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Alcoholics Anonymous and Hazardously Drinking Women Returning to the Community After Incarceration: Predictors of Attendance and Outcome

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Abstract

Background—The number of females incarcerated within the United States has risen dramatically in recent decades and high rates of alcohol problems are evident among this population. Although little is known about the patterns of help utilization and efficacy for alcohol problems, preliminary evidence suggests that AA is a widely available resource for this population.

Methods—Data were collected as part of a study evaluating the effect of a brief intervention to reduce alcohol use among hazardously drinking (i.e., score of 8 or above on the Alcohol Use Disorders Identification Test or 4 or more drinks at a time on at least 3 days in prior 3 months) incarcerated women. The current study characterized demographic, clinical, and previous AA attendance variables associated with AA attendance in the 6-months following incarceration. Associations between frequency of AA attendance and drinking outcomes following incarceration were also evaluated.

Results—Among the 224 participants who provided data about AA attendance, 54% reported some AA attendance during the follow-up assessment period. AA attendance in the year prior to study entry (OR = 4.02; 95% CI: 3.32–4.71) and greater baseline consequences of alcohol use (OR = 2.09; 95% CI: 1.73–2.44) were associated with increased odds of higher frequency of AA attendance following incarceration. Weekly or greater AA attendance was associated with reductions in negative drinking consequences ($B = -0.45$; $p < 0.01$) and frequency of drinking days ($B = -0.28$; $p < 0.01$) following incarceration.

Conclusions—Findings from this study suggest that AA is frequently utilized by hazardously drinking women following incarceration. Alcohol outcomes may be enhanced by AA attendance at a weekly or greater frequency is associated with better alcohol outcomes relative to lower levels of AA attendance. Evaluation of clinical guidelines for prescribing AA attendance for incarcerated women remains a task for future research.

Keywords

Alcohol; alcoholics anonymous; incarceration; prison; women

Introduction

Since 1995, the number of females incarcerated within the United States has increased by more than 50% (Harrison and Beck, 2005). From 2000 to 2008, the rate of increase in incarcerated women was almost twice that of incarcerated males and it has been estimated that approximately 115,000 women were incarcerated in the United States in 2009 (West, 2010). Substance use disorders, including alcohol use disorders, among incarcerated women are prevalent (Fazel et al., 2006; Jordan et al., 1996) and may place women at higher risk for incarceration. Approximately 50% of women reported use of drugs or alcohol at the time of the arrest leading to their incarceration, and daily drinking was reported by 25% of incarcerated women in the year prior to incarceration (Greenfeld and Snell, 1999).

Alcohol use among incarcerated women is of great public health concern due to its association with numerous poor outcomes, including violent crime, mental health problems, risky sexual behavior, and chronic physical health problems (Jordan et al., 1996; Marquart et al., 1999; Stein et al., 2009). Compounding these risk factors, incarcerated women have been described as “a population ignored” with a resulting dearth of research conducted with specific attention to the treatment needs of this population (Braithwaite et al., 2008).

Substance abuse may be more highly associated with criminal behavior for women than for men (Martin and Bryant, 2001), suggesting that treatment for substance use disorders may be particularly relevant for reducing criminal behavior among women. Although many women who have been arrested have experienced a long-term course of alcohol problems, little is known about the patterns of treatment utilization and efficacy of help for drinking problems available to this high-risk population (e.g., Jordan et al., 1996). Notably, female offenders are likely to have received some type of treatment for substance problems prior to, as well as during, incarceration (Greenfeld and Snell, 1999). In a sample of 214 incarcerated, alcohol dependent women, approximately 50% of the women reported having been seen by a mental health professional in the past, and 69% reported that they had ever been in substance treatment. Moreover, 62% of the sample reported that they were willing to enter treatment as soon as possible (Mullings et al., 2004), substantiating considerable perceived need for treatment services among incarcerated women. An examination of lifetime treatment-seeking demonstrates that rates of substance and mental health service utilization vary by study and by state from approximately 20% to 80% (Farabee, 1995; Mullings et al., 2004; Staton et al., 2003; Staton-Tindall et al., 2007). That many incarcerated women have received treatment yet continue to demonstrate significant problems with alcohol use suggests that treatments available for this population, or the patterns in which women are utilizing available treatments, are not sufficient to change the drinking behaviors of this high-risk population.

There is evidence to suggest that women attend AA at rates that are similar to men (e.g., Ogborne and DeWit, 1999; Witbrodt and Romelsjo, 2010). While most research indicates

that the benefits of AA are similar across gender (e.g., Kelly et al., 2006), a small body of research suggests that the benefits of AA may be greater for women than for men. Women may demonstrate a higher degree of AA affiliation (i.e., attendance and other behavioral indicators of involvement in AA) (Bodin, 2006), and affiliation has been linked to superior AA outcomes (Emrick et al., 1993). Further, AA attendance has been found to be associated with more favorable long-term (i.e., 8 year) outcomes, including abstinence, no days drunk or intoxicated, and no drinking related problems for women than for men (Timko et al., 2002). These findings indicate that AA may be particularly beneficial for women, although further research is needed.

Preliminary evidence suggests that incarcerated women with substance use disorders engage in mutual-help groups at particularly high rates. Among incarcerated women who met criteria for a substance use disorder, approximately 88% reported having attended mutual-help groups at some point during their lifetime (Jordan et al., 2002). Mutual-help groups, such as AA, boast a number of advantages, including widespread availability within most communities, entry at no cost, the option to attend casually, lack of required insurance coverage, and the promise of confidentiality. In addition, mutual-help groups offer opportunities to extend sobriety support networks (e.g., Bond et al., 2003; Humphreys et al., 1999), and links to support may be especially crucial during periods of high risk for relapse. It is therefore reasonable that AA and other mutual-help groups represent the most accessible and widely utilized form of substance abuse treatment.

Despite substantial evidence for the benefits of mutual-help groups such as AA for drinking outcomes over time (e.g., Connors et al., 2001; Kissin et al., 2003; Moos and Moos, 2004; Moos and Moos, 2006; Walitzer et al., 2009) and the inclusion of AA referrals in patient treatment plans (Fenster, 2006; Humphreys, 1997), little is known about patterns of AA attendance specific to incarcerated women who are returning to the community. Among general outpatient samples with alcohol use disorders, a variety of factors have been evaluated to better understand predictors of AA participation over time (e.g., Kelly et al., 2006). However, it is unclear whether findings from general outpatient samples would be relevant for understanding characteristics associated with AA attendance among incarcerated women. Therefore, the present study sought to examine demographic and clinical characteristics, as well as previous AA attendance, in relation to AA participation following incarceration among a sample of incarcerated, hazardously drinking women.

In addition to the importance of examining which characteristics are associated with AA attendance among incarcerated women returning to the community, it is also important to evaluate the benefits of AA attendance. Due to the chronic, relapsing nature of alcohol use disorders (e.g., Hunt et al., 1971), prior contact with AA may be a less relevant prognostic indicator of alcohol outcomes than ongoing pattern of AA attendance. Indeed, previous research has demonstrated that the level of AA participation (i.e., frequency) influences alcohol-related outcomes of AA attendance (e.g., Moos and Moos, 2004). Research investigating the existence of a dose-response relationship (Kaskutas, 2009) between AA attendance and alcohol suggests that attendance equal to or exceeding one meeting per week is prognostic of better outcomes compared to less than one meeting per week (Fiorentine,

1999; Kelly et al., 2006; Moos and Moos, 2004). Therefore, the current study examined the relative benefits of various frequencies of AA attendance.

The current study was designed to evaluate AA attendance and alcohol-related AA outcomes in a cohort of hazardously drinking incarcerated women followed for 6-months. Specifically, we evaluated two primary hypotheses: (1) demographic variables (including age, race/ethnicity, and education level), alcohol-related outcomes, and previous history of AA attendance would be associated with frequency of AA attendance following incarceration; (2) greater frequency of AA attendance over time would demonstrate an association with improvements in alcohol-related consequences and patterns of drinking following incarceration (i.e., frequency of drinking days).

Materials and Methods

Study Design and Procedure

Data for this study were collected as a part of a larger study evaluating the effect of a brief intervention to reduce alcohol use and HIV risk among hazardously drinking incarcerated women (Hebert et al., 2008; Stein et al., 2010). Participants were recruited from the woman's facility at the Rhode Island Department of Corrections (RI DOC) Adult Correctional Institute (ACI). As there are no county jails in the State of Rhode Island, the ACI encompasses all jail, prison, and rehabilitative housing of inmates at all levels, including those awaiting arraignment or trial. All women detained in the RI DOC were eligible for screening from February 2004 to June 2007. Participants who were eligible for the study (1) spoke English, (2) provided contact information, (3) endorsed risky sexual behavior, and (4) endorsed hazardous alcohol consumption. Hazardous alcohol consumption was defined as 4 or more drinks at a time on at least 3 separate days during the previous 3 months, or a score of 8 or above on the Alcohol Use Disorders Identification Test (AUDIT; (Saunders et al., 1993). The study was approved by the Miriam Hospital Institutional Review Board, the Office for Human Research Protection, and the RI DOC's Medical Research Advisory Group. A Certificate of Confidentiality from the federal government was obtained in order to provide further protection of data collected from study participants.

Participation in the study involved a baseline assessment, followed by randomization to an intervention group (either motivational intervention or control condition). Interventions involved two sessions, one during incarceration, and the second a month after release from the ACI (participants who remained incarcerated received the second intervention prior to the 3-month follow-up assessment). For further detail regarding the intervention conditions, see Stein and colleagues (2009, 2010).

In addition to baseline assessment, participants also completed 1-month (75.9%), 3-month (79.2%), and 6-month follow-up (80.4%) assessments in which data regarding alcohol and treatment utilization, as well as other variables of interest were collected. Over half (54%) of the participants completed all assessment time-points and 91.4% of participants completed at least one follow-up assessment. Analyses conducted to detect differences in baseline characteristics between participants followed and not followed suggested that participants followed were older ($M=34.53$ vs $M=29.24$) and had less education ($M=10.32$ vs 11.04

years) than participants not followed (all p 's<.05). No differences were detected between those followed and those not followed on race, ethnicity, amount of alcohol used weekly, alcohol consequences, or number of AA meetings attended in the prior year (all p 's>.05).

Participants

A total of 1,415 women were screened. Of the women screened, 1,133 women were ineligible. Approximately 15% of those screened had no HIV risk, 35% had no alcohol risk, 26% had no HIV or alcohol risk, and 10% were ruled out for other reasons (e.g., were non-English speakers). In addition, 37 women refused participation. At 1-, 3-, and 6-month follow-up assessments, 32.3%, 27.3%, and 21.8%, respectively, of the sample was incarcerated. On average, participants spent 14.09, 8.81, and 5.44 days incarcerated per month as reported at the respective 1-, 3-, and 6-month follow-up assessments. The final sample included 245 women; details of recruitment are provided elsewhere (Hebert et al., 2008; Stein et al., 2009, 2010).

Measures

Timeline Followback (TLFB; Sobell et al., 1992)—The TLFB is a reliable and valid structured interview used to assess prior alcohol use (Sobell et al., 1988; Sobell et al., 1986). Baseline use of the TLFB was used to prompt participants for both consumption of any alcohol and the number of drinks consumed on a drinking day in the 90 days prior to incarceration. The TLFB was used at 1-month, 3-month, and 6-month follow-up and was oriented to the timeframe since the previous completed assessment. The TLFB was used to derive scores for proportion of non-incarcerated drinking days.

Short Index of Alcohol Problems (SIP; Miller et al., 1995)—The SIP was used as a measure of level of severity of alcohol involvement at all assessment time points. The SIP scale evaluated the extent to which participants have experienced problems related to their alcohol use through assessment of 15 negative consequences of alcohol use over the last 3-months. Internal consistency coefficient alpha for baseline SIP scale was 0.95, and was 0.95, 0.97, and 0.96 for the respective follow-up SIP scales.

AA Attendance—During the baseline interview, AA attendance was assessed through two items: “Have you ever attended an AA meeting?” and “Have you attended an AA meeting in the last year?” Both lifetime and past-year AA attendance were coded dichotomously (i.e., any versus none). At follow-up assessments, participants were also queried about the number of AA meetings attended since the last interview, and AA frequency was calculated as the number of AA meetings attended divided by the number of non-incarcerated days during the full 6-month assessment period.

Statistical Analysis

Two types of models were employed. First, an ordered generalized estimating equation (GEE) was used to estimate the effect of selected covariates, including demographic characteristics, alcohol consequences over time, treatment condition, and past year AA attendance (dichotomously coded) on frequency of post-incarceration AA attendance. Frequency of AA attendance was operationalized as none, less than once a week, or at least

once per week attendance during the 6-month study follow-up. The proportional odds assumption was tested using a graphical method for assessing the parallel slopes assumption (Harrell, 2001) and was found to be tenable.

Second, linear mixed effects models (LMEs; Laird and Ware, 1982) were used to evaluate the effect of covariates, including demographic characteristics, past year AA, frequency of post-incarceration AA attendance, and treatment condition on drinking outcomes including alcohol consequences (i.e., SIP scores) and frequency of drinking days¹. LMEs included fixed and random effects to estimate the effect of AA engagement on alcohol outcomes. As data were collected at baseline, 1-, 3-, and 6-month time-points, modeling accounted for irregularly spaced data and for unbalanced data (i.e., to permit inclusion of participants who missed assessments). The fixed effects included in the models were time invariant predictors, including age, race, education level, treatment condition, and past year AA attendance. In addition to the fixed effects, we also examined the linear effect of time in all models. As percent of drinking days represents a proportion score, an arcsine transformation was used to appropriately correct for the skewness in the model in which this was included as the dependent variable (Judd and McClelland, 1989).

Results

Participants averaged 34.1 ($SD = 8.9$) years of age, and reported an average of 10.4 ($SD = 8.9$) years of education. The racial/ethnic distribution of the sample was 71.4% White, 19.2% Black, and 2% American Indian; 6.9% of the sample was Hispanic. Thirty five percent of participants reported at least a high school level of education. Approximately 50% ($N=123$) of participants were cohabiting with their sex partner at the time of the baseline assessment. In terms of lifetime drug use, 93% ($N=229$) of study participants had ever tried cannabis, 90% ($N=221$) had tried cocaine, 58% ($N=142$) had tried hallucinogens, 54% ($N=133$) had tried sedatives or benzodiazepines, 53% ($N=129$) had tried heroin, 53% ($N=131$) had tried other opiates, 25% ($N=61$) had tried amphetamines, and 9% ($N=23$) had ever tried barbiturates.

A total of 89.8% of women ($N = 220$) met current criteria for alcohol dependence, as assessed with the Structured Clinical Interview for DSM-III-R (SCID) Axis I Disorders (Spitzer, Williams, Gibbon, & First, 1992); although recruitment targeted hazardously drinking women, the vast majority of participants were alcohol dependent. In the 3-months prior to study entry, participants reported a mean percentage of 51.7 ($SD = 33.6$) days of using any alcohol, and 43.9 ($SD = 33.7$) days of heavy (i.e., greater than 4 drinks) drinking days; that is, 85% percent of drinking days were heavy drinking days. Participants averaged 12.4 ($SD = 10.0$) drinks on a drinking day (Stein et al., 2010).

The majority (81.2%) of women reported some lifetime AA attendance, and over half (55.9%) reported having attended AA in the year prior to study entry. At 1-month, 3-month, and 6-month follow-ups, 37%, 38.7%, 43.1% of participants, respectively, attended at least

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¹As 85% of drinking days reported by participants were heavy drinking days, results for analyses with percent days heavy drinking as the dependent variable are not reported here. Results from these analyses mirrored results for frequency of drinking days.

one AA meeting (this excludes those few who spent all 6-months incarcerated, although it is possible they did attend AA while in prison). Further detail about AA attendance is provided in Table 1. Fifty four percent (N = 120) of participants who provided follow-up data reported attending some AA during the 6-month follow-up period.

Baseline Predictors of Post-Incarceration AA Attendance

Univariate predictors of AA attendance were entered simultaneously into a GEE for ordered outcomes (i.e., ordered frequency of AA attendance: no AA attendance, less than weekly AA attendance, or weekly or greater AA attendance) to determine which predictors were independently related to AA attendance (Table 2). On average, frequency of AA attendance increased over the 6-months following incarceration. Those who had attended AA in the year prior to study entry were approximately four times more likely to be in a higher AA attendance frequency category following incarceration than individuals who had not attended AA in the past year. In addition, a one unit increase in baseline consequences of alcohol use was associated with increased odds of being in a higher frequency category of AA attendance following incarceration. Assignment to the motivational intervention (MI) versus control treatment condition was not associated with a significant increase in the frequency of AA attendance following incarceration.

Predictors of Drinking Outcomes

We used linear mixed effects (LME) models to examine associations between AA attendance frequency and drinking outcomes, including drinking consequences and percent days drinking over the 1-, 3-, and 6-month follow-up periods.

As might be expected, greater baseline alcohol consequences were associated with greater alcohol consequences in the 6-months following incarceration (Table 3) and, on average, the level of alcohol consequences did not change between assessments over the follow-up period. Results also indicated that minority status was associated with greater alcohol consequences over time. When added after all other terms, level of AA attendance at each time point demonstrated a significant time-varying relationship with levels of drinking consequences. Weekly or greater attendance at AA over the time following incarceration was associated with significantly lower levels of alcohol consequences across the follow-up assessments.

As presented in Table 4, analyses of percent drinking days over time using the same set of covariates suggested that there was no significant change in frequency of drinking days over time. Greater baseline frequency of days drinking was associated with a greater frequency of days drinking over time. Weekly or more AA attendance was significantly associated with decreasing levels of frequency of days drinking across the follow-up assessments.

Discussion

Despite the high-risk nature of this population, this is the first study to evaluate characteristics associated with AA attendance and alcohol-related AA outcomes among incarcerated women who reported hazardous levels of drinking and are returning to the community. AA utilization was quite common among these women, with 54% of women

reporting some AA attendance over the follow-up assessment period. This result confirms previous findings by Jordan and colleagues (Jordan et al., 2002), who found high rates of mutual-help group attendance among recently incarcerated women, and indicates that AA represents an accessible source of help for this high-risk population. Our results also indicated that weekly or greater AA attendance was associated with reductions in negative drinking consequences and frequency of drinking days. Therefore, AA attendance at higher rates (i.e., attendance equal to or greater than once per week) may contribute to significant improvements in alcohol-related outcomes following incarceration.

AA Attendance Following Incarceration

Variables associated with AA attendance were somewhat consistent with prior research in other populations. In general, women were, on average, likely to increase their frequency of AA attendance from baseline levels subsequent to incarceration. It may be that incarceration serves as a negative consequence that prompts help-seeking behaviors following release. Therefore, incarceration may be a “teachable moment” during which women can be encouraged to seek help for problems related to alcohol use.

Prior AA attendance was a strong predictor of AA attendance over time. Similarly, Kelly and colleagues (2006) demonstrated that prior mutual-help participation was significantly associated with participation in mutual-help groups following outpatient alcohol treatment. This finding lends support to the notion that previous AA experience, although not wholly successful in reducing drinking, contributes to a familiarity and willingness to participate in AA. Therefore, incarceration may serve as a valuable period for reinforcing the availability of AA resources for individuals who have already had some exposure to AA. Evaluation of whether initial AA exposure during incarceration increases the likelihood that women would attend AA post-incarceration remains a task for future research.

In addition, women who reported more negative alcohol-related consequences at baseline were more likely to attend AA following incarceration. Prior research has documented that greater alcohol use severity, with alcohol use severity measured in a variety of ways, is associated with a greater degree of AA participation (e.g., Emrick et al., 1993; Kelly et al., 2006; Tonigan et al., 2006; Tonigan et al., 1995). Higher levels of alcohol use severity may be associated with higher levels of perceived need for treatment, and therefore may contribute to greater rates of treatment-seeking behavior, including attendance at AA meetings.

We did not find that greater levels of education to be associated with higher levels of AA attendance. Although some researchers have found that education level is associated with likelihood of participation in AA (e.g., Kelly et al., 2006), others have not found this to be the case (e.g., Thurstin et al., 1986), suggesting that the role of education may differ by population. Similarly, although we did not find that racial/ethnic background was associated with likelihood of AA attendance, others have found that Whites are more likely to participate in AA than patients with minority backgrounds (e.g., Kelly et al., 2006). This finding suggests that education and race/ethnicity may be less relevant for understanding patterns of AA attendance of incarcerated women relative to other subpopulations. Future studies examining education, race, and ethnicity more closely may further elucidate the role

of these characteristics in understanding patterns of AA participation among incarcerated women.

Benefits of AA Participation for Incarcerated Women

Although the benefits of AA attendance have been noted for various subpopulations (e.g., Kelly, 2003), there has been little documentation, to date, to suggest that these benefits would be relevant for incarcerated women. Incarcerated women, particularly those experiencing alcohol problems, endure elevated risk in a number of important life domains, including physical and mental health (e.g., Marquart et al., 1999; Stein et al., 2009). Therefore, demonstration of the benefits of AA has significant public health implications for this growing high-risk population. It is therefore important to identify levels at which AA would be beneficial in order to provide guidelines for enhancing the utility of AA participation for this high-risk sample in future research.

In the current study, higher levels of baseline alcohol consequences and consumption levels were associated with poorer outcomes following incarceration. Individuals of minority status reported higher levels of alcohol consequences over time following incarceration. Above and beyond the influence of these covariates, weekly or more AA attendance was associated with decreased negative alcohol consequences, and decreased frequency of drinking days over time. These results contribute to a growing body of research highlighting the benefits of AA attendance (e.g., Fiorentine, 1999; Moos and Moos, 2004), and suggest that the benefits of weekly or greater AA attendance generalize to incarcerated women who report hazardous levels of drinking.

Although efforts to develop treatments specifically catered to the needs of incarcerated women remain an essential goal, AA may serve as an important additional help resource for this population. The current study did not find that a brief MI treatment for incarcerated women significantly influenced AA attendance. It is important to note that the MI condition in the current study represented a stand-alone treatment that yielded improvements in drinking days at 3-months that were attenuated and no longer significant by 6-months (Stein et al., 2010). Therefore, this treatment was not developed and implemented with the objective of providing an intensive AA referral system. Evidence from other studies evaluating intensive AA referral demonstrate that such referral interventions are associated with increased rates of AA attendance and involvement, and with better drinking outcomes (Sisson and Mallams, 1981; Timko and Debenedetti, 2007). Future evaluation of the utility of an intensive AA referral intervention, perhaps one incorporated with an intervention such as the MI treatment tested here, may provide further clarity on methods that could be used to enhance AA attendance among women following incarceration.

Limitations and Future Directions

The objective of the current study was to examine AA participation among incarcerated, hazardingly drinking women with regard to variables associated with attendance and drinking outcomes. Although our findings represent an important examination of AA attendance among incarcerated women, there are several limitations which should be noted. First, analyses described associations between AA attendance and alcohol outcomes

assessed during the same time periods and did not evaluate whether AA attendance preceded improvements in alcohol outcomes. Although prior research substantiates the positive effects of AA attendance on alcohol outcomes (e.g., Fiorentine, 1999; Moos and Moos, 2004), it may also be that improvements in alcohol related outcomes led to increased AA attendance. Future work in this area will therefore benefit from study designs which can elucidate the directionality of this effect. Second, we were unable to verify whether reported AA attendance occurred. We also did not explicitly ask participants if they attended AA meetings while incarcerated. Therefore, when women reported AA attendance in the 6-months following study entry, it is possible that some meetings may have occurred during incarceration. Future work should include the collection of data from collateral informants, and should specify whether AA attendance occurred inside or outside of prison. Third, previous research evaluating the predictive utility of patterns of AA participation on outcomes highlights the importance of both duration and frequency of attendance (Moos and Moos, 2004). Therefore, it will be important for future studies to examine the effect of duration, in addition to frequency, of AA participation on alcohol and other related outcomes among incarcerated women. In addition to duration, other variables that have been found to influence AA outcomes among general outpatient samples include religiosity, social networks, and AA affiliation (e.g., Kelly and Moos, 2003; Kelly et al., 2006). The examination of the effect of such variables on AA outcomes among incarcerated women will provide further information to guide recommendations for AA utilization among this high-risk sample. Fourth, we did not have any information regarding the “discharge planning” of participants at the time of release, which could have included recommendations for AA attendance. Finally, we collected data for only 6-months following baseline assessment, and some women were incarcerated during all or much of this period. Incorporating longer follow-up periods would therefore be informative.

Our findings regarding the benefits of participation in AA support the value of strengthening the AA referral process for incarcerated hazardously drinking women. Some useful guidelines obtained from the current study include recommending that women attend AA meetings at least weekly following incarceration in order to obtain benefits in alcohol-related outcomes. Use of intensive referral interventions within the criminal justice system may therefore serve to enhance AA attendance among incarcerated women who are returning to their communities.

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Table 1

Sample Characteristics Over Follow-Up Assessments

Variable	Baseline		1-Month Follow-Up		3-Month Follow-Up		6-Month Follow-Up	
	Percent or Mean	SD	Percent or Mean	SD	Percent or Mean	SD	Percent or Mean	SD
SIP Scores	1.53	0.93	0.89	0.98	1.03	1.03	0.93	0.92
No AA Attendance	44%		68%		64%		58%	
Less Than Weekly AA Attendance	56%		18%		16%		20%	
Weekly or More AA Attendance**	0%		14%		20%		22%	

Table 2

Generalized Estimating Equation Examining the Effect of Covariates on AA Attendance

Predictor	<i>B</i>	<i>SE</i>	Odds Ration (95% Confidence Interval)	<i>p</i> -value
Education	0.15	0.09	1.16 (0.98–1.33)	0.11
Race	−0.37	0.31	0.69 (0.09–1.30)	0.24
Age	−0.02	0.02	0.98 (0.95–1.02)	0.29
Baseline SIP Scale **	0.74	0.18	2.09 (1.73–2.44)	< 0.01
Past Year AA **	−1.39	0.36	4.02 (3.32–4.71)	< 0.01
Treatment Condition	0.43	0.28	1.54 (1.00–2.09)	0.12
Time	0.14	0.05	1.15 (1.06–1.25)	< 0.01

*
p .05.**
p .01.

Table 3

Linear Mixed Effects Model Examining Effects of AA and other Selected Covariates on Alcohol Consequences

Predictor	<i>B</i>	<i>SE</i>	<i>t</i> -value	<i>p</i> -value
Education	−0.04	0.03	−1.14	0.26
Race (Minority vs. White)	0.23	0.11	−2.12	0.04
Age	0.01	0.01	1.42	0.16
Baseline SIP Scale	0.55	0.06	8.81	< 0.01
Treatment Condition	0.12	0.10	1.20	0.23
Time	−0.01	0.01	−0.74	0.46
Less Than Weekly AA Attendance	0.13	0.10	1.36	0.17
Weekly or More AA Attendance	−0.45	0.10	−4.52	< 0.01

*
p .05.

**
p .01.

Table 4

Linear Mixed Effects Model Examining Effects of Alcoholics Anonymous (AA) and Other Selected Covariates on Percent Drinking Days

Predictor	<i>B</i>	SE	<i>t</i> -Value	<i>p</i> -Value
Education	−0.03	0.02	−1.83	0.07
Race (minority vs. White)	0.05	0.06	−0.90	0.37
Age	0.01	0.00	1.60	0.11
Arcsine baseline percent drinking days	0.29	0.05	5.70	<0.01
Past year AA	−0.07	0.06	−1.30	0.20
Treatment condition	0.09	0.05	1.67	0.10
Time	−0.01	0.01	−0.94	0.35
Less than weekly AA attendance	0.01	0.06	0.21	0.83
Weekly or more AA attendance	−0.28	0.06	−5.00	<0.01