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The Persistence of HIV Risk Behaviors Among Methamphetamine-Using Offenders†

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Abstract

Studies have shown that methamphetamine (MA) is rapidly becoming the drug of choice for a large number of substance-abusing offenders and is associated with significantly higher levels of HIV risk behaviors prior to their incarceration. Despite these findings, there has been little follow-up research to determine whether these patterns persist among recently paroled offenders after attendance in an in-prison treatment program. This study uses the self-reported data from 812 substance-abusing offenders in a multisite NIDA-funded project to determine whether, either before incarceration or nine months after release from an in-prison substance abuse program, MA use in the past 30 days was associated with increased HIV risk behaviors. The findings indicate that offenders who used MA prior to and after incarceration and treatment report higher levels of HIV risk behaviors compared with offenders with no MA use. Clinical and policy implications of the findings are discussed.

Keywords

HIV risk; methamphetamine; offenders; treatment

Methamphetamine (MA) is a Schedule II stimulant derived from amphetamine that strongly affects the body's central nervous system by increasing dopamine levels while

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simultaneously blocking dopamine reuptake in the brain (NIDA 2006). MA is highly addictive, and while the Substance Abuse and Mental Health Services Administration (SAMHSA 2005) reports a stabilization of overall use from 2002 to 2004, the percentage of recent (past 30-day) users of MA who met the criteria for MA abuse or dependence rose from 10.6% to 22.3% during the same period. The National Drug Intelligence Center (2008) in its *National Methamphetamine Threat Assessment* states that treatment admissions for MA use more than doubled from 67,568 in 2000 to 152,368 in 2005.

According to the Centers for Disease Control and Prevention (2007), short-term effects of the drug include alertness, appetite suppression and sexual arousal, with long-term use causing more severe physical, mental, or behavioral deterioration (e.g., tooth decay, stroke, skin lesions, paranoia, hallucinations, irritability, aggressiveness, violence). What is also of concern is the association between MA use and HIV risk behaviors. The existence of this association, especially among homosexual, bisexual and heterosexually self-identified men who have sex with men (MSM), has substantial support in the literature (Halkitis, Green & Garragher 2006; Koblin et al. 2006; Kurtz 2005; Shoptaw et al. 2005; Semple, Patterson & Grant 2002; Halkitis, Parsons & Stirratt 2001; Frosch et al. 1996). While this literature focuses primarily on those MSM subsamples of the population in urban settings, especially in the western portion of the United States, the link between MA use and HIV risk should cause considerable concern to social and health policy makers since the use of methamphetamine is spreading to other areas of the country and to a more diverse population (NDIC 2008). According to SAMHSA (2008), the greatest percentage of treatment admissions for primary MA abuse (65%) occurred in the western states. However, the Midwest reported nearly one in five (19%), the South reported 15%, and the Northeast reported 1% of their respective treatment admissions were for primary MA abuse.

MA use is a problem that is becoming increasingly both rural and heterosexual in scope. In a study of MA use among drug court clients (Stoops et al. 2005), over 30% of the 500 clients admitted to the program reported ever having used MA, and 70.2% of the MA-using sample was from a nonurban site. Molitor and colleagues (1998) used data on a much larger sample of 258,567 noninjection drug users and found that MA use was predictive of higher levels of sexual HIV risk behaviors even after controlling for age, race, gender, and sexual orientation. The authors report that MA use was the most significant predictor of lower levels of condom use and higher levels of sex with drug-injecting partners.

This association between MA use and HIV risk behavior among the heterosexual population is supported by a growing body of literature. In a study examining the association between MA use and both sexual and injection risk behaviors in a sample of out-of-treatment injection drug users, MA use was shown to be associated with higher levels of risk behavior in both males and females (Molitor et al. 1999). While MA use was associated with lower levels of condom use in both male and female subjects, MA-using males reported having more sexual partners than non-MA users, as well as elevated levels of anal sex with females and providing sex for money or drugs compared to non-MA users. The female MA-using sample was found to be more likely to inject their drugs with used needles and more likely not to clean those needles prior to use. These findings held after controlling for age, race and gender, although age (younger) and race (White) were associated with MA use.

In a recent study, Zule and colleagues (2007) used data on 703 substance-abusing participants to examine the association of MA use and sexual risk behavior when MA use was reported to have occurred at the time of the behavior. The sample was majority male (73%), Black (62%), and unemployed (71 %). Only 20% reported being married or living as married. Nearly two-thirds (65%) reported prior substance abuse treatment and over half (57%) reported having spent time in prison. The drugs most used (as a percentage of the

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sample) in the 30 days prior to the interview were crack cocaine, alcohol, heroin, powder cocaine, and marijuana. MA use was reported by 11 % (n = 77) of the sample. As in previous research, the authors found that MA use was associated with certain demographic characteristics. MA users in this sample were more likely to be White, homeless, high-school completers, and unemployed. Again, MA use was found to be significantly associated with certain HIV risk behaviors (e.g., greater number of sexual partners, unprotected anal intercourse, and sex with injection drug users). These associations were especially pronounced when both partners were using MA at the time of the sexual encounter.

Methamphetamine use is rising in the offender population. Mumola and Karberg (2006) report that between 1997 and 2004, the percentage of offenders who used MA in the month prior to committing their offense rose from 6.9% to 10.8%, while offenders reporting the use of cocaine/crack declined from 25% to 21.4% and heroin/opiate use declined from 9.2% to 8.2%. This pattern of use was similar when offenders reported drug use at the time of the offense; the percentage of offenders reporting MA use rose while the percentage using either cocaine/crack or heroin/opiates declined over the seven-year period.

In a study of over 800 prison inmates in California (Farabee, Prendergast & Cartier, 2002), MA was cited as the second most widely used drug after marijuana (MJ) among inmates reporting drug use in the six months prior to their incarceration (MJ = 47.0%; MA = 31.8%; n = 618). When asked to cite their most *problematic* drug, the greatest percentage of these drug-using offenders (26%) reported MA use. The study also found that MA-using offenders were significantly more likely to have unprotected sex with casual partners and more than five times more likely to have sex with injection drug users than were non-MA using offenders prior to their incarceration.

In the 33 states reporting data to the Centers for Disease Control and Prevention (2008), the estimated rate of HIV/AIDS in the general population was 18.5 per 100,000 persons (.019%) in 2006. The latest data (2006) on HIV/AIDS rates among offenders in state and federal prisons (Maruschak 2008) has the HIV/AIDS infection rate at 1.6% for male inmates and 2.4% for female inmates. Clearly, HIV/AIDS is at high levels in the incarcerated population, and since nearly 95% of state prisoners are eventually released back into the community (Hughes & Wilson 2004), this has important implications for correctional interventions as well as post-release resources.

Given the extensive empirical evidence supporting the association of elevated levels of HIV risk behavior among MA users compared to non-MA drug users, this study seeks to determine whether this association exists in a sample of substance-abusing offenders before and after a period of incarceration and substance abuse treatment. It is our hypothesis that MA users will report higher levels of HIV risk behaviors at baseline (preincarceration and pretreatment) than will non-MA drug users and that this association will continue to be present nine months after release from prison.

METHOD

Sample

The current study was conducted as part of a larger study within a constellation of NIDA-funded studies titled the “Criminal Justice Drug Abuse Treatment Studies (CJ-DATS)” (Wexler & Fletcher 2007). The purpose of the larger study, entitled “Transitional Case Management” (TCM), was to evaluate the implementation and effectiveness of case management for offenders being released to the community from state correctional facilities providing substance abuse treatment. The study used a strengths-based case management

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approach to assist offenders in setting and prioritizing goals (prerelease) and working to achieve those goals post-release. Eligible subjects were approached by researchers in state correctional facilities in four states (Colorado, Connecticut, Kentucky, and Oregon), were given a full explanation of the study, and were asked to sign informed consent. Subjects who agreed to participate were randomized to either the TCM group (case management) or to a Standard Referral Group (SRG) where they would receive all of the standard services offered by their respective facilities and community agencies, but no study-related case management services upon release. Those in the TCM group could access case management services for up to six months immediately upon release as well as receive all of the standard parole services. For a full description of TCM, see Prendergast and Cartier (2008).

A total of 812 subjects were recruited and participated in the baseline interview. Forty-seven baseline subjects were subsequently dropped from the follow-up portion of the study as these subjects either received additional time-to-serve and were unable to participate in the study post-release or received transfers to counties or states where the study was not being conducted. Of the remaining 765 participants, 648 (85%) completed their nine-month interview. See Table 1 for baseline and nine-month demographics.

Variables

The primary interview for this study was a version of the Texas Christian University, Department of Criminal Justice–Therapeutic Community Intake Form (TCU/DCJTC Intake: Simpson & Knight 1998). This form, originally designed for community-based treatment, was modified for use with criminal justice populations and to fit the needs of the CJ-DATS initiative. The form was used in a face-to-face interviewing format with the baseline interview conducted when the offender was approximately three months from release and again at three and nine months post-release (follow-up). The interview includes questions on family and peer relations, physical and psychological health status, past criminal activity and criminal justice involvement, drug-use history, and an HIV/AIDS risk assessment. For the purpose of this study, the following sociodemographic variables were used: age, race/ethnicity, marital/partner status, living with spouse or partner, high-school graduate or GED, and employment (past six months). We also included the reported number of lifetime substance abuse treatment episodes. The HIV/AIDS risk assessment includes questions concerning injection drug use and sexual activity. Injection risk questions included: “How many times did you inject with “dirty” needles or syringes — those that had been already used by someone else but were not sterilized or cleaned with bleach before you used them?”; “How often did you use the same cooker, cotton, or rinse water that someone else had already used?”; “How many of the times that you injected drugs were you with other people who were also injecting?”; “Altogether, how many people did you share the same works with?”; and “How many times did you give or loan your used needles or syringes to someone else, who used them without cleaning them with bleach?” The questions concerning risk-related sexual activities included: “How many times did you have sex without using protection?”; “When you had sex without protection that month, how many times was it with someone who is not your spouse or primary partner (i.e. casual partner)?”; How many times was it with someone who shot drugs with needles?”; and “How many times was it when you or your partner were ‘high’ on drugs or alcohol?” The period of time in question for all HIV/AIDS risk-related questions was the 30 days prior to interview date or incarceration date (for baseline interview). Methamphetamine use was defined as any self-reported use in the 30 days prior to interview date or incarceration (for baseline interview).

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Analysis

First, we present descriptive statistics for demographics and analysis variables for the methamphetamine use group and the nonmethamphetamine use group at both time points. Significant differences on characteristics between those who used methamphetamine and those who did not were assessed by chi square or t-tests. Next, bivariate odds ratios are presented for methamphetamine use, injection risk, and sexual risk behaviors at both time points.

Finally, we show results of multivariate analyses of methamphetamine use and sexual risk behaviors conducted at each of the two time points. Logistic regressions were used to conduct these analyses. Because of the likelihood of dependence among observations by site and (for the TCM group) by case manager, sensitivity analyses were conducted replicating the models presented using generalized linear mixed models (GLMM) that included site and case manager as a random intercept effect rather than as a predictor. This type of mixed model accommodates binary dependent variables. The level-2 units for the random effect were site for the Standard Referral group and two members of the TCM group who were the only clients of their respective case managers, and case manager for members of the TCM group when there were at least two clients per case manager (see Snijders & Bosker 1999: 145). We used this strategy in order to have the same number of level-1 observations (clients) in the GLMMs as in the logistic regressions. There were 17 level-2 units. We used the GLMMs as sensitivity analyses rather than as our main analytic models due to the small number of level-2 units. With 17 such units, the model is analogous to — or perhaps even less tenable than — a one-level model with only 17 observations (Snijders & Bosker 1999: 140; see also Maas & Hox 2005; Hox & Maas 2001). Analyses were conducted using SAS (SAS Institute 2004).

All risk behaviors were dichotomized for the purpose of analysis because of their very skewed distributions. The injection drug risk variable was computed using any of the five questions on the questionnaire in order to maximize the number of cases. There were only 20 people who reported using methamphetamine at three months, and this was not sufficient for use of a longitudinal technique such as growth modeling that would include both the three- and nine-month follow-up data. Therefore, the longitudinal portion of the research is restricted to controlling for baseline variables in analyses of nine-month data. Injection risk was not used as a dependent variable in the multivariate analyses because injection is a route of administration for methamphetamine and it would be inappropriate for MA use to be included as a “predictor” of injection behavior.

RESULTS

Table 1 shows the sample characteristics at baseline and nine months. Methamphetamine users were over two years younger than others, on average. Methamphetamine was disproportionately used by Whites, as expected. At baseline, those who did not use methamphetamine (a group composed of 485 users of other drugs and 64 nonusers of drugs) had more prior treatment episodes than did methamphetamine users. Methamphetamine users at baseline were more likely to have graduated from high school but less likely to have been employed prior to incarceration than others. There were very few people who reported having same-sex partners. A significant majority of MA users were from the most western of the research sites (Oregon) and the fewest were in the northeastern site (Connecticut).

There were no significant differences in marital/partner status by methamphetamine use. We note that more respondents reported “living with a spouse or partner” than reported either being “legally married” or “living as married.” It appears, therefore, that respondents who were cohabiting were reluctant to report that they were “living as married.” Based on the

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assumption of its greater accuracy, the “living with a spouse or partner” variable was used in subsequent analyses.

Table 2 displays the bivariate odds ratios relating risk behaviors (methamphetamine use, injection drug use that also involved potential HIV risk, and sexual risk behaviors) at each of the two time points. There was a marked decrease in the prevalence of risk behaviors nine months after incarceration, as compared with their prevalence before prison. Despite this decrease, methamphetamine use was significantly related to injection risk at baseline and to all types of sexual risk behavior at both time points. However, because cell sizes were much smaller at nine months, confidence intervals were quite wide for the odds ratios relating methamphetamine use to unprotected sex with a casual partner and to unprotected sex while a partner was high. Indeed, because only 11 people engaged in injection risk behaviors at nine months, two of the odds ratios involving this variable could not be estimated precisely enough to be meaningful. Other risk behaviors were not interrelated with each other as clearly or consistently, except in the trivial case when one behavior was a subset of one another (e.g., those having unprotected sex and those having unprotected sex when at least one of the partners was high), and these odds ratios are not displayed. We also note the attrition of 164 cases between the two time points. A set of descriptive analyses (not shown) indicated that there were no significant differences in the baseline analysis variables between those who were lost to follow-up and those who completed the nine-month interview. An additional set of descriptive analyses (also not shown) showed no significant differences in the baseline analysis variables between non-MA users and MA users who were lost to follow-up.

Table 2 also shows the interrelations among risk behaviors over time. Those who used methamphetamine at baseline were far more likely than others to be using methamphetamine at nine months. Baseline methamphetamine users also were more likely than others to engage in all other forms of risk behavior at nine months. This consistency in association over time was not observed among most other risk behaviors, except for those who had unprotected sex with casual partners at baseline.

Table 3 shows the multivariate analyses of methamphetamine use and sexual risk behaviors at baseline. As previously stated, the number of people reporting same-sex partners was too few to be able to control for this factor in the multivariate analyses at either time point. Methamphetamine use (col. 1) was strongly related to geographic area and to ethnicity, as expected, and to age. Also, as hypothesized, methamphetamine use was related to all three sexual risk behaviors, controlling for other factors (cols. 2–4). Sexual risk behavior was more likely to occur at the Kentucky site than at the Oregon site. Those with a greater number of prior treatments were more likely than those with fewer prior treatments to have unprotected sex with a casual partner. Living with a spouse or partner predicted engaging in both unprotected sex and unprotected sex while a partner was high.

Table 4 displays the multivariate analyses of methamphetamine use and sexual risk behaviors at nine months. Methamphetamine use at baseline was not included in the model of nine-month methamphetamine use because of the prohibitively small number of clients (eight out of 48) who reported using methamphetamine at nine months but did *not* report using it at baseline. Including this variable produced an untenably high odds ratio and reduced estimated effects of other variables to nonsignificance.

As hypothesized, methamphetamine use was related to all sexual risk behaviors, after controlling for other factors, although as in Table 2, confidence intervals were very wide in the analyses of unprotected sex with a casual partner and while a partner was high. Baseline methamphetamine use was not related to sexual risk behaviors, suggesting that its

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relationship with the nine-month risk behaviors shown in Table 2 was entirely accounted for by current methamphetamine use. The same thing was found for the relationship between baseline sexual risk behaviors and their corresponding nine-month sexual risk behaviors, except that unprotected sex with a casual partner at nine months was predicted by the same baseline behavior. The influence of geography on methamphetamine use persisted at nine months. Unlike at baseline, however, compared with Oregon, unprotected sex was *less* likely to occur at all other sites, and unprotected sex with a casual partner was less likely to occur in Colorado. Older people were less likely than younger people to engage in any of the sexual risk behaviors. Number of prior treatments was not related to unprotected sex with a casual partner, as it was at baseline. Living with a spouse or partner still was related to unprotected sex in general and while someone was high.

Sensitivity Analyses

Sensitivity analyses using GLMMs produced a number of differences compared with the models in Tables 3 and 4. Several were changes in the significance level of findings that nonetheless stayed significant or became significant at a more rigorous level. We report only others in which a finding changed from significant to nonsignificant or the reverse. There were no substantive changes in the magnitudes of the estimated effects.

Table 3 (Baseline) Models

GLMM produced a significant effect of living with a spouse or partner on methamphetamine use. The effect of age on unprotected sex became nonsignificant, but older age became significantly associated with a lower risk of unprotected sex with a casual partner. The effect of number of prior treatments on unprotected sex with a casual partner became nonsignificant.

Table 4 (Nine-Month Follow-up) Models

In the models of nine-month behavior, GLMM again indicated an insignificant effect of age upon unprotected sex. In addition, being Hispanic (vs. White) became significantly associated with less risk of unprotected sex while a partner was high.

DISCUSSION

The purpose of this study was to assess the extent to which methamphetamine use was associated with sex-related and injection-related HIV risk among a sample of offenders prior to and after incarceration and substance abuse treatment relative to nonmethamphetamine-using offenders. As hypothesized, methamphetamine was significantly related to both sex-related and injection HIV risk behaviors at baseline and with sex-related risk behaviors at the nine-month follow-up time point. Methamphetamine users were more likely to engage in unprotected sexual encounters, have unprotected sex with casual partners, and have unprotected sex while they, their partner, or both, were high on drugs or alcohol at both baseline (prior to incarceration and treatment) as well as at follow-up. These findings are consistent with those found in the literature on methamphetamine use and HIV risk behavior and support the fact that the association between MA use and HIV risk behavior is not confined to the MSM population. More importantly, these findings indicate that the association of methamphetamine use and HIV risk, especially sexual risk behaviors, persists even after a period of incarceration and substance abuse treatment.

Findings from this analysis need to be considered in light of several limitations. Due to the small cell sizes at follow-up (especially at three months), we were unable to use more appropriate techniques (e.g. growth modeling) that would have taken better advantage of the longitudinal data. The small number of cases also prevented us from estimating the odds

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ratios with greater precision and from controlling for additional confounders (e.g., same-sex partners). We were limited in more precise data gathering by the questions on the current HIV/AIDS risk questionnaire. An example of this limitation is the question regarding whether either (or both) partners were high at the time of the encounter. We would rather have asked a more detailed series of questions about who was high and what drugs (including alcohol) they had used prior to and during the encounter. Finally, our results are based upon self-reported data, which is widely used in the substance abuse research field and has support in the literature (Johnson et al 1999; Harrison 1995). However, it is still at risk of subject over- or understatement of the facts.

The results of this study suggest that correctional—and especially correctional treatment—policy makers should address the increased HIV / AIDS risk among methamphetamine-using offenders when they are incarcerated and undergoing substance abuse treatment. Particular emphasis should be placed on addressing sex-related risk factors, a dynamic that might be overlooked in the offender population given that injection drug use has typically accounted for more than three times the percentage of AIDS cases among prisoners (Hammett, Harmon & Maruschak 1999). Treatment approaches that have been shown to be effective in MSM samples should be adapted to address the issues of a heterosexual substance-using population.

Additional research into methamphetamine use and HIV/AIDS risk should include refined questionnaires in order to capture more precise event-level sexual risk behavior data. Researchers should maintain longer periods of follow-up in order to determine if the association of methamphetamine use to HIVAIDS risk behaviors persists over extended periods of time and, more importantly, through multiple treatment episodes.

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TABLE 1

Sample Characteristics at Baseline and Nine Months (% or Mean and [SD])

	Baseline		9 Months	
	Non-MA Users (N = 549)	**MA Users (N = 263)**	**Non-MA Users (N = 600)**	**MA Users (N = 48)**
Demographics				
Age	34.9 [9.6]	32.3 [7.7]***	34.0 [9.0]	33.8 [8.4]
Gender				
Male	77.6	72.6	76.3	81.3
Female	22.4	27.4	23.7	18.7
Race/Ethnicity				
African-American	41.2	10.7***	33.3	8.3***
Hispanic	16.0	10.3	13.7	16.7
White Non-Hispanic	38.8	72.2	47.5	75.0
Other	4.0	6.8	5.5	0.0
# Prior AOD Treatments	3.1 [5.5]	2.1 [3.5]**	2.8 [5.0]	2.8 [3.1]
Marital/Partner Status				
Never Married	55.1	56.3	55.8	60.4
Legally Married	13.1	14.5	14.0	6.3
Living as Married	4.4	2.7	3.5	4.2
Separated	5.1	8.4	6.2	2.1
Divorced	21.9	17.9	20.4	25.0
Widowed	0.4	0.4	0.2	2.1
Living w/Spouse or Partner	57.4	65.1*	33.8	37.5
Same-sex Partner	2.6	4.6	1.7	2.1
Socioeconomic Position				
High School Grad./GED	72.7	81.7**	76.5	79.2
Employment Six Months Prior	55.0	35.4***	65.0	62.5
MA Use by Site				
Colorado	24.4	26.6	24.2	25.5
Connecticut	35.3	2.3	28.4	6.4
Kentucky	29.9	13.7	23.9	10.6
Oregon	10.4	57.4***	23.5	57.4***

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

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TABLE 2

Bivariate Associations Among Risk Behaviors at Baseline and Nine Months (Odds Ratio, (95% Confidence Interval))

	1 – Used Meth at Baseline (yes/no)	2 – Had Unprotected Sex at Baseline (yes/no)	3 – Had Unprotected Sex w/ Casual Partner at Baseline (yes/no)	4 – Had Unprotected Sex, Someone High at Baseline (yes/no)	5 – Injection Risk at Baseline	6 – Used Meth at Nine Months (yes/no)	7 – Had Unprotected Sex at Nine Months (yes/no)	8 – Had Unprotected Sex w/Casual Partner at Nine Months (yes/no)	9 – Had Unprotected Sex, Someone High at Nine Months (yes/no)	10 – Injection Risk at Nine Months
1		2.3*** (1.5, 3.4)	1.5* (1.1, 2.0)	3.8*** (2.6, 5.4)	6.8*** (4.5, 10.3)	13.5*** (6.2, 29.5)	1.5* (1.1, 2.1)	2.5** (1.4, 4.5)	2.9*** (1.9, 4.7)	23.2* (2.9, 182.3)
2					1.5 (1.0, 2.5)	1.9 (0.8, 4.3)	1.4 (1.0, 2.0)	1.6 (0.8, 3.6)	2.3* (1.2, 4.4)	>999.9 (<0.0, >999.9)
3				7.5*** (4.9, 11.4)	1.5* (1.0, 2.2)	2.1* (1.2, 3.8)	1.2 (0.9, 1.7)	3.8*** (2.1, 6.9)	2.7*** (1.7, 4.2)	3.9* (1.1, 13.3)
4					2.3** (1.5, 3.5)	2.1* (1.1, 4.3)	1.3 (0.9, 1.8)	2.9* (1.4, 6.1)	2.0** (1.2, 3.4)	6.2 (0.8, 48.5)
5						2.5* (1.3, 4.7)	0.8 (0.5, 1.3)	1.3 (0.6, 2.7)	1.3 (0.7, 2.3)	9.3*** (2.7, 32.3)
6							3.3** (1.7, 6.3)	12.9*** (6.5, 25.6)	15.6*** (8.2, 29.9)	157.6*** (19.7, >999.9)
7										3.5 (0.9, 13.4)
8										4.8* (1.2, 18.7)
9										19.3*** (5.0, 74.4)
N yes	263	620	253	507	132	48	282	49	85	11
N no	549	190	556	302	680	600	364	597	561	637

*$p < 0.05$;

**$p < 0.01$;

***$p < 0.001$

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TABLE 3

Logistic Regression Analyses of Methamphetamine Use and Risk Behavior at Baseline

	Methamphetamine Use			Unprotected Sex			Unprotected Sex, Casual Partner			Unprotected Sex, Someone High		
	OR	95% CI LB	95% CI UB	OR	95% CI LB	95% CI UB	OR	95% CI LB	95% CI UB	OR	95% CI LB	95% CI UB
Methamphetamine Use	--	--	--	2.23**	1.35	3.67	1.89**	1.26	2.84	4.54***	2.89	7.12
Connecticut vs. Oregon	0.02***	0.01	0.04	0.62	0.34	1.12	0.79	0.45	1.40	0.68	0.40	1.17
Kentucky vs. Oregon	0.10***	0.06	0.17	2.61**	1.36	5.01	2.27*	1.39	3.70	3.57***	2.05	6.21
Colorado vs. Oregon	0.25***	0.15	0.39	0.82	0.48	1.41	0.85	0.53	1.37	0.76	0.47	1.23
Male	0.89	0.58	1.37	1.44	0.96	2.17	1.34	0.92	1.95	1.09	0.75	1.58
Age	0.94***	0.92	0.97	0.98*	0.96	1.00	0.98	0.96	1.00	0.99	0.97	1.01
Number of Prior Treatments	1.01	0.96	1.06	1.03	0.99	1.07	1.04**	1.01	1.07	1.03	1.00	1.07
Live w/Spouse or Partner	1.44	0.97	2.14	3.01***	2.11	4.30	0.76	0.55	1.05	1.77***	1.28	2.44
Black vs. White	0.27***	0.16	0.45	1.01	0.65	1.56	1.35	0.92	1.98	1.04	0.70	1.54
Hispanic vs. White	0.38***	0.21	0.66	1.41	0.84	2.36	1.00	0.61	1.66	1.52	0.95	2.43
Max. rescaled (pseudo) R^2	0.47			0.18			0.08			0.23		
LR χ^2, df	331.12***	9		103.86***	10		47.90***	10		146.70***	10	

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

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TABLE 4

Logistic Regression Analyses of Methamphetamine Use and Risk Behavior at Nine Months

	Methamphetamine Use			Unprotected Sex			Unprotected Sex, Casual Partner			Unprotected Sex, Someone High		
	OR	**95% CI LB**	**95% CI UB**	**OR**	**95% CI LB**	**95% CI UB**	**OR**	**95% CI LB**	**95% CI UB**	**OR**	**95% CI LB**	**95% CI UB**
Methamphetamine Use (Nine Months)	--	--	--	3.23**	1.58	6.59	11.95***	5.16	27.69	17.80***	8.14	38.93
Methamphetamine Use (Baseline)	--	--	--	0.84	0.52	1.35	0.74	0.28	1.91	1.05	0.51	2.16
Unprotected Sex (Baseline)	--	--	--	1.11	0.73	1.70	--	--	--	--	--	--
Unprotected Sex, Casual (Baseline)	--	--	--	--	--	--	3.18***	1.62	6.23	--	--	--
Unprotected Sex, High (Baseline)	--	--	--	--	--	--	--	--	--	1.47	0.78	2.76
Connecticut vs. Oregon	0.10**	0.03	0.40	0.53*	0.29	0.95	0.32	0.10	1.04	0.42	0.16	1.07
Kentucky vs. Oregon	0.31*	0.12	0.81	0.57*	0.32	0.99	0.62	0.22	1.71	0.75	0.33	1.71
Colorado vs. Oregon	0.46*	0.21	1.00	0.39***	0.23	0.65	0.22**	0.08	0.67	0.53	0.25	1.16
Male	1.52	0.71	3.29	1.15	0.76	1.74	1.67	0.67	4.15	1.26	0.63	2.51
Age	0.99	0.96	1.03	0.97*	0.96	0.99	0.95*	0.91	0.99	0.93***	0.89	0.96
Number of Prior Treatments	1.04	0.98	1.10	0.99	0.95	1.03	1.02	0.94	1.11	1.04	0.99	1.10
Live w/Spouse or Partner	1.02	0.54	1.91	3.92***	2.74	5.61	0.95	0.48	1.89	3.01***	1.75	5.16
Black vs. White	0.40	0.14	1.11	0.95	0.62	1.47	1.08	0.45	2.57	1.29	0.65	2.59
Hispanic vs. White	1.16	0.48	2.84	1.22	0.71	2.08	1.53	0.55	4.28	0.48	0.19	1.22
Max. rescaled (pseudo) R^2	0.12			0.20			0.26			0.31		
LR χ^2, df	33.662***	9		102.40***	12		74.00***	12		117.41***	12	

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$