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A retrospective and prospective analysis of trading sex for drugs or money in women substance abuse treatment patients

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Abstract

Background—Trading sex for drugs or money is common in substance abuse treatment patients, and this study evaluated prevalence and correlates of this behavior in women with cocaine use disorders initiating outpatient care. In addition, we examined the relation of sex trading status to treatment response in relation to usual care versus contingency management (CM), as well as predictors of continued involvement in sex trading over a 9-month period.

Methods—Women (N = 493) recruited from outpatient substance abuse treatment clinics were categorized according to histories of sex trading (n = 215, 43.6%) or not (n = 278).

Results—Women with a history of trading sex were more likely to be African American, older and less educated, and they had more severe employment problems and were more likely to be HIV positive than those without this history. Controlling for baseline differences, both groups responded equally to substance abuse treatment in terms of retention and abstinence outcomes. Fifty-four women (11.3%) reported trading sex within the next nine months. Predictors of continued involvement in trading sex included a prior history of such behaviors and achieving less abstinence during treatment. Each additional week of abstinence during treatment was associated with a 16% reduction in the likelihood of trading sex over the follow-up.

Conclusions—Because over 40% of women receiving community-based treatment for cocaine use disorders have traded sex for drugs or money and more than 10% persist in the behavior, more intensive and directed approaches toward addressing this HIV risk behavior are recommended.

Keywords

substance abuse treatment; women; sexual behaviors; contingency management; sex exchange; transactional sex; prostitution

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1. INTRODUCTION

Trading sex for money or drugs (i.e., sex trading) is common in individuals who abuse illicit substances, especially women. Among women seeking substance abuse treatment, between 30% and 41% endorse recent sex trading behaviors compared to about 6% to 11% of men (Burnette et al., 2008; Grella et al., 2000; Tross et al., 2009). Lifetime prevalence is even higher, with up to 51% of women and 19% of men seeking substance abuse treatment reporting these behaviors across their lifetime (Burnette et al., 2008). Participating in sex trading may vary by the primary substance of abuse, with up to 90% of crack cocaine users reporting involvement in sex trade (Jiwatram-Negron and El-Bassel, 2015). These women also report higher frequency and intensity of cocaine use relative to those who are not currently or have never engaged in sex trade (Edwards et al., 2006; Jiwatram-Negron and El-Bassel, 2015; Risser et al., 2006).

Heavy drug use plays an important, possibly cyclical, role in sex trade involvement. Sex trading may be initiated in order to support heavy substance use (Hoffman et al., 2000; Inciardi and Surratt, 2001), and substance use may escalate as a way to cope with involvement in sex trade (Mosedale et al., 2009). However, other factors appear to impact engagement in sex trade and may play a role in persisting in this behavior pattern as well. These include homelessness, unemployment, minority status, legal difficulties, and lower income (Burnette et al., 2008; Edwards et al., 2006; Gilchrist et al., 2005; Golder and Logan, 2007; Logan and Leukefield, 2000; Jiwatram-Negron and El-Bassel, 2015; Risser et al., 2006). Psychiatric issues may also be a significant contributing factor for or consequence of sex trade involvement. Women who traded sex in the past 30 days report greater psychological distress, including problems related to anxiety, depression, and PTSD, compared to those not recently engaged in sex trade (Edwards et al., 2006; el-Bassel et al., 1997). The presence of these factors may impact response to substance abuse treatment, which in turn may increase the likelihood of continued engagement in sex trade.

Successful substance abuse treatment may also be important from a public health perspective, as substance abusers who trade sex for drugs or money have higher rates of sexually transmitted diseases, HIV/AIDS, and viral hepatitis than substance abusers without sex trading histories (Burnette et al., 2008; Logan and Leukefield, 2000). The high rates of communicable diseases may reflect engagement in other high-risk practices by those who trade sex, such as injection drug use and other risky sexual behaviors (Logan and Leukefield, 2000; Jiwatram-Negron and El-Bassel, 2015), highlighting the need to gain understanding of practices beyond sex trade involvement, such as reusing needles or not using condoms even with non-paying partners, that contribute to risk in this population.

Despite the high rates of sex trading in women who seek treatment for substance use disorders and the high prevalence of factors that may impact treatment success (e.g., homelessness, psychiatric comorbidity), few studies have focused specifically on this population. Some studies have demonstrated reductions in sex risk behaviors for up to 18 months following treatment entry in therapeutic communities (Cooperman et al., 2005; Woods et al., 1999) and up to six months in stimulant abusers who initiate Matrix model treatment (Shoptaw et al., 1998). All these studies (Cooperman et al., 2005; Shoptaw et al.,

1998; Woods et al., 1999) found associations between treatment exposure (e.g., duration and intensity of treatment) and decreases in sexual risk behaviors. In addition, Gotthel et al. (1998) suggest that decreases in substance use itself also appear important for decreasing sex risk behaviors in their study of 447 cocaine dependent patients initiating intensive outpatient or individual counseling. These studies suggest that interventions that promote retention in treatment and reductions in drug use may be associated with risk reduction. However, none of them directly examined the impact of sex trade status on treatment response or whether women who trade sex for drugs or money benefit specifically from more intensive treatments designed to enhance treatment retention and abstinence.

Contingency management (CM) is an efficacious intervention that enhances engagement in treatment and reduces substance use. It provides monetary reinforcers upon objective evidence of drug abstinence. Across psychosocial treatments for substance use disorders, this intervention has the largest effect size (Dutra et al., 2008), and it is efficacious in a range of substance abuse patient populations and settings (Lussier et al., 2006; Prendergast et al., 2006). CM appears to be equally efficacious in reducing substance use in men and women (Rash et al., 2015), and it has benefits on improving multiple areas of functioning. For example, CM reduces psychiatric symptoms (Petry et al., 2013), improves quality of life (Petry et al., 2007), and decreases HIV risk behaviors (Ghitza et al., 2008; Hanson et al., 2008; Petry et al., 2010; Petry et al, 2011). CM protocols reinforcing stimulant negative urine samples reduce both stimulant use and sexual risk behaviors in men who have sex with men and have been recommended as a primary strategy for HIV prevention (Reback et al., 2010; Shoptaw et al., 2005).

No known studies have examined how women who trade sex for drugs or money respond to usual or enhanced substance abuse treatment relative to women who do not engage in these behaviors. Women with sex trade histories, with their higher rates of psychiatric and other life stressors, may benefit from enhanced treatments such as CM. Identification of treatments that promote treatment success among this group could have substantial impacts from a public health perspective due to their high rates of HIV risk behaviors and associated costs to the healthcare system.

One purpose of this study was to determine the proportion of women in substance abuse treatment at community clinics who have histories of trading sex for drugs or money, as relatively few studies have examined lifetime prevalence of these behaviors. We also examined whether women who engage in these activities differ in terms of baseline characteristics and participation in other risky sexual practices from those who do not trade sex for drugs or money. Another aim of this study was to evaluate how sex trade history impacts treatment outcomes, including retention, duration of abstinence achieved, and proportion of negative samples submitted, in response to usual care and CM. Lastly, we also sought to examine predictors of continued participation in sex trade after initiating substance abuse treatment.

2. METHOD

2.1 Participants

Participants were 493 women with cocaine use disorders who enrolled in randomized trials of CM at community-based outpatient psychosocial treatment clinics (Petry et al., 2004, 2005a, 2006a, 2011, 2012b). These clinical trials had common inclusion criteria: age 18 years or older, beginning intensive outpatient treatment at a substance abuse treatment clinic, ability to understand study procedures, and a DSM-IV substance use diagnosis. Exclusion criteria were significant uncontrolled psychiatric conditions (e.g., active suicidal ideation, bipolar disorder, schizophrenia) or being in recovery for gambling disorder (see Petry and Alessi, 2010; Petry et al., 2006b). University and other applicable Institutional Review Boards approved study procedures, and all patients provided written informed consent for participation.

2.2 Measures

At baseline, participants completed a checklist for the Structured Clinical Interview for the DSM-IV to assess substance use diagnoses (First et al., 1996), the Addiction Severity Index (ASI; McLellan et al., 1985), and the HIV Risk Behavior Scale (HRBS; Darke et al., 1991). The ASI evaluates medical, drug, alcohol, employment, legal, family/social, and psychiatric problems and derives composite scores ranging from 0.00-1.00 on each domain, with higher scores indicating greater severity of symptoms.

The HRBS contains five questions related to risky sexual behaviors and six related to injection drug use behaviors. Responses are coded using a 6-point scale from 0 to 5, with higher scores indicating higher risk behaviors. Summary scores are derived by adding the ordinal value of all responses on each scale, and the scales measure two distinct modes of HIV transmission (Darke et al., 1991; Petry, 2001). The HRBS has established psychometric properties for assessing HIV risk including internal reliability of 0.82 and 0.77 for lifetime and recent versions, respectively (Petry, 2001), and test-retest reliability of $r = 0.90$ for the lifetime version (Petry, 2001) and $r = 0.86$ for the past month version (Darke et al., 1991). High agreement is reported between substance abusers and their regular sexual partners regarding occurrence of sexual behaviors and drug injecting practices (Darke et al., 1991).

We used one item from the lifetime version HRBS sexual risk scale related to trading sex for drugs or money (“How often in your lifetime have you used condoms when you have been paid for sex with money or drugs, or when you have paid for sex with money or drugs?”) to categorize participants. Response categories ranged from “never/no paid sex” to “every time” “often,” “sometimes” “rarely,” and “never.” Anyone selecting a response other than “never/no paid sex” was coded as having a lifetime history of trading sex for drugs/money. Responses to this sex trade item were excluded from subscale and total HRBS scores, as by definition they differed between groups. The resulting sex subscale involved the four remaining sex risk items; scoring of the drug risk behavior scale was not altered and used all 6 items.

At baseline and throughout treatment (see below), breath samples were tested for alcohol using Alcosensor-IV Alcometers (Intoximeters, St Louis, MO, USA) and urine samples for opioids and cocaine using Ontrak TesTstiks (Roche, Somersville, NJ, USA).

2.3 Dependent variables

The three primary substance abuse treatment outcomes included: retention in treatment, longest duration of abstinence (LDA) achieved during treatment, and the percentage of samples submitted that tested negative during treatment. These primary outcomes were identical across studies and available from 100% of the sample. Retention was defined as weeks attended outpatient treatment (range: 0-12 weeks). LDA was the longest period of continuous negative samples for cocaine, opioids, and alcohol submitted during treatment (range 0–12 weeks). Submission of a sample positive for cocaine, opioids or alcohol, or failure to provide a sample on a scheduled testing day reset the LDA (absences cleared in advance and deemed excused by treatment clinic staff did not reset a period of absences). Percentage of negative samples refer to samples testing negative concurrently for cocaine, opioids and alcohol, and they were derived from the number of samples submitted in the denominator so that retention in treatment or missing samples did not affect this variable. This is the most conservative approach toward evaluating between-group differences as it does not presume missing samples are positive (Petry et al., 2012a).

2.4 Procedures

After obtaining informed consent, participants completed demographic questionnaires and structured interviews. A computerized procedure randomly assigned patients to one of the treatment conditions outlined in each study (Petry et al., 2004, 2005a, 2006a, 2011, 2012b) and described briefly below. Participants completed lifetime and recent (past month) versions of the HRBS at baseline, and the recent version at follow-ups scheduled for Month 1, 3, 6, and 9 after treatment initiation. A total of 476 of the 493 women (96.6%) completed one or more follow-ups.

2.5 Treatments

Each study (Petry et al., 2004, 2005a, 2006a, 2011, 2012b) had a standard care condition and one or more CM conditions. Standard care was similar across clinics and studies and involved intensive outpatient treatment comprised of group therapy sessions 3-5 days per week for up to one month. The standard therapy was eclectic in nature, consisting of cognitive-behavioral therapy, motivational enhancement, psychoeducation, 12-step interventions, daily planning and relapse prevention. Level of care was tapered to a minimum of one group per week over 12 weeks. Each clinic also provided HIV risk education although the extent and nature of these interventions was not recorded. As part of the study, all patients were expected to submit up to 24 study breath and urine samples.

The CM conditions varied across trials (see Table 1), but they all involved some common elements, including reinforcement for submission of substance negative samples or other objective therapeutic behavior (e.g., attendance at groups or completion on therapeutic goals). In the Petry et al. (2004) study ($N = 120$), two CM conditions awarded different probabilities of winning prizes for submission of substance negative samples. The Petry et

al. (2005a) study ($N = 142$) compared prize reinforcers to voucher reinforcers for submission of negative samples. The Petry et al. (2006a) study ($N = 131$) compared a CM condition that reinforced submission of negative samples to one that reinforced completion of therapeutic activities (e.g., going on a job interview, attending psychiatric appointments). The Petry et al. (2011) study ($N = 239$) implemented CM in a group setting and reinforced both attendance at group and submission of negative samples. The Petry et al. (2012b) study was comprised of two related studies: one was for patients initiating treatment with a cocaine positive sample (the "positive" arm; $N = 109$) and the other for patients initiating treatment with a cocaine negative sample (the "negative" arm; $N = 333$). The "positive" study reinforced patients for submission of negative samples using two different magnitudes of reinforcers, and the "negative" study reinforced patients for submitting negative samples or attending treatment.

In all studies, reinforcement for abstinence was contingent upon samples testing negative for alcohol, cocaine, and opioids concurrently. All studies found benefits of CM relative to standard care. Further, all provided comparable treatments, including the same duration (12 weeks) and intensity, and all applied similar assessment instruments, allowing for cross-study analyses. However, analyses of outcomes controlled for study, as outlined below.

2.6 Data analysis

Women who reported a lifetime history of trading sex for drugs or money were compared with those who reported no such lifetime history for differences in demographics and baseline clinical characteristics (as listed in Table 2). In addition, we compared lifetime and recent (past month) HRBS subscale scores between these groups. Chi-square tests and independent sample t-tests evaluated differences between these groups on baseline indices.

Controlling for study and non-overlapping differences in baseline characteristics between the groups (race, age, education, and ASI employment scores), multivariate general linear models (GLM) evaluated relationships between sex trade status (ever versus never), treatment condition (CM or standard care), and their interaction on the three primary substance use treatment outcomes.

Logistic regression analyses evaluated predictors of trading sex for drugs/money throughout the 9-month study follow-up period. Independent variables added in step one were study, lifetime history of trading sex for drugs/money, race, age, education, and baseline ASI employment scores. Treatment condition (CM or standard care) was added in step 2, and in the final step, the three treatment outcomes were included. Study, lifetime history of trading sex for drugs/money, race, and treatment condition were included as categorical values, and all others as continuous variables. Analyses were conducted on SPSS for Windows (v 21), and 2-tailed alphas of $p < 0.05$ were interpreted as significant.

3. RESULTS

Cocaine dependent treatment-seeking women endorsing ($n = 278$, 56.4%) and not endorsing ($n = 215$, 43.6%) a lifetime history of sex trade differed on some demographic and baseline variables (Table 2). Women who traded sex were older, less educated, and more likely to be

African American than women who denied trading sex, *p*s < 0.05. Compared with their counterparts who had never traded sex, women with a history of trading sex were also more likely to be unemployed, and they had lower annual earned incomes and more severe ASI employment scores, *p*s < 0.05. HIV status also differed significantly between groups, $p = .001$.

Table 3 shows mean scores on the lifetime and past month HRBS subscales. Women who ever traded sex had significantly higher scores on other lifetime indices of sex- and drug-related HIV risk behaviors than those with no such history, *p*s < .001. Lifetime sex trade status was also associated with other recent risky sexual activities assessed by the HRBS. Even after excluding the item related to sex trading from the calculation of these scores, women who traded sex in their lifetime had higher past month HRBS sex risk scores on the other scale items, $p = .01$, while past month drug subscale scores trended toward significance between the groups, $p = .06$.

In the multivariate general linear model, study, treatment condition, and education were significantly associated with treatment outcomes (Table 4). Specifically, assignment to a CM condition was related to all three outcomes: retention, LDA, and percent negative samples (*p*s < 0.05). Those assigned to a CM condition stayed in treatment for a mean (standard error) of 6.8 (0.3) weeks, achieved 5.4 (0.3) weeks of continuous abstinence, and submitted 78.4% (1.9) negative samples versus 5.7 (0.3) weeks, 3.0 (0.3) weeks of continuous abstinence, and 72.5% (2.6) negative samples for those assigned to standard care. Study was related to all three outcomes as well (*p*s < .01), with those in the Petry et al. (2012b) "positive" study achieving the poorest outcomes. Education was positively associated with LDA ($p < .05$), but not other outcomes. No other baseline variable nor a history of trading sex for drugs/money were related to any drug use treatment outcome, nor was the interaction with treatment condition significant.

Overall, 54 of the 476 women who completed follow-ups reported trading sex for drugs or money at one or more of the post-baseline assessments conducted between months 1 and 9 after treatment initiation. Step 1 of the model, which included demographic and baseline characteristics as well as lifetime history of trading sex, was significant, $\chi^2(11) = 62.35$, $p < .001$. Among these variables, only prior history of trading sex emerged as a significant predictor of subsequent trading sex for drugs or money, *Beta* (*SE*) = 2.51 (.44), Wald = 32.50, $p < .001$; odds ratio (OR) = 12.31, 95% confidence interval (CI) = 5.19 – 29.19. Step 2, including treatment condition did not improve the model, $p > .71$, but Step 3, in which treatment outcomes were added, did predict subsequent involvement in sex trade, $\chi^2(3) = 8.71$, $p < .05$. The overall model, $\chi^2(15) = 71.20$, $p < .001$, correctly predicted 88.0% of cases. Table 5 shows results from the final model, with a past history of trading sex for drugs or money associated with a 14-fold increased risk of engaging in the behavior after initiating treatment, and each week of abstinence achieved during treatment was related to a 16% reduced risk of trading sex after treatment initiation.

4. DISCUSSION

Similar to prior studies (e.g., Burnett et al., 2008), this study found high lifetime rates of trading sex for drugs or money among women in intensive outpatient substance abuse treatment. Women who are involved in sex trade report more life stressors, including higher rates of unemployment, lower incomes, and less education, and these variable have the potential to impact treatment response. However, in this sample, lifetime history of sex trade was not associated with treatment retention or drug use outcomes. History of sex trading was associated with significantly higher lifetime and recent risky sexual behaviors other than sex trading and with significantly higher lifetime HIV drug risk behaviors. In addition to and perhaps related to the overall higher rates of sex and drug risk behaviors, women involved in sex trade had significantly higher rates of HIV infection. In terms of ongoing sex trade involvement, 11% of women with a history of sex trade continued to engage in this behavior during or following substance abuse treatment, and abstinence during treatment was associated with lower odds of involvement in these activities. These findings suggests that lifetime history of sex trade may be a useful indicator for identifying patients presenting for substance abuse treatment who may benefit from more in-depth and structured HIV risk reduction interventions. These data also suggest that successful substance abuse treatment, in and of itself, may reduce HIV risk.

With respect to demographic and background characteristics, women who reported sex trade in their lifetime differed from those who had never traded sex with respect to some demographic and background characteristics. Consistent with prior reports (Edwards et al., 2006; Gilchrist et al., 2005; Golder and Logan, 2007; Jiwatram-Negron and El-Bassel, 2015; Risser et al., 2006), women with a history of sex trading were older and presented with more severe employment problems. Women who sex traded also were more likely to be African American than their counterparts who never traded sex and they were significantly more likely to be HIV positive, with about 13% of those involved in sex trade reporting being HIV positive versus 2% of women not engaged in sex trade. These findings are important in the context of HIV infection incidence, which is increasing dramatically among African American women (CDC, 2013). Given the high prevalence of HIV among individuals who trade sex and the greater representation of African American women in this subgroup, efforts should be extended to decrease HIV transmission specifically among these women. Entry to substance abuse treatment may present an ideal opportunity in which to do so. Initiatives such as “test and treat” are designed to increase initial and repeat testing, especially in high risk persons, so that they can be initiated on antiretroviral therapy quickly if positive. These programs should be promoted among women with sex trading histories and integrated into substance abuse treatment in settings in which large proportions of persons at risk present for care (Kalichman et al., 2010). The ability to retain these patients in substance use treatment as well as medical services may be pivotal to reducing HIV transmission in light of the high rates of HIV infection and sexual risk behaviors in this group.

Although substance abuse treatment clinics offer some HIV-related services, the delivery of HIV risk reduction interventions is not standardized or comprehensive (Grella et al., 2000; Pollack and D'Aunno, 2010). This trend is unfortunate, because when integrated, combined

substance abuse and HIV risk reduction programs result in greater reductions in HIV risk behaviors compared to substance abuse treatment alone (Prendergast et al., 2001). However, to be successful, these interventions may have to accommodate the many practical barriers faced by women involved in sex trade, including unemployment and lack of income as noted in this study and others (Burnette et al., 2008; Edwards et al., 2006). These same issues may play a role in the maintenance of or return to sex trade involvement as a means of survival if not addressed as part of comprehensive treatment. Future studies might assess whether recovery housing, dual diagnosis, or job training programs, which address some of these systemic factors, reduce the likelihood of continued involvement in sex trade.

In addition to the importance of and need for HIV risk reduction intervention in this population, substance abuse treatment may play a role in reducing sex trade behavior. Abstinence during treatment was predictive of lower likelihood of continuation in sex trade, suggesting that effective substance abuse treatments may have substantial long-term impacts on engagement in these high risk sexual practices. However, we did not find benefits of the more intensive CM intervention relative to standard care intensive outpatient substance abuse treatment in terms of changing sex trade behavior.

To date, research examining the response to substance abuse treatment itself among women who engage in sex trade has been limited. This study is among the first to compare those with and without a history of sex trade behaviors in terms of response to substance abuse treatments. Women with a history of sex trade in this study responded to standard care substance abuse treatment and CM at a level consistent with their female peers who never traded sex. The duration of abstinence achieved during treatment was significantly inversely associated with likelihood of continued involvement in sex trading. Thus, efforts to extend durations of abstinence specifically among women who trade sex may yield long term personal as well as societal benefits in terms of lowering HIV and other disease risks. It is important to evaluate whether these associations hold in other treatment settings such as methadone maintenance clinics, as they likely have an even greater proportions of women involved in sex trading. If so, these settings may be critical in which to institute interventions such as CM that consistently enhance durations of abstinence (Lussier et al., 2006; Prendergast et al., 2006). The costs of CM have limited implementation efforts, but CM interventions that award modest levels of reinforcement yield benefits in enhancing durations of abstinence in outpatient psychosocial as well as methadone maintenance settings (Petry et al., 2005ab, 2006a, 2011, 2012ab, 2015). From a cost-benefit perspective, those who are using substances and are involved in sex trade may represent an ideal group to direct CM as they pose substantial public health risks.

Although offering CM to those engaged in sex trade may be beneficial from a societal perspective, these findings must be viewed within the context of the study's limitations. Primary among these is the use of self-reported HIV risk behaviors and HIV status. Although this study used an assessment with established psychometrics (Darke et al., 1991), women may underreport their involvement in high risk behaviors given the sensitive nature of the questions. In addition, women who trade sex for drugs may differ from women trading sex for money in their clinical characteristics and risk behaviors (Dunne et al., 2014; Kwiatkowski and Booth, 2000). For example, women who trade sex for drugs are less likely

to use condoms and more likely to be HIV positive than women who trade sex for money (Dunne et al., 2014). This study assessed sex trading for drugs or money in a single question and is unable to examine whether women who trade sex for drugs differ in respect to their risk level, treatment response, or likelihood of continued involvement in sex trade from those who trade sex for money. Future research might investigate these questions and whether women who trade sex for drugs represent an especially vulnerable subgroup amongst the larger population of those involved in sex trade. Similarly, we did not differentiate between women who were paid for sex versus those who paid for sex, nor did we assess types of sex trading (e.g., street-based, escort, parlour-based prostitution), and these contextual elements may factor into associated risk (Baseman et al., 1999; Jeal and Salisbury, 2007). Women engaged in these various aspects of sex trade may have different needs for substance abuse treatment and risk reduction interventions.

Strengths of this study include the use of a large, heterogeneous sample, and broad inclusion and limited exclusion criteria. These features increase the representativeness of the sample and the generalizability of study findings. The use of multiple community-based clinics, studies and CM protocols also add to the generalization of the results as they suggest that effects are not limited to specific clinics or CM protocols. Additional strengths of the study design include the use of objective indices of substance use and frequent follow-up assessments over time to permit shorter (1-3 months) assessment windows; shorter assessment windows appear to be more reliable for recall of risk behaviors (Napper et al., 2010). Nonetheless, self-report measures of HIV risk behaviors may still be subject to recall biases.

In sum, this study adds to the existing literature on sex trade among substance abusers by examining the relation between sex trade and substance use treatment response, as well as treatment-related predictors of continued involvement in sex trade. Women who ever traded sex responded equally well to standard intensive outpatient treatment and CM compared to women who had never traded sex. Importantly, women who achieved longer durations of abstinence during treatment were less likely to maintain involvement in sex trade during and following treatment. This study also documents the high prevalence rates of sex trade among women in outpatient substance abuse treatment settings, and it highlights the need for targeted risk reduction services for these disadvantaged women. Future research might assess whether treatments tailored for women with sex trading histories, specifically addressing their unique needs in a culturally sensitive and non-judgmental and non-stigmatizing manner (Prince, 2013), may reduce these risk behaviors during and following treatment.

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Highlights

- Trading sex for drugs or money is highly prevalent among substance abuse patients.
- Women who do and do not trade sex respond equally well to treatments.
- About 10% of women continue to engage in sex trade after treatment entry.

Table 1

Summary of Contingency Management Conditions across Randomized Clinical Trials

	Petry et al. 2004		Petry et al. 2005		Petry et al. 2006		Petry et al. 2011	Petry et al. 2012 cocaine (-) arm		Petry et al. 2012 cocaine (+) arm	
CM condition	A	B	A	B	A	B	A	A	B	A	B
Reinforcement target	AB+AC	AB+AC	AB+AC	AB+AC	AB	AC	AT+AB	AB	AT	AB	AB
Reinforcement delivery	Prizes	Prizes	Prizes	Vouchers	Prizes	Prizes	Group-based prizes	Prizes	Prizes	Prizes	Prizes
Average maximum possible earnings	$240	$80	$874	$882	$455	$460	$510*	$250	$250	$250	$560
Average earnings	$68	$36	$295	$335	$118	$60	$160	$160	$187	$65	$303

Notes. AB = Abstinence, AC = Activities, AT = Attendance. Petry et al. (2011) had only one CM condition. The Petry et al. (2012) study involved two arms; participants were separated into these arms according to submission of a cocaine positive or negative baseline sample prior to randomization.

*Average maximum possible earnings were estimated for the Petry et al. (2011) study based on participants who attended all treatment sessions and were abstinent throughout treatment.

Table 2

Demographic and Baseline Characteristics by History of Sex Trade

Variable	No history of sex trade	History of sex trade	Statistical test (df), *p*
N	278	215	
Study, n (%)			$\chi^2(5) = 4.43, .49$
Petry et al. (2012) Positive	45 (16.2)	24 (11.2)	
Petry et al. (2012) Negative	97 (34.9)	79 (36.7)	
Petry et al. (2011)	43 (15.5)	29 (13.5)	
Petry et al. (2006)	25 (9.0)	19 (8.8)	
Petry et al. (2005)	34 (12.2)	36 (16.7)	
Petry et al. (2004)	34 (12.2)	28 (13.0)	
Treatment group, n (%)			χ^2 (1) = 0.02, .90
Contingency management	186 (66.9)	145 (67.4)	
Standard care	92 (33.1)	70 (32.6)	
Hispanic, n (%)	38 (13.7)	22 (10.2)	χ^2 (1) = 1.34, .25
Race/ethnicity, n (%)			χ^2 (2) = 17.33, <.001
African American	105 (37.8)	121 (56.3)	
Caucasian	138 (49.6)	71 (33.0)	
Other	35 (12.6)	23 (10.7)	
Age	34.22 ± 8.73	36.20 ± 7.05	*t* (491) = −2.73, .001
Marital Status, n (%)			χ^2 (3) = 2.28, .52
Never married	153 (55.0)	128 (59.5)	
Married/live with partner	44 (15.8)	26 (12.1)	
Separated/divorced	71 (25.5)	56 (26.0)	
Widowed	10 (3.6)	5 (2.3)	
Years of education	12.07 ± 2.02	11.31 ± 1.91	*t* (490) = 4.22, <.001
Employment, n (%)			χ^2 (3) = 17.24, .001
Full time	95 (34.2)	51 (23.7)	
Part time	81 (29.1)	45 (20.9)	
Unemployed	81 (29.1)	97 (45.1)	
Not in workforce	21 (7.6)	22 (10.2)	
Earned annual income ($)	$6,427 ± 10,388	$3,802 ± 12,796	*t* (490) = 2.51, .01
HIV status, n (%)[a]			χ^2 (2) = 13.20, .001
Negative	115 (86.5)	88 (80.0)	
Positive	2 (1.5)	14 (12.7)	
Never tested	16 (12.0)	8 (7.3)	
DSM-IV past-year diagnosis, n (%)			
Opioid use disorder	80 (28.9)	61 (28.5)	χ^2 (1) = 0.01, .93
Alcohol use disorder	156 (56.1)	131 (60.9)	χ^2 (1) = 1.16, .28
Drug positive sample, n (%)	79 (28.4)	52 (24.3)	χ^2 (1) = 1.05, .31
Alcohol Severity Index Scores			

Variable	No history of sex trade	History of sex trade	Statistical test (df), *p*
Medical	0.25 ± 0.36	0.28 ± 0.37	*t* (491) = −0.90, .37
Employment	0.72 ± 0.27	0.85 ± 0.22	*t* (491) = −5.84, <.001
Alcohol	0.19 ± 0.24	0.19 ± 0.23	*t* (491) = −0.16, .88
Drug use	0.17 ± 0.09	0.18 ± 0.09	*t* (491) = −0.75, .46
Legal	0.12 ± 0.20	0.13 ± 0.20	*t* (490) = −0.58, .56
Family/social	0.21 ± 0.24	0.19 ± 0.23	*t* (490) = 0.75, .46
Psychological	0.32 ± 0.25	0.32 ± 0.23	*t* (489) = −0.11, .91

Notes. DSM-IV = Diagnostic and Statistical Manual for Mental Disorders, HIV = Human Immunodeficiency Virus. Values are means and standard deviations unless otherwise indicated.

[a]HIV status was not assessed in all studies, so the sample size is reduced for this variable.

Table 3

HIV Risk Behavior Scale (HRBS) Scores by Sex Trade Status

Variable	No history of sex trade	History of sex trade	Test (df), *p*
N	278	215	
HIV Risk Behavior Scale scores[a]			
Sexual, lifetime	8.59 ± 3.21	10.43 ± 3.32	t (488) = −6.18, <.001
Sexual, recent	3.93 ± 3.35	4.75 ± 3.63	t (487) = −2.58, .01
Drug, lifetime	2.42 ± 5.97	4.75 ± 8.03	t (490) = −3.70, <.001
Drug, recent	0.47 ± 2.40	0.96 ± 3.34	t (489) = −1.89, .06

Notes. Values are means and standard deviations unless otherwise indicated. Not all participants completed both lifetime and past month versions so sample sizes vary slightly.

[a]Sexual risk scores exclude the sex trade question.

Table 4

Multivariate Predictors of Treatment Outcomes: Retention in Treatment, Longest Duration of Abstinence (LDA), and Percent Negative Samples

Predictors	Retention		LDA		Percent Negative Samples	
	Statistic	*p*	Statistic	*p*	Statistic	*p*
Study	$F(5,477) = 4.45$	.001	$F(5,477) = 10.23$	<.001	$F(5,477) = 30.15$	<.001
Race	$F(2,477) = 0.26$	.77	$F(2,477) = 0.99$	.37	$F(2,477) = 3.11$	.05
Age	$F(1,477) = 2.28$	.13	$F(1,477) = 3.50$	.06	$F(1,477) = 0.03$	.87
Years of Education	$F(1,477) = 0.90$	.36	$F(1,477) = 5.29$	.02	$F(1,477) = 0.84$	.36
ASI employment	$F(1,477) = 0.003$	.96	$F(1,477) = 0.004$	.95	$F(1,477) = 0.20$	.66
History of trading sex	$F(1,477) = 0.30$	.58	$F(1,477) = 2.36$	.13	$F(1,477) = 0.01$	.93
Treatment condition	$F(1,477) = 8.25$	.004	$F(1,477) = 37.40$	<.001	$F(1,477) = 4.47$	.04
Interaction: History of trading sex by Treatment condition	$F(1,477) = 0.17$	.68	$F(1,477) = 0.61$	.44	$F(1,477) = 2.36$	.13

Notes: ASI = Addiction Severity Index, LDA = longest duration of abstinence achieved during treatment. Lifetime history of trading sex for drugs or money was assessed at baseline.

Table 5

Logistic Regression Results Predicting Engagement in Sex Trade During or Following Substance Abuse Treatment

	Beta (*SE*)	Wald (df)	*p*-value	Odds ratio (95% CI)
History of sex trading	2.65 (0.45)	35.06 (1)	<.001	14.19 (5.90-34.13)
Study (ref. = Petry et al., 2004)		8.20 (5)	.15	
Petry et al. (2012) Positive	−0.46 (0.64)	0.52 (1)	.47	
Petry et al. (2012) Negative	0.58 (0.61)	0.91 (1)	.34	
Petry et al. (2011)	−0.23 (0.52)	0.20 (1)	.66	
Petry et al. (2006)	0.50 (0.60)	0.71 (1)	.40	
Petry et al. (2005)	−2.21 (1.12)	3.89 (1)	.05	0.11 (0.01-0.99)
Race (ref. = African American)		1.14 (2)	.57	
Caucasian	0.43 (0.40)	1.14 (1)	.29	
Other	0.25 (0.56)	0.19 (1)	.66	
Age	−0.02 (0.02)	0.67 (1)	.41	
Years education	−0.001 (0.09)	0.00 (1)	.99	
ASI employment score	0.92 (0.78)	1.37 (1)	.24	
CM condition (ref. = SC)	0.31 (0.35)	0.78 (1)	.38	
Treatment Outcomes				
Treatment retention	0.07 (0.05)	1.75 (1)	.19	
Longest duration of abstinence	−0.18 (0.06)	7.84 (1)	.005	0.84 (0.74-0.95)
Percent negative samples	0.01 (0.01)	2.69 (1)	.10	

Notes. ASI = Addiction Severity Index, CI = confidence interval, CM = contingency management, Ref. = Referent, SC = standard care.