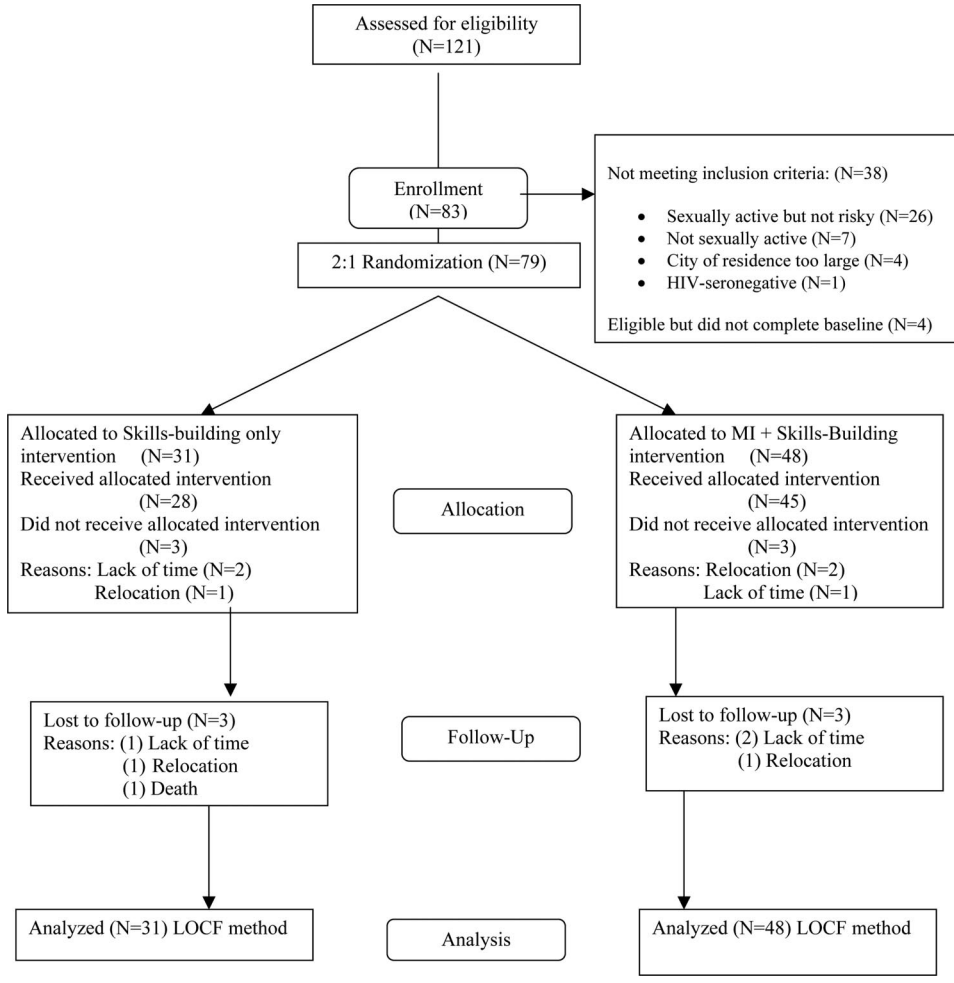

Figure 1. The CONSORT flowchart of study participants.

were recruited through AIDS service organizations in 27 different US states, including, the Northeast (n = 29), the South (n = 19), the Midwest (n = 26), and the West (n = 9).

To recruit participants, recruitment brochures that described the study were mailed to participating rural ASOs who distributed the brochures by: (1) placing them in "high traffic areas" of their organization (e.g., waiting rooms and receptions areas); and (2) circulating them to their clients through regular mail or during face-to-face interactions. Study inclusion criteria were: (1) 18-plus years of age; (2) a self-reported diagnosis of HIV infection or AIDS; (3) residence in a community with a population of 50,000 residents or fewer (verified through http://factfinder.census.gov/home/saff/main.html?_lang=en) that was at least 20 miles from a city of 100,000 or more residents; and (4) engaging in 1 or more occasions of unprotected oral, anal, or vaginal penetrative sex in the past 60 days. Recruitment brochures contained a toll-free telephone number that potential participants used to contact the study institution. During this initial telephone contact, participants completed a telephone-administered eligibility screening interview to verify that the participant satisfied study inclusion criteria. Upon verbally agreeing to participate, eligible participants were mailed an informed consent form and a self-administered preintervention assessment. Of the 121 individuals who completed screening interviews, 83 (69%) were eligible; 79 completed the preintervention measure (Fig. 1).

Upon receiving the consent forms and preintervention assessments from 3 consecutive participants, participants were assigned to 1 of 2 intervention conditions, using a 2:1 randomization strategy. Specifically, for each set of 3 participants that enrolled into the study, 2 were assigned randomly to the integrated intervention and 1 to the skills-building only intervention. The 2:1 randomization procedure ensured that the study included an attention equivalent comparison intervention while also assigning a greater number of participants to the intervention condition hypothesized to be more efficacious. The study's protocol was reviewed and approved by the University's Institutional Review Board; no adverse events were reported during the study.

Intervention Conditions

The study used a single-blind design in which investigators, but not participants, were aware of the condition to which the participant had been assigned. For both intervention conditions, the first intervention session occurred 1 week after the participant's preintervention packet was received by the research office and the second session occurred 1 week after the

first session. The content of each intervention condition is described below.

Skills-Building (SB) Only Intervention. The SB-only intervention (n = 31) was a psycho-educational intervention in which participants discussed 1 or more of 15 topics (e.g., sexual assertiveness communication, condom negotiation, HIV-serostatus disclosure) listed in a "Skills Building Topic Form" (STF) they received via regular mail several days before Session 1. After reviewing the STF, the participant chose topics that he or she wished to discuss and the interventionist provided information and practical strategies needed to master the skills. Participants also asked questions about each topic as necessary. All information provided for each topic by practitioners was adapted from a treatment manual used in previous HIV risk reduction intervention research.[15]

Motivational Interviewing + Skills-Building Intervention (Integrated Intervention). The integrated intervention (n = 48) served as the main experimental intervention. In session 1, participants and interventionists discussed the "Personal Feedback Form" (PFF) that was mailed to the participant before the session. Based on self-report data provided in the participant's preintervention assessment, the interventionist summarized the participant's risky sexual behaviors and provided feedback along 12 different areas related to risky sex (e.g., use of alcohol or drugs before sex). During session 1, the interventionist elicited self-motivational statements from the participant by asking open-ended questions, such as "What worries you about your sexual behavior?" and "How do you think you might reduce your sexual risk behavior if you wished to do so?" During these questions, interventionists utilized standard MI strategies to increase intrinsic motivation to change, including: (1) providing the participant with feedback about his or her risky sexual behaviors; (2) increasing the participant's sense of responsibility to reduce risky sexual behaviors; (3) providing the participant with brief and direct advice to create a desire for change; (4) providing a menu of options from which the participant could choose to reduce one's risk; (5) demonstrating empathy by listening carefully to the client and accurately understanding his or her problems; and (6) enhancing one's self-efficacy to reduce risky sexual behaviors.[16] One practical adaptation made to the intervention to administer it over the telephone was to increase the use of "verbal check-ins" during intervention sessions. For example, if a participant was silent for several seconds, the interventionist might ask "How do you feel about what I just said?" or "Is there something you are thinking about right now?" Verbal check-ins were used to better engage participants in the session and ensure they were not distracted by persons or events in their environment.

After attempting to enhance participants' motivation to change in session 1, interventionists began the skills-building component of the intervention (i.e., providing risk-reduction education and skills using the same manual used with skills-building only participants). By doing this, the integrated intervention did not simply motivate participants to reduce their risky sexual behaviors but also provided skills and information participants would need to act upon their heightened levels of risk reduction motivation. A greater amount of time was devoted to topics that had been identified during session 1, as areas in which the participant appeared to evince knowledge or skills deficits.

General Intervention Methodology

Interventionist Training and Supervision. Interventionists were 11 Master's level clinicians enrolled in doctoral training at the participating university. All interventionists were screened to ensure that they were gay-affirming and possessed positive sexual communication skills. Each interventionist conducted only 1 type of intervention to minimize intervention drift. Interventionists participated in a 4-hour didactic training session to increase their understanding of the study's objectives and to master the specific intervention they would administer. All interventionists used standardized manuals to increase fidelity to intervention protocol and received weekly group supervision by a licensed clinical psychologist.

Assessment Instrument

The study's self-administered assessment was completed in the privacy of the participant's home and returned to the research office in a self-addressed stamped envelope. The 14-page assessment took approximately 60 minutes to complete. Participants received $20 for completing the preintervention assessment and $20 for completing the 2-month follow-up. The follow-up assessment was sent to each participant's home 2 months after completing the second intervention session and was identical to the preintervention assessment. All measures used a retrospective recall period of "the past 2 months." Coefficient α for each measure is based on data collected in this study.

Risk-Reduction Information. The 46-item "Health and Relationships Survey"[17] assessed risk-reduction information. Items were summed to form an HIV prevention information scale score (range: 0–46) with higher scores indicating greater HIV risk-reduction knowledge ($\alpha = 0.71$).

Risk-Reduction Motivation. The 40-item "Measures of Motivation to Perform AIDS Preventive Behavior" questionnaire[17] assessed risk-reduction motivation. Participants' attitudes, subjective norms, and behavioral intentions related to HIV risk-reduction were measured for 8 HIV preventive behaviors using 5 items. The first 3 items used a 5-point scale to measure attitudes towards each preventive act ($\alpha = 0.88$). The fourth item measured subjective norms regarding the domain ($\alpha = 0.81$), and the fifth item measured behavioral intentions to practice the assessed domain ($\alpha = 0.80$). Lower scores indicate stronger risk reduction motivation.

Risk-Reduction Behavioral Skills. The 36-item "Behavioral Skills Measure"[17] assessed risk-reduction behavioral skills. Participants' perceived difficulty of reducing HIV risk behaviors was assessed using the "Perceived Difficulty of AIDS Preventative Behavior" subscale ($\alpha = 0.80$) while perceived effectiveness of methods used to reduce one's risk of HIV infection was assessed using the "Perceived Effectiveness of AIDS Preventative Behavior" subscale ($\alpha = 0.78$).

Risk-Reduction Preventative Behaviors. The 25-item "AIDS Preventative Behaviors" questionnaire[17] assessed the frequency of condom use during sexual intercourse, including vaginal and anal sex, using an ordinal scale (1 = "Never" to 6 = "Always"); the number of different sexual partners with whom he or she had vaginal, anal, and oral sex, and the number of these sexual partners with whom condoms were used "all the time."

Outcomes Questionnaire-45. Participants' psychiatric symptoms were assessed at preintervention and 2-month follow-up using the Outcomes Questionnaire-45 (OQ-45).[18] Each item was scored on a 5-point scale (0 = "Never" to 4 = "Almost Always"). Higher scores indicated more psychiatric symptoms. Total possible scores ranged from 0 to 180 ($\alpha = 0.95$).

Demographics. Participants reported their age, gender, race, sexual orientation, education, employment/income, relationship status, the known or suspected HIV-serostatus of their sexual partners, and their participation in activities that could lead to high-risk sexual episodes (e.g., seeking sexual partners in public parks, roadside rest areas, or adult book stores). Participants also provided data on their use of alcohol and illicit drugs and STI treatment histories.

Data Analytic Procedures

χ^2 tests of association and univariate ANOVA identified differences on demographic and outcome variables at preintervention by condition. ANOVA and regression analyses determined if participation in treatment sessions was related to treatment condition or demographic variables at preintervention. χ^2 tests of association assessed potential relationships between attrition and intervention condition. The primary intervention outcome analysis was a 2 × 2 repeated measures multivariate analyses of variance, with "Intervention Condition" as the between-subjects factor and "Time" as the within-subjects factor. The dependent variables were the proportion of sexual partners with whom condoms were used "all the time" during anal, vaginal, and oral sex and participants' scores on the information, motivation, and behavioral skills scales. Intervention-outcome analyses used an intent-to-treat approach. For the 12 cases that were missing data at 2-month follow-up, a last-observation-carried-forward approach was used.[19] Because it was hypothesized a priori that the integrated intervention would be more efficacious than the skills-building only intervention, all outcome analyses used one-tailed tests of significance and $\alpha = 0.05$.

RESULTS

Sample Characteristics

Most participants were white (67%), self-identified as a gay male (56%), and were in a "partnered" relationship (44%). Among participants who were in a relationship, 49% had a partner who was HIV-seronegative. The average participant was 44.0 years of age (minimum = 22, maximum = 64), had been living with HIV infection for 11.6 years, had completed at least "some" formal college education (58%), and reported an annual income less than $10,000 (46%). Most participants had been prescribed HAART (73%) and had progressed to AIDS (51%). Participants lived an average of 79.8 miles (median = 55 miles) from a city of 100,000 or more residents and most (60%) lived in communities with 20,000 or fewer residents. About 60% of participants reported clinically significant levels of psychiatric distress at preintervention (i.e., ≥63 on the OQ45; sample mean = 74.3).[18] During the 2 months before the intervention, 70% of participants used alcohol, 60% used marijuana, 36% used cocaine, and 36% of men used Viagra. Participants from the 4 major geographic regions of the US were comparable demographically with 1 exception; the South had disproportionally more black participants than the 3 other regions, χ^2 (3) = 14.4, $P < 0.05$.

Participants' Risk Characteristics at Preintervention. At preintervention, 46% of participants had not disclosed their HIV-seropositive status to their sexual partners and only 28% had tried to convince their sexual partner(s) to "always" practice safer sex. At preintervention, 30% of participants engaged in behaviors during the past 2 months that could lead to episodes of high-risk sex, such as visiting public sex venues (e.g., public parks or truck stops) or partying at a bar or dance club with the intention of using alcohol and seeking sex partners. Only 24% of participants (n = 18) used condoms "always" during penetrative vaginal or anal sex (but none of these individuals used condoms consistently during oral sex). The remaining 76% of participants used condoms inconsistently during anal or vaginal sex during the previous 2 months. In 2007 alone, 6 participants (8%) self-reported being newly diagnosed with 1 or more of the following STI's: chlamydia, syphilis, genital warts, herpes, vaginitis, or scabies.

Differences Between Intervention Conditions at Preintervention. χ^2 analyses found no associations between treatment condition and any categorical variable assessed at preintervention (Table 1). Analyses of variance found no significant differences between treatment conditions at preintervention on any continuous measure.

Rates of Attrition. Twelve participants were lost to follow-up, with attrition rates of 13% (n = 6) in the integrated intervention and 19% (n = 6) in the skills-building only intervention. Attrition was unrelated to treatment condition, χ^2 (1, 79) = 0.3, $P > 0.60$. Participants discontinued their involvement in the study because of employment demands (n = 3), family medical issues (n = 3), their telephone being disconnected (n = 3), relocation to urban areas (n = 2), and mortality (n = 1). Participants lost to follow-up were more likely to live in larger communities, χ^2 (5, 79) = 16.4, $P < 0.01$ and were less likely to know their sexual partner's HIV-serostatus, χ^2 (2, 79) = 5.9, $P < 0.05$.

Risk-Reduction Topics Discussed Most Frequently by Participants. Among skills-building only participants, the 3 most frequently discussed topics during intervention sessions were: (1) how to disclose one's HIV-seropositive status to sexual partners (32%, n = 10); (2) sexual assertiveness communication (19%, n = 6); and (3) misconceptions about HIV transmission (19%, n = 6). Among integrated intervention participants, the 3 topics identified as being in greatest need of intervention were: (1) use of harm reduction alternatives (e.g., the relative safety of oral sex; 31%, n = 15); (2) sexual assertiveness communication (27%, n = 13); and (3) improving condom use negotiation skills (17%, n = 8).

Intervention-Outcome Analyses

A 2 × 2 repeated measures multivariate analyses of variance found a significant multivariate "Condition × Time" interaction, F (9, 69) = *1.7,* $P < 0.05$. Post hoc univariate ANOVA revealed that, from preintervention to 2 month follow-up, integrated intervention participants (M_{Pre} = 97.9, M_{Post} = 84.7) reported significantly greater improvements in risk-reduction motivation compared to skills-building only participants (M_{Pre} = 99.4, M_{Post} = 95.5), F (1, 77) = 3.7, $P < 0.05$ (decreases in scores indicate increases in risk-reduction motivation). Integrated intervention participants also reported a greater increase in the proportion of vaginal sex partners with whom condoms were used "all the time" (M_{Pre} = 16.7%, M_{Post} = 27.1%) compared to skills-building only participants (M_{Pre} = 25.8%, M_{Post} = 22.5%), F (1, 77) = 3.2, $P < 0.05$. Finally, integrated intervention participants reported a signifi-

TABLE 1. Sociodemographic Characteristics by Treatment Condition at Preintervention

Variables	Skills-Building Only Condition (n = 31)		Integrated Condition (n = 48)			
	N	%	*N*	%	χ^2	*P*
Region					1.31	0.73
Northeast	13	41.9	15	31.3		
South	5	16.1	12	25.0		
Midwest	10	32.3	16	33.3		
West	3	9.7	5	10.4		
Gender					0.21	0.65
Male	23	74.2	32	66.7		
Female	8	25.8	16	33.3		
Transgender	0	0	0	0		
Sexual orientation					4.62	0.33
Gay men	19	61.3	25	52.1		
Heterosexual men	1	3.2	5	10.4		
Heterosexual women	7	22.6	15	31.3		
Lesbian women	0	0	1	2.1		
Bisexual men	4	12.9	2	4.2		
Race					1.45	0.49
White (non-Hispanic)	20	64.5	33	68.8		
African American (non-Hispanic)	10	32.3	11	22.9		
Other	1	3.2	4	8.3		
Education					0.04	0.83
6–12 yr	12	38.7	21	43.8		
College+	19	61.3	27	56.3		
Employment					11.01	0.09
Employed	5	16.1	6	12.5		
Unemployed	11	35.5	6	12.5		
Student	0	0	4	8.3		
Social security	18	58.1	29	60.4		
Veterans benefits	0	0	1	2.1		
Medicare/medicaid	12	38.7	14	29.2		
Other	4	12.9	7	14.6		
Income					2.14	0.34
$0–10,000	11	35.5	25	52.1		
$10,001–20,000	16	51.6	19	39.6		
$20,001+	4	12.9	4	8.3		
Relation status					6.23	0.10
Married	5	16.4	4	8.3		
Partnered	12	38.7	23	47.9		
Divorced/separated	0	0	6	12.5		
Single	14	45.2	15	31.3		
Partner HIV-status					1.58	0.45
Seronegative	16	51.6	23	47.9		
Seropositive	6	19.4	15	31.3		
Unknown	9	29.0	10	20.8		
Sex frequency					3.29	0.35
No relations	4	12.9	2	4.2		
Casual partners	12	38.7	15	31.3		
Exclusive (<1 yr)	6	19.4	10	20.8		
Exclusive (>1 yr)	9	29.0	21	43.8		
Decade diagnosed HIV+					0.18	0.92
1980	7	22.6	11	22.9		
1990	11	35.5	19	39.6		
2000	13	41.9	18	37.5		
AIDS diagnosis					0.00	1.000
Yes	15	48.4	24	50.0		
No	16	51.6	24	50.0		

(Continues)

TABLE 1. (Continued)

Variables	Skills-Building Only Condition (n = 31) N	%	Integrated Condition (n = 48) N	%	χ^2	P
HAART					0.43	0.51
Yes	21	67.7	37	77.1		
No	10	32.3	11	22.9		
Community size					9.67	0.09
40,000–50,000	3	9.7	9	18.8		
30,000–39,999	2	6.5	4	8.3		
20,000–29,999	7	22.6	7	14.6		
10,000–19,999	5	16.1	10	20.8		
1000–9999	12	38.7	7	14.6		
0–1000	2	6.5	11	22.9		

cant increase in the proportion of oral sex partners with whom condoms were used "all the time" (M_{Pre} = 10.4%, M_{Post} = 27.1%) compared to skills-building only participants (M_{Pre} = 16.1%, M_{Post} = 12.9%), F (1, 77) = 6.3, $P < 0.05$ (Table 2).

DISCUSSION

As HIV incidence and prevalence rates continue to increase in rural areas of the United States, risk-reduction interventions that can reach large numbers of HIV-infected rural persons who have difficulty refraining from high-risk sexual behaviors are urgently needed. This study found that a brief telephone-administered motivational interviewing plus skills-building intervention increased participants' motivation to reduce risky sex and the proportion of participants who reported using condoms "all the time" with their vaginal and oral sex partners compared to an attention equivalent skills-building only intervention.

Findings from this study are consistent with those from previous research showing that telephone-delivered interventions can reduce risky sexual behavior in persons living with, or at risk for, HIV infection.[12–14] Several differences; however, differentiate the current study from previous research. Participants in the current study were all HIV-seropositive men and women from rural areas; past research in this area has typically used samples consisting primarily of HIV-seronegative men (usually MSM) from large urban centers. As such, findings from the current study provide a unique contribution to the HIV risk-reduction literature by showing that telephone-administered, MI-based interventions have potential to reduce risky sexual behaviors in HIV-infected men and women living in geographically-remote areas.

TABLE 2. Changes in Outcome Measures by Treatment Condition

Variables	Skills-Building Only Condition (n = 31) Pretest M (SE)	2 mo F/U M (SE)	Integrated Intervention Condition (n = 48) Pretest M (SE)	2 mo F/U M (SE)	P for "Time × Condition" Interaction	Partial η^2
Risk-reduction information*	33.0 (0.9)	33.2 (0.8)	33.4 (0.7)	34.1 (0.7)	0.27	0.01
Risk-reduction motivation†	99.4 (4.8)	95.5 (3.9)	97.9 (3.9)	84.7 (3.2)	0.03‡	0.05
Risk-reduction behavioral skills†	99.4 (2.7)	97.3 (2.6)	99.7 (2.2)	94.3 (2.1)	0.18	0.01
How often latex condoms are used when having sexual intercourse (vaginal/anal)*	3.5§ (1.6)	4.2§ (1.5)	3.4§ (1.8)	4.1§ (1.8)	0.38	0.01
Percent of vaginal sex partners who used condoms "all the time"	25.8% (0.4) [8/31]	22.5% (0.4) [7/31]	16.7% (0.4) [8/48]	27.1% (0.5) [13/48]	0.04‡	0.04
How often use condoms during vaginal intercourse*	5.3§ (1.2)	5.6§ (0.9)	4.1§ (2.1)	4.6§ (1.9)	0.24	0.01
Percent of anal sex partners who used condoms "all the time"	32.3% (0.4) [10/31]	19.4% (0.4) [6/31]	22.9% (0.4) [11/48]	20.1% (0.4) [10/48]	0.10	0.02
How often use condoms during anal intercourse*	4.4§ (1.9)	5.0§ (1.5)	4.1§ (2.0)	5.0§ (1.7)	0.35	0.01
Percent of oral sex partners who used condoms "all the time"	16.1% (0.3) [5/31]	12.9% (0.3) [4/31]	10.4% (0.3) [5/48]	27.1% (0.4) [13/48]	0.01‡	0.08

*Increases in scores reflect increases in skill/behavior.
†Decreases in scores reflect increases in skill/behavior.
‡Significant at the $P < 0.05$ level.
§Values based on ordinal scale ranging from 1 = "Never" to 6 = "Always."

The current study has several limitations. This research used a small and nonrandom convenience sample. All participants were recruited through ASOs and had access to various risk-reduction and social services. The risk-reduction needs of HIV-infected rural persons who are not affiliated with AIDS service or health care organizations may be even greater than those reported by participants in the current study. Many participants were likely to be receiving risk reduction information or skills from other sources, such as friends, the internet, or other social services. Some changes on outcome measures may have been the result of these outside services and not the interventions tested in this study. While 40% of participants lived in communities of 10,000 residents or fewer and the average participant lived almost 80 miles from a large urban community, the extent to which this study reached the most geographically-isolated persons living with HIV/AIDS is unclear. Although the study used an operational definition of "rural" that incorporated both elements of community size and distance from a large urban area, alternative operational definitions may have altered study findings. The skills-building-only condition, which was intended to serve as an attention-equivalent comparison intervention, may not have been representative of interventions currently offered by many rural-based AIDS service organizations to their clients living with HIV/AIDS, thereby questioning the external validity of the comparison intervention. Although the integrated intervention showed potential to reduce risky behaviors in HIV-infected rural persons, many integrated intervention participants were still at-risk for transmitting HIV to others; indeed, even after the intervention, 73% of integrated intervention participants had vaginal sex partners with whom condoms were not used "all the time." The intervention's efficacy may be strengthened by increasing its dosage (i.e., number of sessions). Although the use of one-tailed statistical tests in the study's intervention-outcome analysis was justifiable from a theoretical perspective, some of the statistically significant between-group comparisons would have reached only marginal levels of statistical significance (i.e., $0.05 < P < 0.10$) if 2-tailed tests were used. Another limitation of the current study is that, in spite of focusing recruitment outreach efforts in many states in the south, many ASOs in southern states declined our offer to participate. In light of HIV's disproportionate impact on southern states, it is critically important to identify efficacious interventions that can reach HIV-infected persons in rural areas of the southern United States. The final limitation is the study's reliance on self-report data. Neither the HIV-seropositive status nor the STD histories of participants was verified through medical records or chart reviews.

In spite of these limitations, the current study is the first known investigation of a telephone-administered intervention that combines motivational interviewing with skills-building and that shows potential to reduce risky sexual behaviors in HIV-infected rural persons. However, before an intervention of this genre can be widely disseminated via AIDS-service and rural-based health care organizations, more large-scale and scientifically-rigorous evaluations of this intervention approach are needed. Future investigations of this intervention approach should include larger and more geographically-diverse samples, additional assessment periods, and more objective outcome measures (e.g., STD testing and/or chart review data).

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