Thoughts of Suicide Among HIV-Infected Rural Persons Enrolled in a Telephone-Delivered Mental Health Intervention

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ABSTRACT

This study characterized rates and predictors of suicidal thoughts among HIV-infected persons living in rural communities of eight U.S. states. Self-administered surveys were completed by 201 HIV-infected persons living in communities of 50,000 or fewer that were located at least 20 miles from a city of 100,000 or more. All participants were clients of rural AIDS service organizations and had recently enrolled into a randomized clinical trial of a telephone-delivered, coping improvement-group intervention designed specifically for HIV-infected rural persons. At baseline, participants reported on thoughts of suicide, psychological symptomatology, life-stressor burden, ways of coping, coping self-efficacy, social support, and barriers to health care and social services. Thirty-eight percent of HIV-infected rural persons had engaged in thoughts of suicide during the past week. A logistic regression analysis revealed that participants who endorsed thoughts of suicide also reported more depressive symptoms (odds ratio [OR] = 2.19; 95% confidence interval [CI] = 1.32–3.63, $p < .002$), less coping self-efficacy (OR = 0.70; 95% CI = 0.56–0.88, $p < .002$), more frequently worried about transmitting their HIV infection to others (OR = 1.66, 95% CI = 1.14–2.40, $p < .008$), and experienced more stress associated with AIDS-related stigma (OR = 1.58, 95% CI = 1.07–2.35, $p < .03$). As AIDS prevalence rates increase in rural areas, interventions that successfully identify and treat geographically isolated HIV-infected persons who experience more frequent or serious thoughts of suicide are urgently needed.

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INTRODUCTION

Through December 1997, more than 17,000 individuals diagnosed with AIDS were living in rural areas of the United States and approximately 50,000 rural persons were living with HIV infection but had not yet progressed to AIDS (1). Much of the increase in rural AIDS is due to high HIV-risk sexual behavior among men who have sex with men. Between 1990 and 1995, the rate of AIDS cases among men who have sex with men in rural areas increased by 69%, compared to a 19% increase among men who have sex with men in urban areas during this same time period (2). Clearly, AIDS is no longer a problem confined to large urban centers.

Research conducted in metropolitan areas suggests that individuals living with HIV disease more frequently contemplate and attempt suicide relative to their HIV-seronegative counterparts. In a study examining reactions to HIV-antibody test results, 21% of persons testing positive for HIV attempted suicide, although no HIV-seronegative persons tried to take their own lives (3). Alfonso and colleagues (4) conducted over 2,300 psychiatric consultations in New York City and found that 20% of HIV-infected patients exhibited suicidal behavior compared to only 13% of patients with unknown HIV serostatus. Recently, Goggins and colleagues (5) reported that 17% of HIV-infected gay men could articulate plans to end their lives if circumstances became intolerable and that these plans were stable over an 18-month period. Although additional research has found frequent thoughts of suicide among HIV-infected persons (6,7), the relation between HIV seroconversion and suicide is not unequivocal. A study of persons enlisting in the U.S. armed services found that recruits who tested positive for HIV were no more likely to kill themselves than were individuals who tested HIV-seronegative (8).

Research clearly shows that HIV-infected persons at greatest risk for suicide are those who have a history of attempted suicide, report higher perceptions of isolation and hopelessness, misuse drugs and alcohol, live in fear that they will lose control of their lives, and have treatment histories for emotional difficulties (9–11). Elevated levels of depression and the use of denial and escape–avoidant coping strategies are also strong

predictors of suicidal thoughts among HIV-infected persons (9,12,13).

These correlates of suicide are troubling when one considers the life circumstances of HIV-infected persons who live in small towns and rural areas. Compared to their urban counterparts, HIV-infected rural persons have less access to medical and mental health care facilities, are more isolated from formal and informal sources of support, experience more incidents of AIDS-related discrimination, and cope less adaptively with life stressors (14,15). In addition, HIV-infected rural persons are more fearful that their HIV-seropositve status will become public knowledge, have fewer similar peers with whom they can discuss life dilemmas, and have reduced access to personal and public forms of transportation (16). In the face of these demoralizing circumstances, HIV-infected rural persons may find it extremely difficult to adjust to their HIV disease and illness-related stressors.

There are currently no reports of suicidal thoughts among HIV-infected persons who live outside of America's AIDS epicenters; however, there are several reasons why suicide prevention research with this group is needed. First, increasing numbers of "native" HIV infections in rural areas (17) and the continued migration of HIV-infected individuals from urban to rural areas (18) will result in more rural AIDS cases than ever before. Second, as HIV-infected rural residents live longer because of potent antiretroviral therapies (9), many will confront novel life stressors with which they have little or no coping experience (e.g., entering into a long-term relationship with an HIV-seronegative individual). Finally, because HIV-infected rural persons confront many unique factors that reduce their life quality (14,19), some members of this group may experience significant coping difficulties and develop more serious thoughts of suicide.

This study had two primary objectives. First, this research delineated rates of suicidal thoughts among HIV-infected rural persons enrolled in a telephone-delivered mental health intervention. In addition, this study identified demographic, psychosocial, and behavioral characteristics predictive of suicidal thoughts among this group. This study was guided by Beck's cognitive theory of depression (20), which has frequently been applied to the prediction of suicidal thoughts and behaviors (21). In Beck's conceptual model of depression and hopelessness, "the hopeless individual expects or believes that nothing will turn out right for him, nothing he does will succeed, his important goals are unattainable, and his worst problems will never be solved" (22, p. 455). Beck's theory of depression has also been linked empirically to completed suicides, suicidal attempts, and suicidal intentions (23). In accord with Beck's model of depression and hopelessness (20), this study hypothesized that HIV-infected rural persons who endorsed thoughts of suicide would also report more depressive symptoms and characteristics indicative of depression, such as less coping self-efficacy, less positive reappraisal, more distancing and escape–avoidant ways of coping, more life-stressor burden, reduced perceptions of social support, and more alcohol and drug use. The study also hypothesized that HIV-infected rural persons who reported more barriers to medical and mental health care services would report thoughts of suicide. Our research contributes to the existing AIDS mental health literature by characterizing suicidal thoughts among a geographically diverse group of 201 HIV-infected rural persons participating in a telephone-delivered mental health intervention in early 2000.

METHOD

Participants and Procedures

Participants completed surveys during the baseline assessment phase of a randomized clinical trial involving HIV-infected rural persons from eight U.S. states. The clinical trial was evaluating the impact of a telephone-delivered, coping improvement-group intervention on the adjustment efforts of HIV-infected rural persons (24). All study participants were clients of AIDS service organizations (ASOs). To recruit participants, ASOs disseminated brochures to their HIV-infected rural clients and displayed print materials in their agency, which outlined the project's purpose and eligibility criteria.

Between July 1999 and January 2000, telephone-based eligibility-screening interviews were conducted with 231 individuals, 201 of whom satisfied the following inclusion criteria: (a) 18 years of age or older; and (b) residence in a community of 50,000 or fewer that was located at least 20 miles from a city of 100,000 or more. There were no inclusion criteria related to the presence of psychological distress. The 30 individuals denied entry into the program were excluded because they reported living in communities with populations exceeding 50,000 residents. Through January 2000, a total of 201 eligible participants were recruited from rural areas of Ohio (47%), Virginia (14%), Pennsylvania (12%), Wisconsin (11%), Michigan (7%), West Virginia (4%), Alaska (3%), and Montana (2%). After participants were provided a complete description of the study during screening interviews, eligible volunteers received, completed, and returned the study's informed consent form via mail. Study protocol was reviewed and approved by the university's Institutional Review Board.

This study relied on print materials and ASO case managers to recruit participants into the project; therefore, it is difficult to estimate the study's overall response rate. Recruitment-related print materials that advertised the project were distributed by ASOs to rural clients through mail, during home visits, and by placing print materials in high-traffic areas of the organization (e.g., reception areas). In addition, case managers in participating ASOs contacted HIV-infected rural clients and encouraged them to contact the study institution to inquire into the project. Because it is difficult to enumerate the population of HIV-infected rural residents aware of the project, it is not possible to establish the denominator necessary to estimate an accurate study response rate.

Assessment Instrument

Each participant completed the self-administered baseline survey in his or her place of residence and returned the measure to the study institution via regular mail. A $30 payment was offered on receipt of the survey. Coefficient alpha for each measure is based on data collected in the current study. The survey

took approximately 1 hr to complete and contained the following measures:

Thoughts of suicide. Item 9 of the Beck Depression Inventory (BDI) was used to assess thoughts of suicide (25). This item consists of four statements that represent a continuum of suicidal risk, 0 (*I don't have any thoughts of killing myself*); 1 (*I have thoughts of killing myself, but I am unlikely to carry them out*); 2 (*I would like to kill myself*); and 3 (*I would kill myself if I had the chance*). Participants endorsed the statement that best described their suicidal thoughts during the past week. Item 9 was used to create two comparison groups, 0 (*No Thoughts of Suicide*) and 1 (*Some/Significant Thoughts of Suicide*); the latter group consisted of individuals who endorsed any thoughts of suicide (i.e., Response Options 1, 2, or 3).

Depression subscale of the Symptom Checklist–90–Revised. A 12-item version of the Symptom Checklist–90–R (SCL–90–R) Depression subscale was employed to assess depressive symptomatology (26). The suicidal ideation item of the SCL–90–R Depression subscale was omitted to avoid overlap with the study's criterion variable. The Depression subscale measured symptoms associated with dysphoric mood, lack of motivation, loss of energy, and other cognitive and behavioral symptoms of depression. Participants used a 5-point Likert-type scale ranging from 0 (*Not at all*) to 4 (*Extremely*) to indicate the extent to which each item had distressed or bothered them during the past 7 days. The 12-item Depression subscale demonstrated excellent internal consistency ($\alpha = .87$).

HIV-Related Life Stressor Burden Scale. Respondents completed a 19-item measure (27) assessing HIV-related life-stressor burden ($\alpha = .91$). Participants rated the severity of each stressor (sample: "Loss of friends to AIDS" and "Financial problems"), using a 5-point Likert-type scale, 1 (*Not a problem*) to 5 (*Most serious problem*). A principal components analysis applied to scale items extracted three subscales that assessed stress due to: AIDS-Related Discrimination (8 items, $\alpha = .81$); AIDS-Related Bereavement (2 items, $\alpha = .74$); and HIV-Infection Transmission Worries (2 items, $\alpha = .71$).

Ways of Coping Checklist (WOCC). The WOCC assessed strategies used in the past month to cope with the stress of living with HIV infection (28). WOCC subscales assessed frequency levels in which the following types of coping were employed: Accepting Responsibility ($\alpha = .63$), Confrontive Coping ($\alpha = .70$), Distancing ($\alpha = .64$), Escape–Avoidance ($\alpha = .78$), Planful Problem Solving ($\alpha = .64$), Positive Reappraisal ($\alpha = .61$), Seeking Social Support ($\alpha = .72$), and Self-Controlling ($\alpha = .78$).

Coping Self-Efficacy Scale. A 26-item measure assessed perceived self-efficacy to cope with prominent stressors (29). Using an 11-point Likert-type scale ranging from 0 (*cannot do at all*) to 10 (*certain can do*), participants rated the extent to which they could perform actions important to adaptive coping (sample: "Sort out what can be changed"). The scale showed very good internal consistency ($\alpha = .95$).

Provision of Social Relations Scale (PSRS). The 15-item PSRS assessed perceptions of social support (30). The measure consisted of two subscales: Support from Family Members (sample: "I know my family will always stand by me," $\alpha = .88$) and Support from Friends (sample: "I feel very close to some of my friends," $\alpha = .89$).

Barriers to Care Scale (BACS). The 13-item BACS assessed barriers that prevent one from obtaining health care and social services (19). A principal components analysis on scale items extracted three subscales: (a) Barriers Due to HIV-Related Stigma and Discrimination (4 items; sample: "Community residents' stigma toward people with AIDS," $\alpha = .85$); (b) Barriers Due to Insufficient Personal Resources (4 items; sample: "Lack of financial resources," $\alpha = .74$); and (c) Barriers Related to Medical and Mental Health Care Inadequacies (3 items; sample: "Lack of adequately trained physicians in rural areas," $\alpha = .70$).

Alcohol/substance use behaviors. Participants indicated the number of days in the past 2 months that they used alcohol, marijuana, cocaine, and injection drugs. Because these variables were significantly and positively skewed, a $\text{Log}_{10}(x+1)$ transformation was applied to each to satisfy assumptions germane to normality, linearity, and homogeneity of variance of residual terms.

Severity of HIV-related symptoms. HIV-disease severity was assessed using a single item that employed a 5-point Likert-type scale ranging from 1 (*I am HIV-positive, but I have no symptoms*) to 5 (*Because of my symptoms, I am in bed or resting for more than one-half of the day*).

Demographic characteristics. Participants indicated their age, sex, ethnicity, education level, annual income, employment status, current relationship status, sexual orientation, population of community of residence, and distance from their town of residence to a city of 100,000 or more.

Intervening With Participants Who Reported Elevated Thoughts of Suicide

On receipt of a participant's survey, an AIDS-certified registered nurse reviewed BDI Item 9 to assess the individual's risk for self-harm. In the event that more serious thoughts of suicide were endorsed (i.e., Options 2 or 3), the practitioner followed an established protocol and either conducted a telephone-based suicide assessment with appropriate counseling or referred the participant to an appropriate local agency. If the participant appeared to be in imminent danger of self-harm but refused to follow the practitioner's recommendations, local authorities were contacted via the 911 emergency assistance system and intervention was arranged.

Data Analysis

Three data analytic strategies were employed in this study. First, descriptive statistics for BDI Item 9 characterized participants' suicidal thoughts during the past week. Second, a series of univariate logistic regression analyses identified psychosocial variables related to thoughts of suicide. Finally, a multiple logistic regression analysis was conducted to develop a more parsimonious model of suicidal thoughts among HIV-infected rural persons. Predictor variables considered for inclusion in the model were those that conceptually related to suicide (8–12) and that predicted suicidal thoughts in univariate logistic regression analyses. The logistic regression analysis was conducted using data from all 201 participants. Because the amount of missing data for key variables was extremely limited and did not conform to a systematic pattern, missing data for continuous measures were imputed using the variable's overall mean.

RESULTS

Sociodemographic Characteristics of Participants

The 201 participants (152 men, 49 women) were, on average, 39.8 years of age (*SD* = 7.6, range = 18–62) and had completed 12.8 years of education (*SD* = 2.1, range = 7–17). Seventy-four percent of participants were White, 19% African American, 2% Hispanic, 2% Native American, and 3% were of other ethnicities. On average, participants had been living with HIV disease for 7.4 years (range = 1–20 years); 46% had been diagnosed with AIDS. Only 30% of participants were employed either full- or part-time; 63% reported annual incomes below $10,000. Forty-two percent of participants were single, 23% partnered, 18% legally married, and 17% were legally divorced or separated. Most participants (85%) were taking one or more HIV-related medications. The majority of participants lived in small communities; 60% lived in towns of 10,000 residents or fewer. In addition, most participants lived in geographically remote communities. On average, participants lived 112.4 miles from a city of 100,000 or more (*SD* = 246, *Mdn* = 60).

Thoughts of Suicide Among HIV-Infected Rural Persons

Examination of BDI Item 9 showed that 38% of participants (76/201) had engaged in thoughts of suicide during the past week (i.e., either response Option 1, 2, or 3 was endorsed). However, the immediate risk for suicide in this group was relatively low; 65 of the 76 indicated that they had thoughts of killing themselves but were unlikely to do so (i.e., Option 1). Nevertheless, 6% of participants endorsed either Option 2 or 3, suggesting that they would like to have killed themselves or would have killed themselves if given the chance during the past week.

Univariate Logistic Regression Analyses Modeling Thoughts of Suicide

A series of univariate logistic regression analyses identified demographic and psychosocial factors that significantly predicted suicidal thoughts on a scale from 0 (*No Thoughts of Suicide*) to 1 (*Some/Significant Thoughts of Suicide*). Findings from these analyses are summarized here.

Suicidal thoughts and sociodemographic characteristics. Suicidal thoughts in the past week were not predicted by any demographic characteristic assessed in this study (all *p*s > .10). Equal proportions of men (38%) and women (37%) had thoughts of suicide, and equal proportions of White (38%) and non-White (36%) participants reported suicidal thoughts. Individuals diagnosed with AIDS (39%) were no more likely to report suicidal thoughts than were HIV-infected individuals who had not yet progressed to AIDS (37%). Thoughts of suicide were not predicted by age ($OR_{95\%\ CI}$ = 0.95–1.02), education ($OR_{95\%\ CI}$ = 0.88–1.15), number of years living with HIV disease ($OR_{95\%\ CI}$ = 0.91–1.13), HIV-disease severity ($OR_{95\%CI}$ = 0.94–1.18), population size of current community ($OR_{95\%\ CI}$ = 0.93–1.17), or distance from place of residence to a city of 100,000 or more ($OR_{95\%CI}$ = 0.90–1.32).

Suicidal thoughts and psychosocial variables. Table 1 displays results of univariate logistic regressions identifying predictors of suicidal thoughts in HIV-infected rural persons. As the table shows, the presence of suicidal thoughts was associated with more depressive symptoms ($OR = 3.75$, $p < .001$), increased stress associated with the possibility of infecting others ($OR = 1.87$, $p < .001$), more stress due to HIV-related stigma ($OR = 1.83$, $p < .001$), less positive reappraisal ($OR = 0.60$, $p < .02$), more escape–avoidant coping ($OR = 2.88$, $p < .001$), and less coping self-efficacy ($OR = 0.58$, $p < .001$). Thoughts of suicide were also associated with less support from family members ($OR = 0.64$, $p < .001$), less support from friends ($OR = 0.49$, $p < .001$), and more barriers to care due to limited personal resources ($OR = 1.63$, $p < .002$). Suicidal thoughts were not predicted by alcohol use, marijuana use, cocaine use, injected drug use, stress due to AIDS-related bereavement, or barriers to care due to inadequate medical and mental health care services (all *p*s > .10).[1]

Multiple Logistic Regression Analysis Modeling Suicidal Thoughts

A multiple logistic regression analysis was conducted to create a more parsimonious model of suicidal thoughts and to control for high intercorrelations among predictor variables.

[1]A series of individual logistic regression analyses was conducted with a modified version of the criterion measure. In the original analyses, the presence of suicidal thoughts was established if individuals endorsed Option 1, 2, or 3 of BDI Item 9. In the reanalysis, the presence of suicidal thoughts was established only if individuals endorsed more serious thoughts of suicide (i.e., Options 2 or 3). In logistic regression analyses conducted with this more rigorous operational definition, no sociodemographic variables predicted thoughts of suicide. In addition, the more rigorous dichotomy of suicidal thoughts was predicted by eight of the nine originally significant predictor variables. The lone exception was the support from family variable, which predicted suicidal thoughts in the original analyses but not in analyses employing the more stringent dichotomy of suicidal thoughts. Therefore, the psychosocial predictors of suicidal thoughts in HIV-infected rural persons were robust across various operational definitions of thoughts of suicide.

TABLE 1
Univariate Predictors of Suicidal Thoughts Among HIV-Infected Rural Persons

	Some or Significant Suicidal Thoughts		*No Suicidal Thoughts*				
Variable	*M*	*SD*	*M*	*SD*	*OR*	*95% CI*	*p <*
Depression subscale of the SCL–90–R	2.23	.75	1.41	.79	3.75	2.40, 5.78	.001
Stress associated with HIV transmission risk[a]	0.34	1.1	–0.20	.78	1.87	1.34, 2.59	.001
Stress associated with HIV-related stigma[a]	0.33	.95	–0.20	.90	1.83	1.33, 2.52	.001
Positive reappraisal	0.97	.64	1.22	.74	0.60	0.39, 0.91	.02
Escape-avoidant coping	1.39	.49	1.07	.58	2.88	1.65, 5.02	.001
Coping self-efficacy	4.11	1.6	5.74	1.8	0.58	0.48, 0.71	.001
Support from family	3.03	1.0	3.55	1.1	0.64	0.48, 0.84	.001
Support from friends	3.32	.87	3.77	.73	0.49	0.34, 0.72	.001
Barriers to care related to personal resources[a]	0.27	.95	–0.17	.96	1.63	1.19, 2.23	.002

Note. OR = odds ratio; CI = confidence interval; SCL–90–R = Symptom Checklist–90–Revised.
[a]Standardized scores ($M = 0$, $SD = 1$); higher scores indicate more of the construct being assessed.

Given the consistently strong relation between suicidal thoughts and depression (9), participants' SCL–90–R Depression subscale scores were first forced into the model. Variables that conceptually related to thoughts of suicide and that predicted suicidal thoughts in preliminary univariate regression analyses were subsequently considered for inclusion using the stepwise entry procedure. The regression analysis was conducted using complete data from all 201 participants.

Table 2 displays the four variables that significantly predicted the presence of suicidal thoughts among intervention-seeking, HIV-infected rural persons. SCL–90–R Depression subscale scores were initially forced into the model and significantly predicted thoughts of suicide, ($OR = 2.19$, $p < .002$); participants who reported thoughts of suicide also reported more depressive symptoms. The second variable to enter the model was coping self-efficacy, ($OR = 0.70$), $\Delta\chi^2(1, N = 201) = 9.9$, $p < .002$; individuals who endorsed thoughts of suicide also reported significantly less coping self-efficacy. The third variable to enter the model was stress associated with HIV transmission risk, ($OR = 1.66$), $\Delta\chi^2(1, N = 201) = 6.4$, $p < .02$; participants reporting suicidal thoughts also experienced more stress associated with the possibility of transmitting their HIV infection to others. The fourth and final variable to enter the model was stress associated with HIV-related stigma, ($OR = 1.58$), $\Delta\chi^2(1, N = 201) = 5.4$, $p < .02$; participants who experienced more stress due to HIV-related stigma and discrimination also reported thoughts of suicide. The Hosmer–Lemeshow goodness-of-fit-test statistic indicated that the four-variable logistic model provided an adequate fit to study data, $\chi^2(8, N = 201) = 8.8$, $p > .30$.[2]

[2]The multiple logistic regression analysis was reconducted using the forced entry method for predictor-variable selection. In this analysis, all psychosocial variables that significantly predicted thoughts of suicide in preliminary logistic regression analyses were simultaneously forced into the model. In both regression analyses (i.e., stepwise and forced entry), thoughts of suicide were predicted by the same four variables: depressive symptoms, coping self-efficacy, stress associated with HIV-transmission risks, and stress associated with HIV-related stigma. Thus, the psychosocial predictors of suicidal thoughts in HIV-infected rural persons were robust across various methods of variable entry.

DISCUSSION

Many individuals living with HIV disease contemplate taking their own life. In fact, research portends that HIV-infected persons are 7 to 60 times more likely to commit suicide than their HIV-seronegative counterparts (31,32). In this study, more than one third of HIV-infected rural persons had thought about suicide in the past 7 days, and 1 in 16 would like to have killed themselves or would have killed themselves if given the chance. This elevated rate demonstrates that, in spite of the potential for highly active antiretroviral therapies to improve physical functioning and extend one's life expectancy, thoughts of suicide exist among a sizable minority of HIV-infected rural persons, especially those seeking support through a telephone-based mental health intervention.

A direct comparison of rates of suicidal thoughts in this sample to other populations is difficult because of the wide variety of operational definitions and retrospective recall periods employed across previous studies of suicidal thoughts and behavior. However, when findings from this study are compared to those that employed similar (albeit nonidentical) methods, it is apparent that HIV-infected rural persons report relatively high rates of suicidal thoughts. For example, two large probability surveys of the general population (33,34) found *lifetime* prevalence rates of suicidal thoughts of 14% and 20%, but a large probability survey of European adults found a prevalence rate of suicidal thoughts of 3% in the *past week* (35). Thoughts of suicide reported in the current sample also surpass those found in other (i.e., nonrural) HIV-infected groups. Kissinger and colleagues (36) reported that 8% of HIV-infected adolescents had thoughts of suicide in their lifetime, and Kalichman and colleagues, who also employed BDI Item 9 to assess suicidal thoughts, found that 27% of older adults living with HIV/AIDS reported thoughts of suicide in the past week (12). Thus, relative to samples of the general population and other HIV-infected groups, rural persons living with HIV disease enrolled in a telephone-delivered mental health intervention report elevated levels of suicidal thoughts.

TABLE 2
Multiple Logistic Regression Analysis Modeling Suicidal Thoughts Among HIV-Infected Rural Persons

	Some or Significant Suicidal Thoughts[a]		*No Suicidal Thoughts*[a]				
Variable	*M*	*SD*	*M*	*SD*	*OR*	*95% CI*	*p <*
Step 1							
SCL–90–R Depression subscale	2.23	.75	1.41	.79	2.19	1.32, 3.63	.002
Step 2							
Coping self-efficacy	4.65	1.5	5.41	1.6	0.70	0.56, 0.88	.002
Step 3							
Stress associated with HIV transmission risk	0.27	1.1	–0.17	.80	1.66	1.14, 2.40	.02
Step 4							
Stress associated with HIV-related stigma	0.20	1.0	–0.12	.91	1.58	1.07, 2.35	.02

Note. Statistics shown are from final logistic regression model. OR = odds ratio; CI = confidence interval; SCL–90–R = Symptom Checklist–90–Revised.
[a]Mean scores shown in table are adjusted for variables entered in previous steps.

This study also identified several factors associated with suicidal thoughts among intervention-seeking HIV-infected rural persons. Consistent with previous research (12), participants who reported thoughts of suicide also reported a greater number of depressive symptoms. Cognitive therapy, which seeks to correct faulty information processing and modify or eliminate maladaptive emotions and behaviors, may constitute a potential approach to reduce thoughts of depression, hopelessness, and suicide among this group (37). Rush and colleagues (38) demonstrated that depressed persons treated with cognitive therapy showed more rapid reduction in hopelessness compared to individuals treated with antidepressants. For the population of HIV-nfected rural persons—many of whom live with an increased number of depressive symptoms—nonpharmacological therapies may be preferable to pharmacological treatments, because depressed individuals have been known to intentionally overdose on pharmaceuticals (20). Research examining the extent to which depressed and suicidal HIV-infected rural persons respond favorably to cognitive therapy would provide a valuable contribution to the AIDS mental health literature.

McNaught and Spicer (23) suggested that, unlike individuals who live with other chronic illnesses (e.g., cancer, asthma, and diabetes), HIV-infected persons often experience increased stress associated with stigma, guilt, and transmitting their illness to others. Consistent with this premise, participants in this study who reported suicidal thoughts also reported more stress associated with possibly transmitting their HIV infection to sexual partners. Given this association, post hoc correlational analyses were conducted to determine if participant's HIV transmission worries were unfounded (i.e., unnecessary worries about infecting others) or well substantiated (i.e., corroborated by patterns of high HIV-risk sexual behavior). Correlational analyses revealed a significant and positive correlation between participants' HIV transmission worries and number of sexual partners during the past 3 months. Perhaps study participants who had multiple sexual partners worried—or had recently learned—that they had infected one or more partners, and this produced increased levels of emotional distress and thoughts of suicide. Alternatively, it is possible that some participants who experienced more distress and thoughts of suicide engaged in higher rates of sexual behavior as a way of coping with life stress. HIV-infected rural persons who endorsed thoughts of suicide also experienced more stress due to HIV-related stigma (e.g., being denied employment or housing because of their HIV infection). Unfortunately, very little research has documented the impact of stigma and discrimination on the life quality of rural people living with HIV disease or delineated intervention strategies that may reduce HIV-related stigma in rural communities.

In light of the associations among life-stressor burden, coping difficulties, and thoughts of suicide in HIV-infected rural persons, the potential for cognitive-behavioral stress management (CBSM) (39,40) and coping-effectiveness interventions (29) to enhance the adjustment efforts of this group warrants investigation. CBSM interventions, which enhance coping responses and emphasize relaxation techniques, health habit changes, regular rest and exercise, meditation, and breathing exercises have reduced depression and anxiety and have improved immune system functioning in HIV-infected persons (39). Similarly, coping effectiveness training (CET) has demonstrated considerable potential to reduce stress and increase coping self-efficacy among depressed HIV-infected persons. CET, frequently implemented in small group settings, emphasizes the correct appraisal of life stressors, the optimal use of problem- and emotion-focused coping, and maximizing the use of social supports to reduce stress and assist coping efforts. Because both CBSM and CET interventions reduce stress and strengthen coping self-efficacy—two factors linked to suicidal thoughts among study participants—the efficacy of these interventions to facilitate the adjustment efforts of HIV-infected rural persons should be explored.

However, due to the unique life circumstances of HIV-infected rural persons, it may be necessary to deliver supportive coping interventions to this group through more innovative methods, such as teleconference technology. Although tele-

phone-linked groups lose some of the interpersonal benefits of face-to-face sessions, they may be necessary for at least two reasons. First, vast geographic distances, limited transportation, and physical disabilities preclude many HIV-infected rural persons from traveling to face-to-face support groups. Second, heightened concerns regarding confidentiality prevent many HIV-infected rural persons from attending support groups. Fortunately, telephone-based mental health interventions can overcome the geographic distances separating HIV-infected rural persons, maximize confidentiality, enhance coping skills, and create systems of mutual support for HIV-infected people isolated by the stigma of their illness and the lack of support systems in their communities (24,41).

This study has several limitations. First, because most participants were recruited from eastern and midwestern states, study findings have limited geographic generalizability. Second, because all participants were recruited through ASOs and had recently enrolled into a mental health intervention, the study may have oversampled persons experiencing acute distress and overestimated thoughts of suicide in this group. The use of a single item to assess suicidal thoughts is another limitation; investigators should employ more sophisticated and psychometrically rigorous measures of suicidal thoughts in future AIDS mental health research. Finally, the role of bidirectionality must be considered; it is unclear if less coping self-efficacy prompts thoughts of suicide or if individuals with suicidal thoughts have greater coping difficulties. Prospective studies are needed to determine the sequence of events that leads to increased thoughts of suicide among HIV-infected rural persons.

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