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Dissolution of Primary Intimate Relationships during Incarceration and Implications for Post-release HIV Transmission

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ABSTRACT *Incarceration is associated with sexually transmitted infections (STIs) including human immunodeficiency virus (HIV). Incarceration may contribute to STI/HIV by disrupting primary intimate relationships that protect against high-risk relationships. Research on sexual network disruption during incarceration and implications for post-release sexual risk behavior is limited. We interviewed a sample of HIV-positive men incarcerated in North Carolina to assess how commonly inmates leave partners behind in the community; characteristics of the relationships; and the prevalence of relationship dissolution during incarceration. Among prison inmates, 52% reported having a primary intimate partner at the time of incarceration. In the period prior to incarceration, 85% of men in relationships lived with and 52% shared finances with their partners. In adjusted analyses, men who did not have a primary cohabiting partner at the time of incarceration, versus those who did, appeared to have higher levels of multiple partnerships (adjusted prevalence ratio (PR), 1.5; 95% confidence interval (CI) 0.9–2.6; $p=0.11$) and sex trade, defined as giving or receiving sex for money, goods, or services (adjusted PR, 2.1; 95% CI 0.9–4.8; $p=0.08$) in the 6 months prior to incarceration. Involvement in financially interdependent partnerships appeared to be associated with further reductions in risk behaviors. Of men in primary partnerships at the time of prison entry, 55% reported their relationship had ended during the incarceration. The findings suggest that involvement in primary partnerships may contribute to reductions in sexual risk-taking among men involved in the criminal justice system but that many partnerships end during incarceration. These findings point to the need for longitudinal research into the effects of incarceration-related sexual network disruption on post-release HIV transmission risk.*

KEYWORDS *Incarceration, Disruption, Sexual networks, Primary partnerships, Sexual behavior, African Americans, Southern US, North Carolina*

BACKGROUND

Former male inmates are three to six times more likely to be HIV-infected than men with no history of incarceration.^{1–4} This may be the case, in part, because incarceration is strongly

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associated with HIV risk behaviors such as multiple and concurrent sex partnerships, sex trade, and substance use.⁵⁻¹³ The factors driving HIV risk among formerly incarcerated men remain unclear and merit further study.

The experience of incarceration itself may contribute to a former inmate's HIV risk behavior because incarceration fractures social ties including intimate relationships.¹⁴⁻¹⁸ It is estimated that 50-80% of inmates are married or in committed relationships at the time of their incarcerations.¹⁹⁻²¹ Since being in a committed relationship is associated with lower levels of sexual risk-taking in general-population samples,^{22,23} loss of a partner during incarceration may lead to post-release HIV risk-taking among former inmates. The conceptual model guiding this research is a modified version of the *Stress-buffering Effect of Social Ties and Health Model*, developed by Cohen et al. (2000) and adapted by Kawachi and Berkman (2001).^{24,25} Figure 1 illustrates the hypothesized effects of the dissolution of primary relationships on post-release HIV risk behaviors. Loss of a primary sex partner during incarceration may lead former inmates to seek new and multiple partners to meet sexual and emotional companionship needs after release. In addition, loss of a committed partner may reduce the former inmate's social support network. Reduced social support may diminish coping and lead to negative emotional and behavioral responses such as depression and anxiety,²⁴⁻²⁶ which in turn may lead former inmates to self-medicate with sex or drugs.²⁵ There is limited epidemiologic research focused on the primary relationships of inmates, including how commonly inmates leave partners behind in the community, levels of relationship stability (e.g., duration of relationships, frequency of seeing one another), the degree to which relationships are protective against HIV risk behaviors, and the prevalence of their dissolution during incarceration. Given the high and growing number of people incarcerated in the USA, the disruptive effect of incarceration on families and relationships, and the potential link between loss of a partner and HIV risk behaviors, research into the disruption of relationships during incarceration is warranted.

We conducted a pilot study to characterize the primary intimate relationships of inmates and to evaluate the dissolution of these relationships during the period of incarceration in North Carolina (NC), a state with high HIV incidence.²⁷ We interviewed a sample of HIV-infected NC state prison inmates to assess how commonly men were in primary relationships at the time of their incarceration; characteristics of their relationships, including the degree to which being in a primary relationship was associated with lower levels of HIV risk behavior in the months prior to incarceration; and the prevalence and correlates of and the perceived reasons for the dissolution of primary relationships during incarceration.

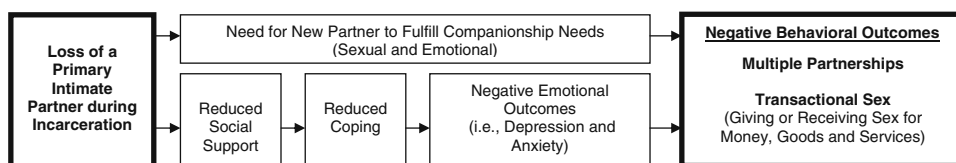


FIG. 1. Dissolution of Relationships during Incarceration and Post-release Sexual Risk Behavior: Conceptual Model. Modified version of the Stress-buffering Effect of Social Ties and Health Model, developed by Cohen et al.²⁴ and adapted by Kawachi and Berkman²⁵

METHODS

Participants and Procedures

The study was conducted in two NC state prisons from June through December 2006. Study participants were HIV-positive men who were currently incarcerated in the NC prison system and who received HIV care from infectious disease clinics housed in the two study prisons. At the time of the study, approximately 80% of the entire population of HIV-infected male inmates received HIV care at these two prison-based clinics. While the men waited for their routine HIV care visit, they were asked to participate in a brief study about relationships during incarceration. Eligibility criteria included: resided in any North Carolina county just prior to the current prison incarceration; resided outside of prison for at least 1 year since the date last released from prison to the date incarcerated in prison for the current sentence, if formerly incarcerated in prison; and had been incarcerated for the current sentence for at least 3 months and no longer than 24 months. Interviewers brought eligible inmates who agreed to participate to a private area to protect confidentiality and, after confirming that respondents were at least 18 years of age, obtained verbal informed consent for an anonymous 15 to 20-minute structured interview.

The UNC-CH School of Public Health Institutional Review Board and the Human Subjects Committee at the NC Department of Correction provided ethical approval for the study.

Measures

Prevalence of Primary Relationships at the Time of the Current Incarceration Study participants were asked, "At the time when you started this current incarceration ... were you in a relationship with a main partner? Was this partner your spouse, someone who was not your spouse but with whom you had a special emotional commitment, or a partner with whom you did not have an emotional commitment?" Those who were married or who had a partner with whom they reported an emotional tie at the time the current incarceration were categorized as having a primary relationship at the time of incarceration (yes versus no).

Characteristics of Primary Relationships Prior to the Current Incarceration Among those who were in a primary relationship at the time of the incarceration, we assessed characteristics of the relationship in the period prior to the incarceration, including whether the respondent was in a heterosexual, marital, cohabiting, and/or parenting partnership; the length of the relationship; how frequently the respondent saw his partner; and whether the partner relied on the respondent financially.

HIV Risk Behavior Prior to Incarceration To evaluate whether primary relationships may be protective against HIV risk, we measured associations between being in a primary relationship at the time of incarceration and two pre-incarceration HIV risk behaviors: multiple partnerships, defined as two or more partnerships (yes versus no), and transactional sex, defined as giving or receiving money, goods, or services for sex (yes versus no) in the 6 months prior to the incarceration.

Dissolution of Primary Relationships during Incarceration We asked incarcerated men who had a primary relationship at the time of incarceration, "Are you still in a relationship with your main partner now?" A respondent who was in a primary relationship when he entered prison, but who was no longer with his partner at the

time of the survey, was categorized as having experienced the dissolution of a primary relationship during incarceration (yes versus no).

Timing of and Perceived Reasons for the Dissolution of Primary Relationships during Incarceration Among those who experienced the dissolution of a relationship during incarceration, we assessed the timing of the break-up and the socio-demographic and behavioral factors that the respondent perceived to have contributed to the dissolution of the relationship. To further assess the factors that drive the dissolution of relationships, we asked all respondents who had ever had a relationship that lasted for at least 1 year to report the factor(s) that played a role in the dissolution of their most recent relationship of at least 1 year.

Data Analysis

We performed analyses in Stata, version 10.0 (Stata Corp., College Station, TX). We calculated frequencies and/or means of respondent background characteristics, pre-incarceration characteristics of the respondents' intimate relationships that were disrupted by incarceration, and perceived reasons for the dissolution of primary relationships during incarceration.

To assess whether primary relationships were associated with lower levels of pre-incarceration HIV risk behaviors, we calculated prevalence ratios (PRs) and 95% confidence intervals (CIs) for the associations between being in a primary relationship, in primary relationship in which partners lived together, and a primary relationship in which partners were financially interdependent (primary partner was someone with whom the respondent shared finances) and HIV risk behaviors, using a generalized linear model with probability weights, log link, Poisson distribution without an offset, and a robust variance estimator.²⁸⁻³⁰ In adjusted models, we included age <30 years, black race, poverty (as indicated by worry about food for self or family in the 4 weeks prior to incarceration), and crack use in the 6 months prior to incarceration.

The same regression methods were used to estimate unadjusted PRs and 95% CIs for the correlations between respondent socio-demographic and behavioral factors and dissolution of relationships during incarceration.

RESULTS

Background Characteristics of Study Population

Of the 78 HIV-positive male inmates recruited for the survey, 64 men (82%) agreed to participate in the interview. Among respondents ($N=64$), the mean age was 40 years. Eighty-nine percent were African American; six respondents were white (9.4% of sample), and one respondent (1.6% of sample) was Native American. A substantial proportion of respondents had not completed high school (38%). One fifth reported worrying about having enough food for themselves or their families in the 4 weeks prior to incarceration. The majority of participants reported use of an illicit drug in the 6 months prior to incarceration (56%), with crack/cocaine use reported by the greatest percentages (50%). No respondent reported use of injection drugs. Among incarcerated men, 52% reported having multiple sex partnerships and 31% reported transactional sex in the 6 months preceding the incarceration.

Respondents' median sentence length for the current incarceration was 21 months. Seventeen percent were serving sentences of less than 12 months, 34%

had sentences of 12 to 23 months, and 48% had sentences of 24 months or longer. At the time of the interview, 9% of men had been incarcerated for 3 to 6 months, 56% for 6 to 12 months, and 34% for greater than 12 months and less than 24 months. All reported having been previously incarcerated in jail or prison for longer than 1 month during their lifetime, and approximately three quarters had gone to jail or prison three or more times during their lifetime. Approximately 28% were incarcerated for a drug crime and 17% for a violent crime.

Prevalence and Characteristics of Primary Relationships of Prison Inmates

Over half of respondents (52%; 33 of 64 respondents) were in a primary relationship at the time of their current incarceration. Of these, the majority were heterosexual relationships (82%) and the majority had lived together (85%), saw one another daily or nearly daily (88%), and had been together for 6 months or longer (64%) or on and off for a number of years (30%). Over half reported that his partner relied on him financially (52%). Few respondents in primary relationships were married ($N=6$) or had children ($N=4$) with their partners.

Associations: Primary Relationships and HIV Risk Behavior Prior to Incarceration

The numbers of sex partners in the 6 months prior to incarceration were lower among respondents who, at the time of the current incarceration, were in a primary relationship (2.7 partners) versus those who were not (4.6 partners, $p=0.10$); were in a primary cohabiting relationship (2.5 partners) versus those who were not (4.6 partners, $p=0.06$); and were in a primary relationship in which partners relied on one another financially (2.1 partners) versus those who were not (4.2 partners, $p=0.08$).

Though the small sample limited statistical power, Table 1 suggests a trend indicating involvement in primary relationships and, particularly, primary relationships in which partners lived together or were financially interdependent, was associated with lower levels of multiple partnerships and transactional sex in the 6 months prior to incarceration. For example, in analyses adjusting for socio-demographic characteristics and crack/cocaine use, those who were not in a primary cohabiting relationship, versus those who were, appeared to be more likely to report multiple partnerships (adjusted PR, 1.52; 95% CI 0.91–2.55; $p=0.11$) and transactional sex (adjusted PR, 2.08; 95% CI 0.91–4.75; $p=0.08$). Likewise, those who were not in a primary relationship in which partners were financially interdependent at the time of incarceration, versus those who were, appeared to have higher levels of multiple partnerships (adjusted PR, 1.83; 95% CI 0.90–3.73; $p=0.10$) and transactional sex (adjusted PR, 3.65; 95% CI 0.95–14.0; $p=0.06$) in the period prior to incarceration.

Dissolution of Primary Relationships during Incarceration

By the time of the in-prison survey, 18 men (55% of 33 respondents in primary relationships) reported that they were no longer in a relationship with their partner. Of these ($N=18$), ten (56%) reported that the relationship ended within the first month of the incarceration.

TABLE 1 Prevalence ratios (PRs) and 95% confidence intervals (CIs) for the associations between being in a primary partnership at the time of the current incarceration and HIV risk behaviors in the 6 months prior to incarceration (N=58)

	≥2 Sex partners (6 months prior to incarceration)		Transactional sex (6 months prior to incarceration)		Adjusted PR (95% CI)*
	%	Unadjusted PR (95% CI)	Adjusted PR (95% CI) ^a	%	
In a primary partnership (was married or had a partner with whom the respondent had an emotional tie)					
Yes (N=33)	48.5	Ref	Ref	27.3	Ref
No (N=25)	64.0	1.32 (p=0.24)	1.33 (p=0.24)	44.0	1.61 (p=0.19)
In a primary partnership in which partners lived together					
Yes (N=29)	41.4	Ref	Ref	20.7	Ref
No (N=29)	69.0	1.67 (p=0.05)	1.52 (p=0.11)	48.3	2.33 (p=0.04)
In a primary partnership in which partners were financially interdependent					
Yes (N=18)	33.3	Ref	Ref	11.1	Ref
No (N=40)	65.0	1.95 (p=0.06)	1.83 (p=0.10)	45.0	4.05 (p=0.04)

^aAdjusted for age, race, poverty (defined as food insecurity in the 4 weeks prior to incarceration), and crack use in the 6 months prior to incarceration

TABLE 2 Prevalence ratios (PRs) and 95% confidence intervals (CIs) for respondent factors associated with partnership dissolution, among respondents in a primary partnership at the time of the current incarceration ($N=33$)

Respondent characteristics	Experienced the dissolution of a primary intimate partnership during incarceration		
	<i>n</i>	%	Unadjusted PR (95% CI)
Socio-demographic characteristics			
Age			
18–39 years ($N=17$)	8	47.1	Referent
40 years or older ($N=16$)	10	62.5	1.33 (0.70–2.52)
Race			
White/Native American ($N=4$)	1	25.0	Referent
African American ($N=29$)	17	58.6	2.34 (0.41–13.51)
Less than a high school education			
No ($N=24$)	13	54.2	Referent
Yes ($N=9$)	5	55.6	1.03 (0.51–2.07)
Worried about having food in the 4 weeks prior to incarceration			
No ($N=29$)	15	51.7	Referent
Yes ($N=4$)	3	75.0	1.45 (0.74–2.85)
Substance use (6 months prior to incarceration)			
Used any illicit drug			
No ($N=14$)	7	50.0	Referent
Yes ($N=18$)	10	55.6	1.11 (0.56–2.19)
Sexual partnerships (6 months prior to incarceration)			
Had multiple (≥ 2) partners			
No ($N=17$)	10	58.8	Referent
Yes ($N=16$)	8	50.0	0.85 (0.45–1.61)
Transactional sex: gave or received money for sex			
No ($N=24$)	14	58.3	Referent
Yes ($N=9$)	4	44.4	0.76 (0.34–1.73)
Currently incarcerated for a violent offense			
No ($N=25$)	11	44.0	Referent
Yes ($N=8$)	7	87.5	1.99 (1.18–3.35)
Currently incarcerated for a drug-related offense			
No ($N=25$)	13	52.0	Referent
Yes ($N=8$)	5	62.5	1.21 (0.62–2.34)
Current incarceration is 2 years or greater			
No ($N=18$)	11	61.1	Referent
Yes ($N=15$)	7	46.7	0.76 (0.39–1.48)

Respondent Socio-demographic and Behavioral Correlates of the Dissolution of Primary Relationships

Based on analyses conducted in the small sample of those who were in a primary partnership at the time of incarceration ($N=33$), loss of a partner during incarceration was not significantly associated with respondent socio-demographic characteristics, pre-incarceration drug use and sexual risk behaviors, length of the current prison sentence, or with being incarcerated for a drug crime (Table 2). However, the analyses indicated that those who were incarcerated for a violent

crime were twice as likely to experience dissolution of a relationship at the time of incarceration as those who were not incarcerated for a violent crime (PR, 1.99; 95% CI 1.18–3.35).

Factors Reported by Respondents to Contribute to the Dissolution of Current and Prior Relationships

Among men who had a primary relationship at the start of the incarceration who were no longer with their partner at the time of the survey ($N=18$), the greatest percentages reported that the break-up was due, at least in part, to the current incarceration ($N=9$, 50%), followed by financial concerns ($N=6$, 33%), a problem with drug or alcohol use by either partner ($N=6$, 33%), and non-monogamy by either partner ($N=6$, 33%).

Among all currently incarcerated men who had ever had a relationship that lasted for at least 1 year ($N=62$), when asked to report the factor(s) that played a role in the dissolution of their most recent relationship of at least 1 year, the greatest percentages cited non-monogamy by either partner (64%), drug or alcohol use by either partner (58%), financial concerns (47%), and incarceration (40%).

DISCUSSION

The findings of this pilot study suggested that among substantial proportions of prison inmates, incarceration disrupts primary relationships that appeared to offer stability and protect against HIV-related high-risk partnerships prior to incarceration. Just over half of respondents were married or in a relationship with someone to whom they had an emotional tie at the time of incarceration. Of those prisoners in primary relationships, prior to the incarceration, the majority lived with their partners and saw them daily or nearly daily and over half shared finances with their partners. Having a primary partner and, particularly, a partner with whom the respondent shared a home or finances, was associated with lower levels of multiple partnerships and transactional sex in the period prior to incarceration, when adjusting for socio-demographic characteristics and drug use. Given involvement in committed relationships is associated with lower levels of multiple concurrent sex partnerships in general-population samples,^{22,23} we hypothesized that involvement in committed relationships likewise would be associated with lower levels of sexual risk-taking among inmates. The results supported the hypothesis, suggesting that relationships appeared to offer protection against HIV risk in this inmate sample. The finding is notable because those involved in the criminal justice system face disproportionate risk of adverse social and economic environments, mental health disorders, and drug use, all of which may threaten the potential protective effects of involvement in committed partnerships against HIV risk.

The study also indicated that over half of primary relationships ended during the incarceration. Prior research has indicated that incarceration leads to emotional division in relationships and could result in dissolution of relationships.^{14–18,31} Because involvement in a primary relationship is associated with lower levels of pre-incarceration risk behavior, it is possible that prison releasees who have lost a primary partner during incarceration may face increased levels of high-risk partnerships during the period of reentry. Prior studies, including by members of our group, have documented the strong associations between incarceration and elevated levels of multiple and concurrent partnerships and sex trade after release.^{5–13} The results of this study provide preliminary evidence to support the

hypothesis that the association between incarceration and high-risk partnerships may exist, in part, because primary relationships that decrease HIV-related high-risk partnerships end during incarceration.

Among currently incarcerated respondents, the most commonly reported reason for the dissolution of a relationship during incarceration was the incarceration itself. Men also reported that non-monogamy, substance use, and financial concerns contributed to the dissolution of their relationships. Non-monogamy, substance use, financial concerns, and incarceration also were reported as determinants of the dissolution of additional prior long-term relationships, suggesting these factors are consistent stressors on the relationships of men involved in the criminal justice system.

Analyses suggested that respondent socio-demographic and baseline drug use and sexual risk behaviors were not associated with relationship dissolution during prison incarceration, but that those who were incarcerated for a violent crime were significantly more likely to lose a partner during incarceration. Observed elevations in relationship dissolution among offenders convicted for violent crimes was not surprising; partners of violent offenders may choose to end the relationship during incarceration if they have felt threatened by their partners in the past, while it also is possible that violent criminals, who are more likely to be affected by psychiatric disorders including antisocial personality disorder,^{32,33} may disengage from their partners during incarceration.

This study was affected by a number of limitations. Observed associations should be interpreted with caution given the modest sample size and the cross-sectional data structure. Equally important, confounding due to unmeasured baseline factors such as respondent mental health status may have biased observed associations between involvement in a primary partnership and lower levels of pre-incarceration sexual risk behaviors. In addition, self-presentation bias may have influenced measurement. For example, while there is evidence that crack use is much more common than injection drug use in North Carolina samples,¹¹ it was somewhat surprising that no respondent of this HIV-positive sample reported having used injection drugs in the 6 months prior to incarceration.

Members of our group had previously conducted semi-structured interviews among HIV-positive prison inmates to assess perceptions of community reentry after prison release, including perceptions of reunification with family members and intimate partners.³⁴ Most viewed family members as a source of social support and saw maintaining relationships with family as motivation for avoiding drugs and alcohol post-release. However, others viewed peer relationships prior to prison negatively, such as if intimate partners were also drug-using partners. These qualitative data indicated that relationships between inmates and ties in the community are complex; some relationships provide strength, while others are seen as negative influences.

This pilot study is among the first to suggest that incarceration disrupts and may contribute to the dissolution of primary relationships that appear to protect against HIV risk, and the findings highlight the need for additional research in larger samples. If additional research indicates that dissolution of primary relationships during incarceration leads to increased HIV risk among the partners of prisoners during the incarceration and/or among recently released prison inmates during the period of reentry, the findings may point to the need for development of prison-based programs to help prisoners and their partners maintain their relationships during incarceration. Such findings, by highlighting unintended effects of incarceration, also may suggest that alternatives to incarceration for non-violent offenders should be considered to limit the disruption of families and social ties.

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