Life events and sexual risk among HIV-negative heterosexual methamphetamine users

Shirley J. Semple, Ph.D.[1], **Steffanie A. Strathdee, Ph.D.**[2], **Jim Zians, Ph.D.**[1], and **Thomas L. Patterson, Ph.D.**[1,3]

[1]Department of Psychiatry, University of California, San Diego

[2]Department of Family and Community Medicine, University of California, San Diego

[3]Department of Veterans Affairs Medical Center, San Diego

Abstract

Identifying psychosocial factors associated with sexual risk behavior among methamphetamine users is essential to enhancing HIV/STI prevention. Our study examined the relationship between positive and negative life events and sexual risk behavior in a sample of 100 HIV-negative, heterosexually identified methamphetamine-using men and women. Negative life event categories included: death of a significant other; negative health event involving self or significant other; and child custody/visitation issues. Categories of positive life events included: birth or pregnancy involving self or significant other; positive relationship event; and positive life change. Multivariate analyses demonstrated that negative life events were positively associated with total number of unprotected sex acts, whereas positive life events were not associated with sexual risk-taking. Also, amount of methamphetamine used did not moderate the relationship between life events and sexual risk behavior. These data support future research to identify underlying mechanisms that link negative life events to sexual risk-taking in this high-risk population.

Introduction

Methamphetamine use rates are high both nationally and worldwide (Iritani, Hallfors, & Bauer, 2007; World Drug Report, 2007). Widespread use of this drug has been documented among men who have sex with men (MSM) and heterosexuals, especially in Western U.S. states (e.g., Halkitis, Parsons, & Stirratt, 2001; Molitor, Truax, Ruiz, & Sun, 1998; Reback, 1997; Semple, Patterson & Grant, 2004).

Although studies on methamphetamine use involving heterosexuals are few in number, they have consistently yielded an association between methamphetamine use and high-risk sexual behaviors. For example, a population-based study of heterosexual male methamphetamine users in California reported a strong association between methamphetamine use, sex with anonymous and casual female partners, anal intercourse, and sex with an injection drug user (Centers for Disease Control and Prevention, 2006). In another study of heterosexual encounters, methamphetamine use was associated with unprotected anal sex and unprotected sex with a new partner (Zule, Costenbader, Meyer, & Wechsberg, 2007).

High-risk sexual behaviors associated with methamphetamine use have been implicated in increasing rates of HIV and other sexually transmitted infections (STIs) among MSM

Corresponding Author: Thomas L. Patterson, Ph.D., Department of Psychiatry (0680) University of California, San Diego 9500 Gilman Drive, La Jolla, CA 92093-0680 Phone: 858-534-3354 Fax: 858-534-7723 E-mail: tpatterson@ucsd.edu.

(Centers for Disease Control, 2004; Drumright, Patterson, & Strathdee, 2006); it is likely that a similar trend will emerge among heterosexual methamphetamine users. Thus, to develop effective HIV/STI prevention approaches, it is critical to identify psychosocial factors or targets associated with sexual risk behavior among methamphetamine-using heterosexuals (Sheeran, Abraham, & Orbell, 1999).

Negative life events and health outcomes

Negative or stressful life events have been associated with a variety of health outcomes. For example, there is an abundance of literature that identifies negative or stressful life events as a risk factor for substance use among adolescents, college students, and adults (He, Kramer, Houser, Chomitz, & Hacker, 2004; Nation & Heflinger, 2006; Perreira & Sloan, 2001; Taylor, 2006). Other adverse health outcomes associated with stressful life events include drug overdose (Neale & Robertson, 2005), suicide attempts (O'Hare, Sherrer & Shen, 2006), depression (Kohn et al., 2001), and reduced quality of life (Han et al., 2006). To date, there is a paucity of research on negative life events and sexual risk outcomes among adults.

Positive life events and health outcomes

A limited number of studies have examined positive life events in relation to health outcomes. Most of the work in this area has focused on mental health outcomes. In a large-scale, community-based study, positive life events were associated with positive adjustment (Zautra & Simons, 1979). High levels of subjective happiness have also been associated with positive life events such as starting a new relationship, pregnancy, and educational achievement (Ballas & Dorling, 2007). In a study of life events among adolescents with psychiatric diagnoses, patients with major depressive disorder had significantly fewer positive events compared to control subjects (Horesh, Ratner, Laor & Toren, 2008). In studies of the elderly, positive life events have been associated with better quality of life and reductions in depressive symptoms (Grimby & Svanborg, 1996; Krause, 1988). To our knowledge, no studies have examined positive life events in relation to sexual risk behaviors among adults.

How might negative life events be associated with higher levels of sexual risk taking among methamphetamine users?

Negative life events are typically associated with unpleasant emotions and substance use is a common strategy for regulating mood (Reynolds et al., 2005). The "self-medication" hypothesis contends that individuals use substances to avoid or reduce the distress associated with negative emotions (Khantzian, 1985; Reynolds, Mezey, Chapman, Wheeler, Drummond, Baldacchino, 2005). Studies that have examined motivations associated with methamphetamine use indicate that it is often used to avoid or escape negative emotions (Halkitis, Mukherjee, & Palamar, 2007, Semple, Patterson, & Grant, 2002). McKirnan, Vanable, Ostrow, and Hope (2001) found that among gay and bisexual men who combined drugs and sex, risky sexual behavior was greater among those who had stronger expectancies that substances facilitated sexuality and cognitive escape from HIV awareness. We proposed a similar cognitive escape model whereby methamphetamine users may engage in sexual risk behavior to escape from negative affect associated with negative life stressors.

How might positive life events be linked to sexual risk behavior among methamphetamine users?

Positive life events can lead to celebration or partying. For example, birthdays, holidays, personal achievements, sporting events, etc. are associated with "celebration intoxication" whereby individuals engage in heavy drinking or use of other substances to celebrate an

important life event or milestone (Neighbors, Spieker, Oster-Aaland, Lewis & Bergstrom, 2005). Sexual encounters linked to the celebration of positive events have been identified as a situational factor associated with risky sexual behaviors (von Sadovszky, Keller, Vahey, McKinney, et al., 2003). Since methamphetamine use enhances social behavior and reduces inhibitions (Clemens, McGregor, Hunt, & Cornish, 2007), we hypothesized that use of this drug in the context of a positive life event would be associated with increased sexual risk behaviors.

The primary objective of this study was to determine if positive and negative life events are associated with sexual risk behavior in a sample of heterosexual methamphetamine users. A secondary objective was to determine whether methamphetamine use moderates the relationship between life events and sexual risk behavior. We hypothesized an interactive effects model whereby life events would interact with methamphetamine use, such that higher levels of methamphetamine use in the context of either a positive or negative life event would be associated with significantly higher levels of sexual risk behavior.

Methods

Sample Selection

These analyses used baseline data from a sample of 100 HIV-negative, heterosexually-identified men and women who were enrolled in a sexual risk reduction intervention. This behavioral intervention targeting heterosexual methamphetamine users was developed in response to increasing rates of methamphetamine use in San Diego County between 2001 and 2005 (Pollini & Strathdee, 2007). The intervention was designed to reduce problem behaviors in three areas -- sexual risk practices, depressive symptoms, and methamphetamine use. The protocol is a nine session, individual counseling program that uses motivational interviewing concepts (Miller & Rollnick, 1991), social cognitive strategies (Bandura, 1986), and cognitive behavioral therapy (Beck et al., 1979) to promote positive behavior change in each of the three targeted areas. Eligible participants were male or female, at least 18 years of age, self-identified as heterosexual, and reported having unprotected vaginal, oral or anal sex with at least one opposite-sex partner in the previous two months. Participants also had to report using methamphetamine at least twice during the past two months, and at least once in the past 30 days. The following exclusion criteria were adopted by the project: not sexually active or always used condoms with all partners in the past 2 months; had unprotected sex with a spouse or steady partner only (i.e., monogamous relationship); trying to get pregnant or trying to get partner pregnant; psychiatric diagnosis with current psychotic symptoms or suicidal ideation; and currently enrolled in a formal outpatient or residential drug treatment program. Participants who scored 3 or less on the 7-item Beck Depression Inventory-Fast Screen (BDI-SF) (Beck, Steer & Brown, 2000) for medical patients were also excluded because these individuals were considered inappropriate for participation in the mood regulation component of the intervention. The research protocol was reviewed and approved by a federally accredited Institutional Review Board (IRB).

Procedures

All participants completed a baseline assessment and nine weekly 60-minute one-on-one counseling sessions. Three sessions were devoted to each targeted behavior domain, including mood management, sexual risk reduction, and methamphetamine cessation/harm reduction. The counseling modules were structured so that all participants were exposed to the same content in a specified sequence. However, the protocol had a built-in flexibility such that barriers to safer sex and triggers of risky behavior could be problem-solved according to the individual's personal situation. Follow-up assessments were conducted at

6-, 12, and 18-months post-baseline. The baseline interview covered a range of topics including socio-demographic characteristics, drug and alcohol use patterns, sexual risk behavior, mood, social cognitive factors, attitudes, intentions, social norms, social support, self-esteem, and family relations. Participants were paid $30 for their baseline assessment and first counseling session, $20 for each subsequent counseling session, and $25 for each follow-up assessment. All study measures were administered through audio-CASI technology (Turner et al., 1998).

Recruitment

A primary recruitment strategy involved a large-scale poster campaign. Outreach workers placed posters in neighborhoods known to have high concentrations of methamphetamine users. The project also implemented a media campaign of weekly advertisements in local magazines and newspapers. Another recruitment strategy involved referrals from case managers and program staff at social service and public health agencies. Participants were also referred to the project through family, friends, and enrolled participants.

Measures

Life Events—Life events were assessed through participant self-report. Participants were asked the following question: "In the past six months, have you experienced any negative life events? By negative life event, we mean something that happened that had a negative impact on you at the time it occurred." For an affirmative response, participants were asked the following open-ended question: What was the negative event that happened in the past six months? The same set of questions was used in relation to positive life events in the past six months. Positive life events were defined as follows: "By a positive life event, we mean something that happened that had a positive impact on you at the time it occurred." The audio-CASI program allowed participants to record multiple negative and positive life events occurring within the six-month timeframe.

Sexual Risk Behavior—Sexual risk behavior was defined as unprotected vaginal, oral, or anal sex with an opposite sex partner. Three categories of partner type were assessed: steady (e.g., spouse, boyfriend); casual (e.g., one-night stand); and anonymous (e.g., someone in the park). For each category of partner type, participants were asked how many times during the past two months they engaged in: (a) receptive vaginal sex (for women only); (b) insertive vaginal sex (for men only); (c) receptive oral sex; (d) insertive (give) oral sex; (e) insertive anal sex (for men only); and (f) receptive anal sex (for women only). For each type of sex, participants were asked a follow-up question to determine the number of times a condom or dental dam was used. In the present study, a summary variable was created to represent total number of unprotected sex acts in the previous two months.

Socio-demographic Characteristics—Age was treated as a continuous variable. Education, ethnicity, marital status, and living arrangement were treated as categorical variables. Gender, employment status, and income were dummy coded variables.

Methamphetamine Use—Methamphetamine use was measured by participant self-report. Participants were asked the following question: "During the past 30 days, how much methamphetamine did you use? Multiple units of measurement were provided (e.g., grams, 8-ball, dime bag, ounce, tiner, line). Unit of measurement and quantity used were converted to number of grams of methamphetamine consumed in the past 30 days (e.g., 8-ball = 3.5 grams, ounce = 16 grams).

Depressive Symptoms—Depressive symptoms were assessed using the Beck Depression Inventory (BDI-II) (Beck, Steer & Brown, 1996). The BDI-II is composed of 21

items. 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 for the BDI-II in this sample was 0.91.

Statistical Analysis—The distribution of each variable was examined prior to analyses. Number of grams of methamphetamine used in the previous 30 days and total unprotected sex yielded positively skewed distributions. To correct for skewness in the data, log 10 transformations were performed on these two variables. Because this common transformation does not repair all skewed distributions (Schroder, Carey & Vanable, 2003, p.10), we performed a Kolmogorov-Smirnov test of normality on the transformed variables. The non-significant finding in relation to the dependent variable (p=.077) indicates that the transformed number of unprotected sex acts approaches a normal distribution. Conversely, the transformed number of grams of methamphetamine yielded a non-normal distribution (p = .02). T-tests and contingency table analysis were used to examine gender differences in continuous and categorical variables, respectively. Multiple regression analysis was used to examine the additive and interactive effects of life events on sexual risk behavior. To eliminate alternative hypotheses regarding the relationship between life events and sexual risk behavior, these analyses controlled for variables that were correlated with the outcome. The following control variables were selected from those found in previous studies to influence sexual risk behavior: gender, depressive symptoms, and amount of methamphetamine used in the past 30 days (e.g., Lykins, Janssen & Graham, 2006; Semple, Grant, & Patterson, 2004; Zule, Costenbader, Meyre, & Wechsberg, 2007). In our previous work with heterosexuals, amount of methamphetamine used was negatively associated with intentions to engage in AIDS protective behaviors (Semple, Grant & Patterson, 2006), and positively associated with a lower stage of change in relation to condom use (Semple, Patterson & Grant, 2004).

Results

Sample Description

Participants were predominately African American or Latino (60%), never married (58%), living with another adult in a non-sexual relationship or living alone (45%), unemployed (77%), with a high school diploma or less (65%), and an income of less than $10,000 per year (70%). Gender composition of the sample was 55% male and 45% female. The average age was 36.8 years (SD=10.1, median 37.0, range 18-68). Mean number of grams of methamphetamine used in the past 30 days was 9.9 (SD= 12.6, median = 4.4). The mean number of unprotected sex acts in the past two months was 72.2 (SD= 89.5, median = 40.5). The mean score on the Beck Depression Inventory was 23.1 (SD=11.9, median = 23.0). Three gender differences were identified. Females were significantly more likely to be married than males. Males reported a significantly greater number of unprotected sex acts and more grams of methamphetamine use in the past 30 days compared to females. Sample characteristics are presented in Table 1.

Description of negative and positive life events

Eight categories of negative life events were identified through thematic analyses (Miles & Huberman, 1984). Categories of negative life events (in rank order) were: 1) death of significant other (29.1%); 2) negative health event involving participant or significant other (14.5%); 3) relationship problems (12.7%); 4) child custody/visitation issues (12.7%); 5) financial problems (10.9%); 6) legal trouble involving participant or significant other (9.1%); 7) participant or significant other victim of violence (5.5%); and 8) negative life change (5.5%). Table 2 shows categories (and examples) of negative life events by gender.

Males and females did not differ in the percentage reporting a negative life event in any category ($\chi2 = 10.1$, df = 7, p > .05).

Five categories of positive life events were also identified through thematic analyses. Categories of positive life events were (in rank order): 1) birth or pregnancy involving participant or significant other (34.0%); 2) positive relationship event (21.3%); 3) positive life change (21.3%); 4) positive family event (17.0%); and 5) improvement in finances (6.4%). Males and females did not differ in the percentage reporting a positive life event in any category ($\chi2 = .712$, df = 4, p >.05) (see Table 2).

We also examined descriptive statistics for risk variables broken down by negative and positive life events. For negative life events, the mean, standard deviation and median number of grams of methamphetamine used in the past 30 days were 8.4, 10.2, and 5.0, respectively. For positive life events, the mean, standard deviation, and median were 10.2, 12.5, and 5.3, respectively. A similar analysis was conducted in relation to unprotected sex acts. For negative life events, the mean, standard deviation, and median number of unprotected sex acts were 53.6, 50.1, and 29.0, respectively. For positive life events, the mean, standard deviation and median number of unprotected sex acts were 38.8, 51.2, and 12.0, respectively.

Life events and sexual risk behavior

A hierarchical regression was used to examine the effects of positive and negative life events on sexual risk behavior. In step one, total unprotected sex (log 10 transformed) was regressed on three control variables (gender, number of grams of methamphetamine used in the past 30 days, and depressive symptoms). In step 2, positive and negative life events were added to the regression model. In step 3, we tested for the moderating effects of methamphetamine use by including two interaction terms in the model (e.g., negative life events x number of grams of methamphetamine). Regression results are presented in Table 3. In the final model, negative life events were positively associated with total unprotected sex. Positive life events were not associated with total unprotected sex. Gender was the only other significant predictor in the equation. Being male was associated with more unprotected sex. The non-significant interaction terms indicate that methamphetamine dose did not moderate the relationship between negative or positive life events and sexual risk behavior.

As previously noted, number of grams of methamphetamine revealed a skewed distribution despite a log10 transformation. Thus, to address reliability of the regression results, we re-ran the model with amount of methamphetamine removed from the equation. The substantive findings did not change; that is, negative life events and gender continued to yield significant relationships with total unprotected sex.

Discussion

This study provides support for the hypothesis that exposure to negative life events is associated with higher levels of unprotected sex in a sample of heterosexual methamphetamine users. Our data do not provide an explanation for this association; however, at least two pathways are plausible. First, the link between negative life events and sexual risk behavior is consistent with a "self-medication" hypothesis (Khantzian, 1985). That is, individuals who experience a negative life event may attempt to escape or ameliorate unpleasant emotions by engaging in activities that are deemed pleasurable, such as substance use and uninhibited sexual behaviors. An alternative explanation suggests that protective health practices, such as condom use, might be judged as unimportant in the face of negative life events. We contend that the most fruitful direction for future studies is the identification of underlying mechanisms that link negative life events to sexual risk

behavior. Studying the process of when, how, and why will help researchers to identify potential points of intervention to prevent or reduce high-risk sexual behaviors associated with negative life events.

Future studies should also attempt to identify characteristics of individuals who may be "at risk" for stress-induced exacerbations in sexual risk behavior. Drug users may be particularly vulnerable. Garrity et al. (2006) found that negative life events were independently associated with subjective stress and risk behaviors, including increased substance use and criminal activity, in a sample of active drug users. It may be equally important to identify protective factors in relation to negative life events and their consequences. For example, Bonnano, Galea, Bucciarelli, and Vlahov (2007) reported that resilience in the face of traumatic life events was associated with gender, age, education, level of traumatic exposure, social support, as well as recent and past stressors. Protective factors may represent avenues of intervention in the treatment process.

These results suggest that treatment providers should address negative life events in the context of HIV/STI prevention programs. One treatment approach would be to focus on the development of effective coping strategies. For example, cognitive and behavioral programs have been shown effective in terms of reducing subjective stress and its consequences (e.g., Antoni et al., 2006). Treatment programs that are designed to enhance self-esteem, and develop communication, assertiveness, and negotiation skills may also be effective in managing the adverse impact of negative life events on sexual risk behavior.

Our hypothesis regarding the association between positive life events and sexual risk behavior in the target population was not supported. This result suggests that "celebration intoxication" (i.e., using substances to the point of intoxication to celebrate positive events) is not a pathway through which methamphetamine users in this sample engaged in sexual risk behavior. However, alternative interpretations are possible. Our measure of positive life events did not capture the extent to which the event was associated with a celebratory response. For example, "getting a place to live" may be more strongly associated with relief than celebration, particularly if the form of housing acquired is substandard. Future tests of the "celebration intoxication" hypothesis should rate the celebratory nature of the positive life event or distinguish between events that are celebratory and non-celebratory.

Contrary to expectation, amount of methamphetamine used did not moderate the relationship between negative life events and sexual risk behavior. The direct and independent effect of negative events on the outcome of interest suggests that negative life events exert a deleterious influence at all levels of methamphetamine use. Clinicians who work with methamphetamine users, regardless of their level of dependence or addiction, should pay attention to client reports of negative life events, and follow-up with an assessment to determine if there has been any increase in the individual's sexual risk behavior.

Additional Research Directions

This study distinguished between positive and negative life events and independently examined their effects on sexual risk behavior. Other characteristics of life events or stressors that need to be considered include the duration of the event, the event domain, and health-relatedness of the event. For example, in a study of substance use patients, Tate, McQuaid, and Brown (2005) found that long-term, non-health stressors had the strongest association with post-treatment substance use. It is also important to consider whether the life event is confounded with the substance of use. For example, Hart and Fazaa (2004) reported that higher levels of alcohol use were more strongly associated with life events that were judged to be a likely consequence of alcohol use compared to life events that were

unlikely to be related to alcohol use. Other researchers have suggested the importance of distinguishing between controllable and uncontrollable life events, particularly since these two types are associated with different bio-behavioral responses (McCown, Fink, Galina, & Johnson, 1992).

Future studies should also examine lifetime exposure to negative events since this factor may be an important determinant of sexual risk behavior and other adverse health outcomes. Hebert, Rose, Rosengard, Clarke, & Stein (2007) found that cumulative exposure to trauma rather than type of trauma was associated with a range of psychological and behavioral outcomes. Specifically, women who had greater lifetime exposure to trauma had significantly higher levels of sexual risk behavior, substance use problems, and medical and psychological health conditions. Although the negative life events reported in this study may not meet clinical criteria for trauma diagnosis, it is not unreasonable to suggest that future studies should examine the impact of lifetime exposure in relation to sexual risk behavior.

In this research, sexual risk behavior was conceptualized as a stress response to negative life events. It is also plausible that some individuals have a personality trait or propensity to engage in risky behavior (Desrichard & Denarie, 2005; Moore et al., 2005). The stress response position is supported, to some extent, by research on stress reactivity and sexual risk-taking. Halpern, Campbell, Agnew, Thompson, & Udry (2002) reported that sexual and nonsexual stressors elicited increased cortisol release in young adult males. Cortisol response, in turn, was associated with participants' reports of sexual risk-taking (i.e., greater number of lifetime partners and decreased frequency of condom use). Further research is needed to address this conceptual issue.

Study Limitations

This study contributes to HIV prevention research by focusing on the understudied link between life events and sexual risk behavior in a sample of drug users. Despite this strength, a number of limitations warrant discussion. Foremost, the generalizability of the findings may be limited by the volunteer nature of the sample and specific eligibility criteria, which could have resulted in a cohort of individuals who had more depressive symptoms, higher levels of methamphetamine use, greater exposure to negative life events and more sexual risk behavior compared to methamphetamine users in general as well as non-using heterosexuals. To underscore the importance of this point, a recent study demonstrated that not all methamphetamine users engage in risky sexual behavior and not all those who engage in risky sex use methamphetamine (Grov, Parsons, & Bimbi, 2008). Moreover, our measurement approach did not include a rating of each life event in terms of associated distress, and the sample size precluded our ability to examine risk behaviors at the level of specific life events. The sample size also limited our ability to test hypotheses related to specific sexual behaviors (i.e., oral, anal, vaginal sex), including insertive and receptive acts. Further, this study is limited by the lack of a control group of non-methamphetamine users, which would allow us to examine the relative contribution of life events versus methamphetamine use to unprotected sex. Also, a stronger research design would be one that directly links amount of methamphetamine used with specific types of partners and sexual acts. A statistical issue involved the non-normal distribution of amount of methamphetamine used. Although significance tests are relatively robust to assumption failure in linear regression (Cohen et al., 2003, p.96), alternative transformations or non-parametric analytic techniques should be considered in future studies with non-normally distributed variables. Finally, the cross-sectional design of this study makes it impossible to determine directionality or causality between negative life events and sexual risk behavior. Future research should use prospective data and longitudinal analyses to examine causality and bi-directional causation in this relationship.

Concluding Remarks

These findings suggest that methamphetamine users may engage in risky sex as a response to negative life events. It is also plausible that the lifestyle of these substance users exposes them to more negative life stressors. The high prevalence of negative life events in this sample suggests that further investigation of the link between negative life events and sexual risk behavior will prove fruitful in the public health battle against rising HIV/STI rates among methamphetamine users.

Acknowledgments

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Table 1

Sample characteristics of HIV-negative, heterosexual methamphetamine users by gender (N=100)

VARIABLE	Male (N = 55)	Female (N = 45)	Test Statistic	p-value
Age in years (Mean, SD)	37.5 (10.0)	36.0 (10.2)	t = .75	p > .05
Ethnicity				
Caucasian	27.3%	26.7%		
African American	36.4	31.1	$\chi^2 = .47$	p > .05
Latino	23.6	28.9		
Other	12.7	13.3		
Education				
Less than high school	20.0%	40.0%		
High school or equivalent	45.5	24.4		
Some college or 2-year degree	29.1	33.3	$\chi^2 = 7.6$	p > .05
College degree	3.6	2.2		
Advanced degree	1.8	0.0		
Marital Status				
Never Married	67.3%	46.7%		
Married	1.8	17.8	$\chi^2 = 9.0$	p < .05
Separated	10.9	13.3		
Divorced	20.0	22.2		
Living Arrangement				
With spouse/steady	21.8%	24.4%		
With other adults	29.1	31.1		
Alone	21.8	6.7	$\chi^2 = 5.8$	p > .05
Homeless	12.7	11.1		
Other	14.5	26.7		
Income				
< = $19,999	87.3%	91.1%		
> $19,999	12.7	8.9	$\chi^2 = .37$	p > .05
Percent Employed	23.6%	22.2%	$\chi^2 = .03$	p > .05
Number of unprotected sex acts in past 2 months (Mean, SD)	89.8 (94.3)	50.7 (79.1)	t = 3.1	p < .01
Number grams of methamphetamine used in past 30 days (Mean, SD)	12.0 (14.5)	7.2 (9.3)	t = 2.2	p < .05
Beck depression scores	21.9 (11.3)	24.6 (12.7)	t = 1.1	p < .05

Table 2

Negative and positive life events reported in the previous six months

Negative life event category	Males	Females
Relationship problems e.g., breakup with boyfriend	7.7%	17.2%
Child custody/visitation issues (e.g., lost custody of son)	11.5%	13.8%
Death of significant other (e.g., father died)	38.5%	20.7%
Negative health event for participant or significant other (e.g., participant miscarried)	15.4%	13.8%
Legal trouble for participant or significant other (e.g., arrested for public disturbance)	3.8%	13.8%
Financial problems (e.g., lost home)	19.2%	3.4%
Participant or significant other victim of violence (e.g., abused by boyfriend)	3.8%	6.9%
Negative life change (e.g., forced to move)	0.0%	10.3%
Positive life event category		
Positive relationship event (e.g., reconnected with daughter)	20.8%	21.7%
Birth or pregnancy for participant or significant other (e.g., grandchild was born)	33.3%	34.8%
Improvement in finances (e.g., won money at the casino)	4.2%	8.7%
Positive family event (e.g., daughter married)	16.7%	17.4%
Positive life change (e.g., got a place to live)	25.0%	17.4%

Table 3

Total number of unprotected sex acts[a] regressed on life events and life events times methamphetamine use interaction terms controlling for gender, depressive symptoms, emotional support, and methamphetamine use[a], (N=99)[b]

	Step1 beta	sr^2	Step 2 beta	sr^2	Step 3 beta	sr^2
Gender (male = 0, female = 1)	-.26**	.062	-.30**	.081	-.28**	.067
Depressive symptoms	-.01	.000	-.03	.001	-.04	.001
Grams of methamphetamine used in past 30 days	.18	.032	.17	.028	.16	.025
Positive life event			.04	.001	.03	.001
Negative life event			.24*	.047	.23*	.046
Positive life event x methamphetamine use					-.04	.001
Negative life event x methamphetamine use					-.04	.001
Constant	1.80***		1.93***		1.91***	
R^2	.12		.18		.18	
Adjusted R^2	.09		.14		.12	
Multiple R	.35		.42		.43	
R^2 change	.12**		.06*		.00	
$F_{(3,95)}$	4.3**					
$F_{(5,93)}$			4.0**			
$F_{(7,91)}$					2.9**	

*
$p<0.05$

**
$p<0.01$

***
$p<0.001$

[a] log 10 transformed variable

[b] One case missing methamphetamine use data