

Impact of Substance-Use Disorder Treatment on Women Involved in Prostitution: Substance Use, Mental Health, and Prostitution One Year After Treatment*

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ABSTRACT. Objective: Prostitution is common among women with substance-use disorders (SUDs). However, little is known about the outcomes of SUD treatment for women involved in prostitution relative to their peers or the impact of SUD treatment on subsequent prostitution. **Method:** Participants were 1,287 women from a national study of SUD treatment sites. Women completed a baseline interview at entry to SUD treatment and a follow-up interview roughly 1 year after discharge. We compared the substance-related and mental health outcomes at follow-up of women involved in prostitution and women not involved in prostitution, and determined if prostitution declined significantly at follow-up. Among women reporting prostitution at baseline ($n = 533$), we examined whether receipt of specific ancillary services (medical, mental health, psychosocial) was associated with cessation of prostitution and whether

cessation of prostitution was associated with better substance-related and mental health outcomes. **Results:** Women reporting prostitution at baseline had more frequent drug and alcohol use, reduced abstinence rates, and more mental health symptoms at follow-up compared with their peers. However, the rate of prostitution declined from baseline to follow-up. Receipt of more mental health and psychosocial services during treatment was associated with the cessation of prostitution at follow-up, and cessation of prostitution was associated with lower substance use, higher rates of abstinence, and fewer mental health symptoms at follow-up. **Conclusions:** Comprehensive services may be needed to effect significant reductions in substance use and mental health symptoms among women engaged in prostitution. (*J. Stud. Alcohol Drugs* **70**: 32-40, 2009)

THE ASSOCIATIONS AMONG PROSTITUTION, the exchange of sex for money or drugs, and substance use and misuse have been well documented (Craddock, 1994; Nuttbrock et al., 2004). A recent meta-analysis suggests that the association between drug use and criminal activity, such as prostitution, has grown stronger from the 1980s to the present day (Bennett et al., 2008). Prostitution is associated with severe patterns of substance use (El-Bassel et al., 1997; Gilchrist et al., 2005; Gleghorn et al., 1998), with a high percentage of women involved in prostitution reporting previous substance-use disorder (SUD) treatment (Nuttbrock et al., 2004). Similarly, several studies over the past decade

suggest that women who have engaged in prostitution also exhibit a wide range of mental health problems—including depression, anxiety, and suicide attempts (Burnette et al., 2008a; Farley and Barkan, 1998; Gilchrist et al., 2005)—that may limit the efficacy of SUD treatment. Yet, we know of no studies that have evaluated the impact of SUD treatment on the substance use and mental health of women involved in prostitution. Likewise, little is known about the impact of SUD treatment on subsequent participation in prostitution or which types of ancillary services are most helpful in reducing future involvement in prostitution. The present study examined these issues among a large sample of female SUD patients.

The temporal relationship between prostitution and substance use is not well understood, but there is likely to be a reciprocal relationship in which each increases the probability of the other. Both recent and older studies suggest that women involved in prostitution report high rates of substance use and dependence (Nuttbrock et al., 2004); increased rates of crack, cocaine, and heroin use (El-Bassel et al., 1997); and frequent intravenous drug use and accidental drug overdoses (Gilchrist et al., 2005). In a descriptive study of 43 women involved in prostitution, Dalla (2000) reported that 37% became involved in prostitution to support drug use. Among women engaging in prostitution primarily to obtain food, shelter, or financial support, most also reported drug use: 53% reported recreational drug use before entry

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to prostitution, and 75% reported regular use following involvement in prostitution. Irrespective of the order of onset of these two domains of risky behavior, these data suggest that, for some women, prostitution may be relevant to understanding the continuation of substance use.

Prostitution has also been linked to a high incidence of co-occurring psychosocial and mental health problems, which may pose additional challenges in the context of SUD treatment. In an earlier study of the current sample, among women seeking treatment for SUD, lifetime involvement in prostitution was associated with childhood sexual abuse, anxiety symptoms in the past year, and lifetime suicide attempt (Burnette et al., 2008a). Several studies in the 1990s documented high rates of exposure to interpersonal violence, including rape and physical assault, and depression and post-traumatic stress disorder (PTSD) among women engaged in prostitution (El-Bassel et al., 1997; Farley and Barkan, 1998). More recent data suggest exposure to violence and mental health problems remain more common among women involved in prostitution today (Church et al., 2001; Dalla, 2002; Raj et al., 2006).

The potential impact of prostitution on outcomes following SUD treatment has not been evaluated. Increasingly, SUD treatment programs have become more attuned to the treatment needs of patients with co-occurring SUDs and psychiatric disorders, because research suggests that these patients may require additional services to benefit fully from SUD treatment (Drake et al., 2004; Najavits et al., 1997; Ouimette et al., 2003a). For example, relative to SUD patients with PTSD who do not receive mental health services, SUD-PTSD patients who receive both SUD and mental health services have better long-term substance-use outcomes (Ouimette et al., 2003b).

In addition to understanding the treatment challenges associated with prostitution, it is also important to examine whether SUD treatment represents a potential mechanism by which women involved in prostitution can leave prostitution. We found only one study related to this issue, which piloted a brief motivational intervention for substance-use and health-risk behaviors among 25 women involved in prostitution. The intervention was associated with significant reductions in the frequency of substance use and days of prostitution at 4 months follow-up (Yahne et al., 2002). Such findings suggest that addressing the SUD symptoms, as well as the comorbid risk behaviors of women involved in prostitution, may reduce involvement in prostitution. However, more information is needed regarding the specific types of services (health-related, psychosocial, mental health, SUD treatment) that help women cease prostitution. Finally, it is also important to examine whether the cessation of prostitution is associated with lower rates of substance-use and mental health symptoms.

The current study was designed to address limitations and gaps in previous research by examining a large sample

of female SUD patients at entry to SUD treatment and again approximately 1 year after discharge from treatment. We examined (1) whether involvement in prostitution at baseline was associated with substance-related and mental health outcomes 1 year after formal SUD treatment, as well as (2) whether formal SUD treatment was associated with a decline in prostitution at follow-up. Among those women engaged in prostitution at baseline, we also examined (3) which ancillary services were associated with cessation of prostitution at follow-up and (4) whether the cessation of prostitution was associated with better substance-use and mental health outcomes at follow-up.

Method

We conducted secondary data analyses of the National Treatment Improvement Evaluation Study (NTIES). NTIES was a multisite, longitudinal (1993-1995) evaluation of SUD treatment programs funded by the Center for Substance Abuse Treatment, an agency of the Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services (Gerstein et al., 1997). The present study was conducted with approval from the Stanford University Institutional Review Board.

Procedures

NTIES sampled participants from 71 SUD treatment facilities across the United States. Participants were assessed at entry to SUD treatment (baseline) and approximately 1 year after discharge from treatment (follow-up). Assessments consisted of structured computer-assisted interviews created specifically for NTIES and completed by research staff. For more information on sampling methods or procedures, see Gerstein and colleagues (1997).

Participants

The original NTIES sample included 1,840 women. We excluded individuals who were younger than age 18 years ($n = 66$), were incarcerated at baseline ($n = 165$) or at follow-up ($n = 52$), or refused to provide information on their prostitution status at baseline ($n = 5$). Of the remaining sample ($n = 1,552$), 83% completed the follow-up portion of the study ($n = 1,287$). NTIES patients are comparable to patients in other large SUD treatment studies on demographics, baseline substance use, and psychiatric comorbidity; but, NTIES includes a higher proportion of Hispanic and black participants (Gerstein et al., 1997; Simpson et al., 1997; Tiet et al., 2006).

Baseline measures

Participants reported on demographic characteristics—including age, gender, race/ethnicity, education level, and

employment status—on entry into SUD treatment. Information on the treatment modality women entered was also collected. Consistent with other uses of these data, modality was coded as outpatient or residential, with residential representing inpatient and residential SUD treatment programs (Ilgen et al., 2007). Participants were also asked if their reason for entering treatment was “pressure from the criminal justice system.”

To assess frequency of prostitution, women were asked, “Since (date 12 months ago), how many different times have you had sex for money or drugs?” Answers were coded as 0 = never, 1 = once, 2 = 2-5 times, 3 = 6-20 times, 4 = 21-100 times, and 5 = more than 100 times. This item was dichotomized so that women reporting at least one instance of sex in exchange for money or drugs in the past year were classified as engaging in prostitution at baseline.

Drug use at baseline was assessed by asking, “Since this past (date 30 days ago), how many days did you use (name of substance)?” Responses were coded as 0 = no days, 1 = 1 day, 2 = 2-5 days, 3 = 6-10 days, 4 = 11-20 days, or 5 = 21 or more days. Women were asked specifically about marijuana, crack, cocaine, heroin, and other narcotic use, because these were the most common substances used in the larger NTIES sample (Gerstein et al., 1997). An index of drug use was created by summing the frequency of use across these substances (range: 0-25). This summary measure of substance use is similar to other measures of substance-use frequency that have been used previously in this sample (Burnette et al., 2008b; Ilgen et al., 2007). Abstinence from drugs was defined as the absence of use in the 30 days before entering treatment.

Alcohol use was assessed by asking, “Since (date 30 days ago), how many days have you had at least one drink of any beer, malt liquor, wine, wine coolers, or hard liquor?” Scores for alcohol use ranged from 0 (none) to 5 (≥ 21 days). Abstinence from alcohol was defined as the absence of use in the past 30 days.

Mental health was assessed using four items. Women were asked whether, in the past year, they (1) had a “period of two weeks or longer when you felt either very sad or depressed,” (2) “felt very suddenly frightened or nervous... at times or in situations when most other people would not have been very afraid or nervous,” (3) “thought seriously about committing suicide,” or (4) had attempted suicide. Items were summed to create a mental health problems index (range: 0-4), with higher scores indicating more mental health symptoms.

Follow-up measures

Approximately 1 year after discharge from treatment, women were asked whether they had engaged in prostitution in the year since leaving treatment and, if so, how many times (using the same scale described previously). Cessation from prostitution was defined as reporting prostitution at

baseline but not at follow-up. Comparisons of self-report information with official arrest records suggest roughly 80% concordance for the reporting of illegal behaviors within the NTIES sample (Gerstein and Johnson, 2000).

The same methods described for baseline were used to assess drug use, abstinence from drugs, alcohol use, abstinence from alcohol, and mental health symptoms at follow-up. A comparison of self-report of substance use with urine tests among women in the NTIES sample suggests self-report data are reasonably valid. Self-report methods typically yielded higher estimates of use, whereas roughly 12% of women completing a urine test denied use but then tested positive (Gerstein and Johnson, 2000).

Ancillary services

On completion of the study, information on the duration of treatment (in months) and the amounts of services received was recorded from patient files. Specifically, staff coded the number of times (0 = 0, 1 = 1, 2 = 2-3, 3 = 4-10, 4 = ≥ 11) patients received 4 types of medical services (i.e., intake by a physician/nurse, other physician services, care by nurse or nurse practitioner, or AIDS education; range: 0-16), 7 types of mental health services (i.e., seen by psychiatrist/psychologist, individual counseling, group counseling, family counseling, self-help groups, interpersonal skills training, or postdischarge planning; range: 0-28), and 10 types of psychosocial services (i.e., employment counseling, job training, academic training, practical skills training, parenting skills, benefit assistance, legal services, transportation services, housing assistance, or room and board; range: 0-40).

Analyses

Analyses were conducted in SPSS Version 11.5 (SPSS, Inc., Chicago, IL), with an a priori α of .05. Chi square tests or *t* tests were used to compare those who were engaged in prostitution at baseline with those who were not on demographic characteristics, services received, substance use, and mental health at baseline and follow-up. To evaluate the impact of prostitution on drug use, alcohol use, and mental health symptoms at follow-up, hierarchical linear regression analyses were conducted in which each was predicted from corresponding baseline values (baseline drug use, alcohol use, or mental health symptoms [Block 1]), demographics (Block 2), treatment modality (Block 3), duration of treatment (Block 4), and baseline prostitution status (Block 5). To evaluate the impact of prostitution on abstinence rates at follow-up, an analogous set of hierarchical logistic regression analyses were run with abstinence from drugs or alcohol as dependent variables.

We used a paired samples *t* test to evaluate whether the percentage of change between the rate of prostitution at baseline and the rate of prostitution at follow-up was significantly

different from a test value of zero (no change). Similarly, to assess whether the frequency of prostitution declined significantly between the pretreatment and posttreatment periods, we created a difference score by subtracting frequency of prostitution at follow-up from that reported at baseline. We used paired samples *t* test to determine whether this difference score was also significantly different from zero.

Remaining analyses were conducted on the 533 women who reported prostitution at baseline. To determine which treatment factors were associated with cessation from prostitution, we conducted hierarchical logistic regression analyses in which cessation of prostitution was predicted from baseline characteristics (Block 1), treatment modality (Block 2), duration of treatment (Block 3), and the amount of services received (Block 4). Finally, to evaluate whether cessation of prostitution was associated with outcomes at follow-up, we conducted hierarchical regressions in which drug use, alcohol use, and mental health symptoms at follow-up were predicted from corresponding baseline values (Block 1), demographics (Block 2), treatment modality (Block 3), duration of treatment (Block 4), and the cessation of prostitution at follow-up (Block 5).

Results

Among women entering SUD treatment, those involved in prostitution at baseline differed significantly from those who were not involved in prostitution. Specifically, women reporting prostitution at baseline were younger (mean [SD] = 31.2 [5.6] years vs 33.3 [7.7] years; $t = -5.6$, 1,285 df, $p < .001$) and used substances more frequently (mean = 3.1 [3.2] vs 2.6 [3.2]; $t = 2.9$, 1,285 df, $p < .01$). They were also more likely to be black (82.2% vs 57.1%; $\chi^2 = 89$, $p < .001$) and less likely to have a high school diploma or equivalent

(47.2% vs 54.4%; $\chi^2 = 6$, $p = .01$) or to be employed (5.3% vs 13.8%, $\chi^2 = 24$, $p < .001$). Women reporting prostitution were more likely to enter a residential treatment program (67.2% vs 47.1%; $\chi^2 = 51$, $p < .001$). Finally, women reporting prostitution were less likely to report that they entered treatment because of pressure from the criminal justice system (2.2% vs 8.4%; $\chi^2 = 21$, $p < .001$). We adjusted for observed differences in subsequent analyses.

Does baseline involvement in prostitution predict substance-related and mental health outcomes at follow-up?

As shown in Table 1, baseline involvement in prostitution was predictive of more frequent drug use ($F = 24.19$, 9/1,275 df, $p < .001$; $R^2 = .15$), more frequent alcohol use ($F = 13.71$, 9/1,274 df, $p < .001$; $R^2 = .09$), and more mental health symptoms at follow-up ($F = 14.67$, 9/1,274 df, $p < .001$; $R^2 = .09$) after adjusting for baseline drug, alcohol, or mental health values; demographic characteristics; and treatment characteristics.

Table 2 shows results from hierarchical models predicting abstinence from drugs or alcohol at 1 year. After adjusting for covariates, prostitution at baseline was predictive of a lower likelihood of abstinence from drugs ($\chi^2 = 151.66$, 9 df, $p < .001$; Nagelkerke $R^2 = .16$) and alcohol ($\chi^2 = 106.13$, 9 df, $p < .001$; Nagelkerke $R^2 = .13$) at follow-up.

Does involvement in prostitution decline following SUD treatment?

Compared with 41.4% ($n = 533$) of women who reported prostitution at baseline, only 11.4% reported prostitution at follow-up ($n = 146$); this reduction of 30% represented a

TABLE 1. Linear regressions predicting frequency of drug use, alcohol use, and mental health symptoms in women ($n = 1,287$) 1 year after discharge from substance-use disorder treatment

Variable	Frequency of drug use <i>b</i> (SE)	Frequency of alcohol use <i>b</i> (SE)	Mental health symptoms <i>b</i> (SE)
Block 1			
Corresponding baseline value	0.28 (0.02) [‡]	0.22 (0.02) [‡]	0.32 (0.03) [‡]
Block 2			
Age	-0.01 (0.10)	<0.01 (<0.01)	<0.01 (<0.01)
Black (no = 0; yes = 1)	-0.02 (0.15)	0.10 (0.05) [*]	-0.14 (0.05) [†]
HS diploma (no = 0; yes = 1)	0.36 (0.14) [*]	0.09 (0.05)	0.13 (0.05) [†]
Employed (no = 0; yes = 1)	-0.03 (0.23)	-0.08 (0.08)	-0.03 (0.08)
Legal pressure (no = 0; yes = 1)	0.38 (0.30)	-0.12 (0.10)	0.30 (0.10) [†]
Block 3			
Treatment modality (outpatient = 0; residential = 1)	-0.51 (0.14) [‡]	-0.03 (0.05)	0.02 (0.05)
Block 4			
Duration of treatment	-0.02 (<0.01)	-0.01 (<0.01) [†]	-0.01 (<0.01) [*]
Block 5			
Baseline prostitution (no = 0; yes = 1)	0.48 (0.15) [†]	0.11 (0.05) [*]	0.10 (0.05) [*]

Note: HS = high school.

* $p < .05$; [†] $p < .01$; [‡] $p < .001$.

TABLE 2. Logistical regressions predicting abstinence from drugs and alcohol in women ($n = 1,287$) 1 year after discharge from substance-use disorder treatment

Variable	Abstinence from drugs		Abstinence from alcohol	
	Adj. OR (95% CI)	<i>b</i>	Adj. OR (95% CI)	<i>b</i>
Block 1				
Corresponding baseline value	3.82 (2.90-5.03)	1.34 [‡]	3.81 (2.83-5.14)	1.34 [‡]
Block 2				
Age	1.00 (0.99-1.02)	<0.01	1.00 (0.98-1.02)	<0.01
Black (no = 0; yes = 1)	0.97 (0.74-1.28)	-0.03	0.65 (0.46-0.92)	-0.43*
HS diploma (no = 0; yes = 1)	1.22 (0.94-1.56)	0.19	1.39 (1.02-1.89)	0.33*
Employed (no = 0; yes = 1)	0.78 (0.51-1.18)	-0.26	0.88 (0.53-1.44)	-0.13
Legal pressure (no = 0; yes = 1)	1.69 (0.88-3.25)	0.52	0.51 (0.28-0.91)	-0.68*
Block 3				
Treatment modality (outpatient = 0; residential = 1)	1.89 (1.44-2.47)	0.64 [‡]	1.18 (0.86-1.62)	0.17
Block 4				
Duration of treatment	1.04 (1.01-1.07)	0.04 [†]	1.06 (1.02-1.10)	0.06 [†]
Block 5				
Prostitution (no = 0; yes = 1)	0.63 (0.48-0.83)	-0.46 [†]	0.69 (0.49-0.95)	-0.38*

Notes: Adj. OR = adjusted odds ratio; CI = confidence interval; HS = high school.
* $p < .05$; [†] $p < .01$; [‡] $p < .001$.

significant change ($t = 21.2$, 1,285 df, $p < .001$). The mean change in the frequency of prostitution (mean = 0.98 [1.72]) was also significant ($t = 20.4$, 1,285 df, $p < .001$; $n = 533$), in that women engaged in fewer incidents of prostitution at follow-up relative to baseline.

Which services predict cessation from prostitution?

Of the 533 women engaged in prostitution at baseline, 419 (78.6%) had ceased prostitution at follow-up. Table 3 shows the predictors of cessation from prostitution; women who had a longer duration of treatment and who received more mental health and psychosocial services were more

likely to have ceased prostitution at follow-up ($\chi^2 = 25.55$, 10 df, $p < .01$; Nagelkerke $R^2 = .07$).

Does cessation of prostitution predict better outcomes at follow-up?

Tables 4 and 5 demonstrate the relationship between cessation of prostitution at follow-up and substance-related and mental health outcomes. After adjusting for covariates, cessation of prostitution was predictive of less frequent drug use ($F = 14.21$, 9/522 df, $p < .001$; $R^2 = .20$) and alcohol use ($F = 8.31$, 9/521 df, $p < .001$; $R^2 = .13$), as well as fewer mental health symptoms at follow-up ($F = 14.92$, 9/522 df, $p < .001$;

TABLE 3. Logistical regressions predicting cessation of prostitution by women previously engaged in prostitution ($n = 533$) 1 year after discharge from substance-use disorder treatment

Variable	Cessation from prostitution	
	Adj. OR (95% CI)	<i>b</i>
Block 1		
Age	1.02 (0.98-1.06)	0.02
Black (no = 0; yes = 1)	1.60 (0.96-2.69)	0.47
HS diploma (no = 0; yes = 1)	0.97 (0.63-1.49)	-0.03
Employed (no = 0; yes = 1)	0.73 (0.30-1.79)	-0.32
Legal pressure (no = 0; yes = 1)	0.86 (0.23-3.28)	-0.15
Block 2		
Treatment modality (outpatient = 0; residential = 1)	0.80 (0.50-1.27)	-0.23
Block 3		
Duration of treatment	1.05 (1.01-1.11)	0.05*
Block 4		
Medical services	0.99 (0.91-1.07)	-0.01
Block 5		
Mental health services	1.08 (1.03-1.13)	0.08 [†]
Block 6		
Psychosocial services	1.08 (1.00-1.18)	0.08*

Notes: Adj. OR = adjusted odds ratio; CI = confidence interval; HS = high school.
* $p < .05$; [†] $p < .01$.

TABLE 4. Linear regressions predicting frequency of drug use, and alcohol use and mental health symptoms in women previously engaged in prostitution ($n = 533$) 1 year after discharge from substance-use disorder treatment

Variable	Frequency of drug use <i>b</i> (SE)	Frequency of alcohol use <i>b</i> (SE)	Mental health symptoms <i>b</i> (SE)
Block 1			
Corresponding baseline value	0.22 (0.04) [‡]	0.21 (0.04) [‡]	0.34 (0.05) [‡]
Block 2			
Age	0.01 (0.02)	0.01 (0.01)	<0.01 (0.01)
Black (no = 0; 1 = yes)	-0.62 (0.33)	0.12 (0.10)	-0.26 (0.10) [†]
HS diploma (no = 0; 1 = yes)	0.43 (0.25)	0.15 (0.08)*	0.13 (0.08)
Employed (no = 0; 1 = yes)	-0.33 (0.56)	0.02 (0.17)	-0.04 (0.17)
Legal pressure (no = 0; 1 = yes)	0.80 (0.83)	-0.30 (0.25)	0.44 (0.25)
Block 3			
Treatment modality (outpatient = 0; residential = 1)	-0.02 (0.27)	0.03 (0.08)	0.05 (0.08)
Block 4			
Duration of treatment	-0.01 (0.02)	-0.01 (0.01)	<-0.01 (<0.01)
Block 5			
Cessation of prostitution at follow-up (no = 0; 1 = yes)	-2.52 (0.28) [‡]	-0.47 (0.09) [‡]	-0.72 (0.09) [‡]

Note: HS = high school.
* $p < .05$; [†] $p < .01$; [‡] $p < .001$.

$R^2 = .21$). Cessation of prostitution was also associated with increased likelihood of abstinence from drugs ($\chi^2 = 77.52$, 9 df, $p < .001$; Nagelkerke $R^2 = .19$) and alcohol ($\chi^2 = 73.55$, 9 df, $p < .001$; Nagelkerke $R^2 = .20$) at follow-up.

Discussion

We examined the impact of prior involvement in prostitution on subsequent substance use, mental health, and prostitution among a large sample of women discharged from SUD treatment. Our findings indicate that, even after adjusting for baseline functioning, women engaged in prostitution continued to experience higher rates of substance use and mental health problems following SUD treatment compared

with women not engaged in prostitution before treatment. Notably, involvement in prostitution declined following SUD treatment (from 40% at baseline to approximately 11% at follow-up). Examination of women engaged in prostitution at baseline suggested that the provision of additional mental health services (e.g., having seen a psychologist, individual counseling) and psychosocial services (e.g., employment counseling, housing assistance) was associated with cessation of prostitution, an outcome that was, in turn, associated with better substance-related and mental health outcomes. This latter set of findings highlights the importance of providing comprehensive SUD treatment for women involved in prostitution and indicates that treatment should address not only substance use but also the complex mental health and

TABLE 5. Logistical regressions predicting abstinence from drugs and alcohol in women previously engaged in prostitution ($n = 533$) 1 year after discharge from substance-use disorder treatment

Variable	Abstinence from drugs		Abstinence from alcohol	
	Adj. OR (95% CI)	<i>b</i>	Adj. OR (95% CI)	<i>b</i>
Block 1				
Corresponding baseline value	3.20 (2.11-4.84)	1.16 [‡]	3.67 (2.38-5.66)	1.30 [‡]
Block 2				
Age	1.00 (0.97-1.04)	<0.01	0.98 (0.94-1.02)	-0.02
Black (no = 0; 1 = yes)	1.07 (0.66-1.72)	0.07	0.61 (0.32-1.15)	-0.50
HS diploma (no = 0; 1 = yes)	1.19 (0.82-1.74)	0.18	1.80 (1.14-2.86)	0.59*
Employed (no = 0; 1 = yes)	0.85 (0.38-1.90)	-0.17	0.80 (0.30-2.14)	-0.22
Legal pressure (no = 0; 1 = yes)	1.62 (0.42-6.30)	0.48	0.40 (0.11-1.46)	-0.92
Block 3				
Treatment modality (outpatient = 0; residential = 1)	1.20 (0.79-1.83)	0.18	1.12 (0.69-1.81)	0.11
Block 4				
Duration of treatment	1.03 (0.99-1.07)	0.03	1.04 (0.98-1.10)	0.04
Block 5				
Cessation of prostitution at follow-up (no = 0; 1 = yes)	4.18 (2.65-6.58)	1.43 [‡]	3.74 (2.26-6.21)	1.32 [‡]

Notes: Adj. OR = adjusted odds ratio; CI = confidence interval; HS = high school.
* $p < .05$; [†] $p < .001$.

psychosocial needs that may influence future involvement in prostitution.

The finding that women engaged in prostitution at baseline exhibit poorer substance-related and mental health outcomes following treatment suggests the presence of unique risk factors associated with prostitution that may affect women's abilities to benefit from SUD treatment. Indeed, studies suggest that women involved in prostitution are exposed to substances on a daily basis (Erickson et al., 2000; Nixon et al., 2002) and experience pressure to use substances by clients or pimps (Dalla, 2000; El-Bassel et al., 2001). The combination of high availability of and environmental pressures to use substances is likely to hinder women's recovery efforts and increase the risk for relapse following SUD treatment. Similarly, a wealth of research demonstrates linkages among prostitution, exposure to interpersonal violence, and high rates of trauma-related disorders among women with lifetime involvement in prostitution (El-Bassel et al., 2001; Farley and Barkan, 1998; Nixon et al., 2002). The intersection of trauma, substance use, and mental health is a topic of great concern among SUD treatment providers (Najavits et al., 1998; Ouimette et al., 2003a), with empirical data suggesting that comprehensive treatment (that addresses SUD and trauma) is best for individuals with this complex risk profile (Cocozza et al., 2005; Morrissey et al., 2005). This literature may have particular relevance in understanding the mental health needs of women with past or current involvement in prostitution who seek SUD treatment.

This study also suggests that, for some women, addressing substance use may reduce future involvement in prostitution. Although not all women engaging in prostitution do so out of need to support an SUD, research suggests a large number of women might. Most women arrested for prostitution test positive for substance use at the time of the arrest (Craddock, 1994), and DeBeck and colleagues (2007) found that 62% of women who injected drugs and engaged in prostitution stated they would give up prostitution if they no longer needed money to buy drugs. Perhaps SUD treatment represents an avenue by which to reduce the legal and public health burdens associated with prostitution.

Nevertheless, providing standard SUD treatment to women involved in prostitution may be insufficient. Nuttbrock et al. (2004) found that 66% of women currently involved in prostitution had been in some form of SUD treatment previously (e.g., 12-step treatment or self-help groups, 21- or 28-day residential programs, or outpatient counseling); such figures suggest that, for some of these women, SUD treatment has been insufficient to curb prostitution and substance use. To be effective, SUD treatment may need to be partnered with more comprehensive efforts that address the specific needs of women engaged in prostitution. Brief motivational interventions targeted at reducing prostitution or promoting readiness for SUD treatment may assist in this regard (Yahne et al., 2002). Additionally, a lack of financial

resources or occupational opportunities may also make it difficult for women to leave prostitution (DeBeck et al., 2007). Our findings suggest that psychosocial interventions, including vocational counseling and case management services (e.g., help to procure affordable housing), may be useful. Finally, the application of integrated treatments designed to address substance use and trauma-related psychopathology has been shown to benefit patients with co-occurring disorders (Drake et al., 2001) and may be particularly relevant, given the high rates of trauma and psychopathology reported among women involved in prostitution (El-Bassel et al., 1997; Farley and Barkan, 1998). Arnold et al. (2000) have even suggested that some women involved in prostitution would prefer substance-use treatment programs that are specific to prostitution. In support of this recommendation, the authors cite qualitative data in which women describe fears of being judged and feeling misunderstood by peers who have not been involved in prostitution. Overall, our findings support the use of supplemental psychosocial and mental health services in the context of SUD treatment to assist women in ceasing prostitution and maintaining sobriety following completion of SUD treatment. Future studies will need to be conducted to determine whether specialty treatment is needed or whether specific types of ancillary services result in more favorable outcomes than others (e.g., individual counseling versus employment counseling).

Current data were limited to a population of women who were seeking SUD treatment. However, there are data to suggest that many women involved in prostitution experience unique barriers to obtaining treatment, including lack of safe housing, fear of losing their children, and fear of being judged by peers and health professionals. These barriers may extend beyond substance-use treatment to treatment for medical and mental health issues (Arnold et al., 2000; Yahne et al., 2002). Street-based interventions (Nuttbrock et al., 2004) and motivational outreach programs (Yahne et al., 2002) have demonstrated some effectiveness in addressing these issues, but more work is necessary to increase the availability of and access to services for women involved in prostitution.

Several limitations of the current study should be noted. Importantly, the percentage of explained variance was modest, suggesting many unexplored risk factors that may be important in understanding SUD treatment outcomes. Despite attempts to adjust statistically for demographic and psychosocial differences between women engaged or not engaged in prostitution, it is unlikely that we were able to account for the extent of differences between these two groups or their impact on outcomes. Therefore, it remains unclear whether other risk factors not assessed in the current study (e.g., coming from a disadvantaged neighborhood, low social support) may better explain or compliment our findings. Although we accounted for important aspects of treatment—including length of treatment, treatment modality,

and whether participants sought treatment because of legal pressures—greater detail on various aspects of the treatment process, such as a woman's readiness for change and the type of treatment approach (e.g., motivational interviewing, cognitive-behavioral, psychosocial rehabilitation model), would be helpful in future studies.

Overall, the measures included in the present study are limited in the scope and depth of information they provide. For example, we do not have information available on how long women have been involved in prostitution, in what contexts, and for what reasons. Differences have been observed between women engaged in prostitution outdoors versus indoors, with the former group reporting an earlier age of involvement in prostitution, more violence by clients—and more illegal drug use than the latter (Church et al., 2001). Future studies should investigate whether these and other factors—such as whether women engaged in prostitution for drugs versus money or how long a woman has been involved in prostitution—moderate treatment efficacy. This line of research would help illuminate the extent to which prostitution (or specific types of prostitution) is a causal risk factor for negative outcomes or acts as a proxy for a host of other risk factors. Notably, given the current lack of available data on prostitution in SUD patients, we used data from NTIES, collected from 1993 to 1995. Additional studies of women in SUD treatment are necessary to understand how changes in legal and societal attitudes toward prostitution influence access to treatment and the type and amount of care SUD patients receive. An emerging concern with dual-diagnosis patients may translate into greater availability of and access to substance-use and mental health services for women involved in prostitution. Finally, these data are all self-report and observational; the use of experimental methods (e.g., randomized trials), as well as other sources of information (e.g., official records, collateral reports), could contribute significantly in this area.

Overall, our findings suggest that, among women entering SUD treatment, prostitution represents an important risk factor for understanding their continued substance use. Future research is needed to understand the long-term impact of prostitution on substance use and delineate methods to prevent and reduce involvement in prostitution. Encouragingly, comprehensive SUD treatment—which includes psychosocial services (e.g., occupational rehabilitation, education, housing assistance) and mental health services (e.g., individual and group counseling)—may represent a potential mechanism by which women can cease prostitution, an outcome that was associated with lower rates of substance use and mental health symptoms in the current study. Therefore, integrated treatment approaches aimed at addressing not only substance use, but also the multiple comorbid risk factors influencing continued involvement in prostitution, hold great promise with regard to improving the lives of women involved in prostitution.

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