

Continuing Care and Trauma in Women Offenders' Substance Use, Psychiatric Status, and Self-Efficacy Outcomes

Preeta Saxena, Christine E. Grella & Nena P. Messina

To cite this article: Preeta Saxena, Christine E. Grella & Nena P. Messina (2015): Continuing Care and Trauma in Women Offenders' Substance Use, Psychiatric Status, and Self-Efficacy Outcomes, Women & Criminal Justice

To link to this article: <http://dx.doi.org/10.1080/08974454.2015.1067173>



Published online: 01 Oct 2015.



Submit your article to this journal [↗](#)



Article views: 5



View related articles [↗](#)



View Crossmark data [↗](#)

Continuing Care and Trauma in Women Offenders’ Substance Use, Psychiatric Status, and Self-Efficacy Outcomes

Preeta Saxena, Christine E. Grella, and Nena P. Messina

UCLA Integrated Substance Abuse Programs, Los Angeles, California, USA

Using secondary data analysis of 3 separate trauma-informed treatment programs for women offenders, we examine outcomes between those who received both prison and community-based substance abuse treatment (i.e., continuing care; $n = 85$) and those who received *either* prison or community aftercare treatment ($n = 108$). We further account for differences in trauma exposure to examine whether continuing care moderates this effect on substance use, psychiatric severity, and self-efficacy outcomes at follow-up. The main effect models of continuing care showed a significant association with high psychiatric status and did not yield significant associations with substance use or self-efficacy. However, the interaction between trauma history and continuing care showed significant effects on all 3 outcomes. Findings support the importance of a continuing care treatment model for women offenders exposed to multiple forms of traumatic events, and provide evidence of the effectiveness of integrating trauma-informed treatment into women’s substance abuse treatment.

Keywords continuing care, self-efficacy, substance-use, trauma, women offenders

Recent reports have indicated that over the 10-year period between 2002 and 2011 in the United States, the number of women arrested increased by 5.8%, whereas arrests of men declined by 11% (Federal Bureau of Investigation, 2011). Although women make up only around 7% of the U.S. prison population (Guerino, Harrison, & Sabol, 2011), between 1991 and 2012, the number of women in prison increased by 50% more than the increase in men, predominantly because of the increased use of incarceration in response to drug-related crimes (Carson & Golinelli, 2013). The rise in the number of women involved in the criminal justice system has led to increased examination of the specific treatment needs of women offenders. Comparisons of male and female offenders consistently show that women have more complex histories of trauma and victimization, mental and physical health issues, and substance abuse. Such contextual variables have been shown to be correlated with high-risk behaviors among women (Grella, Stein, &

Preeta Saxena is now affiliated with RAND Corporation, Santa Monica, California, USA & College of the Canyons, Santa Clarita, California, USA.

Correspondence should be sent to Preeta Saxena, Office of Institutional Research, Planning & Institutional Effectiveness, College of the Canyons, 26455 Rockwell Canyon Road, Santa Clarita, CA 91355, USA. E-mail: preeta.saxena@canyons.edu

Greenwell, 2005; Messina, Grella, Burdon, & Prendergast, 2007). In spite of research showing that women have complex needs, women in prison receive fewer services (Oser, Knudsen, Staton-Tindall, & Leukefeld, 2009) as well as encounter more barriers to accessing services in the community (Staton, Leukefeld, & Logan, 2001) compared to their male counterparts. In addition, women offenders face stressors like reexposure to social networks and relationships that increase their likelihood of relapsing to substance use, criminal activity, and other associated risky behaviors (Falkin & Strauss, 2003; Knudsen et al., 2008; Staton-Tindall et al., 2007).

Existing studies have largely examined the trajectories that have led women into criminal behavior and the criminal justice system, including the impact of substance use on these trajectories, but have often failed to examine the specific factors that may have moderated the impact of substance abuse treatment on psychological and substance use outcomes (Brennan, Breitenbach, Dieterich, Salisbury, & Van Voorhis, 2012; Salisbury & Van Voorhis, 2009). An examination of these moderating factors is necessary to understand the nuances in the effect of substance abuse treatment on outcomes. Furthermore, such examinations aid in the development of tailored and more effective interventions for substance-abusing women in the criminal justice system. Moreover, with the rise in incarceration comes a rise in the number of individuals released into the community after time served. Numerous studies have shown that there is a high risk of overdose and drug-related deaths during the immediate postrelease period (see Binswanger, Blatchford, Lindsay, & Stern, 2011; Binswanger et al., 2007; Lim et al., 2012); hence, it is important to examine the role that continuing care plays in promoting women's substance use recovery, in addition to understanding the factors that initially lead to incarceration.

TRAUMA EXPOSURE

One identified pathway into the criminal justice system centers on exposure to physical and/or sexual abuse among women, which is then associated with substance use and mental disorders that further heighten women's risk for criminal involvement (Kennedy, Tripodi, & Pettus-Davis, 2013; Tripodi & Pettus-Davis, 2013). Prior to incarceration, women are 7 times more likely to have experienced sexual abuse and 4 times more likely to have experienced physical abuse compared to their male counterparts (Center on Addiction and Substance Abuse, 2010). Women involved in the criminal justice system also experience greater exposure to trauma, and more varied types of trauma exposure, throughout their lifetime than women in the general population (Grella, Lovinger, & Warda, 2013; Messina & Grella, 2006).

SUBSTANCE USE AND MENTAL HEALTH

In addition, heightened rates of mental health issues, including substance use disorders, are found among women involved in the criminal justice system. Women offenders are 10 times more likely to be dependent on drugs than women in the general population, and they have higher rates of substance use disorders than male offenders (Fazel, Bains, & Doll, 2006). Compared to male offenders and women in the general population, women offenders who have been exposed to trauma and have substance abuse histories are at greater risk for mental health disorders (Bloom, Owen, & Covington, 2004; Heckman, Cropsey, & Olds-Davis, 2007; Messina et al., 2007). Specifically, 41% of women offenders and 23% of male offenders suffer from

co-occurring substance use and mental health disorders (Center on Addiction and Substance Abuse, 2010). Given these findings, the role of trauma has been stressed in studies of women offenders with co-occurring substance use and mental health disorders.

SUBSTANCE USE AND SELF-EFFICACY

One type of psychological construct that is affected by abuse and trauma is self-efficacy. According to Bandura's (1977) social cognitive theory, self-efficacy is the extent to which one believes that one can successfully execute behaviors needed to produce a desired outcome. As a predictor of a person's coping behavior, performance level, and perseverance when facing problems, self-efficacy has been identified as a necessary component for mobilizing and sustaining coping behaviors, specifically in avoiding situations where there is a high risk of drinking or drug use (Annis & Davis, 1991; Bandura, 1986; Bandura & Locke, 2003). Studies have shown that childhood abuse leads to negative descriptions of oneself, greater feelings of inadequacy and incompetence, and low self-esteem (Bagley & Mallick, 2000; Diehl & Prout, 2002; Dinwiddie et al., 2000). Similarly, Saigh, Mroueh, Zimmerman, and Fairbank (1995) found that trauma and posttraumatic stress disorder (PTSD) negatively affected perceived self-efficacy development among youth who had experienced stressful experiences in war.

Other studies have shown that women progress to substance dependence to increase their sociability when abuse leads to low self-esteem (Grayson & Nolen-Hoeksema, 2005; Jarvis, Copeland, & Walton, 1998). Research on self-efficacy and drug-using women offenders has also shown that compared to men, women report less confidence in their ability to resist using drugs in various situations and in their ability to reach general goals (Pelissier & Jones, 2006). In addition, self-efficacy becomes more relevant in postrelease community settings, where offenders are exposed to situations in which they face temptations to use substances that they must resist. Thus, substance abuse treatment that aims to reduce substance use and improve mental health among women offenders must address issues related to self-efficacy; hence, this issue has been identified as an important domain in gender-responsive treatment and other trauma-informed programs.

TRAUMA-INFORMED INTERVENTIONS

Given these overlapping and complex factors, researchers have called for integrative models of substance abuse treatment for women offenders (Lewis, 2006). Generally speaking, therapeutic communities (TCs) are the most common modality for delivering substance abuse treatment in institutional settings across the nation (Taxman, Perdoni, & Harrison, 2007). Initially applied to residential settings, standard TCs consist of a structured schedule of morning meeting, seminars, and conflict resolution/encounter groups. Based on a theory of social modeling and peer influence, TCs rely on the social environment as the agent of change. Desired outcomes in the TC model of treatment include abstinence from alcohol and drugs and the development of prosocial attitudes and values (De Leon & Wexler, 2009). Another modality is cognitive behavior therapy (CBT), which is a general psychotherapeutic approach that is used to help clients identify emotions and actions that are associated with a particular behavior (e.g., drug use) and develop healthier emotional and behavioral responses to stressors (Schroeder, Epstein, Umbricht, & Preston, 2006). TCs have more recently been modified to include CBT and to be more gender specific by

addressing the role of trauma in women's substance abuse (Najavits, 2002; Sacks, McKendrick, & Hamilton, 2012).

Trauma-informed services have been highlighted to address the gender-specific needs of women (Morrissey et al., 2005) and women offenders in particular (Messina, Calhoun, & Braithwaite, 2014; Messina, Grella, Cartier, & Torres, 2010; Saxena, Messina, & Grella, 2014). Gender-specific interventions such as gender-responsive treatment seek to provide trauma-informed services as part of a comprehensive and integrated treatment model that provides a safe environment, promotes healthy social connections, and addresses women's socioeconomic needs (Bloom, Owen, & Covington, 2003). Studies have largely found empirical support for the effectiveness of trauma-informed services delivered within prison on both short-term and long-term substance use, recidivism, and mental health outcomes for women offenders (Messina et al., 2010; Sacks et al., 2012; Saxena et al., 2014).

COMMUNITY REENTRY

In addition to in-custody services for substance-using women offenders, researchers have also emphasized the importance of sustained support for women offenders reentering the community (i.e., continuing care or aftercare treatment). According to the Bureau of Justice Statistics (2010), in 2009 women offenders were more likely than their male counterparts to be supervised in the community on probation or parole (85% vs. 66%, respectively). Research has shown that retention and engagement in treatment are important predictors of treatment outcomes (e.g., relapse to drug use, criminal behavior, and social adjustment; see Simpson & Joe, 2004), implying that an increased length of time in treatment is associated with improved outcomes.

One randomized study showed that longer time in TC treatment led to particularly beneficial results for women compared to men (Messina, Wish, & Nemes, 2000). Although receiving parole supervision has been shown to help both men and women offenders find employment while also reducing their likelihood of using substances after release, parole has not been shown to have an effect on self-reported criminal behavior and/or rearrest rates resulting from technical violations (Yahner & Visser, 2008). In turn, aftercare in the community has received high praise with regard to reducing reincarceration rates, particularly for women offenders (Messina, Burdon, Hagopian, & Prendergast, 2006; Messina, Burdon, & Prendergast, 2006). For instance, in a study of 4,155 inmates who participated in prison-based TC treatment in California, the odds of those who did not participate in any aftercare being returned to custody increased by 47.4% (Burdon, Messina, & Prendergast, 2004). However, continuing care for substance-using women offenders has not received sufficient empirical examination beyond return-to-custody/reincarceration outcomes (e.g., mental health and substance use). These outcomes become particularly relevant for women offenders given their histories of abuse and trauma.

The authors of the most recent Cochrane review of effective interventions for substance-using female offenders indicated that because of the scarcity of existing studies, they were unable to evaluate whether treatment setting (e.g., court pretrial diversion schemes, mental health courts, or community-based interventions) had an impact on the outcomes of the reviewed interventions (Perry et al., 2014). Sacks and colleagues (2012) found that in a randomized study of incarcerated women receiving gender-specific TC treatment versus standard outpatient cognitive-behavioral substance abuse treatment with gender-related components, both groups benefitted

from gender-sensitive materials. All participants showed reduced reincarceration rates, longer time in the community prior to reincarceration, and improved levels of mental health symptomatology 6 and 12 months after release. The authors of the study attributed these findings to the high rate of involvement in postprison services (83% of all participants) and discussed the significance of continuing care in sustaining and increasing desirable outcomes attained through prison treatment. In addition, a review of gender differences among substance users and another study of gender differences in outcomes of prison-based treatment revealed that the process of changing from a substance-using offender lifestyle to a non-substance-using, non-offender lifestyle differs for men and women (Pelissier, Camp, Gaes, Saylor, & Rhodes, 2003; Pelissier & Jones, 2005). Together, these findings highlight the importance of examining continuing care outcomes among women offenders.

Based on the literature, the profile of substance-using women offenders includes a high prevalence of trauma, abuse, and co-occurring mental health disorders and low levels of self-efficacy, leading to high risk for relapse and recidivism. In addition, research has shown the importance of aftercare in the community for achieving positive outcomes. What remains to be examined is how continuing care from prison to community-based aftercare can moderate the association between history of trauma and psychiatric and substance use outcomes at follow-up.

This study uses a pooled sample of women offenders from three studies of trauma-informed services. This method of *integrated data analysis* (Curran & Hussong, 2009) allows for gaining new insight into the effect of treatment on a diverse group of women offenders, with greater statistical power than would be available in individual studies. Using the pooled data set ($N = 193$), we examine differences between women who received substance abuse treatment in prison or aftercare exclusively ($n = 108$) and those who received substance abuse treatment in both settings (prison plus aftercare; i.e., continuing care; $n = 85$). In addition, we test the moderating effect of continuing care to explore whether women with more trauma exposure vary in their substance use, psychiatric status, and self-efficacy outcomes. The following hypotheses are tested:

- Hypothesis 1: Women offenders who received continuing care and experienced a higher number of traumatic events will report lower numbers of drugs used than those who participated in treatment only in prison or only in aftercare and experienced fewer traumatic events.
- Hypothesis 2: Women offenders who received continuing care and experienced a higher number of traumatic events will have lower levels of psychiatric severity than those who participated in treatment only in prison or only in aftercare and experienced fewer traumatic events.
- Hypothesis 3: Women offenders who received continuing care and experienced a higher number of traumatic events will report higher levels of self-efficacy than those who participated in treatment only in prison or only in aftercare and experienced fewer traumatic events.

METHOD

This study is a secondary analysis of samples drawn from three prior studies on women offenders who received substance abuse treatment in prison and/or in community-based aftercare settings. All procedures were reviewed and approved by the University of California at Los Angeles General Campus Institutional Review Board. All of the women volunteered to

participate in the separate studies and provided written informed consent prior to being interviewed. Participants were paid for baseline and follow-up interviews via gift cards or via deposits to their inmate accounts, if incarcerated.

Study Samples

Sample 1: Gender-Responsive Treatment in Prison (GRTP)

The first sample, the GRTP sample, was originally part of a randomized controlled study in the Valley State Prison for Women, where half of the participants received gender-responsive substance abuse treatment that included a trauma-informed intervention (Beyond Trauma; Covington, 2003, 2008a; see Messina et al., 2010; Saxena et al., 2014, for study outcomes). The current study used the group of women offenders who were randomized to the gender-responsive treatment condition ($n = 50$). The Beyond Trauma model (Covington, 2003) has 11 sessions with a focus on defining trauma and abuse, discussing typical reactions to trauma and abuse, and developing coping skills. Over a 4-weekday course, participants received 20 hr of treatment, and sessions were repeated because some participants were incarcerated for extended periods of time. The treatment was implemented and data were collected during a 2-year period (2006–2008), and participants were assessed at baseline and at a 6-month postrelease follow-up (with an 83% follow-up response rate).

Sample 2: Trauma-Informed Substance Abuse Treatment (TISAT)

The second sample, the TISAT sample, comprised women offenders ($n = 72$) who participated in a study at the Leo Chesney Community Correctional Facility in California. This program provided gender responsive treatment to women prior to their release into community using manualized curricula based on Seeking Safety (Najavits, 2002; Najavits, Weiss, Shaw, & Muenz, 1998), dialectical behavior therapy (Linehan & Dimeff, 1997), and Helping Women Recover (Covington, 2008a). The content of these manuals include integrated CBT-based coping skills training for trauma and PTSD as they relate to substance abuse. For instance, Seeking Safety is a form of first-stage therapy that is based on helping clients with substance use disorders and PTSD establish safety from self-destructive factors (e.g., substances, dangerous relationships—domestic violence and drug-using friends; Najavits, 2002). The service delivery and data collection for TISAT occurred between 2008 and 2010, and participants were assessed at baseline and at a 6-month postrelease follow-up (with a 68% follow-up response rate).

Sample 3: Liberating Our Families From Drugs and Incarceration (LOFFDI)

The third sample used in this secondary analysis was originally part of a larger study, the Female Offender Treatment and Employment Project (Grella & Rodriguez, 2011), a statewide multisite initiative to provide comprehensive services to women parolees with a history of substance abuse problems in order to promote their successful reintegration into the community. One of the Female Offender Treatment and Employment Project programs received external funding for a project called Liberating Our Families From Drugs and Incarceration (LOFFDI) to enhance its services, including the provision of trauma-informed treatment (Seeking Safety;

Najavits, 2002; Najavits et al., 1998). Participants ($n = 71$) were assessed at the time of admission to the community treatment program and at a 6-month follow-up from 2006 to 2010 (with a follow-up response rate of 76%).

All three samples involved women offenders who received trauma-informed services in California and were followed up either 6 months postrelease (GRTP) or 6 months after baseline assessments (TISAT, LOFFDI). All three programs were guided by trauma-focused manualized curricula (i.e., Seeking Safety, Beyond Trauma). These interventions use cognitive-behavioral approaches to help women understand different forms of trauma, reactions to abuse, and how a history of victimization interacts with substance use, and they have been modified for women in the criminal justice system (Covington, 2008a). In addition, these programs are implemented in strategic ways that promote psychological growth and prosocial behaviors. Particular components varied in that for the TISAT and LOFFDI projects, modules that were originally gender neutral and focused on substance abuse and PTSD were altered to stress their relevance to women's substance use issues (i.e., Seeking Safety), and for the GRTP study the module was focused on women-specific needs, trauma, and substance abuse (i.e., Beyond Trauma). All three samples varied in terms of treatment exposure. In-prison treatments (TISAT and GRTP) were mandatory, and LOFFDI was a voluntary treatment program. Moreover, 50% of the GRTP sample ($n = 25$) and 56% of the TISAT sample ($n = 41$) reported participation in aftercare at postrelease follow-up. In the LOFFDI sample, 59% of the participants ($n = 42$) reported prior treatment in prison at baseline. The distribution of the project participants in the two groups for comparison is shown in Table 1.

Measures

Two of the three studies (TISAT and LOFFDI) used the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) and the third study (GRTP) used the Addiction Severity Index Lite (ASI; McLellan, Luborsky, Woody, & O'Brien, 1980) as the basis for the dependent measures. Table 2 provides details on the differences in wording of the relevant measures and the associated means and standard deviations for each study sample.

Number of Drugs

The number of drugs used at the 6-month follow-up measure was based on the sum of responses to whether the participant reported "yes" or "no" with regard to using a drug. Any

TABLE 1
Treatment Group by Project Distributions

<i>Project</i>	<i>Study setting</i>	<i>Prison/aftercare only (n)</i>	<i>Prison and aftercare (n)</i>	<i>Total (n)</i>
GRTP	Prison	25	25	50
TISAT	Prison	41	31	72
LOFFDI	Community aftercare	42	29	71
Total		108	85	193

Note: GRTP = Gender-Responsive Treatment in Prison; TISAT = Trauma-Informed Substance Abuse Treatment; LOFFDI = Liberating Our Families From Drugs and Incarceration.

TABLE 2
Questionnaire Wording of Relevant Measures Across Studies and Associated Statistics

<i>Study baseline measures and statistics</i>						
<i>Variable</i>	<i>GRTP wording</i>	<i>M (SD) or %</i>	<i>TISAT wording</i>	<i>M (SD) or %</i>	<i>LOFFDI wording</i>	<i>M (SD) or %</i>
Number of substances	“Indicate how many times [substance] used in past 30 days” [count of responses >0]	1.9 (.2)	“In the year prior to entering prison this last time, did you use . . . ?” [count of responses >0]	2.5 (.2)	“In the year prior to entering prison this last time, did you use . . . ?” [count of responses >0]	2.2 (.2)
Psychiatric status	ASI Psychiatric Composite score (8 items; past 7 days)	0.19 (.2)	BSI Global Severity Index score (53 items; past 7 days)	0.32 (.5)	BSI Global Severity Index score (53 items; past 7 days)	0.55 (.6)
Self-efficacy*	15 items	2.4 (.1)	15 items	2.6 (.1)	20 items	2.7 (.1)
Number of traumatic events*	Posttraumatic stress disorder [12 items categorized as either nonsexual assault, sexual assault, accident/illness, or other] [0–4]	2.8 (.14)	Trauma history (NESARC) [18 items categorized as either nonsexual assault, sexual assault, accident/illness, or other] [0–4]	2.7 (.11)	Posttraumatic stress disorder [12 items categorized as either nonsexual assault, sexual assault, accident/illness, or other] [0–4]	2.5 (.14)
Prior mental health treatment*	“How many times have you been treated for any psychological or emotional problems? In a hospital or inpatient setting? As an outpatient or private patient?” [if >0 to either question = yes]	54%	“Have you ever stayed overnight for treatment of any emotional or mental health problems? Have you ever had outpatient treatment or counseling for a mental health or emotional problem?” [if >0 to either question = yes]	39%	“Have you ever stayed overnight for treatment of any emotional or mental health problems? Have you ever had outpatient treatment or counseling for a mental health or emotional problem?” [if >0 to either question = yes]	32%
Number of arrests	“How many times in your life have you been arrested and charged with the following . . . ?” [count of all indicated charges]	16.0 (2.2)	“How many times have you been arrested in your life, including juvenile detention?”	12.1 (1.1)	“How many times have you been arrested in your life, including juvenile detention?”	16.3 (2.0)

Note: GRTP = Gender-Responsive Treatment in Prison; TISAT = Trauma-Informed Substance Abuse Treatment; LOFFDI = Liberating Our Families From Drugs and Incarceration; ASI = Addiction Severity Index Lite; BSI = Brief Symptom Inventory; NESARC = National Epidemiologic Survey on Alcohol and Related Conditions.

*Significant differences between studies ($p < .05$).

substance use was scored as 1; no reported use was scored as 0. The outcome variable was then a simple count of the number of substances scored as 1, providing a measure of polysubstance use. The baseline recall period for number of drugs used was not consistent across the samples. Whereas the TISAT and LOFFDI participants were asked about their drug use in the year prior to their most recent incarceration, GRTP participants were asked about drug use 30 days prior to incarceration. Because of this, the baseline measure for number of drugs used was standardized, and z scores were used in the analysis.

Psychiatric Status

Psychological distress was assessed with the BSI (Derogatis & Melisaratos, 1983) in two of the three samples (TISAT and LOFFDI). Derived from the Symptom Checklist-90, the BSI is a 53-item questionnaire; respondents rated on a 4-point scale how much a symptom had distressed them during the previous 7 days, with 0 = *not at all* and 4 = *extremely*. As an indicator of overall psychological distress, the scores on the BSI items were averaged into a Global Severity Index score constructed according to the authors' instructions ($\alpha = .96$ for current study).

For the remaining sample, GRTP, psychiatric status was based on eight yes/no items from the ASI asking participants whether they had experienced depression, anxiety, hallucinations, and so on in the previous 7 days. The mean of the eight items (range = 0–1) was used as the overall psychiatric status score for the GRTP sample. Because the samples used different measures to assess overall psychiatric status, the scores were standardized (z scores). Similar techniques for combining data from the BSI and ASI have been used successfully in studies combining different samples (Grella, Stein, Weisner, Chi, & Moos, 2010), and significant correlations have been reported across ASI psychological composite scores and the BSI Global Severity Index (Benishek, Bieschke, Stöffelmayr, Mavis, & Humphreys, 1992).

The dependent variable, psychiatric status at the 6-month follow-up, then became a dichotomous variable for which those who fell below the mean of the combined study samples were categorized as 0 (i.e., low severity) and those whose scores were above the mean were categorized as 1 (i.e., high severity). None of the cases landed directly at the mean. The psychiatric severity standardized score at baseline was included as a control. Because the psychiatric status outcome is not intended to be a clinical diagnostic tool, grouping individuals by whether they were low or high in psychiatric severity status provided some indication of overall mental health, and this was also the most feasible approach given the difference in psychiatric health assessments (ASI vs. BSI).

Self-Efficacy

The Self-Efficacy Scale, originally based on the Situational Confidence Questionnaire (Annis & Graham, 1988), was used in all three studies to assess the extent to which the participants felt confident in their ability to resist using drugs in different situations. A total of 20 items in two of the studies (GRTP and LOFFDI) and 15 items in one (TISAT) were rated on a 3-point scale, with 1 = not at all confident or sure, 2 = somewhat confident or sure, and 3 = very confident or sure. Items included "if you were with someone who encouraged you to use drugs or suggested that you use drugs together" and "if you were in pain physically." The mean of the items was used to create a continuous scale ranging from 1 to 3. All three scales were assessed using the limited

number of items (15; $\alpha = .92$), with higher scores indicative of greater self-efficacy. The dependent variable was the self-efficacy measure at follow-up, and the baseline score was included as a control.

Continuing Care

Those who participated in TISAT and GRTP all received substance abuse treatment while in prison and were asked whether they received aftercare treatment at the follow-up assessment. Those who participated in LOFFDI were part of aftercare substance abuse treatment in the community and were asked whether they had received substance abuse treatment in prison prior to their admission to the aftercare program. The three study samples were pooled together and were categorized into whether the participants received substance abuse treatment either in prison or aftercare (0) or in both settings (1).

Trauma History

A lifetime number of traumatic events variable was created with a count of the number of traumatic events the participants endorsed at the baseline assessment. Two of the studies (LOFFDI and GRTP) used the 12-item Posttraumatic Diagnostic Scale (Foa, Cashman, Jaycox, & Perry, 1997) to assess exposure to traumatic events (e.g., sexual assault by a stranger, non-sexual assault by a family member/known person), and one of the studies (TISAT) used the 18 items adapted from the National Epidemiologic Survey on Alcohol and Related Conditions to ask respondents about their history of traumatic events (e.g., being physically attacked or badly beaten up; being injured by parents; or being sexually assaulted, molested, or raped; Ruan et al., 2008). For the purpose of consistency, these items were then categorized into more general forms of traumatic events (i.e., nonsexual assault by a family member or stranger, sexual assault by a family member or stranger, serious/life-threatening accident or illness, and other¹) and summed. The scores ranged from 0 to 4, with 0 indicating endorsement of none of the given traumatic events and 4 indicating endorsement of all four of the listed traumatic events.

Baseline Covariates

Number of arrests was based on how many times the participant reported having been arrested in her lifetime for two studies (TISAT and LOFFDI) and a count of how many times the participant reported having been arrested and charged for particular offenses (as provided in a list) for GRTP. Prior mental health treatment was measured using questionnaire items that asked whether the participant had received outpatient or inpatient treatment for an emotional or mental health problem. If the participant indicated “yes” to either question, she was assigned a 1 (and conversely a 0 if she indicated “no” to both questions). Other variables included demographics such as age; race; education; employment; and whether the respondent had children, and, if so, the number of children she had. These controls are further described in “Analyses.”

Analyses

Follow-up measures were used as dependent variables in all analyses (i.e., number of substances used, psychiatric severity level, and self-efficacy score at the 6-month follow-up),

and baseline measures were included as controls (i.e., number of substances used [z scores], psychiatric severity level, and self-efficacy score). A distinct form of robust regression² was used for each dependent variable. Because the number of drugs variable was a count measure, a negative binomial regression yielded incidence rate ratios (IRRs) to estimate effects. For psychiatric status, a logistic regression with odds ratios (ORs) was used because the scores were standardized and were then converted to a binary measure. The self-efficacy measure, which consisted of raw scores, was analyzed using an ordinary least squares regression yielding coefficients for effect size.

Interaction effects between the number of lifetime traumatic events endorsed and the treatment setting were tested to examine whether more exposure to trauma had differential effects on the outcomes for those who received substance abuse treatment in both settings (i.e., continuing care) compared to those who received treatment only in prison or only in aftercare. The interaction term was created by multiplying the continuing care (0,1) variable by the number of traumas variable. Statistical controls included baseline values for the outcomes (number of substances used at baseline, psychiatric status at baseline, and baseline self-efficacy scores), respectively. Other controls that were dichotomized included whether the individual had received any prior mental health treatment (1 = yes) assessed at baseline, participant race (1 = White), employment (1 = full-time or part-time employment), education (1 = at least a high school diploma/general equivalency diploma [GED]), and marital status (1 = married). In addition, the number of prior arrests at baseline and the number of children the participant had at baseline were included as scales. The demographic factors used as covariates (i.e., race, employment status, education level, marital status, and children) were based on historical precedent in prison studies on substance use and psychological outcomes for women offenders (e.g., Robbins, Martin & Surratt, 2009; Sacks et al., 2012).

To further control for differences across study participants at baseline, we used the matching procedure of propensity scores to control for self-selection and other inequalities (e.g., demographic differences) of treatment condition/setting (Rubin, 1979). A propensity score is the conditional probability of receiving a treatment (i.e., prison only, aftercare only, or both) given pretreatment characteristic variables. An advantage of propensity scores is that if two subjects have the same propensity score, one subject in the treated group and one subject in the control group, then one could interpret that these two subjects were randomly assigned to each group—that is, they were equally likely to be in either the treatment group or control group. Because three treatment groups (prison only, aftercare only, and prison plus aftercare) were simultaneously available, multinomial logits were used to construct the propensity scores (Baser, 2008). The scores were then included as a control in the regression analyses using the technique of regression adjustment, in which a large number of covariates³ are used to estimate the propensity score, and then a smaller subset of those covariates and the propensity score are used in the regression (D'Agostino, 2007). This is a commonly used method in which the effect of treatment (i.e., continuing care or single setting) is being compared for those with the same propensity score (Austin, 2009).

RESULTS

Participant Characteristics

The pooled study sample was racially diverse (36% White, 29% Latino, 39% Black, and 15% “other”). Approximately half of the women were married (53%), most had children (81%),

and the mean age was 33.7. More than half of the participants had a high school diploma or GED (60%), and 21% were employed. At baseline, the participants reported on average 14 prior arrests, with 40% reporting some form of prior mental health treatment and an average of 2.7 ($SD = 1.0$) traumatic events. The participants reported an average of 2.2 substances ($SD = 1.4$) ever used. The primary substance reported across all participants was methamphetamines/amphetamines, followed by crack/cocaine. Those whose psychiatric status was assessed with the ASI ($n = 50$) had an average score of .19 (based on the mean of eight items; 0–1 scale); those who were assessed with the BSI had an average score of .44 (based on a scale of 0–1). The average self-efficacy score for the sample was 2.6. More details on characteristics of the total sample and each treatment group are provided in Table 3. There were no statistically significant differences in demographic or background characteristics across treatment groups (prison or aftercare vs. continuing care).

TABLE 3
Participant Characteristics by Treatment Group at Baseline

Characteristic	Prison/aftercare ($n = 108$)	Continuing care ($n = 85$)	Total ($N = 193$)
Race, n (%)			
White	36 (33)	34 (40)	70 (36)
Latina	33 (31)	23 (27)	56 (29)
Black	21 (19)	18 (21)	39 (20)
Other	18 (17)	10 (12)	27 (15)
Marital status, n (%)			
Single/never married	58 (54)	45 (53)	103 (53)
Ever married (divorced/widowed)	50 (46)	40 (47)	90 (47)
Age, M (SD)	33.8 (8.7)	33.6 (8.5)	33.7 (8.6)
High school/GED or more, n (%)	64 (59)	51 (60)	115 (60)
Employed (full or part time), n (%)	21 (19)	20 (26)	41 (21)
Number of children, M (SD)	2.7 (2.4)	2.2 (1.7)	2.5 (2.8)
Number of arrests, n (%)	15 (14)	14 (14)	14 (14)
Prior mental health treatment (yes/no), n (%)	45 (42)	33 (39)	78 (40)
Offense type, n (%)			
Property	42 (39)	41 (48)	83 (43)
Drug	27 (25)	21 (25)	48 (25)
Violent	9 (8)	7 (8)	16 (8)
Parole violation	21 (19)	11 (13)	32 (17)
Number of lifetime trauma events (1–4), M (SD)	2.7 (1.0)	2.7 (1.1)	2.7 (1.0)
Number of substances used, M (SD)	2.2 (1.4)	2.2 (1.4)	2.2 (1.4)
Primary substance, n (%)			
Methamphetamines/amphetamines	55 (50)	45 (53)	100 (52)
Crack/cocaine	16 (15)	19 (22)	35 (18)
Psychiatric severity score, M (SD)			
ASI psychiatric status index ^a	.23 (.22)	.16 (.18)	.19 (.20)
BSI Global Severity Index ^b	.40 (.41)	.49 (.63)	.44 (.52)
Self-efficacy score, M (SD)	2.5 (0.52)	2.7 (0.39)	2.6 (0.03)

Note: GED = general equivalency diploma; ASI = Addiction Severity Index Lite; BSI = Brief Symptom Inventory.
^aPrison/aftercare ($n = 25$), prison plus aftercare ($n = 25$). ^bPrison/aftercare ($n = 83$), prison plus aftercare ($n = 40$).

Multivariate Models on Outcomes at Follow-Up

The three proposed hypotheses were supported by the results of the multivariate regressions. Table 4 shows results from the regression models for each outcome: IRRs for number of substances used, ORs for psychiatric status, and coefficients for self-efficacy scores.⁴ In the polysubstance use model ($n = 188$; Wald $\chi^2 = 70.5$, $p < .001$), those who reported more types of trauma events showed a significant reduction in the number of substances used at the 6-month follow-up when they received continuing care (i.e., prison and aftercare; IRR = 0.63, $p < .05$, 95% confidence interval [CI] [0.41, 0.99]), which supported Hypothesis 1. As a main effect, number of types of trauma events shared a positive relationship with polysubstance use (IRR = 1.6, $p < .05$, 95% CI [1.2, 2.3]). Significant covariates for polysubstance use included its baseline measure, number of arrests, whether respondents were incarcerated at the follow-up interview, age, and number of children. Number of substances used at baseline was positively associated with number of substances used at follow-up, in that the higher the number of substances the participant reported using at baseline, the higher the number of substances being used at follow-up (IRR = 1.4, $p < .01$, 95% CI [1.1, 1.8]). Number of arrests at baseline was negatively associated with polysubstance use (IRR = 0.98, $p < .05$, 95% CI [0.96, 1.0]), and being incarcerated at follow-up (IRR = 3.7, $p < .05$, 95% CI [2.1, 6.6])

TABLE 4
Regressions Predicting Number of Substances Used, Psychiatric Status, and Self-Efficacy at Follow-Up

Variable	Model 1: Number of substances used ($N = 188$)		Model 2: Psychiatric status (low/high severity) ($N = 188$)		Model 3: Self-efficacy score ($N = 175$)	
	IRR	95% CI	OR	95% CI	Coefficient	95% CI
Continuing care = 1	2.6	0.68, 9.7	9.2*	1.5, 57.3	-.13	-0.28, 0.02
Number of trauma events (baseline)	1.6**	1.2, 2.3	1.8*	1.1, 2.8	-.04*	-0.07, -0.001
Number of Trauma Events \times Continuing Care	0.63*	0.41, 0.99	0.46*	0.25, 0.86	.05*	0.000, 0.11
Baseline of follow-up outcome ^a	1.4**	1.1, 1.8	2.9**	1.3, 6.2	.18**	0.12, 0.24
Number of arrests (baseline)	0.98*	0.96, 1.0	1.0	0.98, 1.0	-.00	-0.003, 0.003
Incarcerated at follow-up	3.7**	2.1, 6.6	1.6	0.43, 5.6	-.05	-0.17, 0.06
Prior mental health treatment	0.84	0.52, 1.3	2.3*	1.0, 5.1	-.01	-0.07, 0.05
White	1.4	0.84, 2.2	0.43	0.18, 1.0	-.04	-0.10, 0.02
Age	1.04*	1.0, 1.1	1.1*	1.0, 1.1	.00	-0.002, 0.005
Ever married	1.1	0.62, 1.9	0.75	0.31, 1.8	-.02	-0.08, 0.05
High school/GED	0.89	0.55, 1.4	0.55	0.25, 1.2	.08**	0.03, 0.14
Employed	1.4	0.81, 2.4	0.79	0.34, 1.9	-.02	-0.08, 0.04
Number of children	0.82**	0.72, 0.95	0.98	0.83, 1.5	-.00	-0.01, 0.01
Propensity score	0.64	0.23, 1.8	1.6	0.34, 7.5	-.00	-0.13, 0.13

Note: IRR = incidence rate ratio; CI = confidence interval; OR = odds ratio; GED = general equivalency diploma.

^aModel 1: Number of substances used at baseline; Model 2: Psychiatric severity score at baseline; Model 3: Self-efficacy score at baseline.

* $p < .05$, ** $p < .01$.

had a strong association with polysubstance use at follow-up. Those who were older reported a higher number of substances used (IRR = 1.04, $p < .05$, 95% CI [1.0, 1.1]), and those with more children reported fewer substances used at follow-up (IRR = 0.82, $p < .05$, 95% CI [0.72, 0.95]).

For the psychiatric status model ($n = 188$; Wald $\chi^2 = 33.4$, $p < .01$), those who reported more traumatic events were likely to be low in psychiatric severity when they received continuing care (OR = 0.46, $p < .05$, 95% CI [0.25, 0.86]), which supported Hypothesis 2. Baseline severity for psychiatric status was a strong and positive predictor of psychiatric status at follow-up (OR = 2.9, $p < .01$, 95% CI [1.3, 6.2]); those with prior mental health treatment were more likely to have a more severe level of psychiatric status (OR = 2.3, $p < .05$, 95% CI [1.0, 5.1]), and older participants had a slightly increased likelihood of having a severe psychiatric status (OR = 1.1, $p < .05$, 95% CI [1.0, 1.1]).

Lastly, with regard to the self-efficacy model ($n = 175^5$; $F = 4.6$, $p < .001$), those who reported more types of trauma events had higher self-efficacy scores when they received continuing care (coefficient = .05, $p < .05$, 95% CI [0.00, 0.11]), which supported Hypothesis 3. Number of trauma events as a main effect was negatively associated with self-efficacy (coefficient = $-.04$, $p < .05$, 95% CI [-0.07 , 0.001]). In addition, baseline self-efficacy scores (coefficient = .18, $p < .01$, 95% CI [0.12, 0.24]) and having a high school diploma/GED (coefficient = .08, $p < .01$, 95% CI [0.03, 0.14]) were positively associated with follow-up scores.

Further interpretation of the regressions demonstrated that for every additional trauma event endorsed, there was an increase in the rate of number of substances used (by 60%), an increase in the odds of high psychiatric severity (by 80%), and a decrease in the self-efficacy score (by .04 units). With regard to continuing care's significant main effect on psychiatric severity, those who received continuing care had increased odds of having high psychiatric severity than those who did not receive continuing care (the odds changed by a factor of 9.2). However, for someone who received continuing care, the rate of number of substances used decreased by 63%, the odds of high psychiatric severity decreased by 46%, and the self-efficacy score increased by .05 points for every additional type of traumatic event endorsed.

Furthermore, we provide visual representations⁶ of the interaction effect between continuing care and number of trauma events by graphing predicted values for every combination of continuing care and trauma (continuing care = 0/1; number of traumas = 1–4) on each outcome. In the predicted counts for number of substances used (see Figure 1), the bar patterns indicate that those who experienced fewer numbers of trauma events used fewer substances regardless of continuing care. However, as the number of trauma events increased, those who received continuing care either maintained or decreased the number of substances used. In turn, those with a higher number of trauma events who did not receive continuing care had significantly higher counts of substances used in comparison to those who received continuing care. For the predicted probabilities of psychiatric severity (see Figure 2), the bar patterns show that the probability of high psychiatric status increased for those who did not receive continuing care and decreased for those who received continuing care for higher numbers (more than two) of trauma events. Predicted self-efficacy scores (see Figure 3) showed that those with fewer numbers of trauma events (i.e., zero/one) did not benefit significantly from continuing care. However, those with two or more trauma events who received continuing care had significantly higher self-efficacy scores.

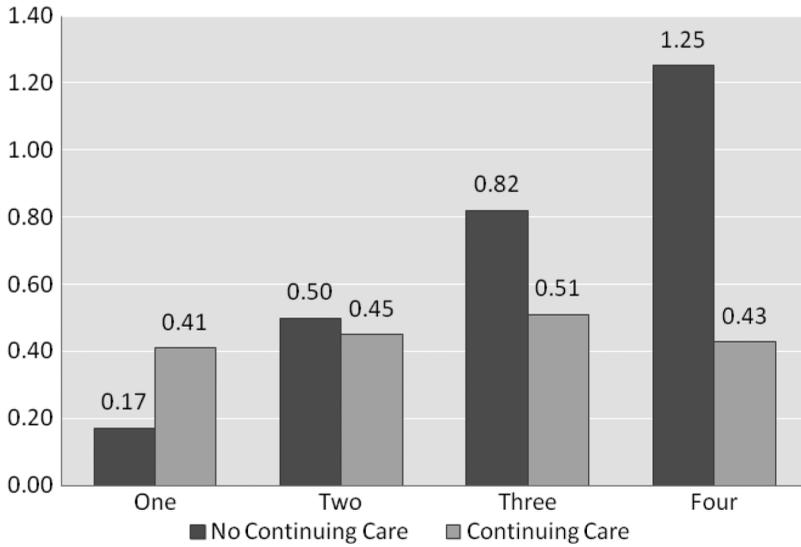


FIGURE 1 Predicted counts for number of substances used for those who received continuing care and those who did not, by the number of trauma events endorsed.

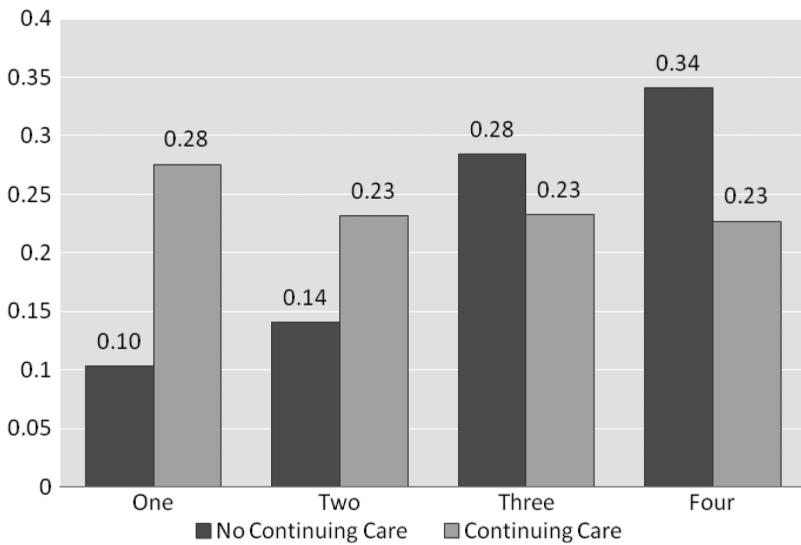


FIGURE 2 Predicted probabilities of high psychiatric severity status for those who received continuing care and those who did not, by the number of trauma events endorsed.

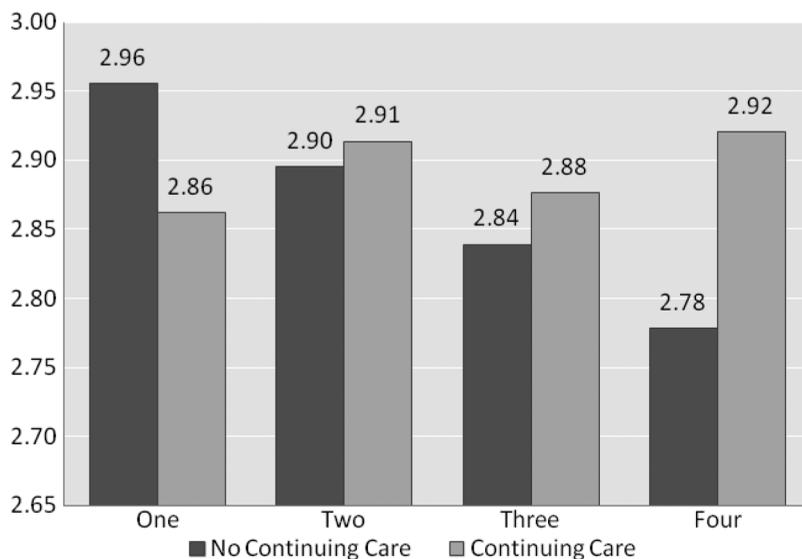


FIGURE 3 Predicted self-efficacy scores for those who received continuing care and those who did not, by the number of trauma events endorsed.

DISCUSSION

This study found that criminal justice–involved women who received continuing care (treatment in both prison and aftercare) and who had a history of exposure to more trauma fared better than those who received treatment in a single setting. As a main effect, the number of traumatic events was associated with a higher number of substances used, more severe psychiatric scores, and lower self-efficacy scores at follow-up. However, if participants received both prison and aftercare treatment, these associations were mitigated. It is important to note that the relationships between trauma exposure and the outcomes examined were similar across trauma levels (1–4) in the continuing care condition, whereas in the comparison group there was more variability in the outcomes dependent on the degree of trauma exposure. The prison/aftercare group had worse outcomes (i.e., a higher number of substances used, an increased probability of high psychiatric severity, and lower self-efficacy scores) as the number of trauma events increased, whereas the outcomes in the continuing care group did not show substantive changes across trauma levels. Thus, continuing care interventions may be particularly warranted for women offenders at higher levels of severity, such as those who are involved in child welfare services, have greater psychiatric severity, and have higher perceived needs (Grella & Rodriguez, 2011).

Besides continuing care, protective factors against polysubstance use included the number of prior arrests and number of children. Number of arrests as a predictor had a weak effect in that it approached the level of no association (i.e., 1.0). The finding that a higher number of lifetime arrests (measured at baseline) was associated with lower numbers of substances used at follow-up cannot be explained theoretically, nor has it been found in the prior literature. Perhaps there is a spurious relationship in which a third factor may be affecting both, but examining this association would be beyond the scope and purpose of the current study.

Another consistent predictor against polysubstance use was being a parent (Robbins et al., 2009). Some accounts suggest that the maternal role serves as a motivating factor for entering treatment (Enos, 2001; Saum, Hiller, Leigey, Inciardi, & Surratt, 2007) or sustaining recovery; other accounts emphasize that the presence of children may create barriers to entering and/or meeting treatment program demands because of limitations in child care and other logistical issues (Richie, 2001). A prior study of mothers in methadone treatment found that the number of children a woman had was inversely related to the number of treatment episodes (McMahon, Winkel, Suchman, & Luthar, 2002). In this study, the more children the women had seemed to serve as a protective factor against polysubstance use (81% of the total sample reported having at least one child).

Risk factors for polysubstance use included the baseline measure of number of substances used and whether the participant was incarcerated at follow-up. These associations have been well established in recidivism studies in which increased substance use leads to parole violations and corresponds with criminogenic environments that lead to more serious criminal activity (Harrison & Gfroerer, 1992). The effect of age, in which those who were older were more likely to have a higher rate of number of substances used, was weak and neared no association (i.e., $IRR = 1.0$).

As expected, psychiatric severity at follow-up was closely tied to prior psychiatric severity and prior mental health treatment. Participants identified as needing mental health treatment are likely to have more severe psychiatric problems than those who do not receive mental health treatment (Messina & Grella, 2006). Similar to the effect of age on polysubstance use, age had a very weak effect on psychiatric status. With regard to self-efficacy, the association between education (high school diploma/GED) and high self-efficacy scores at follow-up is consistent with general population studies showing that self-efficacy is closely tied to academic motivation and attainment (Zimmerman, Bandura, & Martinez-Pons, 1992).

Prior studies have shown a consistent link between histories of trauma and substance use/mental health disorders among women offenders. Similar to findings in this study, experience with abuse has been identified as a risk/need factor for psychological distress (e.g., PTSD; Najavits et al., 1998; Sacks, 2004; Warren, Loper, & Komarovskaya, 2009) and substance use (Covington, 2008a; Saxena et al., 2014). Moreover, responses to adverse events can vary based on one's level of self-efficacy (i.e., one's sense of power to produce desired results; Benight & Bandura, 2004). In turn, self-efficacy aids in the establishment of social support, which itself is an important part of women's substance use recovery, especially postincarceration (Holahan & Holahan, 1987). An effective substance use intervention that incorporates elements of trauma management and long-term care in turn increases self-efficacy to help participants develop healthier emotional and behavioral responses to adverse events and/or risky situations that they may encounter in the community postincarceration.

In addition, the findings in this study are consistent with the general consensus that substance use is a chronic condition that requires longer durations of continuing care (McLellan, Lewis, O'Brien, & Kleber, 2000). In light of these links, this study contributes to the existing literature by highlighting the role of continuing care as a moderator of the detrimental effects of a history of trauma on substance use and mental health outcomes. Yet further research is needed to determine when continuing care is warranted, compared with other interventions, and for whom. Future examinations could address particular types of trauma profiles (e.g., type, duration, and severity), voluntary versus mandated treatment, and combinations of treatment modalities. Such research would help to explain the treatment conditions that are optimal for differing

clinical profiles of women offenders, including those who may benefit from shorter or less intensive interventions.

Although community supervision has received evidence in support of its protective effects on recidivism (Georgiou, 2014), some have noted that mandated treatment and criminal justice oversight lead to higher chances of arrest and return to custody. Proponents of pure public health argue that this type of punitive approach is less effective than engagement with treatment counselors (Marlowe, 2003). Moreover, risks of rearrest and reincarceration are outweighed by the higher risk of increased likelihood of relapse postrelease when individuals face environmental stressors and reentry challenges, such as poor social support and inadequate economic resources. Numerous studies have shown that individuals newly released from prison who relapse are at especially high risk for overdose and death (Binswanger et al., 2007, 2011; Lim et al., 2012). In this regard, the protective effect of transition to structured drug treatment programs, referral to medication-assisted treatment, community-based resources and recovery support (including self-help groups), and family support is critical (Binswanger et al., 2012; Matheson, Doherty, & Grant, 2011; Scott & Dennis, 2012).

Strengths and Limitations

Strengths associated with this study include the use of a pooled sample of women offenders from multiple criminal justice treatment settings, which increases statistical power due to a larger sample size and a more diverse sample. In addition, the use of propensity scoring techniques to account for selection bias and/or population differences and a longitudinal design/analysis also strengthen this study. Although a pooled sample provides more statistical power, it also presents limitations stemming from measurement issues and issues associated with integrating diverse samples. The use of the outcome variable number of substances limits insight into severity or frequency of use. This outcome is representative of polysubstance use, which has been shown to be associated with the prevalence of psychiatric symptoms (e.g., depression, anxiety, cognitive problems, hallucinations) in criminal justice populations (Hakansson, Schlyter, & Berglund, 2011). Moreover, in the current study, on average, participants indicated using two substances at follow-up, whereas substance abuse treatment programs typically endorse abstinence from any substance use as the goal of treatment. Therefore, as a predictor of mental health disorders, polysubstance use as an outcome can provide insight into gradual steps toward achieving abstinence,⁷ which can be an iterative and lengthy process that may not be achieved in 6 months.

Another potential limitation of the current study is the pooling of prison and aftercare populations. One can argue that these populations are different demographically and tend to have varying outcomes. However, because we controlled for demographic characteristics in the regression models, which took into account averages across the samples, heterogeneity was accounted for by covariance. In addition, the propensity scoring techniques also addressed preexisting group differences that may have influenced outcomes. Propensity scores were applied across the three study groups (GRTP, TISAT, and LOFFDI) to account for self-selection and other biases that contribute to differences across study samples that are pooled. Moreover, pooling samples from programs that used different modules of trauma-informed services poses the issue that not all participants received the exact same intervention, and therefore outcomes may vary because of these content-specific differences. However, prior studies have used the technique of pooling samples from multisite studies

of trauma-informed interventions, including integrating data from 14 sites using varying trauma-specific components (e.g., Seeking Safety, Trauma Recovery, Empowerment Model) conducted by the Substance Abuse and Mental Health Services Administration as part of a large initiative on women, co-occurring disorders, and violence (McHugo et al., 2004).

Conclusion

All of the women in this study sample received some form of substance abuse treatment (either in prison or in aftercare) that included a trauma-specific intervention within the context of gender-responsive treatment. The findings of this study highlight the role that trauma exposure plays in treatment outcomes among women offenders and further indicate the importance of addressing trauma in women offenders' treatment. In particular, continuing care is most effective in enhancing psychological and substance use outcomes for women who have suffered more and different types of traumatic events. Furthermore, the findings also imply that, for some groups of women offenders, substance abuse treatment interventions in prison would be more beneficial if they were linked to continuing care, and aftercare programs would also maximize benefits if they were preceded by in-custody interventions. To optimize benefits and to obtain long-term results, treatment for women offenders ought to be comprehensive and long term in addition to being trauma focused.

This study focused on the effects of trauma-informed interventions at different points in the criminal justice process (prison vs. aftercare). Although study findings are suggestive of the beneficial effects of continuing care for some women, future research is needed to determine the specific mechanisms and conditions under which it is or is not beneficial. In addition, the role of trauma in factors that influence treatment motivation and participation could clarify other indirect effects of traumatic exposure on substance use and mental health outcomes. Moreover, because this study pooled multiple samples, and there was variation in the specific content and treatment exposure across the study sites, a more direct comparison of women who do and do not receive aftercare could provide additional insights.

FUNDING

This study was supported National Institute on Drug Abuse Grant Nos. T32-DA007272 and R21 DAO18699; Interagency Agreement Contract No. 07-002467 between the University of California at Davis and the University of California at Los Angeles for the Gender-Responsive Treatment in Prison Study; Contract No. C08.106 with the California Department of Corrections and Rehabilitation, Adult Research Branch, for evaluation of the Trauma-Informed Substance Abuse Treatment Program; and Substance Abuse and Mental Health Services Administration Grant No. TI18374, under subaward with Walden House, Inc., for evaluation of the Liberating Our Families from Drugs and Incarceration Program.

NOTES

1. "Other" traumatic events included parental neglect, stalked by anyone, and so on.
2. Robust models use iteratively reweighted least squares in which the regression is run multiple times and outliers are repeatedly given less weight until the solution stabilizes.

3. Covariates used to generate the propensity score included race, age, marital status, education, employment, presence of children, child custody loss, residence prior to incarceration, mental health treatment experience, age of first arrest, offense type, number of convictions, primary substance, prior substance abuse treatment, and exposure to physical/sexual abuse.
4. In the substance use and psychiatric severity models, an OR/IRR <1 is evidence of a negative association, and an OR/IRR >1 is evidence of a positive relationship .
5. The self-efficacy model had fewer cases because of missing data ($n = 13$) at follow-up.
6. The “one” category in Figures 1, 2, and 3 includes participants who reported zero trauma events ($n = 2$).
7. The outcome abstinence yes/no was not used in order to avoid reducing variation and because the baseline measure for substances used was standardized because of differences in timelines across studies (past 1 year vs. past 30 days).

REFERENCES

- Annis, H. M., & Davis, C. S. (1991). Relapse prevention. *Alcohol Health and Research World*, 15, 204–212.
- Annis, H. M., & Graham, J. M. (1988). *Situational Confidence Questionnaire*. Toronto, Ontario, Canada: Addiction Research Foundation.
- Austin, P. C. (2009). The relative ability of different propensity score methods to balance measured covariates between treated and untreated subjects in observational studies. *Medical Decision Making*, 29, 661–677.
- Bagley, C., & Mallick, K. (2000). Prediction of sexual, emotional, and physical maltreatment and mental health outcomes in a longitudinal cohort of 290 adolescent women. *Child Maltreatment*, 5, 218–226.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A., & Locke, E. A. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*, 88(1), 87–99.
- Baser, O. (2008). Propensity score matching with multi-level categories: An application. *ISPOR Connections*, 14(2), 4–8.
- Benight, C. C., & Bandura, A. (2004). Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. *Behaviour Research and Therapy*, 42, 1129–1148.
- Benishke, L. A., Bieschke, K. J., Stöffelmayr, B. E., Mavis, B. E., & Humphreys, K. A. (1992). Gender differences in depression and anxiety among alcoholics. *Journal of Substance Abuse*, 4(3), 235–245.
- Binswanger, I. A., Blatchford, P. J., Lindsay, R. G., & Stern, M. F. (2011). Risk factors for all-cause, overdose and early deaths after release from prison in Washington state. *Drug and Alcohol Dependence*, 117(1), 1–6.
- Binswanger, I. A., Nowels, C., Corsi, K. F., Glanz, J., Long, J., Booth, R. E., & Steiner, J. F. (2012). Return to drug use and overdose after release from prison: A qualitative study of risk and protective factors. *Addiction Science & Clinical Practice*, 7(1), 3. doi:10.1186/1940-0640-7-3
- Binswanger, I. A., Stern, M. F., Deyo, R. A., Heagerty, P. J., Cheadle, A., Elmore, J. G., & Koepsell, T. D. (2007). Release from prison—A high risk of death for former inmates. *New England Journal of Medicine*, 356(2), 157–165.
- Bloom, B., Owen, B., & Covington, S. (2003). *Gender-responsive strategies: Research, practice, and guiding principles for women offenders*. Retrieved from the National Institute of Corrections Web site: <http://nicic.org/pubs/2003/018017.pdf>
- Bloom, B., Owen, B., & Covington, S. (2004). Women offenders and gendered effects of public policy. *Review of Policy Research*, 21, 31–48.
- Brennan, T., Breitenbach, M., Dieterich, W., Salisbury, E. J., & Van Voorhis, P. (2012). Women’s pathways to serious and habitual crime: A person-centered analysis incorporating gender responsive factors. *Criminal Justice and Behavior*, 39, 1481–1508.
- Burdon, W. M., Messina, N. P., & Prendergast, M. L. (2004). The California treatment expansion initiative: Aftercare participation, recidivism, and predictors of outcomes. *The Prison Journal*, 84(1), 61–80.
- Bureau of Justice Statistics. (2010, December). *Correctional populations in the United States, 2009*. Washington, DC: Author.
- Carson, E. A., & Golinelli, D. (2013). *Prisoners in 2012*. Washington, DC: Bureau of Justice Statistics.
- Center on Addiction and Substance Abuse. (2010). *Behind bars II: Substance abuse and America’s prison population*. Retrieved from <http://www.casacolumbia.org/addiction-research/reports/substance-abuse-prison-system-2010>

- Covington, S. (2003). *Beyond trauma: A healing journey for women. Facilitator's guide*. Center City, MN: Hazelden Press.
- Covington, S. S. (2008a). *Helping Women Recover: A program for treating addiction* (Rev. ed.). San Francisco, CA: Jossey-Bass.
- Covington, S. (2008b). Women and addiction: A trauma informed approach. *Journal of Psychoactive Drugs*, *5*, 377–385.
- Curran, P. J., & Hussong, A. M. (2009). Integrative data analysis: The simultaneous analysis of multiple data sets. *Psychological Methods*, *14*(2), 81–100.
- D'Agostino, R. B. (2007). Propensity scores in cardiovascular research. *Circulation*, *115*, 2340–2343.
- De Leon, G., & Wexler, H. (2009). The therapeutic community for addictions: An evolving knowledge base. *Journal of Drug Issues*, *39*(1), 167–177.
- Derogatis, L. R., & Melisaratos, N. (1983). The Brief Symptom Inventory: An introductory report. *Psychological Medicine*, *13*, 595–605.
- Diehl, A. S., & Prout, M. F. (2002). Effects of posttraumatic stress disorder and child sexual abuse on self-efficacy development. *American Journal of Orthopsychiatry*, *72*(2), 262–265.
- Dinwiddie, S. H., Heath, A. C., Dunne, M. P., Bucholz, K. K., Madden, P. A. F., Slutske, W. S., . . . Martin, N. G. (2000). Early sexual abuse and lifetime psychopathology: A co-twin control study. *Psychological Medicine*, *30*, 41–52.
- Enos, S. (2001). *Mothering from the inside: Parenting in a women's prison*. Albany: State University of New York Press.
- Falkin, G. P., & Strauss, S. M. (2003). Social supporters and drug use enablers: A dilemma for women in recovery. *Addictive Behaviors*, *28*(1), 141–155.
- Fazel, S., Bains, P., & Doll, H. (2006). Substance abuse and dependence in prisoners: A systematic review. *Addiction*, *101*(2), 181–191.
- Federal Bureau of Investigation. (2011). *Crime in the United States, 2011*. Retrieved from <http://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2011/crime-in-the-u.s.-2011/tables/table-33>
- Foa, E. B., Cashman, L., Jaycox, L., & Perry, K. (1997). The validation of a self-report measure of posttraumatic stress disorder: The Posttraumatic Diagnostic Scale. *Psychological Assessment*, *9*, 445–451.
- Georgiou, G. (2014). Does increased post-release supervision of criminal offenders reduce recidivism? Evidence from a statewide quasi-experiment. *International Review of Law and Economics*, *37*, 221–243.
- Grayson, C. E., & Nolen-Hoeksema, S. (2005). Motives to drink as mediators between childhood sexual assault and alcohol problems in adult women. *Journal of Traumatic Stress*, *18*, 137–145.
- Grella, C. E., Lovinger, K., & Warda, U. (2013). Relationships among trauma exposure, familial characteristics, and PTSD: A case control study of women in prison and in the general population. *Women & Criminal Justice*, *23*, 63–79.
- Grella, C. E., & Rodriguez, L. (2011). Motivation for treatment among women offenders in prison-based treatment and longitudinal outcomes among those who participate in community aftercare. *Journal of Psychoactive Drugs*, *43*(S1), 58–67.
- Grella, C. E., Stein, J. A., & Greenwell, L. (2005). Associations among childhood trauma, adolescent problem behaviors, and adverse adult outcomes in substance-abusing women offenders. *Psychology of Addictive Behaviors*, *19*(1), 43–53.
- Grella, C. E., Stein, J. A., Weisner, C., Chi, F., & Moos, R. (2010). Predictors of longitudinal substance use and mental health outcomes for patients in two integrated service delivery systems. *Drug and Alcohol Dependence*, *110*(1–2), 92–100.
- Guerino, P., Harrison, P. M., & Sabol, W. J. (2011, December). *Prisoners in 2010* (NCJ 236096). Retrieved from the Bureau of Justice Statistics Web site: <http://www.bjs.gov/content/pub/pdf/p10.pdf>
- Hakansson, A., Schlyter, F., & Berglund, M. (2011). Associations between poly-substance use and psychiatric problems in a criminal justice population in Sweden. *Drug and Alcohol Dependence*, *118*(1), 5–11.
- Harrison, L., & Gfroerer, J. (1992). The intersection of drug use and criminal behavior: Results from the National Household Survey on Drug Abuse. *Crime & Delinquency*, *38*, 422–443.
- Heckman, C. J., Cropsey, K. L., & Olds-Davis, T. (2007). Posttraumatic stress disorder treatment in correctional settings: A brief review of the empirical literature and suggestions for future research. *Psychotherapy: Theory, Research, & Practice*, *44*, 46–53.
- Holahan, C. K., & Holahan, C. J. (1987). Self-efficacy, social support, and depression in aging: A longitudinal analysis. *Journal of Gerontology*, *42*, 65–68.
- Jarvis, T. J., Copeland, J., & Walton, L. (1998). Exploring the nature of the relationship between child sexual abuse and substance use among women. *Addiction*, *93*, 865–875.

- Kennedy, S. C., Tripodi, S. J., & Pettus-Davis, C. (2013). The relationship between child abuse and psychosis for women prisoners: Assessing the importance of frequency and type of victimization. *Psychiatric Quarterly*, *84*, 439–452.
- Knudsen, H. K., Leukefeld, C., Havens, J. R., Duvall, J. L., Oser, C. B., Staton-Tindall, M., & Inciardi, J. A. (2008). Partner relationships and HIV risk behaviors among women offenders. *Journal of Psychoactive Drugs*, *40*, 471–481.
- Lewis, C. (2006). Treating incarcerated women: Gender matters. *Psychiatric Clinics of North America*, *29*, 773–789.
- Lim, S., Seligson, A. L., Parvez, F. M., Luther, C. W., Mavinkurve, M. P., Binswanger, I. A., & Kerker, B. D. (2012). Risks of drug-related death, suicide, and homicide during the immediate post-release period among people released from New York City jails, 2001–2005. *American Journal of Epidemiology*, *175*, 519–526.
- Linehan, M. M., & Dimeff, L. A. (1997). *Dialectical behavior therapy manual of treatment interventions for drug abusers with borderline personality disorder*. Seattle: University of Washington.
- Marlowe, D. B. (2003). Integrating substance abuse treatment and criminal justice supervision. *Science & Practice Perspectives*, *2*(1), 4–14.
- Matheson, F. I., Doherty, S., & Grant, B. A. (2011). Community-based aftercare and return to custody in a national sample of substance-abusing women offenders. *American Journal of Public Health*, *101*, 1126–1132.
- McHugo, G. J., Kammerer, N., Jackson, E. W., Markoff, L. S., Gatz, M., Larson, M. J., . . . Henninigenet, K. (2004). Women, co-occurring disorders, and violence study: Evaluation design and study population. *Journal of Substance Abuse Treatment*, *28*(2), 91–107.
- McLellan, A. T., Lewis, D. C., O'Brien, C. P., & Kleber, H. D. (2000). Drug dependence, a chronic medical illness: Implications for treatment, insurance, and outcomes evaluation. *Journal of the American Medical Association*, *284*, 1689–1695.
- McLellan, T., Luborsky, L., Woody, G. E., & O'Brien, C. P. (1980). An improved diagnostic evaluation instrument for substance abuse patients. *Journal of Nervous and Mental Disease*, *68*(1), 26–33.
- McMahon, T. J., Winkel, J. D., Suchman, N. E., & Luthar, S. S. (2002). Drug dependence, parenting responsibilities, and treatment history: Why doesn't mom go for help? *Drug and Alcohol Dependence*, *65*, 105–114.
- Messina, N., Burdon, W., Hagopian, G., & Prendergast, M. (2006). Predictors of prison TC treatment outcomes: A comparison of men and women participants. *American Journal of Drug and Alcohol Abuse*, *32*(1), 7–28.
- Messina, N., Burdon, W., & Prendergast, M. (2006). Prison-based treatment for drug-dependent women offenders: Treatment versus no treatment. *Journal of Psychoactive Drugs*, *3*, 333–343.
- Messina, N., Calhoun, S., & Braithwaite, J. (2014). Trauma-informed treatment decreases posttraumatic stress disorder among women offenders. *Journal of Trauma & Dissociation*, *15*(1), 6–23.
- Messina, N., & Grella, C. (2006). Childhood trauma and women's health outcomes in a California prison population. *American Journal of Public Health*, *96*, 1842–1848.
- Messina, N., Grella, C., Burdon, W., & Prendergast, M. (2007). Childhood adverse events and current traumatic distress: A comparison of men and women prisoners. *Criminal Justice and Behavior*, *34*, 1385–1401.
- Messina, N., Grella, C., Cartier, J., & Torres, S. (2010). A randomized experimental study of gender responsive substance abuse treatment for women in prison. *Journal of Substance Abuse Treatment*, *38*(2), 97–107.
- Messina, N., Wish, E., & Nemes, S. (2000). Predictors of treatment outcomes in men and women admitted to a therapeutic community. *American Journal of Drug and Alcohol Abuse*, *26*(2), 207–228.
- Morrissey, J. P., Jackson, E. W., Ellis, A. R., Amaro, H., Brown, V. B., & Najavits, L. M. (2005). Twelve-month outcomes of trauma-informed interventions for women with co-occurring disorders. *Psychiatric Services*, *56*, 1213–1222.
- Najavits, L. M. (2002). *Seeking Safety: A treatment manual for PTSD and substance abuse*. New York, NY: Guilford Press.
- Najavits, L., Weiss, R., Shaw, S. R., & Muenz, L. R. (1998). Seeking Safety: Outcomes of a new cognitive-behavioral psychotherapy for women with posttraumatic stress disorder and substance dependence. *Journal of Traumatic Stress*, *11*, 437–456.
- Oser, C., Knudsen, H., Staton-Tindall, M., & Leukefeld, C. (2009). The adoption of wraparound services among substance abuse treatment organizations serving criminal offenders: The role of a women-specific program. *Drug and Alcohol Dependence*, *103*(Suppl. 1), S82–S90.
- Pelissier, B., Camp, S. D., Gaes, G. G., Saylor, W. G., & Rhodes, W. (2003). Gender differences in outcomes from prison-based residential treatment. *Journal of Substance Abuse Treatment*, *24*(2), 149–160.
- Pelissier, B., & Jones, N. (2005). A review of gender differences among substance abusers. *Crime & Delinquency*, *51*(3), 343–372.

- Pelissier, B., & Jones, N. (2006). Differences in motivation, coping style, and self-efficacy among incarcerated male and female drug users. *Journal of Substance Abuse Treatment, 30*, 113–120.
- Perry, A. E., Neilson, M., Martyn-St. James, M., Glanville, J. M., McCool, R., Duffy, S., . . . Hewitt, C. (2014). Interventions for female drug-using offenders. *Cochrane Database of Systematic Reviews, 1*, CD010910. doi:10.1002/14651858.CD010910
- Richie, B. (2001). Challenges incarcerated women face as they return to their communities: Findings from life history reviews. *Crime & Delinquency, 47*, 368–389.
- Robbins, C. A., Martin, S. S., & Surratt, H. L. (2009). Substance abuse treatment, anticipated maternal roles, and reentry success of drug-involved women prisoners. *Crime & Delinquency, 55*, 388–411.
- Ruan, W. J., Goldstein, R. B., Chou, S. P., Smith, S. M., Saha, T. D., Pickering, R. P., . . . Grant, B. F. (2008). The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): Reliability of new psychiatric diagnostic modules and risk factors in a general population sample. *Drug and Alcohol Dependence, 92*(1–3), 27–36.
- Rubin, D. B. (1979). Using multivariate matched sampling and regression adjustment to control bias in observational studies. *Journal of the American Statistical Association, 74*, 318–324.
- Sacks, J. Y. (2004). Women with co-occurring substance use and mental disorders (COD) in the criminal justice system: A research review. *Behavioral Sciences & the Law, 22*, 449–466. doi:10.1002/bsl.597
- Sacks, J. Y., McKendrick, K., & Hamilton, Z. (2012). A randomized clinical trial of a therapeutic community treatment for female inmates: Outcomes at 6 and 12 months after prison release. *Journal of Addictive Diseases, 31*(3), 258–269.
- Saigh, P. A., Mroueh, M., Zimmerman, B. J., & Fairbank, J. A. (1995). Self-efficacy expectations among traumatized adolescents. *Behavior Research Therapy, 33*, 701–706.
- Salisbury, E. J., & Van Voorhis, P. (2009). Gendered pathways: A quantitative investigation of women probationers' paths to incarceration. *Criminal Justice and Behavior, 36*, 541–566.
- Saum, C., Hiller, M., Leigey, M., Inciardi, J., & Surratt, H. (2007). Predictors of substance abuse treatment entry for crime-involved, cocaine-dependent women. *Drug and Alcohol Dependence, 91*(2/3), 253–259.
- Saxena, P., Messina, N. P., & Grella, C. E. (2014). Who benefits from gender-responsive treatment? Accounting for abuse history on longitudinal outcomes for women in prison. *Criminal Justice and Behavior, 41*, 417–432.
- Schroeder, J. R., Epstein, D. H., Umbricht, A., & Preston, K. L. (2006). Changes in HIV risk behaviors among patients receiving combined pharmacological and behavioral interventions for heroin and cocaine dependence. *Addictive Behaviors, 31*, 868–879.
- Scott, C. K., & Dennis, M. L. (2012). The first 90 days following release from jail: Findings from the Recovery Management Checkups for Women Offenders (RMCWO) experiment. *Drug and Alcohol Dependence, 125*(1–2), 110–118.
- Simpson, D. D., & Joe, G. W. (2004). A longitudinal evaluation of treatment engagement and recovery stages. *Journal of Substance Abuse Treatment, 27*(2), 89–97.
- Staton, M., Leukefeld, C., & Logan, T. K. (2001). Health service utilization and victimization among incarcerated female substance users. *Substance Use & Misuse, 36*, 701–716.
- Staton-Tindall, M., Leukefeld, C., Palmer, J., Oser, C., Kaplan, A., Krietemeyer, J., . . . Surratt, H. L. (2007). Relationships and HIV risk among incarcerated women. *The Prison Journal, 87*(1), 143–165.
- Taxman, F. S., Perdoni, M. L., & Harrison, L. D. (2007). Drug treatment services for adult offenders: The state of the state. *Journal of Substance Abuse Treatment, 32*(3), 239–254.
- Tripodi, S. J., & Pettus-Davis, C. (2013). Histories of childhood victimization and subsequent mental health problems, substance use, and sexual victimization for a sample of incarcerated women in the US. *International Journal of Law and Psychiatry, 36*(1), 30–40.
- Warren, J. I., Loper, A. B., & Komarovskaya, I. (2009). Symptom patterns related to traumatic exposure among female inmates with and without a diagnosis of posttraumatic stress disorder. *Journal of the American Academy of Psychiatry and the Law, 37*(3), 294–305.
- Yahner, J., & Visher, C. A. (2008). *Illinois' prisoners reentry success three years after release*. Retrieved from the Urban Institute Web site: <http://www.urban.org/research/publication/illinois-prisoners-reentry-success-three-years-after-release>
- Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self motivation for academic attainment: The role of self efficacy beliefs and personal goal setting. *American Educational Research Journal, 29*, 663–676.