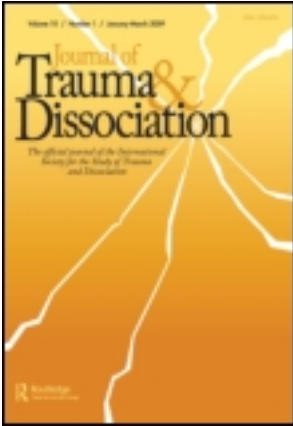


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Trauma-Informed Treatment Decreases Posttraumatic Stress Disorder Among Women Offenders

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ARTICLES

Trauma-Informed Treatment Decreases Posttraumatic Stress Disorder Among Women Offenders

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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 2 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; $n = 135$) were compared to women in non-GRT ($n = 142$) in regard to their change in posttraumatic 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%). Moreover, 55% of the women reported histories of sexual abuse and 37% physical abuse. Finally, 31% had a diagnosis of PTSD. Using generalized estimation equations, we detected significant Group \times Time interactions in PTSD (odds ratio [OR] = 0.17) and some related symptomatology (reexperiencing: OR = 0.42; and avoidance: OR = 0.24). Given the aggregate impact of trauma in the lives of women offenders, these women, 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 *posttraumatic stress disorder, substance abuse, women offenders, trauma-informed and gender-responsive treatment*

INTRODUCTION

Research assessing the needs of women offenders consistently shows extensive histories of trauma and abuse throughout these women's lives (e.g., physical abuse, sexual abuse, domestic violence). 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 have been assessed, findings have repeatedly linked these histories to later problems in psychological functioning among women, particularly posttraumatic 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 *reexperiencing* of the traumatic event, persistent *avoidance* of stimuli associated with the trauma, and persistent symptoms of increased *arousal* (American Psychiatric Association, 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 these issues are typically treated separately in mixed-gender (MG) 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 (Pitman 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; Morrisey 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, Back, Lawson, & Brady, 2010; Greenfield et al., 2008; 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 of parole. The recent literature is beginning 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 used 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 used an experimental design and randomized women in drug court treatment to receive a standard MG outpatient program model or a gender-responsive trauma-informed model. That 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 supported 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 because of a 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 data set 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 with greater statistical power the trends found in the individual studies relating to PTSD symptomatology. 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 stage of the recovery process. The pooled samples also provide diversity in types of criminal justice setting and treatment program length.

The hypothesis for the current examination of the combined data is that a diagnosis 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 used 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 toward the needs of women (Bloom, Owen, & Covington, 2003).¹

All procedures were reviewed and approved by the University of California at Los Angeles (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 program for women parolees on women's 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 that matched 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 ($SD = 5.0$). Moreover, 31% 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., reexperiencing, avoidance, arousal, functioning), we found that the GRT group reported significantly reduced symptoms in reexperiencing, 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 compared GRT and 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). In addition, 31% of the total sample met PTSD criteria at baseline according to 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 generalized estimation equations [GEE] model of change in diagnosis over time approached significance, $p < .07$). The change in endorsement of specific symptoms (i.e., reexperiencing, avoidance, arousal, functioning) showed that the GRT group reported nonsignificant reduced symptoms for each symptom measured. In contrast, the women in the MG groups reported an increase in reexperiencing their traumatic event from baseline to follow-up and no change in their other symptoms.

Characteristics of the Pooled Sample

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. Moreover, 31% met the criteria for a diagnosis of PTSD according to the PDS. Methamphetamine was the women's 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 sociodemographic variables was created for inclusion in this data set. The exact wording of each assessment question was examined,

and questions that were similar across studies were included in the combined data set. The demographic variables included were ethnicity, marital status, age at baseline, education, primary drug, and 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 *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (American Psychiatric Association, 1994), criteria for a diagnosis of PTSD, requiring exposure to a traumatic event (must cause fear of injury and/or helplessness, Items 15–20), reexperiencing symptoms (one or more of Items 21–25), avoidance symptoms (three or more of Items 26–32), arousal symptoms (two or more of Items 33–37), symptom duration of 1 month or more (Item 38), and distress or impairment in functioning (one or more of Items 40–48). Binary variables were created to distinguish between those who met these 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 the severity of each symptom, with higher scores indicating greater severity. Studies have shown test–retest reliability for the PDS of .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 had completed their respective treatment program. Although the hypothesis is expressed as one tailed, we recognize that outcomes may occur that are 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 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 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 matrix,⁶ which takes the ordering of repeated measures data into account (Ghisletta & Spini, 2004; Hanley,

Negassa, Edwardes, & Forrester, 2003). This method was 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%, respectively) and fewer previously married (i.e., divorced, separated, widowed) non-GRT subjects than GRT subjects (28% vs. 39%, respectively).

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%, respectively, $p < .01$) and sexual assault by a stranger (40% vs. 19%, respectively, $p < .01$) than the non-GRT sample. Cumulatively, the women endorsed childhood family abuse as the most traumatic event experienced. A total of 63% of the women reported that their most traumatic event had occurred during childhood or more than 5 years ago, 55% felt that their life was in danger at the time, and 34% reported having been 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 (a) change in current diagnosis of PTSD and severity and (b) change in PTSD symptomatology from baseline to follow-up.

BETWEEN- AND WITHIN-GROUP CHANGE (REPEATED MEASURES ANALYSIS OF VARIANCE)

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

TABLE 1 Prevalence of Traumatic Events and Diagnosis of PTSD

Variable	GRT	Non-GRT	Total
	(<i>n</i> = 135) %	(<i>n</i> = 142) %	(<i>N</i> = 277) %
1. Sexual abuse in childhood (< age 18)**	62	43	52
2. Sexual assault by family member (attempted rape/rape) [†]	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 on PDS (0–12) ^a			
None	8	7	8
1–2	24	27	25
3–4	22	26	24
>5	46	40	43
Met <i>DSM-IV</i> criteria for PTSD at baseline	32	30	31
Reexperiencing at baseline	67	67	67
Avoidance at baseline	44	45	45
Arousal at baseline	54	51	53
Functioning at baseline	57	62	60

Notes: PTSD = posttraumatic stress disorder; GRT = gender-responsive treatment; PDS = Posttraumatic Diagnostic Scale; *DSM-IV* = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*.

^aTwelve traumatic events listed on the PDS.

[†] $p < .10$.

** $p < .01$.

TABLE 2 Mean Severity Ratings for PTSD and Symptomatology

Symptom	GRT		Non-GRT		Baseline		Follow-up	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
PTSD	8.67	5.76	9.63	5.57	9.54	5.68	8.60	5.74
Reexperiencing	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

Notes: PTSD = posttraumatic stress disorder; GRT = gender-responsive treatment.

PTSD severity rating, we found a significant main effect for treatment condition (GRT = 8.67, non-GRT = 9.63, $p = .071$) as well as a significant interaction effect between treatment condition and assessment point ($p =$

TABLE 3 Repeated Measures Analysis of Variance (Group \times Time Assessment)

Variable	<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 \times Time Assessment	1	110.672	5.46	0.021*
Reexperiencing				
Group	1	0.587	0.94	0.334
Time assessment	1	0.263	0.87	0.353
Group \times 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 \times 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 \times Time Assessment	1	0.684	1.86	0.175

Notes: PTSD = posttraumatic stress disorder.

[†] $p < .10$.

* $p < .05$.

.02). When we explored the symptomatology (i.e., reexperiencing, avoidance, and arousal), we found 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 avoidance outcome (GRT = 1.60, non-GRT = 1.82, $p = .012$). No interaction effects for symptomatology reached significance (see Table 3).

MULTIVARIATE ANALYSES

GEE analyses for repeated measures were used 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 that the results could 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 it), we felt that the analysis should utilize a dependent outcome that allowed us to make such conclusions. We examined main effects and an interaction (Assessment Point \times 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 \times Group (GRT or non-GRT) was significant in three of the

TABLE 4 Generalized Estimation Equations Results

Variable	PTSD	Reexperiencing	Avoidance	Arousal	Functioning
Prior sexual abuse	1.121 (0.3357)	1.944* (0.3353)	1.482 (0.3169)	1.503 (0.3066)	1.436 (0.3069)
Education	0.899 (0.0753)	0.998 (0.0803)	0.957 (0.0722)	0.931 (0.0708)	1.016 (0.0712)
Marital status	0.494* (0.3472)	0.718 (0.3235)	0.669 (0.3154)	0.879 (0.3022)	0.641 (0.3001)
Time assessment	1.289 (0.3738)	1.524 (0.4023)	2.025* (0.3570)	1.000 (0.3535)	2.332* (0.4229)
Group	0.960 (0.4109)	0.528 (0.4275)	0.922 (0.4008)	0.698 (0.3948)	0.703 (0.4071)
Group × Time interaction	0.172*** (0.5749)	0.419* (0.5100)	0.244** (0.4940)	0.491 (0.4814)	0.524 (0.5494)
Intercept	1.962 (0.9812)	2.360 (1.0611)	1.126 (0.9552)	2.629 (0.9414)	1.155 (0.9488)

Notes: Data are odds ratios (*SE*). PTSD = posttraumatic stress disorder.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

five analyses (overall PTSD, reexperiencing, and avoidance), with the GRT group displaying a significant decreased likelihood of the dependent measure at Assessment Point 2 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 in the two groups, as the interaction showed that the GRT group of women had a decreased likelihood of a PTSD diagnosis over time (odds ratio [OR] = .172). Also, women who were never married, compared with those with a different relationship status,⁷ had a decreased likelihood of PTSD (OR = 0.494). History of sexual abuse and education level did not reveal significant relationships with PTSD. The main effects of group and time assessment were not significant.

Change in reexperiencing. The Group × Time Assessment interaction for reexperiencing was significantly different in the two programs, as the interaction showed that the GRT group of women had a decreased likelihood of reexperiencing symptomatology over time compared to the non-GRT group (OR = 0.419). Also, women with histories of sexual abuse, compared to those without such histories, were more likely to exhibit reexperiencing (OR = 1.94); neither education level nor marital status affected the likelihood of reexperiencing. 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 showed that the GRT group of women had significant decreases in avoidance

over time (OR = 0.243). Also, the main effect of assessment point was significant, with more women demonstrating avoidance at follow-up compared to baseline (OR = 2.025). No control variables explained a significant amount of the variance in avoidance.

Change in arousal. No significant covariates were derived from modeling the relationship between the explanatory variables of interest and the symptom of arousal. 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 hypothesis, with women in the GRT group experiencing a decreased likelihood of arousal compared to those in the non-GRT group (OR = 0.698). Furthermore, the GRT group of women appeared more likely to experience this decreased likelihood at follow-up compared to the non-GRT group (OR = 0.419).

Change in functioning. A significant main effect for time assessment indicated that women (in the pooled sample) were more likely to report the likelihood of impaired functioning in the past 30 days at follow-up compared to baseline (OR = 2.33). This finding is not surprising, given the significant increase in 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 the 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 we controlled 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, reexperiencing, and avoidance). It is difficult to speculate on why the interaction was significant for some symptomatology and not others. The specific indicators of reexperiencing are continuous upsetting thoughts about the trauma, nightmares, physical reactions, and emotional upset. The specific indicators of avoidance are not thinking about or having memory loss regarding the trauma, avoiding people or places, feeling cut off or emotionally numb, and so on. 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 one's trauma and the impact on behavior and emotion regulation skills, may have been most beneficial for 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. Substance abuse, PTSD, and mental health problems have typically 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 well-being. The strong relationship between substance abuse and PTSD in response to trauma among women offenders further supports the need for integrated treatment that addresses both disorders (Green, Miranda, Daroowalla, & Siddique, 2005; Grella et al., 2013; 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 the treatment of women offenders. Gender-responsive experts advocate for treatment that is specific to women and for curricula that are 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 a hierarchy of participants. This may increase trauma among women or retraumatize women. In fact, our findings showed that the women in the non-GRT group reported an increase in impaired functioning (i.e., problems with work, family, relationships, etc.) at the posttreatment follow-up time point. Perhaps the non-GRT group experienced increased anxiety as they left treatment and prepared to deal with daily stressors in the community. Thus, it is imperative that services provided to women offenders address both their past trauma exposure and subsequent retraumatization 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 retraumatizing to women (Kubiak, 2004; Moloney, van den Bergh, & Moller, 2009; Owen, 1998). The likelihood of revictimization and retraumatization for women in prison is high, as internal physical searches, power imbalances, privacy violations, and verbal belittlement are characteristic of many correctional environments.

Taken together, the findings suggest that, at a 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. In addition, multiagency collaboration (e.g., collaboration among child welfare, criminal justice, mental health, and social services) is an important element of women's integrated treatment. 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 a minimum, the standard of care in the community. Finally, this study used a dichotomous indicator of PTSD diagnostic status that did 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 allowed 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 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.

NOTES

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

2. Recruitment for Study 1 took place from January 19, 2009, through February 3, 2010. Baseline interviews were conducted with participants within 30 days of 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 six subjects had been 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.

3. Recruitment for Study 2 began in February 2007 and ended in March 2009. All participants were interviewed within the first 30 days of entry into 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, 1 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.

4. Scoring for a PDS diagnosis of PTSD was done 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 included whether specific *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994) symptom criteria were met.

5. These results are available upon request.

6. *Autoregressive* is a term derived from times series analysis that assumes that observations are related to their own past values through one, two, or a higher order autoregressive 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.

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

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