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TRAUMA-INFORMED TREATMENT DECREASES PTSD AMONG WOMEN OFFENDERS

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Abstract

Traumatic experiences among women offenders can impact their psychological well-being and patterns of substance use and offending. However, rigorous research in this area for women offenders with a history of trauma is sparse. This study combined data from two previous studies of women offenders in order to provide greater statistical power in examining the psychological trends found in the individual studies. Specifically, women in gender-responsive treatment (GRT; $n = 134$) were compared to women in non-GRT ($n = 143$) in regard to their change in post-traumatic stress disorder (PTSD) and related symptomatology from baseline to follow-up. The pooled sample of women were predominantly White (58%) or Hispanic (22%) and many had never been married (47%); their mean age was 36 years ($SD = 8.9$), and, on average, they had 12 years ($SD = 1.8$) of education. Methamphetamine was their primary drug (71%). Fifty-five percent of the women reported histories of sexual abuse and 37% physical abuse. Thirty-one percent had a PTSD diagnosis. Using Generalized Estimating Equations, significant group*time interactions were detected in PTSD ($OR = .17$) and some related symptomatology (re-experiencing: $OR = .42$, and avoidance: $OR = .24$). Given the aggregate impact of trauma in the lives of women offenders, they, their families, and their communities could benefit from research on how trauma influences their lives and on services that mitigate the negative impact of such histories.

Keywords

Women offenders; post-traumatic stress disorder; trauma-informed; gender-responsive treatment; Substance abuse; Gender; Incarceration

Introduction

Research assessing the needs of women offenders consistently shows extensive histories of trauma and abuse throughout their lives (e.g., physical abuse, sexual abuse, domestic violence, etc.). In fact, trauma and abuse are consistently reported in the literature as critical factors negatively impacting the lives of women (Block, Blokland, Van der Werff, Van Os, & Nieuwebeerta, 2010; Cauffman, 2008; Colman, Han Kim, Mitchell-Herzfeld, & Shady, 2009; Keenan, 2010; Tuchman, 2010).

When long-term outcomes of childhood traumatic experiences are assessed, findings have repeatedly linked these histories to later problems in psychological functioning among

women, particularly post-traumatic stress disorder (PTSD; Grella, Lovinger, & Warda, 2013; Haller & Miles, 2004; Messina, Burdon, Hagopian, & Prendergast, 2004; Messina & Grella, 2006; Warren, Loper, & Komarovskaya, 2009). PTSD is an anxiety disorder in which symptoms develop following an extreme psychologically distressing event. Characteristic symptoms of PTSD include persistent *re-experiencing* of the traumatic event, persistent *avoidance* of stimuli associated with the trauma, and persistent symptoms of increased *arousal* (American Psychiatric Association [APA], 1994). The symptoms can include flashbacks, nightmares, and intense distress that interfere with day-to-day functioning.

A high prevalence of co-occurring PTSD and substance abuse among women offenders has also been identified as an issue that needs to be addressed within treatment programs (Heckman, Cropsey & Olds-Davis, 2007; Messina, Grella, Cartier, & Torres, 2010). However, consensus is lacking regarding treatment approaches for co-occurring PTSD and substance use disorders, and they are typically treated separately in mixed gender settings (Hien, Cohen, Litt, Miele, & Capstick, 2004). There is concern that addressing traumatic events during treatment for substance use could impede the recovery process by triggering a relapse of substance use (Pittman et al., 1991; Triffleman, Carroll, & Kellogg, 1999) and increase the risk of other adverse events and experiences (Hien et al., 2004). However, some studies have shown that substance abuse treatment that includes a trauma-focused component does not necessarily result in more adverse events (Killeen et al., 2008) and can lead to improvements in trauma-related symptomatology and/or substance use outcomes (Dumaine, 2003; Hien et al., 2010; Morrissey et al., 2005).

Empirical Evidence for Trauma-Informed Substance Abuse Treatment

A small body of literature shows the efficacy of integrated interventions addressing both PTSD and substance use among women (Greenfield et al., 2008; Greenfield, Back, Lawson, & Brady, 2010; Hien et al., 2010; Messina, Calhoun, & Warda, 2012; Messina et al., 2010). Hien and associates (2010) analyzed data from 353 women randomized to 12 sessions of trauma-informed treatment or health education to assess improvement in symptoms of PTSD and drug use. Findings showed that trauma-focused treatment was significantly more effective than health education at reducing substance use among the most severe drug users and for those who had reductions in PTSD. Another study from Hien and colleagues (2004) found decreases in PTSD and substance use symptoms when trauma-related symptoms were treated early in the recovery process.

Another recent experimental study compared outcomes for 115 women in a prison-based substance abuse program incorporating curricula for trauma (Messina et al., 2010). Women were randomized to the trauma-informed program or a standard prison-based therapeutic community program. Both groups reported improved psychological well-being; however, participants in the trauma-informed group had greater reductions in drug use on parole, remained in residential aftercare treatment longer, and were less likely to have been reincarcerated within 12 months after parole. The recent literature begins to show that integrated interventions for women can provide an opportunity for improved recovery from substance use disorders and PTSD symptoms.

The current study is a secondary data analysis, combining data from two original studies examining various substance abuse treatment approaches for women offenders. The original studies were unique in their in-depth and longitudinal examination of enhanced substance abuse treatment for women offenders, incorporating manualized trauma curricula, and multiple follow-up points. The first study employed a quasi-experimental design, predominantly assessing reductions in drug use (i.e., urine tests) and recidivism (i.e.,

incarceration) for women parolees deferred from incarceration into a residential treatment program implementing trauma-informed curricula, compared with those who were returned to prison. The second study employed an experimental design and randomized women in drug court treatment to receive a standard mixed-gender (MG) outpatient program model or a gender-responsive trauma-informed model. This study assessed reductions in drug use (i.e., urine tests), treatment compliance (i.e., time in treatment and sanctions), and recidivism (i.e., arrest). The resulting published studies predominantly focused on objective records data. Each individual study also measured change in psychological functioning (i.e., via self report) which revealed positive trends that support the beneficial effects of services oriented toward women's needs within various corrections-based treatment settings. However, there were limitations in power and generalizability in both studies due to reliance on self report data and attrition).

Combining the samples provides an avenue for gaining new knowledge on effective substance abuse treatment strategies for a diverse group of women offenders. Analyzing a dataset that has been formed by pooling the samples from two or more studies has been referred to as "integrated data analysis" (Curran & Hussong, 2009). The combined sample allows us to examine the trends found in the individual studies relating to PTSD symptomatology with greater statistical power. Pooling the samples also results in a more diverse sample of women offenders in terms of level of criminal history, ethnicity and other demographic features, as well as the various stages of the recovery process. The pooled samples also provide diversity in types of criminal justice settings and treatment program length.

The hypotheses for the current examination of the combined data is that a diagnoses of PTSD and related symptomatology will be reduced for women offenders in the trauma-informed condition, compared with women offenders who were returned to prison or randomized into a more generic MG treatment condition.

Method

Samples and Study Procedures

The data for these analyses were collected between 2007 and 2011 as part of an experimental pilot study and a demonstration project for women offenders primarily assessing reductions in drug use and recidivism. Both studies employed programs following the national drug court model, which combines intensive supervision, drug testing, positive reinforcement, and sanctions. Both studies' enhanced treatment programs followed the principles of a gender-responsive treatment (GRT) model, incorporating trauma-informed curricula and other services oriented towards the needs of women (Bloom, Owen, & Covington, 2003).¹

All procedures were reviewed and approved by the UCLA General Campus Institutional Review Board (IRB), Prototypes IRB, and the California State IRB acting on behalf of the California Department of Corrections and Rehabilitation. All of the women volunteered to participate in the study 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.

Sample 1 consisted of 126 women who participated in the Diverting Women Parolees from Prison Study.² This quasi-experimental study assessed the impact of a GRT prison diversion

¹The GRT programs employed program components designed specifically for women, including gender specific staff, health and wellness care, education/employment training and placement, and transportation and child care.

program for women parolees on their drug use and criminal activity (Messina & Chand, 2009). The program provided an array of gender-responsive and trauma-related services utilizing the drug court model. The curriculum *Seeking Safety, Treatment for Trauma/PTSD and Substance Abuse* (Najavits, 2002) was delivered to the GRT program participants. The evaluation included a matched comparison group design, matching women in the GRT group to women who would have been eligible for the program but were returned to prison because the program was not in their jurisdiction. The matched comparison group of women who were sent to prison did not receive treatment during incarceration.

The GRT group in Sample 1 spent on average 9.5 months in residential treatment ($SD = 5.1$) and 9 months in outpatient treatment ($SD = 5.0$). Thirty-one percent of the women had a current diagnosis of PTSD, as assessed by the Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997). At the 12-month follow-up ($N = 75$), there was a significant difference between the groups' current diagnoses of PTSD, with greater reductions found for the GRT sample; however, cell sizes were small and thus chi-square tests were interpreted with caution. When we explored the change in criteria of specific symptomatology (i.e., re-experiencing, avoidance, arousal, functioning), the GRT group reported significantly reduced symptoms in re-experiencing, avoidance, and arousal, whereas the prison group had increases or no change in their PTSD symptomatology.

Sample 2 consisted of 150 women who participated in the Enhancing Substance Abuse Treatment for Women Offenders Study.³ This experimental study examined GRT compared with mixed-gender (MG) treatment for women entering four drug court programs in California (Messina et al., 2012). Women were randomized to either the experimental GRT programs or standard MG outpatient programs. The GRT program was modified to incorporate specific curricula designed for women offenders, *Helping Women Recover* and *Beyond Trauma* (Covington, 2003, 2008). The MG group received the standard treatment delivered to drug court participants in California.

On average, the women in Sample 2 spent approximately 15–20 months in outpatient treatment (Messina et al., 2012). Thirty-one percent of the total sample met PTSD criteria at baseline via the PDS (Foa, 1997). At follow-up, only 13% of the total sample had a diagnosis of PTSD (36% reduced to 9% of the GRT group; 26% reduced to 18% of the MG group). As cell sizes were small at follow-up, chi-square significance tests were not generalizable (the GEE model of change in diagnosis over time approached significance, $p < .07$). The change in endorsement of specific symptoms (i.e., re-experiencing, avoidance, arousal, functioning) showed that the GRT group reported non-significant reduced symptoms for each symptom measured. In contrast, the women in the MG groups reported

²Recruitment for Study 1 took place from January 19, 2009, through February 3, 2010. Baseline interviews were conducted with participants within 30 days after entry into the program and with the prison comparison participants 6 months prior to their release from prison. By the time of the final follow-up interview, one subject was found to be deceased and 6 subjects were deported. Thus, they were removed from the potential follow-up sample. Out of the 120 remaining participants, 83 were located and completed the posttreatment follow-up interview (88% of the GRT group and 56% of the Prison group), which was conducted 12 months after their baseline assessment. Participants lost to follow-up were compared to those who were located and interviewed on their baseline characteristics. There were no significant differences in age, race, education, or marital status between those interviewed and those not interviewed at the 12-month follow-up. There were also no significant differences in criminal offense history or drug use history.

³Recruitment began in February 2007 and ended in March 2009. All participants were interviewed within the first 30 days after entry into the drug court programs (baseline) by UCLA research assistants. Baseline interviews focused on capturing behaviors 30 days and also 4 months prior to the arrest that led to court-mandated drug court treatment. By the time of the final follow-up interview, one subject was found to be deceased and 23 subjects remained in treatment. Thus, they were removed from the potential follow-up sample. Out of the 126 remaining participants, 94 were located and completed the posttreatment follow-up interview (77% of the GRT group and 71% of the MG group), which was conducted 4 months after they left treatment. Participants lost to follow-up were compared to those who were located and interviewed on their baseline characteristics. There were no significant differences in age, race, education, or marital status between those interviewed and those not interviewed 4 months after leaving treatment. There were also no significant differences in criminal history or drug use history.

an increase in re-experiencing their traumatic event from baseline to follow-up, and no change in their other symptoms.

Pooled Sample Characteristics

The final pooled sample contained women who were predominantly White (58%) or Hispanic (22%), and 47% had never been married at the time of program admission (36% reported being divorced, separated, or widowed). On average, participants were approximately 36 years old ($SD = 8.9$) with 12 years ($SD = 1.8$) of completed education. Thirty-one percent met the criteria for a diagnosis of PTSD via the PDS. Methamphetamine was their primary drug problem (71%). Many of the women reported histories of sexual abuse (55%) and physical abuse (37%), as well as substantial histories of other trauma.

Data Sources and Outcome Measure

A common set of socio-demographic variables was created for inclusion in this dataset. The exact wording of each assessment question was examined, and those that were similar across studies were included in the combined dataset. The demographic variables included were ethnicity, marital status, age at baseline, education, primary drug, and the number of years incarcerated.

The PDS was used to determine a current diagnosis of PTSD and severity, and to create binary variables for meeting the criteria for a specific symptom (Foa, 1997).⁴ The PDS follows the DSM-IV (APA, 1994) criteria for a diagnosis of PTSD, requiring exposure to a traumatic event (must cause fear of injury and/or helplessness, items 15–20); re-experiencing symptoms (1 or more of items 21–25); avoidance symptoms (3 or more of items 26–32); arousal symptoms (2 or more of items 33–37); symptom duration of 1 month or more (item 38); and distress or impairment in functioning (1 or more items 40–48). Binary variables were created to distinguish between those who met the above criteria for PTSD and/or related symptoms. Severity scores are also reported, whereby the sum of the ratings provides an overall index of PTSD severity and of each symptom severity with higher scores indicating greater severity. Studies have shown test-retest reliability for the PDS as .70 (Foa, 1997; Foa et al., 1997).

Data Analysis

The primary analyses tested the study hypothesis by comparing participants in the GRT group with those in the non-GRT group using an intent-to-treat design (Nich & Carroll, 2002). All subjects were included in the analyses, regardless of whether they completed their respective treatment program. Although the hypothesis is expressed as one-tailed, we recognize that outcomes may occur that were not in the direction expected. Therefore, the hypothesis was tested at the .05 significance level using a two-tailed test. T tests were used to compare the GRT group and the non-GRT group for variables represented by a single continuous variable. For between-subjects comparisons using categorical and binary variables, chi-square analysis was used. A Generalized Estimating Equations (GEE) model for repeated measures approach was also used to consider changes over time by group, while controlling for significant between-group differences, including sexual abuse history, education, and marital status. In our preliminary models, fixed effects representing treatment site were also included in order to account for between-site variations; however, an omnibus *F*-test revealed that these variables were not *jointly* significant to the prediction of PTSD or

⁴Scoring for PDS diagnosis of PTSD was conducted by NCS Pearson, Inc. © Reported inventories (profile reports) included presence of PTSD diagnosis, symptom severity score, symptom severity rating, total number of symptoms endorsed, and level of functioning impairment. Profile reports also include whether specific *Diagnostic and Statistical Manual of Mental Disorders* (DSM; APA, 1994) symptom criteria were met.

any of the associated symptomatology.⁵ GEE, introduced by Zeger and Liang (1986), is used to analyze repeated measures data, taking into account the possibility of correlated or clustered data. The PTSD and symptomatology data reflected a binomial distribution. We specified each analysis with a common logit link function with a first-order autoregressive working correlation matrix⁶, which takes the ordering of repeated measures data into account (Ghisletta & Spini, 2004; Hanley et al., 2003). This method is particularly appropriate, given that a minority of women who *did not* meet the criteria for PTSD or associated symptomatology at baseline did display these effects at the follow-up period.

Results

Baseline comparisons of the demographic variables revealed one significant difference between the final pooled samples: total completed years of education. GRT subjects appeared to have less education (11 years) than non-GRT subjects (12 years, $p < .05$). Marital status also approached significance ($p < .10$). There appeared to be more married women in the non-GRT sample than the GRT sample (30% vs. 22%) and fewer previously married (i.e., divorced, separated, widowed) non-GRT subjects than GRT subjects (28% vs. 39%).

Table 1 displays the traumatic experiences reported by the participants by group and diagnosis of PTSD. Both groups reported high percentages of trauma during childhood and adulthood; however, a greater proportion of the GRT group had experienced childhood sexual abuse (62% vs. 43%, $p < .01$) and sexual assault by a stranger than the non-GRT sample (40% vs. 19%, $p < .01$). Cumulatively, the women endorsed childhood family abuse as “the most traumatic event experienced”. Sixty-three percent of the women reported that the most traumatic event occurred during childhood or more than 5 years ago, 55% felt their life was in danger at the time, and 34% reported being extremely bothered by the event within the past 30 days.

PTSD Diagnosis and Symptomatology Change

Our hypothesis stating that a diagnosis of PTSD and related symptomatology would be reduced for women offenders in the GRT condition as compared to women offenders who were returned to prison or randomized to more generic MG treatment was explored via change in current diagnosis of PTSD and severity, and change in PTSD symptomatology from baseline to follow-up.

Between- and within-group change (Repeated Measures ANOVA)

Mean severity ratings for PTSD and each PTSD symptom were examined by group (GRT vs. non-GRT) and time point (baseline or follow up) using repeated measures analysis of variance, a mixed-effects model that accounts for both between- and within-subjects effects. Severity score ratings for PTSD and associated symptomatology are presented in Table 2. When examining PTSD severity rating, there was a significant main effect for treatment condition (GRT = 8.67, non-GRT group = 9.63, $p = .071$), as well as a significant interaction effect between treatment condition and assessment point ($p = .02$). When we explored the symptomatology (i.e., re-experiencing, avoidance, and arousal), there was a significant main effect for assessment point when examining the arousal outcome (baseline = 1.82, follow-up = 1.59, $p = .063$), and a significant main effect for treatment condition when examining the

⁵These results are available from the authors upon request.

⁶“Autoregressive” is a term derived from times series analysis that assumes observations are related to their own past values through one, two, or a higher order autoregressive (AR) process. An autoregressive correlation structure indicates that two observations taken close in time (or space) within an individual tend to be more highly correlated than two observations taken far apart in time from the same individual.

avoidance outcome (GRT = 1.60, Non-GRT = 1.82, $p = .012$). All interaction effects for symptomatology did not reach significance (see Table 3).

Multivariate analyses

GEE analyses for repeated measures were employed to assess change over time while accounting for time assessment point (baseline diagnosis and symptomatology vs. follow-up) by group. We elected to collapse the dependent outcome as a dichotomous measure (i.e., PTSD and associated symptomatology diagnosis: yes/no) so the results can be interpreted as a change in diagnosis. Given that the ultimate goal of GRT programming is to cease PTSD and associated symptomatology in women (not merely reduce), we felt the analysis should utilize a dependent outcome that allows us to make such conclusions. We examined main effects and an interaction (assessment point by group). We further controlled for factors shown to be significantly different between the two groups at baseline: sexual abuse history (coded as yes/no), highest level of education (continuous), and marriage (never married or “other”). We ran five separate analyses, one for each dependent variable (see Table 4). In support of our hypothesis, the interaction effect of assessment point by group (GRT or non-GRT) was significant in three of the five analyses (overall PTSD, re-experience, and avoidance), with the GRT group displaying a significant decreased likelihood in the dependent measure at assessment point two compared to the non-GRT group. With regard to functioning and avoidance, time of the PDS assessment (i.e., baseline or follow-up) reached significance at the $p < .05$ alpha level.

Change in PTSD—The rate of PTSD over time was significantly different by the two groups, as the interaction shows that the GRT group of women had decreased likelihood of PTSD diagnosis over time ($OR = .172$). Also, women who were never married, compared with those with a different relationship status,⁷ had a decreased likelihood of PTSD ($OR = .494$). History of sexual abuse and education level did not reveal significant relationships to PTSD. The main effects of group and time assessment were not significant.

Change in re-experiencing—The interaction of group-by-time assessment of re-experiencing was significantly different in the two programs, as the interaction shows that the GRT group of women had decreased likelihood of re-experiencing symptomatology over time compared to the non-GRT group ($OR = .419$). Also, women with histories of sexual abuse, compared to those without such histories, were more likely to exhibit re-experiencing ($OR = 1.94$); neither education level nor marital status affected the likelihood of re-experiencing. The main effects of group and time assessment were not significant.

Change in avoidance—The decreased likelihood of avoidance symptomatology was significantly different in the two programs, as the interaction shows that the GRT group of women had significant decreases in their avoidance over time ($OR = .243$). Also, the main effect of assessment point displayed significance, with more women demonstrating avoidance at follow-up compared to baseline ($OR = 2.025$). No controls demonstrated statistical significance to explaining the variance in avoidance.

Change in arousal—There were no significant covariates derived from modeling the relationship between the explanatory variables of interest and the arousal symptom. It is worth noting, however, that the main effects for program type and time assessment, as well as the interaction effect, behaved in a manner that followed our hypotheses, with women in the GRT group experiencing decreased likelihood in arousal compared to the non-GRT

⁷This includes those who were married, remarried, divorced, separated, or widowed.

group ($OR = .698$). Further, the GRT group of women appeared more likely to experience this decreased likelihood at follow-up, compared to the non-GRT group ($OR = .419$).

Change in functioning—A significant main effect for time assessment indicated that women (in the pooled sample) were more likely to report likelihood of past 30 days impaired functioning at follow-up compared to baseline ($OR = 2.33$). This finding is not surprising, given the significant increase functioning symptomatology for the non-GRT group from baseline to follow-up (62% to 74%, $p = .048$). The main effect for program type and the interaction between program type and time assessment did not reach statistical significance in this model, nor did the control variables.

Discussion

Combining two studies that included different types of criminal justice settings and treatment modalities that utilized varying degrees of GRT resulted in a diverse sample of women offenders with substantially more power and range than found in the individual studies. The between-group comparisons of PTSD and related symptomatology indicated that the two groups were similar at baseline. However, comparisons of prevalence of PTSD and related symptomatology at follow-up indicated significant differences for each of the measures of PTSD symptomatology between the groups in the hypothesized direction.

After controlling for noted baseline differences, the repeated measures analysis showed significant interaction effects between group and time-point for three of the five GEE analyses (change in PTSD, re-experiencing, and avoidance). It is difficult to speculate on why the interaction was significant for some symptomatology and not others. The specific indicators of re-experiencing are continuous upsetting thoughts about the trauma, nightmares, physical reactions, and emotional upset. The specific indicators of avoidance are not thinking about or memory loss regarding the trauma, avoiding people or places, feeling cut off or emotionally numb, etc.). It is possible that the gender responsive and trauma-informed treatment protocol created a safe environment for women to explore these symptoms of their disorder. The educational aspect of trauma-informed services, such as understanding ones trauma and the impact on behavior and emotional regulation skills, may have been most beneficial in these specific symptoms.

Implications for Treatment

The finding that the GRT group of women had positive changes in their diagnosis of PTSD and some related symptomatology is important, as there is currently great debate over addressing trauma histories during substance abuse treatment. Typically, substance abuse, PTSD, and mental health problems have been treated separately. Yet, treatment practitioners have begun to recognize that a substantial proportion of women offenders have experienced trauma and that this plays a vital role in their overall wellbeing. The strong relationship between substance abuse and PTSD in response to trauma among women offenders further supports the need for integrated treatment that address both disorders (Grella et al., 2013; Green et al. 2005; Messina & Grella, 2006). However, integrated treatment approaches may be costly and many substance abuse treatment staff may not be adequately trained to handle or treat certain co-occurring psychological disorders. Effective services will most likely need to be provided across multiple service delivery systems. This will require referral services and community partner collaborations. Some of the most important social systems partners are those who can provide mental health screening, assessment, and treatment.

There is further debate surrounding the appropriate approach and setting for treatment of women offenders. Gender responsive experts advocate for treatment that is women specific and providing curricula that is designed specifically to meet women's complex needs.

However, findings of outcomes for women in MG settings are not consistent (Prendergast, Messina, Hall, & Warda, 2011). Some literature suggests that traditional treatment approaches can differentially affect outcomes for men and women, as they may be harmful to women (Greenfield et al., 2007). Gender neutral treatment programs are typically MG programs and rely on confrontation and hierarchy of participants. This may increase trauma among women or re-traumatize women. In fact, our findings showed that the women in the non-GRT group reported an increase in impaired functioning at the post treatment follow up time point (i.e., problems with work, family, relationships, etc.). Perhaps the non-GRT group experienced increased anxiety as they leave treatment and prepare to deal with daily stressors in the community. Thus, making it imperative that services provided to women offenders address both their past trauma exposure and subsequent re-traumatization to provide them with coping strategies (Grella et al., 2013; Messina et al., 2010).

Other literature has indicated that imprisonment is further likely to be re-traumatizing to women (Kubiak, 2004; Moloney, van den Bergh, & Moller, 2009; Owen, 1998). The likelihood of re-victimization and re-traumatization for women in prison is high, as internal physical searches, power imbalances, privacy violations, and verbal belittlement is characteristic of many correctional environments.

Taken together, the findings suggest that, at minimum, the integration of trauma-informed services (e.g., trauma education and coping skills) into substance abuse treatment may play a vital part in women's recovery. Additionally, multi-agency collaboration is an important element of women's integrated treatment (e.g., child welfare, criminal justice, mental health, and social services). These and other health service systems have resources to address some of the complex needs of these women (e.g., parenting support, child development, and mental health).

Limitations

Although we had a diverse group of women offenders in the pooled sample, generalizability is potentially limited by conditions that are unique to California, including the higher prevalence of methamphetamine use and the availability of a range of treatment options within the criminal justice system. However, characteristics of the pooled sample closely resemble those of other samples of substance-using female offenders. Also, the "non-GRT" group was a combination of a "treatment-as-usual group" and a "no treatment group"; thus, differences in measured outcomes between groups were possibly minimized due to the fact that half of the women in the comparison group received, at minimum, the standard of care in the community. Finally, this study uses a dichotomous indicator of PTSD diagnostic status, which does not completely capture the range of clinical presentations that could manifest. However, for the purposes of this study, the use of a dichotomous PTSD variable allows us to examine the effectiveness of GRT in eliminating PTSD among GRT participants.

Conclusion

The consistent literature outlining the extensive trauma histories of women offenders as compared to men and the undeniable link between trauma exposure, PTSD, and addictive behaviors suggest that these issues need to be addressed safely and systematically for women in order to best meet their treatment needs. The current study indicates that substance-using women offenders with co-occurring PTSD can effectively improve with integrated and trauma-informed treatment approaches within the community.

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Table 1

Prevalence of Traumatic Events and Diagnosis of PTSD

	GRT (N = 135) %	Non- GRT (N = 142) %	Total (N = 277) %
1. Sexual abuse in childhood (<18) **	62	43	52
2. Sexual assault by family member (attempted rape/rape) <i>p</i> < .10	44	34	38
3. Sexual assault by stranger (attempted rape/rape) **	40	19	29
4. Serious physical assault by family member (mugging, shot, stabbed, attacked)	56	52	54
5. Serious physical assault by stranger (mugging, shot, stabbed, attacked)	43	35	39
6. Torture	16	11	14
7. Other Trauma (unspecified)	24	20	22
8. Incarceration **	47	69	59
9. Serious accident, fire, or explosion	43	43	43
10. Natural disaster	25	24	25
11. Military or War	--	1	1
12. Life threatening illness	28	29	28
Total Number of Traumatic Events Endorsed via PDS (0 – 12) ^a			
None	8	7	8
One - Two	24	27	25
Three - Four	22	26	24
>Five	46	40	43
Met DSM-IV Criteria for PTSD at Baseline	32	30	31
Re-Experiencing at Baseline	67	67	67
Avoidance at Baseline	44	45	45
Arousal at Baseline	54	51	53
Functioning at Baseline	57	62	60

^aTwelve traumatic events listed on the Posttraumatic Stress Diagnostic Scale.

* *p* < .05,

** *p* < .01.

Table 2

Mean Severity Ratings for PTSD and Symptomology

	GRT		Non-GRT		Baseline		Follow-up	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
PTSD	8.67	5.76	9.63	5.57	9.54	5.68	8.60	5.74
Re-Experiencing	1.55	0.68	1.67	0.77	1.64	0.74	1.55	0.70
Arousal	1.66	0.79	1.83	0.88	1.82	0.87	1.59	0.76
Avoidance	1.60	0.67	1.82	0.79	1.73	0.75	1.69	0.73

Table 3

Repeated Measures ANOVA (Group by Time Assessment)

	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>
PTSD				
Group	1	123.535	3.29	0.071*
Time Assessment	1	29.184	1.44	0.232
Group × Time Assessment	1	110.672	5.46	0.021**
Re-experiencing				
Group	1	0.587	0.94	0.334
Time Assessment	1	0.263	0.87	0.353
Group × Time Assessment	1	0.048	0.16	0.692
Arousal				
Group	1	1.469	1.84	0.176
Time Assessment	1	1.681	3.53	0.063*
Group × Time Assessment	1	0.106	0.22	0.638
Avoidance				
Group	1	3.934	6.43	0.012**
Time Assessment	1	0.050	0.14	0.713
Group × Time Assessment	1	0.684	1.86	0.175

*
p<0.10,**
p<0.05

Table 4

Generalized Estimation Equations Results

	PTSD		RE-EXPERIENCE		AVOIDANCE		AROUSAL		FUNCTIONING	
	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se	OR/se
<i>Prior Sexual Abuse</i>	1.121 (0.3357)	1.944* (0.3353)	1.482 (0.3169)	1.503 (0.3066)	1.436 (0.3069)					
<i>Education</i>	0.899 (0.0753)	0.998 (0.0803)	0.957 (0.0722)	0.931 (0.0708)	1.016 (0.0712)					
<i>Marital Status</i>	0.494* (0.3472)	0.718 (0.3235)	0.669 (0.3154)	0.879 (0.3022)	0.641 (0.3001)					
<i>Time Assessment</i>	1.289 (0.3738)	1.524 (0.4023)	2.025* (0.3570)	1.000 (0.3535)	2.332* (0.4229)					
<i>Group</i>	0.960 (0.4109)	0.528 (0.4275)	0.922 (0.4008)	0.698 (0.3948)	0.703 (0.4071)					
<i>Group*Time Interaction</i>	0.172***	0.419*	0.244**	0.491	0.524					
<i>Intercept</i>	1.962 (0.9812)	2.360 (1.0611)	1.126 (0.9552)	2.629 (0.9414)	1.155 (0.9488)					

* p<0.05,

** p<0.01,

*** p<0.001