



Published in final edited form as:

Am J Addict. 2011 November ; 20(6): 516–524. doi:10.1111/j.1521-0391.2011.00173.x.

“High On My Own Supply”: Correlates of Drug Dealing among Heterosexually-identified Methamphetamine Users

Shirley J. Semple, PhD¹, Steffanie A. Strathdee, PhD², Tyson Volkmann, MPH², Jim Zians, PhD¹, and Thomas L. Patterson, PhD¹

¹Department of Psychiatry, University of California, San Diego, La Jolla, California

²Division of Global Public Health, Department of Medicine, University of California, San Diego, La Jolla, California

Abstract

Although rates of methamphetamine use continue to increase throughout the United States, little is known about the individuals who sell methamphetamine at the street level. This exploratory study examined the prevalence and correlates of drug-dealing behavior in a sample of 404 heterosexually-identified methamphetamine users who were participants in a sexual risk reduction intervention in San Diego, CA. Twenty-nine percent of participants (N = 116) reported “dealing” methamphetamine in the past two months. In a multivariate logistic regression, methamphetamine dealing was associated with being male (OR = 1.99; 95% CI 1.16 – 3.39), younger age (OR = 1.87 per year; 95% CI 1.10 – 3.17), more frequent use of methamphetamine (OR = 2.69; 95% CI 1.59 – 4.57), injecting methamphetamine (OR = 3.10; 95% CI 1.79 – 5.37), and higher hostility scores (OR = 1.07 per unit increase; 95% CI 1.01 – 1.13). These characteristics, particularly intensity of drug use and hostility, may be associated with greater resistance to drug treatment and lower success in treatment programs.

INTRODUCTION

Drug dealers and drug users are often viewed as distinct groups in the context of social, legal, and public health risk, but many drug users also participate in the drug economy, blurring this distinction. Drug users' involvement in the drug economy may include a number of activities, including trading or selling drugs to support their own habits,¹ or packaging and transporting drugs. A complex set of characteristics may explain the behaviors of the drug user who is part of the drug economy, rendering a differentiation of the users and dealers difficult. In Baltimore, MD, drug users involved in the drug economy were using drugs significantly more often and were significantly more likely to be injectors than those who were not involved in the drug economy. These drug users, who were predominantly heroin users, also had larger drug and social networks than other drug users.² In another study of heroin and cocaine users in Vancouver, Canada, Kerr, Small, Johnson et al.¹ found that injection drug users (IDUs) who reported dealing drugs were more likely to have been incarcerated, used drugs more frequently and were more likely to have overdosed than IDUs who were not dealers. These findings suggest that the hybrid drug dealer/user could potentially be exposed to increased social and epidemiological risk of adverse health events and may require different or more intensified interventions.

Address correspondence to Dr. Patterson, Department of Psychiatry (0680), University of California, San Diego, 9500 Gilman Drive, La Jolla, CA 92093-0680. tpatterson@ucsd.edu.

Declaration of Interest The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

Throughout the US, drug dealers have been a primary target of law enforcement crackdowns on drug markets.³ An unintended public health consequence is that drug dealers are “hidden,” and as such, may avoid public health programs that address HIV prevention and drug treatment. As evidenced in studies of injection drug users, police crackdowns have been associated with reluctance to access needle exchange and overdose prevention programs.⁴ Accordingly, drug dealers who are vulnerable to arrest and incarceration may be less likely to participate in harm reduction programs. As a result, drug dealers who are dependent or addicted to drugs may be at elevated risk for HIV/STI infection or transmission and should be targeted for HIV prevention and intervention programs. In order to develop effective intervention programs, it is imperative that we enhance our understanding of the social, behavioral, and psychological correlates of drug-dealing behavior.

Social stigma and threat of legal punishment are documented barriers to research participation among adult drug dealers.⁵ Most of what we know about drug-dealing behavior has emerged from studies of adolescents and inner-city youth. Studies of adolescents suggest that the sale of drugs, particularly cannabis, occurs primarily within informal friendship networks.⁶ In one study of adolescent drug dealers, motivations for dealing varied by frequency of selling and amount of drugs sold, but generally involved economic incentives, financing of personal drug use,⁷ and helping out friends. Drug-dealing behavior among inner-city youth is more likely to be considered a “career activity.”⁸ Among inner-city youth, factors associated with drug dealing include poverty, low education, poor neighborhood conditions, drug-selling opportunity, perceived acceptability of drug dealing, familial risk factors (eg, parental substance use, low parental monitoring), limited job opportunity, personality characteristics (eg, risk-taking), and high levels of peer group deviance.^{8–12} However, these studies may not generalize to adult drug users or users of heavier illicit drugs.

Among adult drug users, the two most common reasons that street-level dealers sell drugs are to generate personal income and to cover the cost of their own drug use.^{1,13,14} Fitzgerald⁵ identified “respect” from others and “control” of others as important psychological motivators of drug dealing. In Kerr et al.’s¹ Vancouver-based study of adult IDUs, socio-demographic factors associated with drug dealing included unstable housing, recent incarceration, and an inner-city residence. Behavioral factors associated with drug dealing included frequent heroin and cocaine injection, binge drug use, syringe lending, recent overdose, and receiving help injecting.

Studies that have examined psychological characteristics as potential correlates of drug-dealing behavior are few in number. We reasoned that specific characteristics of the drug-dealing environment, including the experience of violence, social stigma, lack of trust in relationships, and isolation from mainstream society^{4,5,15} may be associated with elevated levels of psychological symptoms among drug dealers. In a recent study, drugs users who reported involvement in criminal activity, primarily drug dealing, had significantly more symptoms of psychological distress (ie, anxiety, depressive symptoms) as compared to those who did not report criminal activity.¹⁶ In our own work with methamphetamine users, individuals who had a felony conviction for crimes such as drug dealing reported significantly higher levels of social stigma, boredom, and social isolation compared to non-felons.¹⁷ From a clinical perspective, identification of psychological correlates of drug dealing behavior is important because symptoms are potentially modifiable through therapies and pharmacological treatments.

The present study sought to identify socio-demographic, behavioral, and psychological correlates of drug-dealing behavior among methamphetamine users. We focused on

methamphetamine users for several reasons. First, methamphetamine dealing may be a highly prevalent activity among users due to the stimulating quality of methamphetamine and the associated desire for repetitive use that creates a high demand. Second, methamphetamine use is associated with risky sexual behavior and high rates of HIV infection and other sexually transmitted infections.^{18–20} Finally, we identified only two previous studies of drug dealers that focused on methamphetamine users,^{14,21} who may have a greater and more immediate need for HIV prevention and intervention programs compared to other types of drug dealers.

METHODS

Sample Selection—Baseline data from a sample of 404 heterosexually-identified, methamphetamine-using men and women were used in these analyses. Participants were volunteers in a 9-session behavioral intervention targeting methamphetamine users, with the primary treatment goal of reducing sexual risk behavior and secondary goals of reducing/abating methamphetamine use and depressive symptoms. One-on-one counseling sessions used motivational interviewing,²² social cognitive strategies,²³ and cognitive behavioral therapy²⁴ to promote behavior change. Eligible participants were at least 18 years of age, self-identified as heterosexual, and reported having had unprotected vaginal or anal sex with an opposite-sex partner in the previous two months. Study eligibility also required that participants used methamphetamine at least twice during the past two months, and at least once during the past 30 days. Participants were recruited through multiple sources, including community-based service providers, poster and media campaigns, street outreach, and referrals from enrolled participants. The research protocol was reviewed and approved by the UCSD Institutional Review Board (Project #061330).

Measures

Socio-demographic Factors—Gender was coded 1 = male and 0 = female. Socio-demographic factors with categorical coding were recoded as follows: ethnicity (white = 1, ethnic minority = 0), income (> \$10,000 = 1, ≤ \$10,000 = 0), education (1 = some college or more, 0 = high school or less), living arrangement (1 = homeless, 0 = other), employment status (1 = employed, 0 = unemployed), and felony conviction (1 = yes, 0 = no). A dichotomized variable was created for age using a median split where less than or equal to 38 years was coded 1 (younger) and greater than 38 years was coded 0 (older).

Substance Use Variables—The interviewer-administered survey collected data on socio-demographics, lifetime and recent substance use history, modes of administration of methamphetamine and other drug use, and binge use, as previously described.¹⁸ The frequency of methamphetamine use was measured as the number of days the participant used methamphetamine in the past 30 days (“During the past 30 days, on how many days did you do meth?”). A dichotomized variable was computed using a median split where 1 = score > 15 (high frequency) and 0 = score of ≤ 15 (low frequency). Amount of methamphetamine used in the past 30 days was recorded as number of grams. Positive skewness in the distribution necessitated a split at the second tertile so that a larger amount of methamphetamine was defined as > 9 grams (coded 1) and a smaller amount was ≤ 9 grams (coded 0). Alcohol use was assessed using the following item from the AUDIT:^{25–27} “How often do you have a drink containing alcohol?” Response categories were collapsed to create a dichotomously-scored variable (1 = more than once a month, 0 = once a month or less). Dealing was assessed by asking respondents if they had sold or traded methamphetamine in the past two months.

Psychological Characteristics—Sexual sensation-seeking was assessed using the 11-item scale developed by Kalichman et al.²⁸ Sample items include “I like wild, uninhibited sexual encounters” and “I enjoy the sensation of intercourse without a condom.” Items are measured on a 4-point scale, ranging from 1 (Not at all like me) to 4 (Very much like me). Symptoms of anxiety and hostility were measured using subscales of the Brief Symptom Inventory (BSI).²⁹ Participants were presented with a list of problems and complaints and asked six questions to assess anxiety symptoms (“During the past week, including today, how much were you distressed by nervousness or shakiness inside, suddenly scared for no reason, feeling tense or keyed up?”) and five questions to assess hostility symptoms (“During the past week, including today, how much were you distressed by temper outbursts that you could not control, having urges to beat, injure or harm someone?”). Each item was rated on a 5-point scale ranging from 0 (not at all) to 5 (extremely). Depressive symptoms were assessed using the Beck Depression Inventory-II (BDI-II).³⁰ The BDI-II comprises 21 items, each of which has four graded statements that are ordered (0–3) to show increasing depressive symptoms. Summary scores ranged in value from 0 to 63. Assertiveness was measured using 5 items from the drug item subscale of The Assertion Questionnaire in Drug Use.³¹ Sample items include: “I have no trouble telling friends not to bring drugs over to my house” and “If I were at a good party and a person that I just met offered me some free drugs, I would turn him down without any trouble.” Items are measured on a 4-point scale ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). The assertion scale has good test-retest reliability and adequate convergent and discriminant validity.³¹ Cronbach alphas for the psychological measures are specific to the present sample, and are reported in the Results section.

Statistical Analysis—Group differences in continuous and categorical variables were examined using *t*-test and chi-square, respectively. Logistic regression analyses were used to identify factors associated with methamphetamine dealing in the last 2 months. A total of four logistic regressions were performed. In the first logistic equation, seven socio-demographic variables were examined in relation to methamphetamine dealing (ie, gender, age, ethnicity, education, income, employment status, living arrangement). The second equation examined five substance use variables in relation to methamphetamine dealing (ie, binge use of methamphetamine, frequency of use, number of grams of methamphetamine used, injection use, and frequency of alcohol use). A third logistic equation examined psychological characteristics of the individual in relation to dealing behavior (ie, depressive symptoms, anxiety, hostility, assertiveness in turning down drugs, sexual sensation-seeking). The final logistic regression included all variables that were significantly associated with methamphetamine-dealing behavior in the first three logistic equations.

RESULTS

Socio-demographic Characteristics

Of the 404 respondents, the majority were male (52%), African American (32.7%) or Latino (23.8%), never married (52.0%), living alone with another adult in a non-sexual relationship (50.9%), with a high school degree or less (66.6%), unemployed (76.7%), and reported an income of less than \$10,000 per year (69.1%). The average age was 37.8 years (*SD* = 10.0, median = 38.0, range 18–68). Fifty-nine percent reported having a felony conviction. Twenty-nine percent of participants (*N* = 116) reported dealing methamphetamine in the past two months. Participants who reported dealing methamphetamine in the past two months were significantly more likely to be male, younger, and have a felony conviction compared to their counterparts who did not deal methamphetamine (see Table 1).

Substance Use Factors

Participants used methamphetamine an average of 14 days in the past 30 days ($SD = 9.4$, median = 15.0, range 1–30). Fifty-two percent of the sample self-identified as binge users of methamphetamine. Twenty-six percent reported injecting methamphetamine in the past two months. Mean number of grams of methamphetamine used in the past 30 days was 11.9 ($SD = 18.0$, median = 5.05, range .05–140). Fourteen percent of the sample did not consume alcohol in the past month. Among those who consumed alcohol ($N = 347$), 27% drank once per month or less and 73% drank more than once per month. Participants who reported dealing methamphetamine were significantly more likely to report injecting methamphetamine, used methamphetamine on more days in the previous month, and used more grams of methamphetamine in the past 30 days compared to those who did not deal drugs (see Table 1).

Psychological Characteristics

Mean scores on the BSI hostility ($\alpha = 0.88$) and anxiety ($\alpha = 0.88$) subscales were 2.6 ($SD = 3.5$, range 0–15) and 3.0 ($SD = 3.9$, range 0–18), respectively. The mean score on the Beck Depression Inventory ($\alpha = 0.92$) was 22.6 ($SD = 13.0$, range 0–68). Sexual sensation-seeking ($\alpha = 0.83$) and assertiveness ($\alpha = 0.64$) scores ranged from 1 to 4 with a mean of 2.7 ($SD = 0.54$) and 2.6 ($SD = 0.51$), respectively. Participants who reported dealing methamphetamine scored significantly higher on BSI hostility and sexual sensation-seeking (see Table 1).

Logistic Regression Analyses

In the first logistic regression, socio-demographic variables were examined in relation to methamphetamine-dealing behavior. The model with seven predictors was statistically significant (model $\chi^2 = 16.1$, $df = 7$, $p = .024$). Male participants had almost two times the odds of methamphetamine-dealing behavior compared to females ($OR = 1.73$; 95% CI 1.09–2.75). Also, younger participants (ie, 38 years or less) had almost twice the odds of dealing methamphetamine compared to older participants ($OR = 1.94$; 95% CI 1.22–3.10). Ethnicity, employment status, income, education, and living arrangements were not associated with methamphetamine-dealing behavior.

In the second logistic regression, five substance use variables were examined in relation to methamphetamine-dealing behavior. The model with five predictors was statistically significant (model $\chi^2 = 45.8$, $df = 5$, $p = .001$). Participants who injected methamphetamine had almost three times the odds of dealing methamphetamine in the past two months compared to non-injection users ($OR = 2.73$; 95% CI 1.62–4.59). Also, participants who used methamphetamine more frequently (ie, 15 or more days in the past 30 days) had approximately two and half times the odds of dealing methamphetamine compared to those who used less often ($OR = 2.57$; 95% CI 1.53–4.31). Lastly, participants who used larger amounts of methamphetamine (ie, 9 or more grams in the past 30 days) had almost two times the odds of dealing methamphetamine as compared to their counterparts who used less methamphetamine in the past month ($OR = 1.76$; 95% CI 1.06–2.91). Binge use of methamphetamine and frequency of alcohol use were not associated with dealing behavior.

In a third logistic regression, psychological characteristics of the individual were examined in relation to methamphetamine-dealing behavior. The five-variable model was statistically significant (model $\chi^2 = 20.02$, $df = 5$, $p = .001$). BSI hostility symptoms and sexual sensation-seeking were associated with drug-dealing behavior. For every unit increase in hostility scores, the odds of being in the methamphetamine dealing group increased by approximately 12 percent ($OR = 1.12$; 95% CI 1.05–1.20). Also, for every unit increase in sexual sensation-seeking scores, the odds of being in the drug dealing group increased by 57

percent ($OR = 1.57$; 95% CI 1.01–2.44). Depressive symptoms, assertiveness in turning down drugs, and anxiety symptoms were not associated with dealing methamphetamine.

Factors Independently Associated with Methamphetamine-Dealing Behavior

The final logistic regression included the seven variables that were associated with methamphetamine-dealing behavior in the above analyses. Five variables were significantly associated with methamphetamine dealing (Table 2). Being male, younger age, greater frequency of methamphetamine use, injection use of methamphetamine, and higher BSI hostility scores were factors independently associated with dealing methamphetamine in the past two months. Because of the high rate of felony convictions among methamphetamine dealers identified in the univariate analyses, we conducted a separate logistic regression with the felony variable added to the final logistic equation reported in Table 2. Not surprisingly, participants who had a felony conviction had approximately two and one half times the odds of dealing methamphetamine in the past two months ($OR = 2.40$; 95% CI 1.36–4.24).

DISCUSSION

In this large sample of methamphetamine users who were participants in a sexual and drug risk reduction intervention in San Diego, CA, nearly one third reported dealing methamphetamine within the last two months. Our finding that methamphetamine dealers tended to be younger, higher intensity users is consistent with previous studies in other drug-using populations. For example, Kerr et al.'s¹ Vancouver study found that drug dealers have more indicators of high-intensity drug use compared to non-dealers, which suggests the need for early intervention with suspected drug dealers. Individuals who are arrested but not charged with trafficking or selling violations should be referred to drug treatment programs. Kubiak, Arfken, Swartz and Koch³² proposed that brief interventions during the arrest phase may motivate individuals to seek more comprehensive substance use treatment. Schwartz and colleagues³³ found that interim methadone maintenance provided to community-based drug users in Baltimore, MD who were on the waiting list for treatment was effective in reducing drug use. However, the lack of a proven substitution therapy for methamphetamine limits the kinds of drug treatment modalities that may be offered.

The relationship between drug dealing and psychological characteristics of the individual (eg, hostility, sexual sensation seeking) suggests that dealers who come into contact with the criminal justice system should also have access to psychological services. In the United Kingdom and the US, drug treatment programs that address the mental health of arrestees have been shown to reduce drug use and drug-related criminal activity.^{34,35} Methamphetamine dealers should thus be evaluated for drug abuse behaviors and mental health issues as part of the sentencing procedure. Several other studies have reported that drug treatment for offenders has beneficial effects for the individual, and enhances public health and safety.^{36–38} More research is needed to determine the type of programs that are most effective for individuals within the criminal justice system as well the timing of substance use treatment (eg, in prison, pre-release, or post-prison). Incarceration of drug-abusing dealers in the absence of effective treatment programs is likely to result in a return to drug-related criminal behavior. Indeed, it appears that having a felony conviction was not an effective deterrent for the majority of drug dealers in our sample. Seventy-seven percent of those who dealt methamphetamine in the past two months reported a felony conviction in their past.

This study also highlights the importance of hostility as a correlate of drug-dealing behavior among methamphetamine users. Smith defined hostility as a “set of negative attitudes, beliefs, and appraisals concerning others”. Hostility is distinguishable from anger, which is conceptualized as an emotional state or personality trait. It can be also be differentiated from

aggression, which is “defined by overt behavior (eg, attack, hurtful actions).”^{39(p139)} Directionality in the relationship between hostility and drug-dealing behavior cannot be disentangled in this research. It is possible that hostile individuals are less threatened or intimidated by the dangers and challenges of drug dealing. Indeed, hostility in the family environment has been implicated in the incidence of substance use, delinquency, and dysfunctional coping among adolescents.⁴⁰ It is also likely that individuals with high levels of hostility are better able to adapt to drug-dealing environments, which may be characterized by violence, mistrust, suspicion, and other negative aspects of human interactions. A study of violent male substance users reported significantly higher levels of hostility and suspiciousness compared to non-violent substance users.⁴¹ In short, hostility may be a trait that facilitates entry into the world of drug dealing and it may also help individuals to function in this often violent and dangerous risk environment. Longitudinal, prospective research is needed to understand the reciprocal relationship between hostility and drug-dealing behavior as well as the trajectory of hostility symptoms over time among methamphetamine dealers.

Behavioral or overt expressions of hostility are also strongly associated with antisocial personality disorder.^{42,43} The link between hostility and drug dealing behavior suggests that methamphetamine dealers may need to be evaluated for antisocial personality disorder and related types of psychopathology. In terms in treatment, methamphetamine dealers who exhibit high levels of hostility may benefit from antidepressant treatment (eg, fluoxetine)⁴⁴ and cognitive behavioral therapy (eg, cognitive restructuring, relaxation).⁴⁵

We found that men had approximately twice the odds of being a drug dealer compared to women. Several explanations are plausible. Men may have more opportunity to deal drugs. Indeed, previous research has shown that males have greater opportunity to purchase drugs compared to females. Storr, Chen & Anthony⁴⁶ reported that men in a high-risk neighborhood were approached more often by drug dealers than were women. A qualitative study of drug users in Tijuana, Mexico found that male drug users tended to acquire and use drugs in more public settings with a large number of people, whereas female drug users tended to buy and use drugs from the same person and places, and had fewer drug users in their social networks.⁴⁷ Men may also be more motivated by financial incentives and less concerned about legal punishment (eg, prison) compared to women. It is also likely that women, particularly those who have children, are less likely to engage in drug dealing activities because of the value placed on family roles as well as the care and protection of young children.⁴⁸ It is also possible that the gender differences in drug dealing behavior were specific to our San Diego study sample. In a qualitative study of methamphetamine users in three sites, Morgan and Joe²¹ found that gender differences in drug-related activity (ie, dealing, distribution, manufacturing) varied by study site. In San Francisco, the proportion of women who sold methamphetamine was greater than for men; the opposite was true in Honolulu. More research is needed to ascertain the role of women as dealers in the illicit drug economy. It is possible that women dealers are a hidden population that are in urgent need of intervention. Future studies should also seek to identify and understand gender differences in motivations and barriers associated with drug-dealing behavior so that effective gender-responsive treatment programs can be developed.³⁷

Being younger was associated with a greater odds of drug-dealing behavior. Age may be a marker for a range of factors, including economic need, social inexperience, and age-related personality traits such as fearlessness, thrill-seeking, and impulsivity. Also, younger persons may be more likely than their older counterparts to view the social and economic benefits of drug dealing as outweighing the threat of legal punishment. More research is needed to understand the mechanisms that link age to drug-dealing behavior. This information could be critical to the development of drug treatment programs targeting drug dealers.

Taken together, these findings indicate that socio-demographic factors, substance use variables, and psychological symptoms are important factors to consider in the development of an empirically-based profile of methamphetamine dealers. Additional factors should be examined in future studies. Data on the social networks of dealers could be key to understanding drug-dealing behavior and developing effective treatment programs. Fitzgerald⁵ reported that the social networks of low-level drug dealers are comprised almost exclusively of drug-using friends and family, as well as others who are involved in the drug market (eg, paying customers, producers, enforcers). In addition, drug dealers are often isolated from those in the dominant social community.¹⁵ Indeed, those who do not have contact with the criminal justice system or social services appear to be a neglected and hidden population. Thus, programs that integrate substance use treatment with the development of a supportive non-drug-using social network may increase the likelihood of exiting from a drug-dealing lifestyle.

The present study contributes to our understanding of drug-dealing behavior by focusing on an understudied group of individuals who deal methamphetamine. However, like all studies, this study is not without limitations. The volunteer nature of this project limits the generalizability of our research findings. Because the intervention protocol included a methamphetamine cessation/reduction component, it is likely that some participants were actively seeking treatment for their drug use. The inclusion of treatment-seeking participants in our sample may further limit the generalizability of our findings to the broader population of methamphetamine dealers. This study was also limited to heterosexual methamphetamine users, despite continuing popularity of this drug among gay and bisexual men in the US.^{49,50} Future studies should seek to identify more representative samples of methamphetamine dealers including gay, bisexual, lesbian, and transgender persons. To our knowledge, the present sample did not include any high-level distributors that functioned within well-organized selling organizations that manufacture or transport methamphetamine across international borders. Thus, the factors associated with drug-dealing behavior are likely to differ depending on their role in the local drug economy.² Future studies should delineate specific criteria that distinguish between different levels of drug dealing. Also, we did not provide participants with a formal definition of drug dealing, and we do not know to what extent participants shared a common definition. Thus, this study cannot distinguish between dealing that involved “social supply of illicit drugs” (which occurs between friends) and “proper dealing” which involved economic incentives and the wider drug market.⁷ This research also lacks contextual description of drug-dealing behavior. Future studies should include descriptive data that details the frequency and amount of drugs sold, the number and characteristics of buyers, the location of drug deals, strategies for acquiring clients, and the variety of drugs sold. Another limitation stems from the self-report nature of the data. In particular, this study may underestimate the prevalence of methamphetamine-dealing behavior. Given that drug dealers are a primary target of law enforcement efforts, it is not unreasonable to assume that individuals would not be forthcoming about this activity, despite confidentiality assurances. However, we have no reason to suspect that under-reporting would have biased the associations we observed in an upward direction. It is also of note that the drug dealer question was asked in a two-month time frame so that we could identify a sufficient number of methamphetamine dealers for these analyses. It is possible that the disparate timeframes associated with our measure of drug dealing and drug use behaviors (eg, amount and frequency of methamphetamine use were measured over 30 days) may have resulted in an underestimation of the associations between these variables. Finally, since this study is limited by the use of cross-sectional data, we cannot infer causality about the associations we observed. Longitudinal data are needed to investigate reciprocal relationships in key variables.

In summary, this study identified correlates of methamphetamine-dealing behavior that could represent barriers to participation in drug treatment and HIV prevention programs. Future studies should examine intensity of drug use, hostility, gender, and age in relation to treatment motivation and resistance among individuals who engage in methamphetamine-dealing behavior.

Acknowledgments

This research was funded by grants T32 DA023356 (Dr. Strathdee) and R01 MH061146 (Dr. Patterson) from the National Institutes of Health, Bethesda, MD.

REFERENCES

1. Kerr T, Small W, Johnston C, Li K, Montaner JS, Wood E. Characteristics of injection drug users who participate in drug dealing: implications for drug policy. *J Psychoactive Drugs*. 2008; 40:147–152. [PubMed: 18720663]
2. Sherman SG, Latkin CA. Drug users' involvement in the drug economy: implications for harm reduction and HIV prevention programs. *J Urban Health*. 2002; 79:266–277. [PubMed: 12023502]
3. Courtwright DT. The Controlled Substances Act: how a “big tent” reform became a punitive drug law. *Drug Alcohol Depend*. 2004; 76:9–15. [PubMed: 15380284]
4. Kerr T, Small W, Wood E. The public health and social impacts of drug market enforcement: A review of the evidence. *International Journal of Drug Policy*. 2005; 16:210–220.
5. Fitzgerald JL. Mapping the experience of drug dealing risk environments: an ethnographic case study. *Int J Drug Policy*. 2009; 20:261–269. [PubMed: 19171472]
6. Parker, H.; Aldridge, J.; Egginton, R. *UK Drugs Unlimited: New Research and Policy Lessons on Illicit Drug Use*. Palgrave Macmillan; New York: 2001.
7. Coomber R, Turnbull P. Arenas of drug transactions: Adolescent cannabis transactions in England - Social Supply. *The Journal of Drug Issues*. 2007; 37:845–865.
8. Little M, Steinberg L. Psychosocial correlates of adolescent drug dealing in the inner city: Potential roles of opportunity, conventional commitments, and maturity. *Journal of Research in Crime and Delinquency*. 2006; 43:357–386. [PubMed: 20011229]
9. Altschuler DM, Brounstein PJ. Patterns of drug use, drug trafficking, and other delinquency among inner-city adolescent males in Washington, DC. *Criminology*. 1991; 29:589–622.
10. Dunlap E, Johnson BD, Kotarba JA, Fackler JL. Macro-level social forces and microlevel consequences: poverty, alternate occupations, and drug dealing. *J Ethn Subst Abuse*. 2010; 9:115–127. [PubMed: 20509085]
11. Black MM, Ricardo IB. Drug use, drug trafficking, and weapon carrying among low-income, African-American, early adolescent boys. *Pediatrics*. 1994; 93:1065–1072. [PubMed: 8197009]
12. Stanton B, Galbraith J. Drug trafficking among African-American early adolescents: prevalence, consequences, and associated behaviors and beliefs. *Pediatrics*. 1994; 93:1039–1043. [PubMed: 8197004]
13. Friedman SR, Kang SY, Deren S, et al. Drug-scene roles and HIV risk among Puerto Rican injection drug users in East Harlem, New York and Bayamon, Puerto Rico. *J Psychoactive Drugs*. 2002; 34:363–369. [PubMed: 12562104]
14. Senjo SR. Trafficking in meth: an analysis of the differences between male and female dealers. *J Drug Educ*. 2005; 35:59–77. [PubMed: 16270698]
15. Dunlap E, Johnson BD. *Gaining Access to Hidden Populations: Strategies for Gaining Cooperation of Drug Sellers/Dealers and Their Families in Ethnographic Research*. *Drugs Soc (New York)*. 1998; 14:127–149.
16. Kinner SA, George J, Campbell G, Degenhardt L. Crime, drugs and distress: patterns of drug use and harm among criminally involved injecting drug users in Australia. *Aust N Z J Public Health*. 2009; 33:223–227. [PubMed: 19630840]
17. Semple SJ, Zians J, Strathdee SA, Patterson TL. Methamphetamine-using felons: psychosocial and behavioral characteristics. *Am J Addict*. 2008; 17:28–35. [PubMed: 18214720]

18. Semple SJ, Patterson TL, Grant I. The context of sexual risk behavior among heterosexual methamphetamine users. *Addict Behav.* 2004; 29:807–810. [PubMed: 15135564]
19. Shoptaw S, Reback CJ. Associations between methamphetamine use and HIV among men who have sex with men: a model for guiding public policy. *J Urban Health.* 2006; 83:1151–1157. [PubMed: 17111217]
20. Zule WA, Costenbader EC, Meyer WJ Jr, Wechsberg WM. Methamphetamine use and risky sexual behaviors during heterosexual encounters. *Sex Transm Dis.* 2007; 34:689–694. [PubMed: 17471112]
21. Morgan P, Joe KA. Citizens and outlaws: The private lives and public lifestyles of women in the illicit drug economy. *Journal of Drug Issues.* 1996; 26:125–142.
22. Miller, WR.; Rollnick, S. *Motivational interviewing: Preparing people to change addictive behavior.* Guilford Press; New York, NY: 1991.
23. Bandura, A. *Social foundations of thought and action: A social cognitive theory.* Prentice-Hall; Englewood Cliffs, NJ: 1986.
24. Beck, AT.; Rush, AJ.; Shaw, BF.; Emery, G. *Cognitive therapy of depression.* Guilford Press; New York: 1979.
25. Fiellin DA, Reid MC, O'Connor PG. Screening for alcohol problems in primary care: a systematic review. *Arch Intern Med.* 2000; 160:1977–1989. [PubMed: 10888972]
26. National Institute on Alcohol Abuse and Alcoholism. *The physician's guide to helping patients with alcohol problems.* National Institutes of Health; Rockville, MD: 1995. NIH Pub. No. 95-3769
27. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption--II. *Addiction.* 1993; 88:791–804. [PubMed: 8329970]
28. Kalichman SC, Rompa D. Sexual sensation seeking and Sexual Compulsivity Scales: reliability, validity, and predicting HIV risk behavior. *J Pers Assess.* 1995; 65:586–601. [PubMed: 8609589]
29. Derogatis LR, Melisaratos N. The Brief Symptom Inventory: An introductory report. *Psychological Medicine.* 1983; 13:595–605. [PubMed: 6622612]
30. Beck, AT.; Steer, RA.; Brown, GK. *Manual for the Beck Depression Inventory-II.* Psychological Corporation; San Antonio, TX: 1996.
31. Callner DA, Ross SM. The reliability and validity of three measures of assertion in a drug addict population. *Behavior Therapy.* 1976; 7:659–667.
32. Kubiak SP, Arfken CL, Swartz JA, Koch AL. Treatment at the front end of the criminal justice continuum: the association between arrest and admission into specialty substance abuse treatment. *Subst Abuse Treat Prev Policy.* 2006; 1:20. [PubMed: 16879743]
33. Schwartz RP, Highfield DA, Jaffe JH, et al. A randomized controlled trial of interim methadone maintenance. *Arch Gen Psychiatry.* 2006; 63:102–109. [PubMed: 16389204]
34. Crossen-White H, Galvin K. A follow-up study of drug misusers who received an intervention from a local arrest referral scheme. *Health Policy.* 2002; 61:153–171. [PubMed: 12088889]
35. Inciardi JA, Martin SS, Butzin CA, Hooper RM, Harrison LD. An effective model of prison-based treatment for drug-involved offenders. *Journal of Drug Issues.* 1997; 27:261–278.
36. French MT, Fang H, Fretz R. Economic evaluation of a prerelease substance abuse treatment program for repeat criminal offenders. *J Subst Abuse Treat.* 2010; 38:31–41. [PubMed: 19631489]
37. Messina N, Grella CE, Cartier J, Torres S. A randomized experimental study of gender-responsive substance abuse treatment for women in prison. *J Subst Abuse Treat.* 2010; 38:97–107. [PubMed: 20015605]
38. Wexler HK. The promise of prison-based treatment for dually diagnosed inmates. *J Subst Abuse Treat.* 2003; 25:223–231. [PubMed: 14670526]
39. Smith TW. Hostility and health: current status of a psychosomatic hypothesis. *Health Psychol.* 1992; 11:139–150. [PubMed: 1618168]
40. Johnson V, Pandina RJ. Effects of the family environment on adolescent substance use, delinquency, and coping styles. *Am J Drug Alcohol Abuse.* 1991; 17:71–88. [PubMed: 2038985]
41. Brown TG, Werk A, Caplan T, Shields N, Seraganian P. The incidence and characteristics of violent men in substance abuse treatment. *Addict Behav.* 1998; 23:573–586. [PubMed: 9768295]

42. Haertzen CA, Hickey JE, Rose MR, Jaffe JH. The relationship between a diagnosis of antisocial personality and hostility: development of an Antisocial Hostility scale. *J Clin Psychol.* 1990; 46:679–686. [PubMed: 2246379]
43. Hatzitaskos PK, Soldatos CR, Sakkas PN, Stefanis CN. Discriminating borderline from antisocial personality disorder in male patients based on psychopathology patterns and type of hostility. *J Nerv Ment Dis.* 1997; 185:442–446. [PubMed: 9240362]
44. Farabaugh A, Sonawalla S, Johnson DP, et al. Early improvements in anxiety, depression, and anger/hostility symptoms and response to antidepressant treatment. *Ann Clin Psychiatry.* 2010; 22:166–171. [PubMed: 20680189]
45. Fuller JR, Digiuseppe R, O'Leary S, Fountain T, Lang C. An open trial of a comprehensive anger treatment program on an outpatient sample. *Behav Cogn Psychother.* 2010; 38:485–490. [PubMed: 20420758]
46. Storr CL, Chen CY, Anthony JC. Unequal opportunity”: neighbourhood disadvantage and the chance to buy illegal drugs. *J Epidemiol Community Health.* 2004; 58:231–237. [PubMed: 14966238]
47. Cruz MF, Mantsios A, Ramos R, et al. A qualitative exploration of gender in the context of injection drug use in two US-Mexico border cities. *AIDS Behav.* 2007; 11:253–262. [PubMed: 16865542]
48. Aneshensel CS, Frerichs RR, Clark VA. Family roles and sex differences in depression. *J Health Soc Behav.* 1981; 22:379–393. [PubMed: 7320475]
49. Pantalone DW, Bimbi DS, Holder CA, Golub SA, Parsons JT. Consistency and change in club drug use by sexual minority men in New York City, 2002 to 2007. *Am J Public Health.* 2010; 100:1892–1895. [PubMed: 20724693]
50. Reback CJ, Shoptaw S, Grella CE. Methamphetamine use trends among street-recruited gay and bisexual males from 199 to 2007. *J Urban Health.* 2008; 85:874–879. [PubMed: 18843536]

Table 1

Characteristics of heterosexual methamphetamine users who have and have not dealt methamphetamine in the past two months ($N = 404$)

Variable	Dealt MA in the past two months ($N = 116$)	Did not deal MA in the past two months ($N = 288$)	Test statistic	p -value
Socio-demographics				
<i>Gender</i>				
Male	58.6%	49.3%	$\chi^2 = 2.88$.05
Female	41.4	50.7		
<i>Ethnicity</i>				
Caucasian	37.9%	32.3%	$\chi^2 = 6.32$.10
African American	31.0	33.3		
Latino	26.7	22.6		
Other	4.3	11.8		
<i>Education</i>				
Less than high school	30.2%	23.6%	$\chi^2 = 4.21$.38
High school or equivalent	33.6	44.1		
Two-year degree or some college	31.9	28.8		
Four-year college degree	3.4	2.4		
Graduate or advanced degree	0.9	1.0		
<i>Marital Status</i>				
Never married	52.6%	51.7%	$\chi^2 = 1.69$.79
Married	10.3	6.9		
Separated	12.1	12.8		
Divorced	23.3	26.0		
Widowed	1.7	2.4		
<i>Living Arrangement</i>				
With spouse	11.2%	6.3%	$\chi^2 = 5.07$.41
With steady partner	15.5	15.6		
With other adults who are not sexual partners	35.3	35.1		
Alone	11.2	17.7		
Homeless	12.1	10.4		
Other	14.7	14.9		
<i>Income</i>				
Less than \$10,000	67.2%	69.8%	$\chi^2 = 3.52$.62
\$10,000–\$19,999	18.1	19.4		
\$20,000–\$29,999	7.8	5.9		
\$30,000–\$39,999	3.4	2.1		
\$40,000–\$49,999	3.4	1.7		
\$50,000 or more	0.0	1.0		
Employed	21.6%	24.0%	$\chi^2 = .268$.35
Felony conviction	77.4%	51.7%	$t = 22.4$.000

Variable	Dealt MA in the past two months (N = 116)	Did not deal MA in the past two months (N = 288)	Test statistic	p-value
Age (mean, SD)	36.0 (10.1)	38.4 (9.9)	$t = 2.22$	.03
Substance Use Behaviors				
Binge use in past two months	58.6%	49.0%	$\chi^2 = 3.09$	.08
Injection drug use in past two months (mean, SD)	40.5%	19.8%	$\chi^2 = 18.6$	.000
Number of days methamphetamine used in past 30 days (mean, SD)	18.18 (9.1)	12.52 (9.1)	$t = 5.68$	.000
Number of grams of methamphetamine used in past 30 days (mean, SD)	16.75 (20.25)	9.92 (16.69)	$t = 3.10$	.002
<i>Frequency of alcohol use</i>				
Once a month or less	36.2	38.2	$\chi^2 = .139$	.40
More than once a month	63.81	61.8		
Psychological Characteristics				
Sexual sensation-seeking (mean, SD)	2.83 (0.52)	2.67 (0.55)	$t = 2.59$	.01
Assertiveness in turning down drugs (mean, SD)	2.63 (0.51)	2.68 (0.52)	$t = .857$	.39
Beck Depression (mean, SD)	23.84 (12.7)	22.12 (13.2)	$t = 1.20$	.23
BSI hostility (mean, SD)	3.58 (3.94)	2.24 (3.27)	$t = 3.49$	.001
BSI anxiety (mean, SD)	7.17 (5.79)	6.13 (5.38)	$t = 1.7$	.09

Table 2

Factors independently associated with methamphetamine dealing behavior among heterosexual methamphetamine users ($N = 404$)*

Variable	Odds ratio	95% confidence interval
Gender (male vs. female)	1.99	1.16–3.39
Age (younger vs. older)	1.87	1.10–3.17
Injection use of methamphetamine	3.10	1.79–5.37
Days per month of methamphetamine use (high frequency vs. low frequency)	2.69	1.59–4.57
Amount of methamphetamine used in the past 30 days (high vs. low)	1.59	0.94–2.69
Hostility symptoms (per unit increase)	1.07	1.01–1.13
Sexual sensation-seeking (per unit increase)	1.08	0.66–1.77

* 34 cases missing data