Published in final edited form as:

J Soc Serv Res. 2015 ; 41(1): 39–48. doi:10.1080/01488376.2014.935559.

Predictors of Abstinence Self-Efficacy: Examining the role of HIV-risk Sexual Behavior

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Abstract

Abstinence self-efficacy, or the confidence in one's beliefs in one's ability to effectively engage in behaviors to maintain substance use abstinence, is a crucial recovery resource. However, little research has been conducted on what predicts increases in this recovery resource. Understanding predictors of abstinence self-efficacy could help social service practitioners in creating effective treatment plans/interventions while extending what is presently known in this small body of research. Predictors of abstinence self-efficacy were analyzed among a sample of ex-offenders (224 men and 46 women) who were completing inpatient treatment for substance use disorders. Hierarchical linear regression was conducted to examine changes in participants' abstinence self-efficacy in relation to factors directly related (HIV-risk drug use behaviors, substance use, 12-step meeting attendance) and indirectly related (HIV-risk sexual behaviors, incarceration histories) to substance use. HIV-risk sexual behaviors and substance use predicted significant decreases in abstinence self-efficacy whereas 12-step meeting attendance predicted significant increases. However, incarceration histories and HIV-risk drug use behaviors were not significant predictors of abstinence self-efficacy. Findings suggest HIV-risk sexual behavior should be considered when assessing relapse prevention for persons with substance use disorders, and that researchers should examine behaviors that are not directly related to substance use when investigating recovery resources.

Keywords

abstinence self-efficacy; HIV-risk sexual behaviors; incarceration histories; ex-offenders; substance use

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All work related to this investigation was done within the United States of America.

Introduction

Persons with substance use disorders are at risk for a number of problems including HIV-risk, and there are a number of investigations that have examined intriguing relationships between substance use-specific behaviors (e.g., sharing needles, substance use) and HIV-risk. Many investigations on HIV-risk use measures that assess two categories of HIV-risk behaviors: sexual and drug use behaviors. Most research has examined HIV-risk sexual and drug use behaviors as outcomes, and little is known regarding their predictive qualities in relation to recovery resources among persons with substance use disorders.

In addition, some studies have examined self-efficacy (Bandura, 1997) as a resource in relation to goal-oriented behaviors, such as safer sexual practices (e.g., condom use self-efficacy) in HIV research. However, this is not the same as self-efficacy for abstinence, or abstinence self-efficacy; the confidence in one's belief in one's ability to effectively engage in behaviors for maintaining ongoing abstinence. Most investigations have examined outcomes in relation to this recovery resource, yet some investigators have turned their attention to identifying predictors of abstinence self-efficacy in recent years. However, because drug use and sexual practices are often intertwined among persons with substance use disorders, there is a need to examine whether HIV-risk sexual and HIV-risk drug use behaviors are related to abstinence self-efficacy. There are no previous investigations on this subject to our knowledge, and we believe it is important to extend the small body of research on predictors of abstinence self-efficacy.

The present study examined predictors of abstinence self-efficacy among 270 persons with substance use disorders in hopes of uncovering factors that could be addressed by social service practitioners as a means to inform treatment interventions, and to encourage researchers to extend this small body of research by examining direct and indirect factors of abstinence self-efficacy. We examined factors that are directly and indirectly related to substance use and found one indirect factor to be a significant predictor of abstinence self-efficacy. These included HIV-risk drug use behaviors, substance use, and 12-step meeting attendance as direct factors and HIV-risk sexual behaviors and incarceration histories as indirect factors. We hope findings from our investigation will encourage other researchers to more closely examine the sex-drug relationship among persons with substance use disorders as a way of gaining insights into bolstering important resources for ongoing recovery such as abstinence self-efficacy.

Literature Review

Abstinence self-efficacy is a construct based on Bandura's (1997) self-efficacy theory that is regarded as an important treatment consideration for relapse prevention (Annis & Davis, 1991; Marlatt & Gordon, 1985). Clinical investigations have found abstinence self-efficacy to predict future abstinence (Chavarria, Stevens, Jason, & Ferrari, 2012; Greenfield, Hufford, Vagge, Muenz, Costello, & Weiss, 2000; Johnson, Finney, & Moos, 2006), with decreased alcohol consumption at 16 years follow-up in one investigation (Moos & Moos, 2007).

Abstinence self-efficacy has been found to be bolstered by involvement in 12-step groups such as Alcoholics Anonymous and Narcotics Anonymous (Bogenschutz, Tonigan, & Miller, 2006; Ilgen, McKellar, & Moos, 2007; Majer, Jason, Ferrari, & Miller, 2011; Moos & Moos, 2007). One 8-year outcome study (Moos & Moos, 2004) found continued twelve-step meeting attendance was related to increases in both abstinence self-efficacy and abstinence. However, there are very few studies that have examined predictors of abstinence self-efficacy other than 12-step involvement.

Other predictors of abstinence self-efficacy that have been examined include social support, coping skills, impulsivity (McKellar, Ilgen, Moos & Moos, 2008), coping skills and stress management training (Ilgen et al., 2007) and depressive symptoms (Greenfield, Venner, Kelly, Slaymaker, & Bryan, 2012). Identifying predictors of abstinence self-efficacy has important treatment implications, especially among ex-offenders who have high rates of substance use.

For instance, Keene (1997) found that the rate of substance use within correctional facilities was approximately the same (74–82%) as inmates' report of substance use prior to incarceration, suggesting that traditional treatment interventions for substance use disorders in correctional settings do not have far reaching effects for released offenders. Substance use is perhaps the greatest predictor of recidivism among offenders (Broome, Knight, Hiller, & Simpson, 1996), and this might provide some explanation as to why many offenders repeatedly go through the criminal justice system.

In addition, substance use has been associated with increased HIV-risk sexual behavior across samples of incarcerated persons (Sacks et al., 2008; Valera, Epperson, Daniels, Ramaswamy & Freudenberg, 2009). Incarcerated persons report high rates of HIV-risk sexual behavior (Alemagno, Stephens, Stephens, Shaffer-King, & White, 2009; Leukefeld et al., 2012), and a recent longitudinal investigation (Knittel, Snow, Griffith, & Morenoff, 2013) found substance use and incarceration histories predicted increased HIV-risk sexual risk behavior.

Taken together, findings across studies suggest that abstinence self-efficacy and 12-step groups are resources that promote abstinence whereas HIV-risk sexual behavior and incarceration histories are related to relapse among substance dependent persons. In addition, most investigations have examined abstinence self-efficacy as a predictor whereas little is known about what predicts abstinence self-efficacy apart from 12-step involvement. It is reasonable to suspect that HIV-risk sexual behavior and incarceration histories are related to abstinence self-efficacy because these factors have been associated with substance use across studies. Examining HIV-risk sexual behavior and incarceration histories as potential predictors of abstinence self-efficacy would extend our knowledge of areas for abstinence self-efficacy enhancement through clinical interventions (Kadden & Litt, 2011).

There is a need to examine whether HIV-risk sexual behavior and incarceration histories predict (decreased) abstinence self-efficacy beyond what might be expected from substance use and 12-step meeting attendance. The present study examined current HIV-risk sexual behavior and incarceration histories, together with recent substance use and 12-step meeting

attendance, in relation to abstinence self-efficacy among a sample of ex-offenders receiving inpatient treatment for substance use disorders. We hypothesized that substance use, current HIV-risk sexual behavior, and incarceration histories would predict significant decreases in abstinence self-efficacy, whereas 12-step meeting attendance would predict significant increases.

Methods

Participants

Two hundred, seventy adults (224 men and 46 women) with a mean age of 40.4 ($SD = 9.5$) years were recruited from inpatient treatment centers in northern Illinois, in the United States. The largest proportion of participants were single (85%), and in terms of race, the majority (74.1%) of participants were Black/African-American, 21.1% were White/Anglo-American, 3.3% were Latino/a-American, and 1.5% reported other racial groupings.

Most participants reported having been unemployed (32.7%), in a controlled environment (27.7%), or employed either part-time (25.4%) or full-time (11.2%) in the past three years. Participants reported an average total monthly income of \$367.85 ($SD = 709.66$) with an average of 10.9 ($SD = 1.9$) years of education. Participants reported an average of 6.3 ($SD = 13.7$) prior convictions, an average of 9.9 ($SD = 17.4$) incarcerations, with a lifetime average rate of 77.2 ($SD = 79.2$) months incarcerated. In terms of substances use, the majority (41.4%) reported a history of using heroin/opiates, followed by cocaine (27.8%), alcohol (12.8%), polysubstance use (11.3%), and cannabis (6.4%), with 7% of the sample reporting injection drug use.

Procedures

The present investigation was proposed to and approved by an institutional review board. All participants were recruited through inpatient treatment facilities for substance use disorders or reentry/case management programs. Ninety-three percent of the participants ($n = 251$) were recruited from inpatient treatment facilities where they were receiving inpatient services. Five percent of the participants ($n = 13$) were referred to the project through inpatient treatment facilities although the participants themselves were not receiving inpatient services at the time of recruitment. Two percent of the participants ($n = 6$) were referred through reentry/case management services.

Recruitment began in March of 2008 and continued through May of 2011. Participants eligible for inclusion were over the age of 18, recovering from substance use disorders, and had been released from prison or jail within the past 24 months. Research staff partnered with clinical staff employed at inpatient treatment centers in the northern Illinois area that identified potential participants for the present study. Participants met face-to-face with research staff who engaged each participant in a process of informed consent prior to conducting individual interviews in a private room provided by the treatment facility, and participants were informed that they could stop the interview and/or withdraw from the study at any time without any repercussion. Research staff administered measures used in the present study (in addition to other measures used in the parent study; Jason, Olson, &

Harvey, 2014) in the form of individual interviews that lasted approximately 2 hours, and participants were given \$40 as an incentive for their involvement.

Measures

Demographics—We created a brief survey to collect sociodemographic characteristics. In addition, this brief survey solicited participants' information regarding their incarceration histories and previous treatments for substance use disorders.

Abstinence self-efficacy—We administered the *Drug-Taking Confidence Questionnaire* (DTCQ, Annis & Martin, 1985), to assess participants' confidence in resisting the urge to use drugs or alcohol across 50 hypothetical situations. The DTCQ is rooted in Bandura's (1997) cognitive behavioral self-efficacy theory, and it is based on antecedents of substance use disorder relapse (Annis & Davis, 1991). The DTCQ has been used among people with different addiction typologies (Sklar, Annis, & Turner, 1999). Because confirmatory factor analyses support the eight-factor model of the DTCQ's highly reliable subscales (.79 to .95; Sklar, Annis & Turner, 1997), we used a total confidence score in the present study by collapsing the subscale scores and averaging these scores on a scale that ranges from 0% (*not at all confident*) to 100% (*very confident*). This total score approach to calculating self-efficacy for abstinence has been effectively used in previous studies (Greenfield et al., 2000; Majer, Jason, & Olson, 2004; Miller, Ross, Emmerson, & Todt, 1989). The DTCQ had excellent reliability with the present sample (Cronbach's $\alpha = .98$).

Risk Behavior Survey (RBS)—The *Risk Behavior Survey* (RBS; NIDA, 1993), a measure derived from the Risk Behavior Assessment (NIDA, 1991), was used to collect information regarding HIV-risk sexual and drug use behaviors. The RBS consists of two sets of questions regarding sexual and drug use behaviors in the past 30 days. Due to the sensitivity of questions, participants were given the choice to self-administer the set of sexual behavior questions of the RBS. Although there is no critical cut-off score determined for significant HIV-risk behavior, endorsement of any RBS risk item may indicate unacceptable risk, with higher values (i.e., frequency of behaviors) indicating greater risk.

We independently assessed HIV-risk sexual and drug use behavior by totaling participants' frequency scores of engaging in various protected behaviors (e.g., condom use, using clean needles) and subtracting them from their total frequency scores of engaging in various unprotected behaviors (e.g., not using condoms, sharing needles) for both sexual and drug use behaviors, respectively. This provided us with two composite scores: HIV-risk sexual behavior and HIV-risk drug use behavior. It was important to distinguish these two types of risk to replicate previous findings from a recent investigation among incarcerated persons (Clark, McCullumsmith, Waesche, Islam, Francis, & Cropsey, 2013) that found high rates of HIV-risk drug use behavior in addition to HIV-risk sexual behavior. Our summary approach to assessing HIV-risk behavior in the present study is consistent with previous investigations (Kang, Deren, & Goldstein, 2002; Meade, Kershaw, Hansen, & Sikkema, 2009; Pilowsky, Wu, Burchett, Blazer, & Ling, 2011; Wilson & Widom, 2011). The internal consistency of RBS items used in the present study was fairly good for HIV-risk sexual behavior and adequate for HIV-risk drug use behavior (Cronbach's α s = .71, .60, respectively).

Substance use—We administered Miller’s (1996) *Form-90* to collect a continuous record of alcohol and drug use, and 12-step meeting attendance in the past six months. The Form-90 provides a retrospective time frame for assessment and has excellent test-retest reliability (Miller & DelBoca, 1994).

Data Analysis

A hierarchical linear regression was used to test for the influence of predictors on levels of the outcome variable (abstinence self-efficacy), entering predictors sequentially in three steps in a manner that approximated their temporal relationship to abstinence self-efficacy. Sociodemographic variables (gender and race) were first entered to control for their variance in abstinence self-efficacy because of the significantly disproportionate cases across categories of these variables. Previous substance use and 12-step meeting attendance rates (past six months), and incarceration histories (total number in months) were included in the second step. We entered these variables in the second step to control for the influence of substance use and 12-step meeting attendance while examining the role of incarceration histories. Finally, HIV-risk sexual behavior and HIV-risk drug use behavior (in the past 30 days) were included in the third step to examine their potential effects apart from potential effects of predictors in the other steps of the model. It was important to examine these HIV-risk behaviors concurrently to better understand the role of HIV-risk sexual behavior as a potential predictor of abstinence self-efficacy. We tested for potential multicollinearity between these third step predictor variables and found they were not significantly related ($r = -.05$, $p = .48$), thus they were examined together in the third step of our model.

Descriptive analyses were conducted to provide sociodemographic characteristics of the sample in addition to describing rates of substance use, 12-step meeting attendance, and total number of previous incarcerations (in months). Chi-square tests were conducted to examine proportional differences among participants based on gender and racial groupings.

Missing data—A listwise deletion approach was used to evaluate data and calculate analyses, and participants with missing data (15% of all available cases) were excluded from analyses. We utilized a listwise approach instead of imputing values that would have increased the risk of artificially reducing variance given the proportion of missing cases, as the use of true scores are ideal for multiple regression models. A missing values analysis of all the predictor and dependent variables indicated that the data were missing completely at random, Little’s MCAR test; $\chi^2(45) = 56.78$, $p = .112$, thus our listwise deletion approach to treating missing cases was a valid technique for producing relatively unbiased estimates of regression coefficients (Allison, 2009).

Results

Preliminary Analyses

Participants reported an average number of days using alcohol 20.0 ($SD = 40.7$) and drugs 44.7 ($SD = 57.4$) for a combined alcohol/drug use average of 33.33 days ($SD = 41.21$); ranging from 1–180 days over the past six months. They reported an average of 30 days ($SD = 48.7$) attending 12-step meetings in the past six months. There were proportionately more

men than women [$X^2(1, N = 270) = 117.34, p < .01$], and African-American participants than those from other racial groupings [$X^2(4, N = 270) = 532.59, p < .01$] in the sample.

Major Analyses

A hierarchical regression model was employed to test our hypotheses, and results of this model are presented in Table 1. Sociodemographic characteristics in the first step were not significant. The inclusion of substance use and 12-step meeting attendance in the second step, but not months incarcerated, contributed significantly to predicting abstinence self-efficacy, accounting for 8.7% of the variance. Substance use predicted significant decreases in abstinence self-efficacy whereas 12-step meeting attendance predicted significant increases. The inclusion of HIV-risk sexual behavior in the third step, but not HIV-risk drug use behavior, significantly contributed to predicting decreased abstinence self-efficacy by accounting for an additional 10.8% of the variance.

Discussion

The significant negative relationship between HIV-risk sexual behavior and abstinence self-efficacy suggests that engaging in risky sexual behaviors diminishes confidence in the ability to effectively engage in abstinent behaviors. HIV-risk sexual behavior might be a manifestation of sensation-seeking (Oshri, Tubman, Morgan-Lopez, Saavedra, & Ciszmadia, 2013) and/or impulsive decision-making (Charnigo, Noar, Garnett, Crosby, Palmgreen, & Zimmerman; 2012) that increases risk of relapse among substance dependent persons. Although such claims can only be verified through additional investigations, findings in the present study nonetheless point to the need for examining HIV-risk sexual behavior as a potential relapse trigger.

Paradoxically, substance use, but not HIV-risk drug use behavior, was a significant negative predictor of abstinence self-efficacy. Although the relationship between abstinence self-efficacy as a predictor of substance use outcomes is well established in addiction research, substance use as a significant predictor of decreased abstinence self-efficacy in the present study comprised of ex-offenders is consistent with research (Ilgen et al., 2007) that demonstrated increased substance use severity predicted significantly lower levels of post-treatment abstinence self-efficacy. However, what is more intriguing is that HIV-risk drug use behavior, a substance use-specific behavior, was not a significant predictor of abstinence self-efficacy in the present study. This might have been a result of the low rate of recent injection drug use similar to that of other investigations involving correctional populations (Beckwith, Liu, Bazerman, DeLong, Desjardins, Poshkus, et al., 2010; Clark et al., 2013) or indicative of a trend of decreased HIV-risk in terms of drug injection drug use, but not for sexual behavior risk, among substance dependent persons (Corsi, Kwiatkowski, & Booth, 2006).

Incarceration histories did not significantly predict changes in levels of abstinence self-efficacy. Although some research evidence (Knittel et al, 2013) suggests incarceration experiences and substance use may interact to influence increased HIV-risk sexual behavior, results in the present study extend this body of research in that substance use and HIV-risk sexual behavior, but not incarceration histories per se, predicted decreased levels of

abstinence self-efficacy. High prevalence rates of HIV-risk sexual behaviors have been observed in studies involving incarcerated populations (Alemagno et al., 2009; Leukefeld et al., 2012), thus one implication of the present study would be for future treatment investigations involving incarcerated/correctional populations to consider the role of HIV-risk sexual practices in relation to outcomes such as self-efficacy for abstinence.

Twelve-step meeting attendance was a significant predictor of increased levels of abstinence self-efficacy, consistent with previous investigations (Bogenshutz et al., 2006; Ilgen, McKellar, & Moos, 2007; Moos & Moos, 2004, 2007), suggesting that 12-step involvement is a recovery resource utilized by substance dependent persons with significant incarceration histories. Perhaps more importantly, findings from the present investigation demonstrated HIV-risk sexual behavior had greater shared variance with abstinence self-efficacy than 12-step meeting attendance and substance use. Although 12-step attendance might be a protective factor that bolsters self-efficacy for abstinence, findings in the present study suggest other factors not directly specific to substance use such as HIV-risk sexual behavior pose a serious threat in the development of this important recovery resource. Taken together, our findings are consistent with other investigations that found significant predictors of abstinence self-efficacy apart from attending 12-step groups (Greenfield et al., 2012; Ilgen et al., 2007; McKellar et al., 2008), adding to the growing body of knowledge on this subject.

Although predictors of abstinence self-efficacy might be better understood when accounting for HIV-risk sexual behavior, there are some limitations in the present study. For instance, participants' treatment experiences probably affected their levels of abstinence self-efficacy. Measuring HIV-risk in terms of the frequency of sexual and drug use behaviors in the past 30 days is only one way to measure HIV-risk when other measures including lifetime rates of behaviors, number of partners, engaging in sex work, and whether participants' sexual partners are high risk (e.g., injection drug users, sex workers) might also indicate such risk. Twelve-step meeting attendance is one way of measuring involvement in groups like AA/NA, whereas a complete or categorical approach to involvement across a number of 12-step behaviors has been demonstrated as being a better measure of such involvement (Majer, Jason, Aase, Droegge, & Ferrari, 2013; Majer, Droegge, & Jason, 2012; Majer, et al., 2011). Finally, the use of self-reported data at one time-point is another limitation of the present study, as repeated measures design might have provided more information in relation to changes in predictor variables and abstinence self-efficacy over time. Although results in the present study have implications for future research, it would be prudent for treatment providers to give serious consideration to HIV-risk sexual behavior when devising relapse prevention plans among persons with substance use disorders.

Conclusions

Most research on abstinence self-efficacy has examined it as a predictor, and the present study adds to the small body of research that has recently examined abstinence self-efficacy as an outcome variable. More importantly, our findings draw attention to the need for researchers to examine predictors of abstinence self-efficacy that are not directly related to substance use (e.g., HIV-risk sexual behaviors, incarcerations experiences) in addition to those that are directly related to substance use (e.g., HIV-risk drug use behaviors, substance

use, 12-step meeting attendance) in understanding abstinence self-efficacy. In addition, findings from our investigation suggest researchers may want to consider examining factors that are directly and indirectly related to substance use when investigating recovery resources other than abstinence self-efficacy.

The present study examined predictors of abstinence self-efficacy that have not been examined in previous investigations involving persons with substance use disorders. Our investigation is innovative in that it examined two types of HIV-risk behaviors that are frequently assessed in HIV-research, and found HIV-risk sexual behavior (but not HIV-risk drug use behavior) to predict decreases in abstinence self-efficacy apart from (increases predicted by) 12-step meeting attendance. Social service practitioners should assess for HIV-risk sexual behavior when devising relapse prevention interventions for clients with substance use disorders. Likewise, social service practitioners should consider 12-step involvement as a resource to bolster self-efficacy for abstinence among ex-offenders who have substance use disorders. In addition, the present investigation involved both men and women with considerable incarceration experiences and found that their incarceration histories did not have an impact on their levels of abstinence self-efficacy, adding to the growing body of literature on ex-offenders. Social service practitioners should consider HIV-risk sexual behaviors among this population as a more proximal variable related to recurrent substance use rather than their incarceration history, per se. Overall, findings in the present investigation suggest that HIV-risk sexual behavior should be considered when assessing relapse prevention, particularly among ex-offenders with substance use disorders.

Acknowledgments

We appreciate the financial support from the National Institute on Drug Abuse (NIDA), Bethesda, MD, USA (grant number DA13231).

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Table 1

Hierarchical Regression Analyses for Variables Predicting Abstinence Self-Efficacy

Predictor	R ²	B	SE B	β
Step 1	-.005			
Gender		1.55	4.32	.024
Race		1.22	1.48	.055
Step 2	.087***			
Substance use		-.134	.036	-.242***
Months incarcerated		.003	.020	.009
12-Step meetings		.078	.031	.163**
Step 3	.108*			
HIV-risk (sexual)		-.414	.153	-.170**
HIV-risk (drug use)		-.058	.598	-.006
Total R ²	.246			
n	231			

Note.

*
p < .05,**
p < .01,***
p < .001.