Published in final edited form as:

Drug Alcohol Depend. 2012 September 1; 125(1-2): 154–159. doi:10.1016/j.drugalcdep.2012.04.007.

Factors associated with experiences of stigma in a sample of HIV-positive, methamphetamine-using men who have sex with men

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Abstract

Background—While methamphetamine users report high rates of internalized or self-stigma, few studies have examined experiences of stigma (i.e., stigmatization by others) and its correlates.

Methods—This study identified correlates of stigma experiences in a sample of 438 HIV-positive men who have sex with men (MSM) who were enrolled in a sexual risk reduction intervention in San Diego, CA.

Results—Approximately 96% of the sample reported experiences of stigma related to their use of methamphetamine. In multiple regression analysis, experiences of stigma were associated with binge use of methamphetamine, injection drug use, increased anger symptoms, reduced emotional support, and lifetime treatment for methamphetamine use.

Conclusions—These findings suggest that experiences of stigma are common among methamphetamine users and that interventions to address this type of stigma and its correlates may offer social, psychological, and health benefits to HIV-positive methamphetamine-using MSM.

Keywords

Stigma experiences; Methamphetamine; Men who have sex with men; HIV

1. Introduction

Illicit drug users are stigmatized in countries throughout the world (Schomerus et al., 2011). Stigma is commonly divided into two main types: *internalized stigma*, which is defined as

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Contributors

The specific contributions of each author are as follows: TP and SJS designed the study; SJS conducted the statistical analyses and wrote the first draft of the paper; all authors contributed to the main content and provided critical comments on the final draft. All authors approved the final manuscript.

Conflict of interest

The authors have no competing interests to declare.

negative beliefs, views, and feelings toward oneself arising from self-identification with a particular attribute such as substance abuse or mental illness, and *experiences of stigma* (also referred to as enacted stigma) which encompasses acts of discrimination and experiences of rejection or mistreatment by others (Link et al., 1989; Logie and Gadalla, 2009). Studies have reported that illicit drug use is more stigmatized than mental illnesses such as depression and schizophrenia (Link et al., 1999; Schomerus et al., 2011), perhaps because substance users are perceived as having control over their drug use, and are thus more likely to be blamed for their illness (Corrigan et al., 2009; Livingston et al., 2012). Use of illicit substances is also more stigmatized than alcohol dependence (Schomerus et al., 2011), perhaps because the criminalization of certain drugs increases the stigma attached to their use (Ahern et al., 2007; Livingston et al., 2012).

Ahern and colleagues (2007) suggest that users of some illicit drugs are more stigmatized than users of other drugs. The strong negative attitudes toward methamphetamine users arise from behaviors associated with methamphetamine use, which include criminal activity, violence, risky sex, anonymous sex, sex work, and injection drug use—behaviors that are either illegal or considered by most to be morally reprehensible. Methamphetamine users, much like users of crack cocaine and heroin, are viewed as “unpredictable,” “unreliable,” “dangerous,” “weak,” “lazy” and “sexually promiscuous” (Ahern et al., 2007; Young et al., 2005). As such, they are likely to experience high levels of stigma and rejection in their personal and social lives. Additionally, methamphetamine users often have multiple stigmatizing characteristics (e.g., HIV, MSM, mental illness, felony convictions) making them at higher risk for experiencing stigma and its health consequences.

Studies of substance users, including alcohol-dependent patients, have identified an association between internalized stigma and social stigma (endorsement of stereotypes and actions against a stigmatized group) and delays in seeking drug treatment, non-entry into drug treatment, non-completion of treatment, poor physical and mental health (e.g., depression), low self-esteem, reduced quality of life, and low rates of referral to drug treatment by health care providers (Ahern et al., 2007; Cunningham et al., 1993; Livingston et al., 2012; Luoma et al., 2008; Tucker et al., 1994; Young et al., 2005). The effects of stigma on drug-use behaviors include increased involvement in risky practices such as injecting drugs and needle-sharing (Simmonds and Coomber, 2009) and reduced use of preventive services (e.g., needle exchange programs, voluntary counseling and testing; Livingston et al., 2012). Feelings of stigma and anticipated experiences of stigma can also prevent substance users from pursuing employment, spending time with family and friends, or getting involved in intimate relationships (Luoma et al., 2008). Substance users whose disheveled appearance, homelessness, or injection stigmata identify them as addicts may be more visible to police, which can contribute to an ongoing cycle of incarceration and marginalization (Strathdee et al., 2008).

Stigma experienced by HIV-positive drug users may be especially potent (Ahern et al., 2007). HIV-related stigma is likely to exacerbate and reinforce existing stigma associated with illicit drug use (Pulerwitz et al., 2010). In HIV-positive populations, perceived HIV-related stigma has been associated with increased depressive symptoms, more HIV-related physical health symptoms, less adherence to HIV medications, poorer health-related quality of life, and poor access to care (Kinsler et al., 2007; Rintamaki et al., 2006; Sayles et al., 2007; Schuster et al., 2005; Vanable et al., 2006). In a Los Angeles study, 26% of HIV-positive persons reported ever experiencing at least one type of stigma from a health care provider (Kinsler et al., 2007), and stigma was associated with reduced levels of access to care, as documented by other researchers (Sayles et al., 2009; Schuster et al., 2005).

Ahern et al. (2007) reported that the dual stigmas of HIV and illicit drug use combine to form a barrier to drug treatment and HIV care. Experiences of stigma may deter illicit drug users from seeking care because they anticipate mistreatment by health care providers or fear disclosure to law enforcement (Ahern et al., 2007). In our work with HIV-negative, heterosexual methamphetamine users, experiences of stigma were associated with never having sought treatment for methamphetamine use (Semple et al., 2005).

To date, there have been few studies of stigma experiences associated with methamphetamine use. The present study examines the prevalence and correlates of stigma experiences in a sample of 438 HIV-positive methamphetamine users who are also MSM. Enhanced understanding of the factors associated with stigma may contribute to the development of effective interventions that could improve the social, psychological, and physical health and well-being of HIV-positive methamphetamine-using MSM. These findings should also benefit health care and service professionals by identifying potential targets of intervention to be addressed in clinical practice.

2. Methods

2.1. Sample selection

Data were gathered from a sample of 438 HIV-positive, methamphetamine-using MSM who were enrolled in the EDGE-II research project at the University of California, San Diego (UCSD). The 9-session EDGE-II project evaluated the long-term efficacy of a sexual risk reduction intervention. Motivational interviewing (Miller and Rollnick, 1991), social cognitive strategies (Bandura, 1986), and cognitive behavioral therapy (Beck et al., 1996a; 1996b) were used to promote, reinforce, and maintain safer sex behaviors in the target population. Participants were at least 18 years of age, self-identified as MSM, and reported having unprotected anal sex with at least one same-sex partner during the past two months. To avoid enrolling one-time only users, participants had to report using methamphetamine at least twice during the past two months, and at least once during the past 30 days. Recruitment strategies included poster and media campaigns, street outreach, and referrals from enrolled participants and community service providers. The UCSD Human Research Protections Program approved the research protocol (Project# 061331). The ClinicalTrials.gov protocol number for the study is NCT 00432926.

2.2. Measures

2.2.1. Socio-demographic variables—Age, ethnicity, employment status, and living arrangement were included in these analyses.

2.2.2. Experiences of stigma—Experienced stigma was measured by six items (Semple et al., 2005). Participants reported their experiences of rejection or mistreatment associated with methamphetamine use from a variety of sources, including family, friends, neighbors, and sexual partners. Two items tapped into general sources of stigma, which could include health care and other service providers (“I have been mistreated by others because I use meth”). Experiences of stigma ranged from minor slights (e.g., “family members act differently toward me because I use meth”) to major life events (e.g., “I have lost friends because they found out about my meth use”). Items were measured on a 4-point scale, ranging from 1 (strongly disagree) to 4 (strongly agree). A mean score was calculated. Cronbach's alpha for the scale in the present sample was 0.85.

2.2.3. Anger symptoms—The five-item anxiety subscale of the Brief Symptom Inventory (BSI) (Derogatis and Melisaratos, 1983) was used to assess anger symptoms. “During the past week, including today, how much were you distressed by _____?”

(e.g., having urges to break or smash things, getting into frequent arguments). Items were rated from 1 (not at all) to 5 (extremely). A summary score was calculated. Cronbach's alpha for the scale in this sample was 0.83.

2.2.4. Depressive symptoms—The 21-item Beck Depression Inventory-II (BDI-II) was used to assess depressive symptoms (Beck et al., 1996b). Each item has four graded statements that are ordered (0-3) to show increasing depressive symptoms. Summary scores ranged in value from 0 to 63. Cronbach's alpha in the present sample was 0.91.

2.2.5. Emotional support—Emotional support was measured using a seven-item scale developed by (Pearlin et al., 1990). This measure assesses the availability of family members and friends who are perceived as caring, trustworthy, uplifting, and confidants (e.g., “The people close to you let you know they care about you”). Items were rated on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree). The alpha coefficient for this scale in the present sample was 0.93. Mean scores were calculated.

2.2.6. Methamphetamine use variables—Amount of methamphetamine used was measured by the number of grams of methamphetamine consumed in the past 30 days as reported by the participant. Frequency of use was assessed by the number of days on which the participant reported having used methamphetamine in the past 30 days. Binge use of methamphetamine and injection use in the past two months were represented by dichotomous variables (1 = yes, 0 = no). Binge use was defined in the following way: “You keep using large quantities of meth for a period of time—until you run out or just can't physically do it anymore.” Number of years of methamphetamine use was treated as a continuous variable.

2.2.7. Alcohol use—Severity of alcohol use was assessed by a single item from the AUDIT (Saunders et al., 1993) that asked participants how often they consumed six or more drinks on one occasion. Responses were coded 0=never to 4=daily or almost daily.

2.2.8. Participation in treatment for substance use, HIV and mental health—Three questions were used to assess participants' involvement in treatment for methamphetamine use, HIV disease, and mental health issues: “Have you ever been in treatment for methamphetamine use?” “Do you take any antiretroviral medications, such as AZT or protease inhibitors?” “Are you currently under the care of a psychologist or psychiatrist?” Responses to each question were coded “1” for yes and “0” for no.

2.3. Statistical analysis

All variables of interest were examined for missing data and normality of distribution. Number of grams of methamphetamine yielded a positively skewed distribution that was corrected with a log 10 transformation. To examine differences between participants with high versus low stigma scores, we computed a binary variable using a cut point of one standard deviation above the mean. Accordingly, participants with stigma scores less than or equal to 3.46 were coded 0 (low stigma) and those with scores greater than 3.46 were coded 1 (high stigma). T-tests and contingency table analysis were used to examine group differences in continuous and categorical variables, respectively.

A single hierarchical multiple regression analysis was performed with stigma as the dependent variable. Independent variables were entered into the regression model in four separate steps. In step 1, stigma was regressed on four socio-demographic variables. Age was treated as continuous, while ethnicity, employment status, and living arrangement were coded dichotomously (Caucasian = 1, ethnic minority = 0; employed = 1, not employed = 0;

homeless = 1, non-homeless = 0). In step 2, six substance use variables (amount and frequency of methamphetamine used, binge use, injection drug use, number of years used methamphetamine, severity of alcohol use) were entered as a block of independent variables (IVs). In step 3, three psychosocial factors (depression, anger, emotional support) were entered as another block of IVs. In step 4, stigma scores were regressed on three treatment variables (ever been in treatment for methamphetamine, currently taking antiretroviral medications, currently under the care of a psychiatrist or psychologist).

3. Results

3.1. Description of the sample

By design, all participants were men who self-identified as MSM. Participants were predominantly Caucasian (55.5%), never married (82.6%), living with another adult in a non-sexual relationship or living alone (57.5%), unemployed (83.3%), with a two-year college degree or less (84.0%), and an annual income of less than \$20,000 (87.2%). The average age was 39.3 years (SD = 8.8, median = 40.0, range = 18–61).

Participants reported using methamphetamine for an average of 14.2 years (SD = 8.8, median = 13.0, range = <1–42 years). Mean number of days on which participants used methamphetamine in the past 30 days was 10.7 (SD = 9.1, median = 8.0, range = 1–30). Forty-three percent of the sample self-identified as binge users of methamphetamine. Forty-eight percent reported injecting methamphetamine in the past 2 months. Mean number of grams of methamphetamine used in the past 30 days was 9.5 (SD = 16.9, median = 3.5, range = .05–135).

Stigma scores ranged from 1 to 4 with a mean of 2.6 (SD = .83, median = 2.7). Participants who scored high versus low on stigma did not differ with respect to age, marital status, ethnicity, income, living arrangement, education or employment status. However, men who scored high on experiences of stigma were significantly more likely to have injected methamphetamine in the past 2 months, to have “binged” on methamphetamine, and to report more symptoms of depression and anger compared to MSM who scored low on stigma. The difference between groups with respect to having ever been in treatment for methamphetamine use was marginally significant (see Table 1).

3.2. Correlates of Experiences of Stigma

In step 1, employed participants reported significantly fewer experiences of stigma. Also, living arrangement was positively associated with stigma, indicating that homeless participants reported more experiences of stigma. Age and ethnicity were not statistically significant. In step 2, employment status and living arrangement remained statistically significant. In addition, binge use of methamphetamine and injection use of methamphetamine in the past two months were both positively associated with experiences of stigma. In step 3, anger symptoms were positively associated with stigma while emotional support was inversely related. Binge use of methamphetamine and injection use retained statistical significance. In step 4, having ever been in treatment for methamphetamine use was associated with more experiences of stigma. Thus, in the final equation, higher stigma scores were independently associated with being a binge user of methamphetamine, injecting methamphetamine, more anger symptoms, less emotional support, and lifetime treatment for methamphetamine use (see Table 2).

4. Discussion

Although the popular literature suggests that methamphetamine users are among the most highly stigmatized of illicit drug users (e.g., “How to kill the meth monster,” NY Times,

2010), there has been little systematic study of the causes and consequences of stigma in this marginalized population. The present study identified socio-demographic, behavioral, and psychosocial correlates of experiences of stigma in a sample of HIV-positive, methamphetamine-using MSM. Higher levels of stigma were associated with injection and binge use of methamphetamine, more anger symptoms, less emotional support, and a history of methamphetamine treatment. This profile of the “stigmatized” user is consistent with general findings on methamphetamine use. Previous studies have reported that binge users of methamphetamine have higher rates of social and legal problems, including felony convictions and involvement in the drug and sex trades—activities that create stigma in the form of public perceptions of users as dangerous, unpredictable, and immoral (Halkitis and Shrem, 2006; Semple et al., 2003; 2010).

Methamphetamine injectors also have low social status; previous studies have reported stigma and discrimination from various sources, including the public, health care professionals, and non-injecting methamphetamine users (Brown, 1993; Semple et al., 2004). Elevated levels of anger and aggression are also common among methamphetamine users and have been associated with personal and social disadvantage, early conduct disorder, experiences of childhood adversity (e.g., sexual abuse), chronic methamphetamine exposure, poly-substance abuse, and methamphetamine-induced psychosis (Cohen et al., 2003; Kramer et al., 2009; McKetin et al., 2008; Messina et al., 2008; Sommers and Baskin, 2006; Szuster, 1990; Zweben et al., 2004).

Increased social support has yielded positive effects on the mental health status of methamphetamine users (Semple et al., 2011). It might also mitigate the negative social and emotional health consequences of stigma (Young et al., 2005). Each factor identified in this research is potentially modifiable in an intervention context; however, the complex profile suggests that reducing levels of stigma among methamphetamine users might best be achieved using a multi-level approach that includes individual therapies to address drug cravings and negative emotions (e.g., Cognitive Behavioral Therapy, motivational interviewing), structural interventions (e.g., opioid substitution programs) to reduce injection drug use and promote safer injection practices, and community-based interventions to increase access to and availability of drug treatment programs. We also propose that service providers and the police receive education and sensitivity training to ensure that their actions and attitudes do not exacerbate experiences of stigma among the substance users they are intending to assist.

The relationship between injection drug use and experiences of stigma has implications for HIV/AIDS prevention. High levels of stigma, particularly among youth, may be a risk factor for initiation or escalation of injection behaviors. Therefore, it is imperative that interventions to reduce stigma associated with methamphetamine use address its relationship to injection behaviors, and seek to prevent initiation behaviors or reduce risky injection practices among those who have already started. Break the Cycle (BTC), a prevention program developed by Neil Hunt and operated by Population Services International (PSI; Gray, 2008; Hunt et al., 1998) targets young drug users who are at risk of transitioning to injecting. Researchers in Scotland using the BTC program identified stigma (along with other factors such as overdose) as a “risk” to new injectors, thereby suggesting the importance of addressing stigma in prevention and intervention efforts for IDUs (Pringle, Drug Actions Aberdeen). Since our study focused on methamphetamine users who were potentially subject to two additional sources of stigma besides their substance use (i.e., HIV infection and sexual orientation), more research is needed on how health care providers affect the stigma experiences of other methamphetamine users. In particular, experiences of more than one type of stigma from health care providers could have negative consequences for patients’ health and longevity (Kinsler et al., 2007). Studies of HIV stigma in the

absence of methamphetamine use have reported associations with delays in seeking HIV treatment, increased hospitalizations, advanced clinical symptoms, lack of adherence to HIV medications, and increased mortality (Kinsler et al., 2007). Provider characteristics may also be important in terms of patient attendance to HIV care and treatment (Sayles et al., 2009). Methamphetamine users who have experienced stigmatizing interactions with HIV care providers may be less likely to return for care. Pulerwitz et al. (2010) contend that experiences of stigma among HIV-positive individuals also occur at the institutional and community level, and each can have different manifestations which, in turn, can reduce the effectiveness of prevention and treatment interventions.

Behavioral interventions to achieve long-term stigma reduction among HIV-positive methamphetamine users have not been developed. The high rates of stigma reported in this sample point to the urgent need to develop effective interventions to reduce stigma in this population. In the mental health field, interventions to reduce experiences of stigma are more common (Luoma et al., 2008) and have involved multiple strategies including connecting stigmatized patients with their stigmatizers (Link et al., 2002), addressing care providers prejudiced attitudes toward patients (Kinsler et al., 2007), teaching health care professionals how to provide unbiased care (Kinsler et al., 2007), and teaching patients how to cope with stigma by working through their experiences with a counselor (Link et al., 2002). Common coping strategies employed by illicit drug users to manage stigma (e.g., withdrawal, social isolation, anger, and covering up and hiding drug use) also need to be addressed in an intervention context (Ahern et al., 2007; Semple et al., 2005). Age of methamphetamine initiation, which averaged 25 years in our sample, may have implications for choice of intervention strategies. For example, older onset users may endorse specific coping strategies (avoidance, secrecy) that are more resistant to change, thus rendering coping-focused stigma-reduction interventions less effective. The development of stigma reduction interventions should seek to understand initiation into methamphetamine use and its relationship to characteristics of the individual.

In one of the few interventions designed to reduce stigma in a sample of substance users, Luoma et al. (2008) used Acceptance and Commitment Therapy (ACT)—an approach that focuses on experiencing undesirable thoughts and feelings fully and moving beyond them by taking positive action (Luoma et al., 2008). Luoma's study demonstrated reductions in stigma, shame, and self-concealment among illicit drug users (Luoma et al., 2008). Future studies should examine the effectiveness of ACT in helping HIV-positive methamphetamine users accept and manage experiences of stigma within health care and other community settings. Moreover, addressing stigma in the context of ongoing or concurrent case management programs would build upon existing initiatives and may result in improved client outcomes and longer-term treatment effects among HIV-positive methamphetamine users.

An alternative approach to stigma reduction at the individual level involves Cognitive Behavioral Therapy (CBT; Beck et al., 1979). CBT is a form of psychotherapy that teaches the individual skills that are designed to challenge negative thoughts and emotions, as well as modify negative interpretations of situations. This approach has been shown effective in terms of reducing self-stigma among persons with mental illness (Corrigan and Calabrese, 2005). Other promising approaches to stigma reduction include group-based approaches (self-help, support, advocacy; Lucksted et al., 2011) and targeted interventions for subpopulations within stigmatized communities (e.g., transgender women; Garofalo et al., 2012).

This research also draws attention to the layering of stigma. The HIV-positive methamphetamine users in our sample were highly stigmatized by others for their drug-

using behaviors. Although we did not measure HIV-related stigma, one can assume that many of these men were also stigmatized for their seropositive status as well as for other attributes, including HIV-transmission behaviors (e.g., injection drug use, sex work) and certain personal characteristics (e.g., sexual orientation, class, ethnicity; Reidpath and Chan, 2005). Indeed, Aggleton et al. (2005) propose that many individuals come to drug use with pre-existing layers of stigma and associated experiences, which make them more vulnerable to the adverse consequences associated with the stigma of using illicit drugs and living with HIV/AIDS.

More research is needed to understand the layering of stigmas and how multiple stigmas affect the health and well-being of HIV-positive methamphetamine users. Research has shown that experiences of discrimination related to multiple attributes (e.g., race, sexual orientation) have a greater impact on health than discrimination from a single attribute (Young et al., 2005). Also, there are serious methodological challenges associated with disentangling the stigmas associated with methamphetamine use and HIV from other stigmatized statuses (Lekas et al., 2011). Treatment and prevention programs must face the difficult task of addressing the layering of stigma in drug-using, HIV-positive populations.

This research has several limitations. The sample consisted of volunteers in a sexual risk reduction intervention that employed specific inclusion and exclusion criteria. As such, our sample cannot be considered representative of the general population of HIV-positive methamphetamine-using MSM, and the findings cannot be generalized. Although stigma reduction was not a formal component of the EDGE-II intervention, participants had the opportunity to discuss this issue in their counseling sessions. Thus, the association between methamphetamine use and stigma may be underestimated in this sample. Also, there may be subgroup differences in the reporting of stigma. For example, individuals with poor mental health (e.g., depression, anxiety) may have perceived their interactions with others as more stigmatizing than their counterparts who did not have these symptoms (Ahern et al., 2007). This study is also limited by the use of self-report measures of stigma and mental health. In the absence of observational studies, which are difficult and expensive to conduct, it is impossible to determine whether the stigma reported by participants matched the behavior of those who stigmatized them. Also, the use of cross-sectional data prevents us from addressing issues of directionality and causality in the relationships among variables in our regression analysis. For example, these data do not permit us to disentangle the direction of the relationship between higher stigma scores and methamphetamine treatment history. It is possible that experiences of stigma, particularly those involving valued family and friends, serve as a strong motivator of entry into drug treatment. Alternatively, participation in drug treatment, including interactions with fellow users and staff, may be associated with increased experiences of stigma. Future studies should employ longitudinal research designs.

In summary, the strong association between methamphetamine use and HIV risk behaviors (e.g., Forrest et al., 2010)) suggests that the number of individuals who will face these dual stigmas and their health consequences is likely to increase over time. More research is called for to identify additional factors associated with methamphetamine-related stigma and to determine its impact on the physical and psychological health and well-being of HIV-positive methamphetamine users, with the ultimate goal of developing effective interventions to reduce stigma and improve quality of life in this population. Future studies should also assess institutional and structural factors that contribute to the stigma experiences of individuals who live with the dual stigmas of HIV disease and methamphetamine use.

Acknowledgments

Role of funding source

The study was supported by the US National Institutes of Health (R01DA021115). The funding source had no further role in any of the following: study design; collection, analysis, and interpretation of data; writing of the report; or the decision to submit the paper for publication.

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Table 1

Characteristics of a sample of HIV+ methamphetamine-using men who have sex with men with high and low stigma scores ($N = 438$)

Variable	Low scores on stigma ($N = 347$)	High scores on stigma ($N = 91$)	Test statistics	p-value
<i>Ethnicity</i>			$\chi^2 = 0.02$	.500
Caucasian	55.3% (192)	56.0% (51)		
Ethnic minority	44.7 (155)	44.0 (40)		
<i>Education</i>			$\chi^2 = 160$	.126
High school diploma or less	42.1% (146)	49.5% (45)		
Some college or more	57.9 (201)	50.5 (46)		
<i>Annual Income</i>			$\chi^2 = 0.33$	.564
Less than \$20,000	86.7% (301)	89.0% (81)		
Greater than or equal to \$20,000	13.3 (46)	11.0 (10)		
<i>Living Arrangement</i>			$\chi^2 = 1.53$	.143
Homeless	13.5% (47)	18.7% (17)		
Other living arrangement	86.5 (300)	81.3 (74)		
Percent employed	18.2 (63)	11.0 (10)	$\chi^2 = 2.67$	.103
Age (Mean, SD)	39.4 (8.6)	38.7 (9.5)	$t = 0.73$	.463
Number grams MA used in past 30 days (Mean, SD)	8.6 (17.1)	11.0 (16.5)	$t = 1.33$	.258
Number of days used MA in past 30 days (Mean, SD)	10.6 (8.8)	11.3 (10.1)	$t = .59$	.553
Number of years use MA (Mean, SD)	13.9 (9.0)	15.4 (8.0)	$t = 1.38$	.167
Binge use of MA in past 2 months	38.6% (134)	59.3 (54)	$\chi^2 = 12.6$	.000
Injection use of MA in past 2 months	44.7% (155)	59.3% (54)	$\chi^2 = 6.22$	.009
Ever been in treatment for MA	45.8% (159)	57.1% (52)	$\chi^2 = 3.7$	.054
Taking HIV medications	52.4% (182)	48.4% (44)	$\chi^2 = 0.49$	.486
Under the care of a psychiatrist or psychologist	28.2% (98)	30.8% (28)	$\chi^2 = 0.23$	.635
Depressive symptoms (Mean, SD)	17.0 (11.6)	21.1 (13.2)	$t = 2.92$	.004
Anger symptoms (Mean, SD)	8.2 (3.4)	10.2 (4.8)	$t = 3.71$	.000
Emotional support (Mean, SD)	3.4 (0.6)	3.3 (0.8)	$t = 1.56$	.122

*MA = methamphetamine

Table 2

Experiences of stigma regressed on socio-demographic variables (Step 1), substance use factors (Step 2), psychosocial factors (Step 3), and treatment variables (Step 4) (N=401)^a

Variable	Step 1		Step 2		Step 3		Step 4	
	beta	sr ²	beta	sr ²	beta	sr ²	beta	sr ²
Age	-.030	.001	-.055	.002	-.015	.000	-.005	.000
Ethnicity	-.040	.002	.027	.001	.030	.000	.038	.001
Employment status	-.171***	.028	-.118*	.013	-.099	.009	-.093	.008
Living arrangement	.153**	.023	.113*	.011	.068	.004	.074	.005
Grams of methamphetamine used			-.013	.000	-.013	.000	-.011	.000
Binge use of methamphetamine			.245***	.057	.224***	.045	.214***	.041
Frequency of methamphetamine use			.045	.001	.018	.000	.019	.000
Injection use of methamphetamine			.173***	.025	.137**	.015	.109*	.009
Number of years used methamphetamine			.057	.002	.059	.003	.043	.001
Frequency of alcohol use			-.015	.000	-.011	.000	-.012	.000
Beck depression					.079	.004	.064	.002
Anger symptoms					.142**	.014	.149**	.015
Emotional support					-.111*	.011	-.127**	.015
Ever in treatment for methamphetamine use							.142**	.018
Taking antiretroviral medications							.014	.000
Under the care of a psychiatrist or psychologist							.002	.000
R ²	.060		.154		.204		.222	
Multiple R	.244		.392		.451		.471	
Adjusted R	.050		.132		.177		.190	
F (df)	6.29***	(4,396)	7.10***	(10,390)	7.62***	(13,387)	6.86***	(16,384)

beta = standardized regression coefficient

b₃₇ cases missing data

* p < .05

***
p < .01

***
p < .001 (2-tailed tests).

^aCorrelations among independent variables in the regression ranged from -0.26 to 0.53.