

Research Report

Methamphetamine use among incarcerated women

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Problem Women face greater vulnerability to using stimulant drugs, their rate of incarceration for methamphetamine use is increasing, and women's issues have been historically neglected in substance abuse research. This study examined demographic, social and psychological characteristics of incarcerated methamphetamine-using women that could influence service needs and utilization during incarceration.

Method Incarcerated women completed individual interviews and questionnaires regarding drug use and other psychosocial variables. Psychosocial factors were examined according to lifetime drug use history. Comparison groups were: (1) nonstimulant drug users ($n=16$); (2) noninjection methamphetamine users ($n=24$); and (3) injection methamphetamine users ($n=31$). Psychosocial factors were also examined according to recent methamphetamine use. Recent use comparison groups were: (1) no recent drug use ($n=18$); (2) nonstimulant drug use ($n=17$); (3) noninjected methamphetamine ($n=22$); and (4) injected methamphetamine ($n=20$).

Findings Nearly one-third of these incarcerated drug-using women had never before received substance abuse treatment. Drug abuse, sexual assault and concomitant psychiatric symptoms were high across the entire sample, but greatest for methamphetamine users.

Conclusion Results revealed the complex psychosocial needs and risks that confront incarcerated methamphetamine-using women and pose serious threats to eventual drug recovery.

Keywords: drug abuse; women; injection drug abuse

INTRODUCTION

Methamphetamine use surged during the 1990s (Anglin *et al.* 2000), prompting a need to understand treatment needs of methamphetamine users. Methamphetamine use by women is a particular concern as women are especially vulnerable to stimulant abuse. In some geographic areas, the incidence of methamphetamine use is greater among women than men (National Institute on Drug Abuse 1997). Women turn to methamphetamine for help coping with life stress (Boyd *et al.* 1998) and for its anorexic and dietetic effects (Joe 1995, Anderson and Flynn 1997). Fear of weight gain, in turn, presents a barrier to discontinued use (Anderson and Flynn 1997). Methamphetamine use has contributed to increased rates of incarceration of women (Henderson 1998, Lockwood *et al.* 1998). For many drug-dependent incarcerated women, prison may be the first setting where they receive substance abuse services. Several reviewers have highlighted physiological, psychological, social and cultural factors that substantially differentiate drug abuse by women from men (Nelson-Zlupko *et al.* 1995, Blume 1998), yet we still understand

less about women's drug use than men's (Zweben 1996, Blume 1998). Given women's vulnerability for stimulant use, their increasing rate of incarceration for methamphetamine use, and the relative neglect of women's issues in substance abuse research, it is imperative to address the void in knowledge about incarcerated women who use methamphetamine.

Stimulant-abusing women are less likely to enter and remain in treatment and more likely to encounter social and contextual barriers to treatment than their male counterparts (Blume 1998). Compared with men, women who enter treatment for substance abuse are younger, more often in a committed relationship and underemployed (Wechsberg *et al.* 1998). Drug-abusing women are more likely than men to use cocaine daily, to have been physically and sexually abused, and to have parenting responsibilities (Nelson-Zlupko *et al.* 1995, Zweben 1996, Wechsberg *et al.* 1998). Among cocaine users, women are less likely than men to have ever received treatment for substance abuse (Powis *et al.* 1996). Given the likelihood that prison might be a drug-dependent woman's first exposure to substance abuse treatment, and the salient

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differences between drug-abusing men and women, it is essential to attend to the issues and concerns that a drug-dependent female inmate faces. Particular concerns relevant to women include history of sexual aggression, comorbid psychiatric problems, and health and legal consequences of use.

Sexual aggression is common among women in treatment for substance abuse (Nelson-Zlupko *et al.* 1996, Zweben 1995). Drug-addicted women are more likely than drug-addicted men to have experienced physical and/or sexual abuse (Grice *et al.* 1995, Blume 1998), and stimulant users face a greater likelihood of sexual violence than nonstimulant drug users (Grice *et al.* 1995). Both sexual aggression and drug abuse can increase risk for psychological problems. Psychiatric disorders and symptoms that co-occur with substance abuse negatively impact substance abuse treatment (Rosenthal and Westreich 1999). Affective disorders are more typical among addicted women than men, whereas addicted men exhibit psychopathy more often than addicted women (Nelson-Zlupko *et al.* 1995). Addicted women frequently experience depression, powerlessness and low self-esteem (Zweben 1996), and methamphetamine-dependent arrestees are more likely to experience depressive symptoms and suicidal ideation than those denying methamphetamine dependence (Kalechstein *et al.* 2000). Estimates of antisocial personality disorder (ASPD) among cocaine-dependent women ranged from 11% to 61%, depending on whether antisocial behaviours consequent to drug use were considered when making diagnoses (Rutherford *et al.* 1999). Finally, rates of posttraumatic stress disorder (PTSD) are higher among drug-abusing individuals than among the general population. One in three men and women who sought substance abuse treatment met criteria for PTSD (Grice *et al.* 1995).

Women who use drugs face a number of serious health risks, especially reproductive and gynaecological complications, chronic infections, circulatory problems, HIV and other sexually transmitted infections, and hepatitis C (Zweben, 1996, Nelson-Zlupko *et al.* 1995, Blume 1998, Wechsberg and Cavanaugh 1998). Additionally, health complications may develop more rapidly for drug-abusing women than for drug-abusing men (Blume 1998).

Incarcerated women are disproportionately ethnic minority and are typically low-income, undereducated, unskilled and single, young parents (Owen and Bloom 1995). These typically devalued characteristics mirror the specific treatment barriers and needs that drug-addicted women face (Nelson-Zlupko *et al.* 1995, Blume 1998). Women who are incarcerated for drug-related offenses are not typically dangerous and generally pose a less serious threat to the community than male prisoners (Owen and Bloom 1995). Unlike with men, addiction typically pre-dates criminal behaviour among women (Anglin and Hser 1987). Cocaine-addicted women do not typically engage in criminal behaviour to support themselves (Powis *et al.*

1996). Consequently, estimates of ASPD are considerably lower when drug-involved antisocial behaviours are not considered for making diagnoses (Fullilove *et al.* 1993, Zweben 1996, Rutherford *et al.* 1999). The implication of these findings is that criminal behaviour and legal problems among drug-using women are more probably consequences of drug use than predisposing factors.

Methamphetamine-using women are increasingly going to prison, and prison might present their first exposure to substance abuse treatment. Unfortunately, we know very little about treatment needs of incarcerated methamphetamine-using women. The purpose of this study was to identify demographic, social and psychological characteristics of incarcerated methamphetamine-using women that might inform service needs and approaches during incarceration. The primary question was whether methamphetamine users differed from nonstimulant drug users on psychosocial variables, including childrearing, sexual assault history, psychiatric and other health concerns, and motivation to change drug use. A second question addressed the extent of previous addictions treatment among these women. A third research question addressed whether methamphetamine-injecting women differed from women who did not inject. Specifically, women who injected methamphetamine were hypothesized to experience more extensive and severe difficulties than noninjecting women.

METHOD

Sampling

Participants were drawn from a sample of women incarcerated in a state prison who agreed to participate in a larger study of health-risk behaviour. Of the 109 women who participated in the health risk study, 103 reported either regular drug use or met criteria for one or more drug-dependence diagnoses. Of these 103 women, 77 completed all three interviews and questionnaires.

Of the 26 women who did not complete the study, six (5.8%) were transferred to another prison prior to completion, 18 (17.5%) declined further participation after completing the interview, and two completed the diagnostic interview and questionnaires but did not complete the background interview. Of those who withdrew from the study, two indicated that the study was too distressing, and one stated that participation required too much work. The remaining 15 did not specify a reason for discontinuing; however, the time-intensive education and treatment programming of the unit these women were assigned to might have contributed to their withdrawal. Women who dropped out of the study and those who completed did not differ in age, drug dependencies, other psychiatric diagnoses or psychiatric symptoms.

Participants

The 77 participants ranged in age from 18 to 49 years (mean = 31.23, SD = 8.57). They were primarily Caucasian (80.8%), with 9.6% Hispanic, 5.5% Latina, 1.4% Asian and 2.7% Native American. Fewer than half completed high school (37%), but half of those who did not finish high school had earned a General Equivalency Diploma (GED) (31.5% of total sample). Women were married (24.7%), living with a long-term partner (9.6%), divorced or separated (34.2%), or had never been married (30.1%). One woman was widowed. Nearly all of these women had one or more children (84.9%), and the average number of children among those with children was 2.47 (SD = 1.14). Fixed sentence ranged from 0 to 10 years (mean = 2.33, SD = 1.93). Crimes were primarily drug related (83.6%). Specific charges included possession/delivery (49.3%), theft/forgery (17.8%), probation/parole violation (19.2%) and other (13.7%). These women had been jailed an average of 5.14 times (SD = 6.84, range 0–50), and the modal number of previous prison incarcerations was zero (mean = 0.21, SD = 0.55, range 0–3). Trained graduate research assistants collected all interview and questionnaire data. None of the research assistants worked for or was otherwise affiliated with the prison. Research assistants were deliberately selected for the research and interview skill and lack of affiliation with the prison in order to assure the integrity of data collection and to maintain the independence of these data from prison staff and inmate records. The latter was useful in assuring participants of the confidentiality of their responses.

Two-thirds of these women (71.2%) met Diagnostic and Statistical Manual (DSM-IV; American Psychiatric Association 1994) criteria for lifetime methamphetamine dependence diagnosis based on their responses to the structured diagnostic interview (see Measures). Over half of those with a lifetime dependence diagnosis (53.8%) injected methamphetamine at some point in their lives.

Procedure

This research was conducted with the approval of the prison's warden and the human subjects committee at Idaho State University. Upon entering the prison, women spent 2 weeks in the Receiving and Diagnostics Unit (RDU). Participants were recruited into the study while in RDU. Those who consented to participate completed two diagnostic interviews (CDDR and Clinical Interview) prior to transferring out of RDU. After 2 weeks, women transferred from RDU to another unit to serve the remainder of their sentence. A background interview and questionnaire data were collected following transfer from RDU. Women were not paid or otherwise compensated for their time.

Based on interview responses, women were assigned to

one of three groups reflecting lifetime methamphetamine dependence and history of injection use. Most women reported regular use of methamphetamine during their lifetime or met criteria for methamphetamine dependence (72.0%). Thirty-one women were dependent on methamphetamine and had injected the drug, another 24 were dependent but had never injected, and 22 did not meet criteria for methamphetamine dependence. Four of the 22 nonmethamphetamine users did meet criteria for dependence on cocaine or amphetamine. Two others did not meet criteria for methamphetamine dependence, yet reported regular use during the 6 months prior to incarceration. These six women were excluded from lifetime drug-use analyses to maintain the nonstimulant nature of that group. Thus, 71 women constituted the final sample for the lifetime methamphetamine comparison of this study.

To examine recent drug use, all 77 women were grouped according to their use during the 6 months prior to incarceration. Eighteen women (23.4%) denied drug use within 6 months of incarceration, 17 (22.1%) reported only nonstimulant drug use, 22 (28.6%) used methamphetamine without injecting, and 20 (26.0%) injected methamphetamine. These groups were used to examine differences on account of recent methamphetamine use.

Measures

Customary Drinking and Drug Use Record (CDDR)

The CDDR (Brown *et al.* 1998) is a structured interview that provides current and lifetime indices of drug use (e.g. ages of onset, frequency of use) and dependence diagnoses for alcohol and other drugs. Domains assessed by the CDDR include level of involvement, physical tolerance, withdrawal characteristics and psychological dependence symptoms. The CDDR has been found to have sound psychometric characteristics, including internal consistency, convergent validity, and diagnostic specificity (Brown *et al.* 1998). Questions were added to the CDDR in order to assess recent alcohol and other drug use during periods of time immediately prior to incarceration (i.e. 1, 3 and 6 months).

Diagnostic interview

A structured diagnostic interview was developed for this study and modelled after the Diagnostic Interview Schedule (DIS; Robins *et al.* 1981). Three modifications were made to accommodate institutional time constraints. First, diagnoses were limited to major Axis I conditions (major depression, dysthymia, bipolar affective disorder, generalized anxiety, panic disorder, PTSD) and ASPD. Second, only lifetime diagnoses were assessed; current diagnoses were not assessed separately. Third, a gating strategy was used in which participants were asked a series

of screening questions that targeted potential DSM-IV (American Psychiatric Association 1994) diagnoses. After identifying potential diagnostic conditions (i.e. presence of primary diagnostic symptom in the absence of substance use), participants were asked specific and detailed questions about symptoms, ages of onset and symptom duration. Endorsed symptoms were probed further for occurrence during protracted abstinence (3 or more months) from alcohol or other drug use. Diagnoses were given only when an episode had occurred during protracted abstinence from drug use. This conservative strategy was used to limit diagnosis to independent primary disorders and to exclude disorders secondary to or caused by substance use (Schuckit 1994). A licensed clinical psychologist made all diagnoses.

Background interview

A background interview was designed for this study to collect demographic data and assess sexual assault history, incarceration factors, and health concerns. Sexual assault questions based on common definitions of sexual assault drawn from the literature (e.g. Koss *et al.* 1987) were included in this interview (Culbertson *et al.* 2001). Some questions reflected nonspecific global labels ('Have you ever been sexually assaulted?', 'Have you ever been raped?'). Other questions probed specific behaviours ('Have you ever been forced into having sex when you did not want to?', 'Have you ever been forced to perform sexual acts against your will?', 'Has someone ever pressured you to have sexual relations?').

This interview also assessed for a history of specific health problems. Women were asked if they had high blood pressure, thyroid problems, diabetes, heart problems, cancer, kidney or bladder problems, mononucleosis, liver problems (e.g. hepatitis), blood clots, measles, mumps, rubella, asthma, migraines or persistent headaches, chlamydia, venereal warts (HPV), genital or oral herpes, syphilis, gonorrhoea (clap), a sore on the genitals, pain or problems with sex, head-injury history and seizures. A total score was computed by counting the number of health problems. Additionally, women were classified according to specific health problems (cardiac, sexually transmitted diseases and head injury).

Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES)

The SOCRATES (Miller and Tonigan 1996) was adapted from the University of Rhode Island Change Assessment (URICA; Prochaska and DiClemente 1992) to assess an individual's readiness to reduce problem drinking. Participants responded to each item using a five-point Likert-type scale (5 = strongly agree; 4 = agree; 3 = unsure; 2 = disagree; 1 = strongly disagree). Factor analysis of the SOCRATES (Miller and Tonigan 1996) revealed

three factors among problem drinkers: 'ambivalence', 'recognition' and 'taking steps'. Subsequent studies have replicated this three-factor structure among college students (Vik *et al.* 2000a) and psychiatric patients (Carey *et al.* 2001). Although it was developed to assess readiness to change problem drinking, the SOCRATES has potential to describe readiness to reduce other drug use. Preliminary data from incarcerated women revealed a similar factor structure for the SOCRATES when questions were revised to enquire about readiness to reduce use of a person's drug of choice (Sellers and Vik 1999). Therefore, the SOCRATES was modified for the present study to inquire about each participant's most recent drug of choice. Factor analysis using the current data verified that the three-factor structure applied despite adaptation of the instrument to reflect drug of choice. A Principal Components Analysis with varimax rotation was used, and a three-factor solution was specified. The three factors extracted in the current study accounted for 62.2% of the variance and were nearly identical to the factors reported by Miller and Tonigan (1996). Coefficient alphas from the current data for the 'ambivalence', 'recognition' and 'taking steps' factors, respectively, were 0.77, 0.89 and 0.78.

Brief Symptom Inventory (BSI)

The BSI (Derogatis 1993) is a 53-item self-report measure designed to assess current psychological symptom patterns. Reliability of the BSI is good. Estimates of internal consistency ranged from 0.71 to 0.85, depending on the subscale, and test-retest reliability coefficients for the global indices ranged from 0.8 to 0.9 (Derogatis 1993). The BSI has been found to have good predictive validity with regard to screening for psychiatric illnesses, and convergent validity of the BSI has been demonstrated with the Minnesota Multiphasic Personality Inventory (MMPI) (Derogatis 1993). For the present study, a total score from the BSI was used.

RESULTS

Lifetime drug use

Lifetime drug-use groups were nonstimulant users ($n=16$), noninjecting methamphetamine-dependent ($n=24$) and injecting methamphetamine-dependent ($n=31$).

Recent methamphetamine use

Lifetime drug-use groups were compared on recent drug use and number of drug dependencies. A chi-square analysis was conducted crossing lifetime drug use with class of drugs used during the 6 months prior to incarceration. Lifetime drug-use groups differed in their drug use during

the 6 months prior to incarceration ($\chi^2=66.03$, $df=6$, $n=71$, $p<0.001$). Prior to incarceration, drug use reflected lifetime use groups; however, drug use during the 6 months prior to incarceration was denied by 50% of the nonstimulant users but only 12.5% of noninjecting methamphetamine users and 19.4% of the injecting methamphetamine users. Groups also differed in the number of drugs they were dependent on ($F=10.18$, $df=2$, 68 , $p<0.001$, $\chi^2=0.230$). Post-hoc analyses revealed that nonstimulant users were dependent on fewer drugs, on average, than both methamphetamine groups.

Prior drug treatment

Nearly one-third (31.0%) of this sample of drug-using women had never received substance abuse treatment prior to this incarceration (see Table 1). Likelihood of prior treatment varied according to lifetime drug use ($\chi^2=11.70$, $df=4$, $n=71$, $p=0.020$). Almost half (43.8%) of the nonstimulant users had prior treatment, compared with one quarter (27.3%) of methamphetamine users. Among methamphetamine users, injectors were more likely to have had multiple prior treatments (45.2%) than noninjectors (16.7%).

Demographics and contextual factors

Table 1 presents age, marital status, ethnicity, education and childrearing data for the three lifetime drug-use groups (nonstimulant drug users, noninjection methamphetamine

users, iv-methamphetamine users). Groups were not different according to age, marital status, education, ethnicity or child rearing responsibility. Nearly all women (84.5%) had one or more child. Among those with children, the nonstimulant users had more children, on average, than the methamphetamine users ($F=6.34$, $df=2$, 59 , $p=0.003$).

Sexual assault history

The majority (68.6%) of women in the sample reported a history of sexual assault. Drug-use groups differed according to experience of sexual assault ($\chi^2=9.44$, $df=2$, $n=70$, $p=0.009$). Nearly all who injected methamphetamine had been sexually assaulted (87.1%) compared with approximately half of the nonstimulant (46.7%) and noninjecting methamphetamine (58.3%) users. Table 2 breaks down assault history according to whether it occurred in childhood, adulthood, or both childhood and adulthood. The table reveals differences in timing of sexual assault according to lifetime drug-use group. Sexual assault rarely occurred only in childhood (8.6% of entire sample; 12.5% of assaulted women), and assault occurred most commonly during both childhood and adulthood (37.1% of entire sample; 54.2% of assaulted women). Among sexually assaulted women, nonstimulant drug users typically experienced sexual assault only as an adult (57.1%), whereas methamphetamine users (71.4% of noninjectors, 55.6% of injectors) reported assaults both in childhood and adulthood.

Table 1 Demographic and background variables by methamphetamine use group

	Nonstimulant users		Noninjection meth users		Injection meth users	
	Mean	SD	Mean	SD	Mean	SD
Age	34.00	10.41	29.12	7.91	30.81	7.63
Number of Children [†]	3.33	1.30	2.48	1.08	2.04	.90
		%		%		%
Prior substance abuse treatment						
None		43.8		20.8		32.2
One prior treatment		25.0		62.5		22.6
Two or more treatments		31.3		16.7		45.2
Marital status						
Married or long-term partner		50.0		29.2		29.0
Divorced, separated, widowed		25.0		37.5		38.7
Never married		25.0		33.3		32.3
% Caucasian		68.8		79.2		90.3
Education						
Less than high school		62.5		73.9		41.9
High school		12.5		13.0		35.5
Some schooling beyond high school		25.0		13.0		22.6
Have children		75.0		87.5		87.1

[†]Included only women who have a child ($n=60$); nonstimulant > noninjection methamphetamine users = injection methamphetamine users.

Table 2 Sexual assault history by methamphetamine use group

	Nonstimulant users (%)	Noninjection meth users (%)	Injection meth users (%)
No sexual assault history	53.3	41.7	12.9
Childhood assault only	13.3	8.3	6.5
Adult sexual assault only	26.7	8.3	32.3
Child and adult assault	6.7	41.7	48.4

Psychological functioning

Groups were compared on three BSI indices (Global Severity Index (GSI), Positive Symptom Total (PST), Positive Symptom Distress Index (PSDI)) and lifetime diagnoses of ASPD and PTSD. Results are presented in Table 3. Women who injected methamphetamine scored higher than other women on two of the three BSI summary scores: GSI ($F=4.35$, $df=2$, 62 , $p=0.017$, $\chi^2=0.123$) and PST scores ($F=4.85$, $df=2$, 62 , $p=0.011$, $\chi^2=0.135$). Groups did not differ on the PSDI score.

One in four women (25.4%) met criteria for an ASPD diagnosis that was independent of her drug use, and slightly more (28.2%) met criteria for a PTSD diagnosis. ASPD diagnosis did not statistically differ across lifetime drug use groups ($\chi^2=0.59$, $df=2$, $n=71$, $p=0.744$); however, PTSD rates tended to vary according to lifetime drug-use groups ($\chi^2=5.48$, $df=2$, $n=71$, $p=0.064$). Methamphetamine-injectors appeared twice as likely as noninjection methamphetamine users to meet criteria for PTSD (41.9% vs 20.8%, respectively), and nearly three times more likely than nonstimulant-using women (12.5%).

Incarceration factors

Drug use was the predominant cause of current incarcerations for these women (83.1%). Half of the sample (47.9%) was in prison specifically for possession or delivery of drugs. Reasons for incarceration (possession or delivery versus other reasons) did not differ significantly according to lifetime use group ($\chi^2=3.50$, $df=2$, $n=71$, $p=0.174$).

A comparison of the mean number of prior arrests and previous incarcerations showed that few of these women had had previous prison experience (mean times in prison = 0.21, $SD=0.56$), but most had multiple prior arrests (mean = 5.17, $SD=6.91$). Neither number of prison incarcerations nor prior arrests were significantly different between lifetime drug use groups.

Health status

Groups did not differ in the number of health problems experienced. Further comparison of groups on specific health problems revealed no differences in cardiac problems or sexually transmitted diseases. Groups did differ in their rates of head injuries ($\chi^2=7.66$, $df=2$, $n=71$, $p=0.027$). Most injection methamphetamine users (77.4%) and half of the noninjection methamphetamine users (54.2%) had a history of a head injury, compared with a third (37.5%) of the nonstimulant users.

Motivation to change

Women completed the SOCRATES according to their most recent drug of choice. On average, women scored high on 'recognition' and 'taking steps', compared with mid-range scores for 'ambivalence'. These scores indicate that women generally recognize they have a drug-use problem and have initiated efforts to resolve it. Lifetime drug-use groups were not different on any of the three SOCRATES scales (ambivalence, recognition, and taking steps).

Table 3 Differences in psychological symptoms according to lifetime methamphetamine use

	Nonstimulant users		Non-IV meth users		IV-meth users	
	Mean	SD	Mean	SD	Mean	SD
Global Severity Index [†]	0.57	0.53	0.66	0.57	1.01	0.52
Positive Symptom Total [‡]	18.00	10.99	19.45	13.17	27.73	10.70
Positive Symptom Distress Index [§]	1.56	0.67	1.68	0.50	1.87	0.56
Antisocial Personality Disorder		18.8%		25.0%		29.0%
Posttraumatic Stress Disorder		12.5%		20.8%		41.9%

[†]GSI cutoff score ≥ 0.97 (nonpatient adult female norms) for clinical elevation (T score > 65); IV methamphetamine users $>$ non-IV and nonstimulant users.

[‡]PST cutoff score ≥ 31 (nonpatient adult female norms) for clinical elevation (T score > 65); IV methamphetamine users $>$ non-IV and nonstimulant users.

[§]PSDI cutoff score ≥ 1.97 (nonpatient adult female norms) for clinical elevation (T score > 65). No reliable group differences.

DISCUSSION

Methamphetamine use has increased the incarceration rates of women (Lockwood *et al.* 1998), and many incarcerated women first experience substance abuse services while in prison. The present findings suggest that one out of four methamphetamine-using women and nearly half of the nonstimulant-using women in prison had not received prior substance abuse treatment despite severe drug-use backgrounds. This finding is especially disconcerting given that nearly all women recruited for the study reported regular use of drugs (94.5%), and over eight out of 10 attributed their incarceration to their involvement with drugs. Clearly, drug abuse treatment is a pressing need for women in prison. Furthermore, mounting evidence demonstrates the importance of tailoring treatment services around the unique needs and circumstances of women (Zweben 1996, Blume 1998, Wechsberg *et al.* 1998). Unfortunately, little is known about the specific needs of incarcerated methamphetamine-abusing women. The current study offers an important examination of psychosocial factors associated with methamphetamine use by incarcerated women.

What emerged was a picture of the complex psychosocial needs and sociocontextual risks that confront methamphetamine-using women. Drug abuse, sexual assault and concomitant psychiatric symptoms were prevalent across the entire sample. These same factors will negatively impact recovery from psychoactive substance-use disorders (Rosenthal and Westreich 1999). The findings highlighted the need to develop state-of-the-art substance abuse services for incarcerated women. These services must be tailored to the particular needs of incarcerated women. Specifically, providers of substance abuse services to women's prisons must recognize that this very probably is the first treatment experience for many of these women, and women are likely to respond better to efforts to engage them in treatment as opposed to traditional confrontational approaches (Zweben 1996, Connors *et al.* 2002). Providers must also recognize that most incarcerated women are struggling with addiction to stimulants, and that stimulant dependence among women is further complicated by sociocultural factors that reward and maintain use (e.g. weight loss issues, partner pressure, coping assistance). Empirically supported protocols developed for treating stimulant dependence, such as the Matrix Model (Obert *et al.* 2000) need to become routine aspects of treatment for incarcerated women. Most of these women are dealing with sexual assault issues. Providers cannot ignore this reality. Nor can they ignore the subsequent risk for psychological sequelae, and the challenge to the course of treatment resulting from sexual assault and psychological distress. Finally, providers must attend to the important differences between women who use methamphetamine, women who inject the drug, and those who use nonstimulant drugs, recognizing that

many of these difficulties are compounded for women who inject stimulants.

More than two-thirds of these women met criteria for lifetime methamphetamine dependence. Results revealed several subtle differences between those with methamphetamine dependence and users of nonstimulant drugs with regard to their drug-use background. Not surprisingly, methamphetamine users had more severe drug-use histories than the nonstimulant users, and methamphetamine users struggled more to resist drug use during the months immediately prior to incarceration. The period prior to entering prison often involves jail time, court appearances and other legal actions. Continued drug use during this time can exacerbate legal problems. Thus, the weeks and months prior to incarceration are critical for female methamphetamine users.

Sexual assault and emotional distress were prevalent among incarcerated drug-using women, but especially among methamphetamine users. Rates of sexual assault (over two-thirds of the sample) and PTSD (over one-quarter) in this sample were nearly identical to rates found among men and women seeking drug treatment (Grice *et al.* 1999). Sexual assault was most common, however, among methamphetamine users, with injectors reporting the highest rate. Nearly nine out of 10 methamphetamine injectors experienced sexual assault at some point in their lives, and over half appeared to suffer assault in childhood and adulthood. General psychological distress was greatest among women who regularly injected methamphetamine. The higher level of psychological distress among injectors replicated previous findings from a separate sample of incarcerated women (Vik *et al.* 2000b). It is imperative, therefore, that treatment planners routinely address sexual assault history among stimulant-using women (Walker *et al.* 1991).

Several methodological issues limited interpretation of the findings. First, this study lacked collateral information to corroborate women's responses. To compensate for the lack of collateral data, procedures were implemented to increase the accuracy of these data. Specifically, data were gathered via both questionnaires and individual interviews, some questions were repeated in order to detect inconsistencies in responses, and participants were repeatedly reminded and reassured of the confidentiality, and ultimate anonymity, of their responses. Using such procedures can enhance the reliability of self-report substance abuse assessments (Babor and Del Boca 1992, Del Boca and Noll 2000). Nevertheless, future studies should endeavour to include a collateral informant component. Second, the descriptive, nonexperimental design of this study limited causal implications regarding direct effects of methamphetamine use. For example, is methamphetamine a consequence or a cause of sexual assault and psychiatric distress? Most likely, this relationship is reciprocal. Subsequent studies might attempt to unravel the nature of the relationship between these

variables. Uncontrolled third-variable effects cannot be ruled out as explanations of the differences observed between the groups. A related limitation was the lack of a sufficient comparison group of women who did not use drugs. Although such a comparison group was initially planned, very few women who used no drugs could be identified from the sample. Finally, drug-use histories were more complex for methamphetamine-using women than for nonstimulant users. Methamphetamine users also tended to use other stimulant drugs. Consequently, it is difficult to attribute differences solely to methamphetamine use rather than other stimulant drugs.

Several methodological strengths compensate for study limitations, including multimodal methods of data collection, repeating questions to detect response inconsistencies, and clearly distinguishing this research from prison procedures. Future research should explore the impact of psychosocial differences on postrelease functioning, drug use and recidivism. At a systems level, these results can inform policy regarding programming priorities for women while they are in prison. Namely, treatment must occur, with attention to resolution of social and contextual risks that will confront women upon release. Accordingly, postrelease support and intervention resources must become a probation/parole priority to reduce harm of continued drug abuse and risk for recidivism.

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