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Effect of Continuing Care for Cocaine Dependence on HIV Sex-Risk Behaviors

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Abstract

Evaluate the effect of continuing care interventions for cocaine use with HIV risk-reduction components on HIV sex-risk. Explore whether cocaine use at treatment initiation interacts with the type of continuing care intervention to affect HIV sex-risk. Cocaine dependent participants (N = 321) were randomized to: (1) Treatment as usual (TAU): intensive outpatient treatment, (2) TAU and telephone monitoring and counseling (TMC), and (3) TAU and TMC plus incentives for participation in telephone contacts (TMC+). Participants in TMC and TMC+ received a brief HIV intervention, with booster sessions as needed. Generalized estimating equations analysis compared TAU, TMC and TMC+ at 6, 12, 18, 24 months post-baseline on the following outcomes: overall HIV sex-risk, number of sexual partners, condom usage, exchange of drugs for sex, exchange of sex for drugs, exchange of money for sex, exchange of sex for money, and crack house visits. Overall sex-risk decreased for all treatment conditions at follow-up, with no treatment main effects. For people with no cocaine use at baseline, TAU experienced greater sex-risk reductions than TMC ($p < .01$) and TMC+ ($p < .001$). The three treatment conditions are effective in reducing HIV sex-risk. TMC with HIV risk-reduction components is unnecessary for cocaine-dependent clients who stop using cocaine early in treatment.

Keywords

HIV; Sex-risk; Continuing care; Cocaine

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Conflict of Interest Alexandra S. Wimberly declares that she has no conflict of interest. Megan Ivey declares that she has no conflict of interest. Lior Rennert declares that he has no conflict of interest. James R. McKay declares that he has no conflict of interest.

Compliance with Ethical Standards

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Introduction

Among the roughly 50,000 people infected with HIV yearly in the United States, about 10 % are infected through injection drug use [1]. National estimates documenting the extent that drug use leads to increased sex-risk and subsequent HIV infection do not exist. However, research has shown that sex-risk behavior is greater among people who use drugs, particularly among those who use more stigmatized drugs, such as crack and injection drugs [2]. Additionally, in comparison to other drugs, including injection drugs, powder cocaine and crack use have demonstrated a greater association with sex-risk behavior [3–5]. The association of cocaine use with high-risk sexual behaviors results in an increased threat of HIV infection, a trend that has continued for decades [6–11]. In the absence of a vaccine for HIV, and with the high monetary and quality of life costs associated with HIV treatment, interventions that impact the sex-risk of cocaine users are essential for HIV prevention [12, 13].

Efficacy of Sex-Risk Interventions for Drug Users

While meta-analyses have shown that HIV sex-risk interventions targeted to drug users have moderate effects in impacting sex-risk [13–16], intervention effects vary based on participant, intervention and methodological characteristics [15]. Studies that compared enhanced approaches (more time or resource intensive than standard approaches) with standard approaches have surprisingly found that enhanced approaches are not significantly better than standard approaches [13, 17–19]. Enhanced approaches typically involve more sessions of the chosen intervention and may cover additional topics than a standard approach.

It is possible that enhanced interventions are not more effective because the additional components do not address the right behaviors. Sex-risk behavior is associated with substance use [20] and therefore changes in sex-risk may be determined more by levels of drug use than intervention factors [5]. On the other hand, Semaan et al.'s [13] meta-analysis hypothesized that the lack of significant effect of enhanced approaches in comparison to standard approaches may be related to minimal difference between standard and enhanced interventions; insufficient treatment exposure; delivering the intervention to a sample with low risk levels; or obscuring study results due to conflating studies with various types of drug users in one meta-analysis. Other possible reasons include threats to internal validity such as testing, in other words baseline study interviews may increase a participant's awareness of needed behavior change, regardless of treatment condition [13]. Finally, participants may change due to internal and external motivations regardless of treatment condition [13].

Differential sex-risk findings across studies are partially attributed to the use of different sex-risk outcome measures [13]. Study participants may change on certain sex-risk behaviors rather than others, suggesting that interventions affect only certain sex-risk behaviors. For example, an intervention for African American female crack cocaine users found greater reductions in the number of partners and frequency of sex with paying partners than increases in condom use [17]. Studies also point to participants privileging certain sex-risk

behaviors over others. For example, in one study participants who decreased their number of sexual partners also used condoms less. Authors hypothesized that after decreasing their number of sexual partners, participants perceived less need for condoms, which led to decreased condom usage [12].

Absent from the literature on sex-risk interventions for drug users is an examination of intervention efficacy for people who receive continuing care for substance use treatment. HIV risk-reduction interventions have yielded greater effect sizes when provided at the end of substance use treatment, suggesting that sex-risk behavior improves when drug activity has subsided [16]. People in continuing care for substance use, who would have completed inpatient or intensive outpatient treatment where they received relapse prevention and coping skills, have the potential to experience sizeable improvements in sex-risk if their drug use is stabilized. The following study will address this research gap by looking at the effects of an adaptive continuing care intervention for cocaine dependent persons that includes HIV risk-reduction components. In addition, the study will look at whether participant cocaine use immediately prior to intake to or during the first few weeks of intensive outpatient treatment interacts with the type of intervention to affect sex-risk change. For example, it may be that people with no cocaine use at treatment initiation are more stable in their recovery and therefore require a less intensive intervention than people with cocaine use at treatment initiation. Conversely, those who are using cocaine at treatment initiation may benefit from a more intensive continuing care intervention because their drug use and sex-risk behavior are not yet stabilized. Such information can better inform treatment providers regarding treatment decisions at continuing care intake.

This report looks at the sex-risk outcomes of cocaine-dependent persons in one of two publicly funded intensive outpatient programs in Philadelphia, PA. This report is an ancillary analysis to the main study that looked at the effect of a continuing care substance use intervention on drug use [21]. Participants (n = 321) were randomly assigned to intensive outpatient treatment only (i.e., treatment as usual, or TAU), TAU and telephone monitoring and counseling (TMC), or TAU and TMC plus small monetary incentives for attendance (TMC+), and followed for 24 months. TMC and TMC+ received cognitive behavioral-based counseling sessions for drug use, which included a HIV risk-reduction component.

The following hypotheses were tested:

1. TMC+ and TMC will experience greater reductions in sex-risk scores than TAU.
2. Those in TMC+ with baseline cocaine use will experience the greatest reduction in sex-risk scores.

Methods

The Institutional Review Boards of the University of Pennsylvania and the City of Philadelphia approved this study. Participants were recruited between July 2007 and November 2009. Within the first 2 weeks of admission into their intensive outpatient program, potential participants were screened for the study to determine eligibility. If eligible and interested in the study, a full screening and voluntary informed consent were

administered to the potential participant after completion of the first 2 weeks of the intensive outpatient program.

Blocked randomization was used in order to achieve an equal number of participants within each treatment condition at the two intensive outpatient program sites. Blocks of 30 were generated by the study statistician. The study coordinator put each treatment condition assignment in an envelope, to be revealed at each participant's point of randomization.

At 3, 6, 9, 12, 18, and 24 months post-baseline, follow-up assessments were conducted. Sex-risk outcomes were only collected at 6, 12, 18, and 24 months because the Risk Assessment Battery, the operationalization of sex-risk for this study, collects information for the previous 6 months. Research staff who conducted the study assessments were not blinded to treatment condition, but were blinded to the study hypotheses. Participants received \$50 for attendance to the baseline assessment and \$50 for attendance to each of the follow-up sessions.

Participants

Eligibility criteria included lifetime DSM-IV cocaine dependence; cocaine use in the 6 months prior to intensive outpatient completion; the absence of any psychiatric or medical condition that precluded outpatient treatment; being between the ages of 18 and 65; no regular intravenous heroin use (i.e., three or more times per week) within the past 12 months; ability to read at approximately the 4th grade level; and having some stability in one's living situation (as determined by each participant providing an address and two verified contacts). Of the 773 people screened for the study, 321 people were eligible and interested in participation. Reasons for non-participation among those screened included no lifetime cocaine dependence or no cocaine use in the previous 6 months, non-completion of the initial 2 weeks of their intensive outpatient program, no contacts, regular intravenous opiate use in the previous year, attended screening outside of study enrollment window, psychiatric instability, and uninterested in participation.

HIV Risk Reduction Component for TMC and TMC+

Participants in TMC and TMC+ received a two-session HIV risk-reduction counseling intervention (total of 40 min in duration) developed by the Center for Disease Control and Prevention, and tested in a study by Kamb et al. [22]. The goals of the two-session protocol are the assessment of actual and perceived HIV/STD risks, recognition of barriers to risk-reduction, negotiation to arrive at an acceptable and achievable risk-reduction plan, and the support of patient-initiated behavior change. The first session concludes with a behavioral goal setting exercise in which the participant identifies a small risk-reduction step that could be achieved before the second session. Progress in completing this step is reviewed in the second session, and a longer-term risk reduction plan is developed. The two 20-min sessions were delivered at the beginning of the intervention as part of two face-to-face sessions to orient TMC and TMC+ participants to the protocol. In addition, during subsequent telephone and in-person counseling sessions, HIV risk-behavior was assessed and addressed in the counseling session. If participants required stepped care as assessed by the number and type of high risk drug or sex-risk situations, participants would receive a "booster" HIV

risk reduction counseling session, which included motivational interviewing and relapse prevention techniques.

TAU: Intensive Outpatient Treatment

The intensive outpatient programs consisted of about 9 h of weekly group-based treatment for up to 3–4 months, after which patients were offered 2–3 months of standard out-patient treatment. HIV-risk reduction components in the intensive outpatient programs were comprised of non-routinized dispersal of information regarding HIV risk-reduction in the group setting.

Continuing Care Treatment Conditions

Therapists for the following continuing care treatment conditions were experienced in working with people with substance use disorders in the outpatient setting. Educational backgrounds of therapists included masters in psychology or social work (n = 5), PhD in clinical psychology (n = 1) and bachelor's degree (n = 1).

Telephone Monitoring and Counseling (TMC)—In addition to intensive outpatient treatment, participants received brief telephone calls for up to 24 months. These 20-min cognitive behavioral based counseling sessions were offered weekly for the first 8 weeks, every other week for the next 44 weeks, once per month for 6 months, and every other month for the final 6 months. Each call began with a structured 13-item progress assessment of current substance use, HIV-risk behaviors, and intensive outpatient treatment attendance; other risk factors (e.g., being in risky situations, etc.); and protective factors (e.g., attendance at self-help meetings, etc.). The remainder of each call was tailored to address problems that had been identified in the progress assessment, including an increase in HIV-risk behavior. Coping behaviors to address these problems were identified and rehearsed, using cognitive behavioral techniques. Participants could opt to complete sessions in person if they had difficulty getting private access to a telephone or preferred to attend the session at the clinic.

Telephone Monitoring and Counseling Plus Incentives (TMC+)—This intervention was the same as TMC, with the addition of incentives for attendance to counseling sessions. The incentives included \$10 gift certificates to Walmart, Target or a local grocery store, given for each session attended in the first year. In addition, each time three consecutively scheduled sessions were completed, participants received an additional \$10 gift certificate. The total amount that a participant could receive via incentives if all sessions were completed was \$400. It should be noted that about 20 % of patients randomized to TMC and TMC+ failed to complete the initial orientation sessions and were not eligible for telephone continuing care sessions, and therefore did not receive any HIV-risk reduction interventions.

Measures

HIV Risk Behavior—Drug and alcohol use in the previous 30 days and sexual behaviors in the previous 6 months that put participants at heightened risk to contract the HIV virus were assessed using the Risk Assessment Battery [23, 24]. This 41-item self-report questionnaire was developed as part of a longitudinal study of HIV transmission among drug

users in Philadelphia. It possesses good internal consistency and test–retest reliability ($> .70$), and higher scores consistently predicted seroconversion in a longitudinal study [23].

The Risk Assessment Battery generates a drug-risk score and a sex-risk score. For this study, the sex-risk score was used as the outcome measure of sexual behavior that is associated with HIV transmission. The sex-risk score ranges from 0 to 18, with 0 denoting no sex-risk and 18 denoting highest sex-risk. Previous research among drug using populations have found a sex-risk score mean of 6.2 [25]. The Risk Assessment Battery sex-risk score includes the following items: number of male and female partners, condom usage, frequency of the exchange of sex for drugs and the exchange of drugs for sex, frequency of visits to crack houses, sexual orientation, and frequency of the exchange of sex for money and the exchange of money for sex. In this report, these particular items were separated out to examine whether each item was consistent with the sex-risk score.

Each item within the Risk Assessment Battery sex-risk section has a response range from 0 to 3. Number of male and female partners has the following response options: 0 = 0 partners, 1 = 1 partner, 2 = 2–3 partners, 3 = 4+ partners. Exchange of sex for drugs, exchange of drugs for sex, exchange of money for sex, and exchange of sex for money have the following response options: 0 = never, 1 = a few times or less, 2 = a few times each month, 3 = once or more each week. Condom usage has the following response options: 0 = no sex in the past 6 months or use condoms all the time, 1 = use condoms most of the time, 2 = use condoms some of the time, 3 = use condoms none of the time. Crack house visits has the following response options: 0 = never, 1 = a few times or less, 2 = a few times each month, 3 = once or more each week.

Psychiatric Diagnoses—The structured clinical interview for DSM-IV (SCID) [26] was administered at baseline to assess substance use disorder diagnoses and rule out psychiatric disorders that preclude study participation.

Baseline Cocaine Use—To determine cocaine use immediately prior to and during the first few weeks of intensive outpatient treatment (i.e., within 30 days prior to the baseline assessment), data was derived from the Time-Line Follow-Back [27] and Addiction Severity Index [28]. Time-Line Follow-Back reports of days of cocaine use have been highly correlated with urine toxicology results [29, 30]. The Addiction Severity Index obtained information on lifetime substance use and treatment (including route of administration of cocaine). It has demonstrated adequate to good internal consistency, test–retest, and inter-rater reliabilities [31]. Because of the skewed nature of the distributions, measures were dichotomous, not continuous. Just under half of participants reported cocaine use 30 days prior to baseline.

Data Analyses

Differences between the three conditions at baseline were evaluated with one-way ANOVAs (continuous measures) and χ^2 tests (categorical measures). Multi-collinearity was assessed by looking at the variance inflation factor (amount of variance attributed to collinearity) of the independent variables used in the subsequent analyses.

Generalized estimating equations (GEE; SAS PROC GENMOD) was used to compare the continuing care conditions on overall sex-risk, number of female and male partners, frequency of exchange of sex for drugs and exchange of drugs for sex, frequency of visits to crack houses, frequency of exchange of sex for money and exchange of money for sex, and condom usage at 6, 12, 18, and 24 months in intent-to-treat analyses. Sexual orientation was not evaluated as an outcome because its correlation with overall sex-risk was <0.3 ($r_s = .28$, $p < .0001$). The independent variables were baseline values of the sex-risk outcome, treatment condition, time, treatment x time interactions, and baseline cocaine use x treatment interactions. Time was modeled as a categorical factor with four levels. When self-report indicated that participants refused to answer, it was coded as missing. While this may have under-represented effects, there is greater assurance that any effect found is accurate.

Results

Comparison of Treatment Conditions at Baseline

Participants in the three treatment conditions were compared on demographic, diagnostic and treatment variables assessed at baseline. The treatment conditions did not differ significantly on any of these variables (see Table 1). The 321 recruited participants were on average 43.2 (SD = 7.4) years old, mostly male (76 %), mostly African American (89 %) and had 11.6 (SD = 1.8) years of education. Most met criteria for current cocaine dependence (83 %), and a little over one-third had current alcohol dependence (39 %). Cocaine route of administration was similar across the treatment conditions, with smoking being the most frequent at 86 % among all participants.

Follow-Up Rates

The three treatment conditions did not differ significantly on follow-up rates at any point. The follow-up rates at each follow-up point were as follows: 6 months, 74 %; 12 months, 72 %; 18 months, 71 %; and 24 months, 70 % (see Table 1).

Multi-collinearity

No multi-collinearity was identified. The variance inflation factors of the predictor variables were between 1 and 2.3; well below 10 (the variance inflation factor value that indicates serious multi-collinearity) [32].

HIV Risk-Reduction Component

All participants in the TMC and TMC+ treatment conditions received the initial HIV risk-reduction counseling intervention. In approximately 29 % of subsequent telephone and monitoring calls, HIV risk was identified and addressed.

Hypothesis 1: Sex-Risk Changes and Treatment Effects

Changes in sex-risk score reflect a normal distribution, with a skewness of .21 and a kurtosis of 1.05. Sex-risk decreased for all treatment conditions from an average of 5.17 at baseline to 2.80 at Month 24 (Fig. 1). Treatment condition comparisons on sex-risk score were not significant ($\chi^2 = 1.86$, $p = 0.39$). In addition, TMC and TMC+ did not produce greater

reductions than TAU in condom usage ($\chi^2 = 1.84$, $p = 0.40$), number of male partners ($\chi^2 = 4.07$, $p = 0.13$), number of female partners ($\chi^2 = 2.74$, $p = 0.25$), exchange of sex for drugs ($\chi^2 = 1.25$, $p = 0.54$), exchange of drugs for sex ($\chi^2 = 2.23$, $p = 0.33$), exchange of sex for money ($\chi^2 = 2.53$, $p = 0.28$), exchange of money for sex ($\chi^2 = 3.62$, $p = 0.16$), or crack house visits ($\chi^2 = 1.77$, $p = 0.41$).

Hypothesis 2: Interaction of Baseline Cocaine Use with Treatment Condition

The interaction of cocaine use in the 30 days prior to baseline with treatment condition ($p < .05$) was a significant predictor of sex-risk. When the nature of this interaction was examined, the analyses indicated that among participants with baseline cocaine use, TMC and TMC+ participants experienced lower sex-risk scores during follow-up than those in TAU, but these differences were not significant (Fig. 2b). Conversely, among participants with no baseline cocaine use, those in TAU experienced a lower sex-risk score than those in TMC ($z = -2.58$, $p < .01$) and TMC+ ($z = -3.20$, $p < .001$; Fig. 2a). The interaction of cocaine use in the 30 days prior to baseline with treatment condition was not a significant predictor of condom usage, number of male partners, number of female partners, exchange of sex for drugs, exchange of drugs for sex, exchange of sex for money, exchange of money for sex, or crack house visits.

Discussion

This study looked at the impact on sex-risk of continuing care interventions for cocaine dependent persons. Of those in TMC and TMC+ who received the brief HIV intervention, HIV sex-risk behavior was discussed in 29 % of the subsequent counseling sessions. TAU received standard of care, which included informal information regarding HIV risk in the intensive outpatient and outpatient substance use group setting. While we found no treatment effect on sex-risk, sex-risk scores generally decreased across treatment conditions from baseline to 24-months.

Consistent with prior research [13], this study found that the enhanced approaches (TMC and TMC+) were not significantly better than the standard approach (TAU) in regards to sex-risk effects. As suggested by Semaan et al. [13], it may be that there was minimal difference between the treatment interventions. Indeed, the HIV risk-reduction components at the beginning of continuing care only comprised two twenty-minute sessions.

Another explanation for the lack of treatment effect is that some participants clearly did not need the intervention. An analysis of the moderation effects of cocaine use at baseline with treatment condition suggests that the enhanced approaches work better with people who are using cocaine at baseline, although these results only reached the level of a trend. Conversely, among participants who were cocaine abstinent at baseline, sex-risk scores during follow-up were higher in TMC ($p < .01$) and TMC+ ($p < .001$) than in TAU. Therefore, for people who have no cocaine use at baseline, TAU experienced the greatest sex-risk reductions. This is consistent with the study's findings regarding substance use main effects that found that among participants with cocaine use during baseline, the TMC and TMC+ interventions produced better substance use outcomes than TAU. Among people without cocaine use at baseline there were no differences in treatment effects on substance

use across TAU, TMC or TMC+ [21]. The present study's findings suggest that a continuing care intervention with a brief HIV intervention should be directed towards people with cocaine use immediately prior to or early in intensive outpatient treatment, not towards people with no cocaine use during that period.

Future research may want to explore this finding further to understand why a more intensive intervention is less effective for people who stop using cocaine at treatment initiation. It may be that people who have already stopped using cocaine have better outcomes when they are not reminded of sex and drug risks as through the intervention. For example, in the TMC and TMC+ groups, participants first identified HIV sex-risks and subsequently may have discussed those risks in the TMC sessions. Such discussions may have run counter to the oft-noted recovery strategy to avoid people, places and things associated with substance use. In other words, for people who are not using cocaine when initiating continuing care treatment, discussion of risks may have hindered avoidance of those risks. It is also possible that providing these additional services to patients who are making good initial progress in treatment in some way undermines their self-efficacy, or commitment to making and sustaining positive changes [21]. For those people, less treatment is enough treatment.

Separating out particular sex-risk items from the Risk Assessment Battery did not yield a treatment effect on the number of male and female partners, condom usage, exchange of sex for drugs, exchange of drugs for sex, exchange of sex for money, exchange of money for sex or crack house visits. Therefore, there was no indication that the intervention impacted particular sex-risk behaviors differently. This may reflect the fact that all potential risks could not be fully targeted in a brief intervention, and counselors were instructed to focus only on the most salient risk behavior in subsequent continuing care sessions. Moreover, rates of some of these risk factors were low, which reduced the likelihood of finding significant treatment group differences.

Limitations

Due to the very sensitive nature of the questions on the Risk Assessment Battery, it is possible that participants under-reported in regards to substance use and sex-risk behavior, which may have reduced effect sizes. Of the TMC and TMC+ telephone monitoring calls, 29 % included discussion of sex-risk behaviors, following the initial intervention. Therefore it may be that in the 71 % of sessions in which sex-risk was not discussed, participants either were not experiencing sex-risk behaviors or were uncomfortable discussing such activity with the counselors. It is also possible that a more intensive approach, in which sex-risk is discussed more fully in most continuing care sessions, at least for sexually active participants, would have yielded stronger effects.

Conclusion

This study found that sex-risk decreased across the treatment groups, suggesting that the standard and enhanced care were equally effective across the whole sample. In participants with poor initial progress in treatment, as indicated by continued cocaine use, the enhanced conditions may have provided some additional reductions in HIV risk, although these results only reached the level of a trend. Conversely, the enhanced conditions were clearly less

effective than treatment as usual for those who had achieved initial cocaine abstinence. These results suggest that people with cocaine dependence who stop using cocaine early in treatment do not benefit from further focus on HIV risk behaviors in continuing care sessions focused on drug use behavior.

While much research has shown a link between substance use and sex-risk, the nuances of this relationship are less understood. In the same way that substance use is conceptualized as a chronic relapsing condition [33], it may be helpful to consider that sex-risk will increase and decrease as drug use fluctuates. Indeed, research has shown that people who use more stigmatized drugs such as crack and injection drugs engage in more sex-risk behavior than people who use less stigmatized drugs such as marijuana [2]. Future studies can explore how changes in amount of substance use affect sex-risk and explore participant perspectives regarding the relationship between sex-risk and substance use in order to better inform intervention development. Additionally, research can look at the impact on sex-risk of continuing care interventions targeted towards people who have problems with drugs other than cocaine.

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Fig. 1.

Sex-risk scores by treatment arm. Sex-risk decreased for all treatment conditions from an average of 5.17 at baseline to 2.80 at Month 24. Treatment condition comparisons on sex-risk score were not significant ($\chi^2 = 1.86$, $p = 0.39$). Error bars represent standard error

Fig. 2.

a Interaction of no cocaine use at baseline with treatment condition on sex-risk score.

Among participants with no baseline cocaine use, those in TAU experienced a lower sex-risk score during follow-up than those in TMC ($p < .01$) and TMC+ ($p < .001$). Error bars represent standard error. **b** Interaction of cocaine use at baseline with treatment condition on sex-risk score. Among participants with baseline cocaine use, those in TMC and TMC+ experienced lower sex-risk scores during follow-up than those in TAU, but this was not significant. Error bars represent standard error

Table 1

Characteristics of sample at baseline

	N = 108 TAU	N = 106 TMC	N = 107 TMC+	χ^2	p value
Demographics					
Race—% (N)				5.02	.29
African American	90.7 (97)	84.0 (89)	91.6 (98)		
White	7.5 (8)	9.4 (10)	5.6 (6)		
Other	1.9 (2)	6.6 (7)	2.8 (3)		
Gender—% male (N)	75.9 (82)	75.5 (80)	77.6 (83)	0.14	.93
Age—m (SD)	42.9 (8.0)	43.3 (7.8)	43.4 (6.5)	0.13	.87
HIV status—% positive (N)	9.4 (10)	9.5 (10)	10.5 (11)	0.09	.96
Education—m (SD)	11.4 (1.9)	11.8 (1.6)	11.5 (1.8)	1.66	.19
Sexual preference—% (N)				1.24	.53
Heterosexual	94.4 (101)	93.3 (98)	90.1 (96)		
Bisexual	5.6 (6)	6.7 (7)	9.4 (10)		
Substance use					
Cocaine administration—% (N)				8.85	.35
Smoking	83.3 (90)	88.7 (94)	85.1 (91)		
Nasal	12.0 (13)	4.7 (5)	7.5 (8)		
Intravenous injection	2.8 (3)	4.7 (5)	4.7 (5)		
Oral	0.0 (0)	0.0 (0)	1.9 (2)		
Cocaine in prior 30 days—% (N)	47.2 (51)	40.6 (43)	40.2 (43)	1.38	.50
Alcohol in prior 30 days—% (N)	35.2 (38)	33.0 (35)	34.6 (37)	0.12	.94
Prior drug treatments—m (SD)	4.4 (5.2)	4.4 (5.7)	4.6 (5.9)	0.05	.95
Follow-up rates—% (N)					
Month 0	98.1 (106)	98.1 (104)	99.1 (106)		
Month 6	76.9 (83)	70.8 (75)	74.8 (80)		
Month 12	73.1 (79)	69.8 (74)	72.0 (77)		
Month 18	68.5 (74)	67.9 (72)	75.7 (81)		
Month 24	64.8 (70)	73.6 (78)	72.0 (77)		

TAU = treatment as usual, TMC = telephone monitoring and counseling, TMC+ = telephone monitoring and counseling plus incentives