

Outcomes of Trauma Treatment Using the TARGET Model

Linda Frisman, PhD
Julian Ford, PhD
Hsiu-Ju Lin, PhD
Sharon Mallon, PhD
Rocío Chang, PsyD

ABSTRACT. In a randomized trial of a group intervention for co-occurring substance abuse and traumatic stress disorders “Trauma Adaptive Recovery Group Education and Therapy” (TARGET) was compared to trauma-sensitive usual care (TSU) with 213 clients in three adult outpatient clinics. Improvement at 6- and 12-month assessments occurred across conditions. TARGET was superior to TSU in maintaining sobriety self-efficacy. How-

Linda Frisman, PhD, is Director of Research, Connecticut Department of Mental Health and Addiction Services, and Research Professor, University of Connecticut, 410 Capitol Avenue, MS # 14 RSD, PO Box 341431, Hartford, CT (E-mail: linda.frisman@uconn.edu).

Julian Ford, PhD, is Clinical Psychologist and Associate Professor, Psychiatry at the University of Connecticut Health Center, Farmington, CT.

Hsiu-Ju Lin, PhD, is Data Analyst, Research Division, Connecticut Department of Mental Health and Addiction Services.

Sharon Mallon, PhD, is Clinical Psychologist, Pathways Center for Learning & Behavioral Health, Essex, CT.

Rocío Chang, PsyD, is Research Associate, Department of Psychiatry, University of Connecticut School of Medicine.

This study was funded by the Center for Substance Abuse Treatment of the Substance Abuse & Mental Health Services Administration, Grant No. 5KD1 TI12554, with additional resources from the Connecticut Department of Mental Health & Addiction Services.

Address correspondence to Linda Frisman, University of Connecticut, 410 Capitol Avenue, MS # 14 RSD, PO Box 341431, Hartford, CT 06106 (E-mail: linda.frisman@uconn.edu).

Journal of Groups in Addiction & Recovery, Vol. 3(3–4), 2008

Available online at <http://www.haworthpress.com>

© 2008 by The Haworth Press. All rights reserved.

doi: 10.1080/15560350802424910

285

ever, ethnic differences emerged. White TARGET participants reported more improvement than non-White participants on post-traumatic cognitions, and fewer non-White men reported relapses in TSU than in TARGET. TARGET appears to enhance sustained sobriety, but may require culturally specific adaptations.

KEYWORDS. Trauma, addiction, PTSD, psychotherapy

INTRODUCTION

Persons in treatment for substance use disorders are more likely than the general population to report exposure to psychological traumas such as sexual abuse and other types of physical abuse (Dansky, Saladin, Brady, Kilpatrick, & Resnick, 1995; Deykin & Buka, 1997; Triffleman, Marmar, Delucchi, & Ronfeldt, 1995; Wasserman, Havassy, & Boles, 1997). Post-traumatic stress disorder (PTSD) also is more common among people being treated for substance use disorders (SUDs), who have PTSD rates of 20% to 59% (Brown, Kahler, Read, & Kahler, 2003; Dansky et al., 1996; Najavits, Weiss, Shaw, & Sarah, 1997; Ouimette, Brown, & Najavits, 1998) compared to 7% in the general population (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). The majority of these patients have never been referred for treatment of their PTSD, and they consistently state a desire to receive simultaneous treatment for PTSD and substance abuse rather than only one or the other (Brown, Stout, & Gannon, 1998). Although the exact relationship between trauma exposure and substance use problems is not yet known, the co-occurrence of substance abuse disorders and trauma-related psychiatric disorders has been shown to cause considerable psychosocial impairment (Brown & Anderson, 1991; Goff, Brotman, Kindlon, Waites, & Amico, 1991; Rose, Peabody, & Stratigeas, 1991; Stewart, Conrod, Pihl, & Dongier, 1999; Stewart, Pihl, Conrod, & Dongier, 1998). Moreover, trauma-related disorders interfere with substance abuse treatment recruitment and retention (Brown et al., 1998) and treatment outcomes (Palacios, Urmann, Newel, & Hamilton, 1999). Psychiatric comorbidity in general also reduces the impact of 12-step groups (Kelly, McKellar, & Moos, 2003).

In 2000, The Connecticut Department of Mental Health and Addiction Services (CTDMHAS) began to explore models of treatment that could be integrated with outpatient substance abuse treatment. One model, Trauma

Adaptive Recovery Group Education and Therapy (TARGET), developed by the second author, had been piloted with a group of people receiving services at a local mental health center. For the present study, TARGET was adapted for use with persons with addictive disorders, and the result was an eight- to nine-session, gender-specific, psychoeducational, manualized group treatment. TARGET teaches a simple sequence of practical skills to enable people to safely process stressful current experiences and PTSD and SUD symptoms without escalating into avoidance, hypervigilance, dissociation, decompensation, or acute crises (Ford & Russo, 2006).

CTDMHAS recruited three outpatient substance abuse clinics to test the TARGET model. Like most treatment providers, these clinics were wary of trauma approaches that involve reexamination of past traumatic experiences, but they expressed an interest in the here-and-now focus of the TARGET model. CTDMHAS applied for and received funding from the Center for Substance Abuse Treatment (CSAT) to conduct a randomized controlled trial, comparing TARGET to usual services, enhanced through training in trauma-sensitive usual care (TSU). In this article, the major outcomes of the intent-to-treat sample are presented.

METHODS

Research Sites

Three Connecticut-based agencies were invited to be research sites: Rushford Center, Inc., in Middletown; The Connection, Inc., also in Middletown; and Morris Foundation, in Waterbury. These were all private, non-profit agencies licensed to provide outpatient and other levels of substance abuse treatment services. Rushford had the largest outpatient program, with 400 to 500 persons served annually. The Connection's Middletown clinic and the Morris Foundation served a somewhat smaller outpatient population (200 to 300 annually). The most typical form of outpatient treatment in each of these agencies was group therapy, and all employed highly qualified, certified substance abuse counselors. All three agencies had experience collaborating on research projects. They were selected because of their interest in trauma treatment and willingness to devote resources to training and provision of trauma services. Because the TARGET model was under study, TARGET groups were not reimbursable per Medicare rules. The participating centers shared the cost of the groups with CTDMHAS.

Participants

Study participants were recruited from among adult outpatients at the three participating clinics using procedures approved by the Institutional Review Boards of CTDMHAS and the University of Connecticut Health Center. Prior to enrollment, counselors used a two-item screen to establish (a) a likely history of psychological trauma and (b) PTSD symptoms in the past month. Eligible clients made an appointment to meet a clinical interviewer. After obtaining informed consent, the clinical interviewer obtained more detailed information about trauma history, including type of event and age at which it occurred, and determined whether the prospective participant had experienced at least one psychologically traumatic event according to *DSM-IV* PTSD Criterion A (American Psychiatric Association, 1994). The clinical interviewer next established an inclusion diagnosis using four instruments: (a) Clinician-Administered PTSD Scale for *DSM-IV* (CAPS-DX; Blake, Weathers, Nagy, & Kaloupek, 1995); (b) R-SIDES, Revised Structured Interview for Disorders of Extreme Stress, Not Otherwise Specified (DESNOS; Pelcovitz et al., 1997); (c) Beck Depression Inventory (BDI; Beck, Steer, Garbin, 1988); and (d) Structured Clinical Interview for *DSM-IV* Dissociative Disorders (SCID-D) (Steinberg, 1997). Thus, the formal admission requirements for the study were (a) a history of trauma that fulfilled the conditions for *DSM-IV* PTSD criterion A, (b) a substance use disorder, and (c) *DSM* criteria for one of the following: PTSD, DESNOS plus at least one or more *DSM-IV* Axis I disorders, or a diagnosis of major depressive disorder, dysthymic disorder, or dissociative disorder. Of the 274 individuals screened, 239 met the all inclusion criteria and were invited to participate, and 234 persons provided informed consent to take part in the research. However, only 213 are included in the study because 21 persons did not complete the baseline interview. Of the 213 participants, 130 met criteria for PTSD without DESNOS, 72 met criteria for PTSD with DESNOS, 7 met criteria for DESNOS without PTSD, and 4 met criteria for other disorders, such as dissociative disorder and major depression.

In several respects, study referrals were a distinct group from the overall substance abuse outpatient population at the three clinics involved in the study. In comparison to the greater substance abuse treatment population, where 30% were women, women were overrepresented (61%) in the study sample. Persons with very low income (\$20,000 or less per year) also were overrepresented in the study sample (89%) compared to the overall substance abuse treatment population (75%). However, the study sample

was comparable to the overall treatment population with regard to age, ethnicity, and types of substance use problems. The mean age of study participants (38.0 years) was similar to that for the overall substance abuse treatment population (36.7 years), and there were no significant differences between the study sample and the larger population in race or ethnicity. Most (90%) study participants were not currently married and many (46%) had never been married, similar to the overall treatment population (82% unmarried currently; 53% never married).

Treatments

Comparison Condition: Trauma-Sensitive Usual Care (TSU)

All of the counselors in the three outpatient substance abuse treatment centers attended a 3-hour workshop on trauma-sensitive care conducted or supervised by the second author. These workshops included information about the effect of traumatic events and disorders that trauma may cause or exacerbate. Also, the counselors learned about the typical problems experienced by trauma survivors and some ways in which past trauma can interfere with substance abuse recovery. Counselors received literature about trauma, post-traumatic stress, and substance abuse recovery that could be shared with clients. The information garnered from the training was incorporated into regular substance abuse treatment sessions.

Experimental Condition: TSU Plus TARGET

Participants randomized to TARGET treatment were offered this 8- or 9-week manualized group treatment (Ford & Russo, 2006). TARGET provides psychoeducation about the impact of traumatic exposure and PTSD on the body's stress response system and the brain using the strength-based concept of an adaptive psychobiological "alarm reaction" that may require recalibration after exposure to psychological trauma. A sequential set of self-regulation skills is taught to facilitate stress system recalibration, using the acronym FREEDOM to describe the seven core skills: focusing, recognizing stress triggers, emotion identification, evaluating cognitions, defining personal goals, making choices with options grounded in personal strengths, and making a contribution to restore a sense of hope, faith, and purpose in the wake of trauma and PTSD. Experiential exercises are used to teach, model, role-play, and integrate the FREEDOM skills and to use them to develop a coherent memory narrative of the client's life that incorporates a range of experiences including but not limited to traumatic stress.

Gender-specific men's and women's TARGET groups were run separately by pairs of clinicians trained in the TARGET model. Women's groups were always run by women, and men's groups were run by men whenever possible, but because of a shortage of male counselors at participating agencies, often men's groups were run by a male–female team. One of the group leaders was a staff member at the substance abuse treatment center; and the second group leader was a clinical psychology graduate student with the research group who was trained to rate fidelity to the model. All of the group leaders were White except for two female graduate student co-leaders, one of whom was Black and the other Latina. Clinicians generally met prior to each week's session to review the materials and plan for sessions, as well as to discuss the prior week's TARGET session.

Groups were held weekly, commencing as soon as possible following the randomization date for the cohort. At the first session, participants were provided with the TARGET workbook and a journal. They were encouraged to bring the workbook each week and to review the materials between group sessions. Regular attendance was emphasized as important to treatment, and graduate assistants routinely called participants to remind them about the groups. To enhance retention in the groups, small incentives that also reinforced aspects of the TARGET model (e.g., pens, key chains) were handed out on three occasions during the group. Furthermore, clinicians periodically brought refreshments to the groups. Weekly supervision was provided at each center by the supervising clinician for the study in consultation with the TARGET developer.

TARGET Training and Study Condition Overlap

Two-day training workshops were conducted by the second author to introduce clinicians to the TARGET model and to provide an opportunity to practice the material, ask questions, and provide feedback. While groups were running, the supervising clinician for the study (the fourth author) held weekly supervisory meetings at each center, and the second author remained available for consultation as needed. It should be noted that each agency's TARGET group leaders also ran TSU groups for participants in the comparison condition. Although they were asked to not use specific materials from the TARGET model in those groups, it was not considered ethical or possible to prohibit their use of the TARGET core concepts (which were also taught to all agency counselors in trauma sensitivity training) or TARGET's core self-regulation skills (although they did not teach the organizing FREEDOM framework in non-TARGET groups).

A frequent topic of supervision concerned which information, skills, and techniques could be used in trauma-sensitive usual care groups. The general rule was that TARGET materials and the FREEDOM steps should only be used in TARGET. Counselors were permitted to use their general knowledge of trauma symptoms, self-regulation techniques, and emphasis on safety in all groups.

Fidelity

A fidelity checklist indicated that all TARGET groups were operated with a high level of fidelity. The most common challenge to group leaders was to cover all material for a session within the time constraints of the group meeting. Often, group leaders had to continue topics into the following week. A larger threat to study validity was that, with permission from the clinical supervisors, many of the techniques of the TARGET model were used in regular treatment groups.

Materials

A trained research assistant conducted face-to-face interviews with participants at baseline, 6 months, and 12 months, using portions of the Global Appraisal of Individual Needs (GAIN; Dennis, Scott, Godley, & Funk, 1999). The GAIN (www.chestnut.org/LI/gain/index.html) is widely used in substance abuse treatment outcome studies. GAIN subscales for traumatic stress, depression symptoms, anxiety symptoms, and self-efficacy were primary outcome measures. These subscales have been shown to be reliable (i.e., internal consistency coefficient $\text{Alpha} = .72-.96$; re-test reliability = $.70-.80$) and to have criterion validity for the identification of psychiatric diagnoses (or substance abuse risk, in the case of the self-efficacy subscale). GAIN subscales for substance use frequency, percent drinking to intoxication, percent using any drugs, and percent abusing drugs or alcohol, were used to assess changes in substance use and abuse.

The Post-Traumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999) was administered in order to assess change in trauma-related beliefs. The PTCI includes three subscales: negative cognitions about self, negative cognitions about the world, and self-blame. The total scale and all three subscales have been shown to have excellent internal consistency (alphas ranged from $.86$ to $.97$), good test-retest reliability, good convergent validity, and excellent ability to discriminate between traumatized individuals with and without PTSD (Foa et al., 1999).

Procedures

The study was designed as a randomized controlled trial, but the procedures of random assignment were modified midway through the study. When the study was launched, random assignment was conducted in the usual fashion. That is, using a random numbers program, each participant was randomized to the TARGET or TSU condition following the clinical interview establishing eligibility and informed consent. However, early in the study participants who had been randomized to the TARGET model often had to wait significant periods of time (up to several weeks) before there were sufficient participants at a treatment center to form a group. By the time that a TARGET group cohort could be formed, prospective participants often had completed or discontinued services at the agency. This delay meant that many experimental participants received an insufficient dose of TARGET sessions. Therefore, the randomization procedures were modified to randomize by cohorts. As each individual was consented into the study, he or she would be placed on a cohort list. When enough consent forms had been signed to form a group, then the group was randomly assigned to TARGET or TSU. This randomization scheme succeeded in greatly reducing the wait time between screening and the beginning of treatment groups. If the randomization was to TARGET, groups were begun as soon as possible following the results of the randomization. Because so many study participants in the TARGET condition had missed an opportunity to participate in TARGET prior to leaving treatment, the balance of the random assignments was weighted to favor TARGET on a 3:1 basis. Thus, the final sample is weighted in favor of the experimental group ($n = 141$, versus 72 in TSU).

The demographic characteristics of the study sample are presented in Table 1, along with comparisons between the groups. As shown, except for one area (past arrests, greater for the TARGET group), the groups were very similar. Given the large number of comparisons, the single difference between the groups indicates the overall success of random assignment.

Treatment Dose

Participants in the TSU condition, unlike those in the experimental condition, were not offered additional treatment. However, TARGET groups often replaced other groups for study participants. As shown in Table 2, TARGET participants actually received slightly fewer overall treatment visits (including the TARGET group sessions) than TSU participants,

TABLE 1. Demographic Information by Study Groups

Characteristics	Study Group		Tests of Significances
	Target (<i>N</i> = 141)	TSU (<i>N</i> = 72)	
Age*	37.84 ± 8.42	36.85 ± 8.44	<i>t</i> (211) = 0.82, n.s.
Female	89 (63.1%)	41 (56.9%)	$\chi^2(1) = 0.77$, n.s.
Race/ethnicity			$\chi^2(3) = 0.84$, n.s.
White, not Hispanic	82 (58.2%)	38 (52.8%)	
Black/African American	34 (24.1%)	18 (25.0%)	
Hispanic/Latino	13 (9.2%)	9 (12.5%)	
Other ^a	12 (8.5%)	7 (9.7%)	
Marital status			$\chi^2(2) = 0.99$, n.s.
Never married	69 (48.9%)	32 (44.4%)	
Presently married ^b	23 (16.3%)	10 (13.9%)	
Other ^c	49 (34.8%)	30 (41.7%)	
Education (years)	11.28 ± 1.98	11.17 ± 1.74	<i>t</i> (211) = 0.40, n.s.
High school diploma/GED	106 (75.2%)	53 (73.6%)	$\chi^2(1) = 0.60$, n.s.
Employed (either FT or PT)	20 (14.2%)	13 (18.1%)	$\chi^2(1) = 0.55$, n.s.
Current homeless	10 (7.1%)	5 (6.9%)	$\chi^2(1) = 0.02$, n.s.
Never been homeless	50 (35.5%)	26 (36.1%)	$\chi^2(1) = 0.09$, n.s.
<i>N</i> of children under 21	1.43 ± 1.51	1.42 ± 1.43	<i>t</i> (211) = 0.04, n.s.
<i>N</i> of arrests (lifetime)	11.98 ± 21.41	6.26 ± 9.21	<i>t</i> (211) = 2.16, <i>p</i> < .05
<i>N</i> of arrests (lifetime) (excluded outlier)	10.56 ± 13.33	6.26 ± 9.21	<i>t</i> (210) = 2.45, <i>p</i> < .05
Ever been arrested	130 (92.2%)	59 (81.9%)	$\chi^2(1) = 5.01$, <i>p</i> < .05
Age of first alcoholic drink or drug use	14.14 ± 5.15	14.63 ± 5.56	<i>t</i> (211) = -.63, n.s.

^aIncluding American Indian, Alaskan Native, Asian/Pacific Islander, mixed, and other.

^bIncluding living with someone as married, remarried, and married but living apart.

^cIncluding widowed, divorced, and legally separated.

*Age range from 18 to 73. *T* test excluding 73-year-old case showed no group difference.

TABLE 2. Group Attendance

# Sessions	TARGET (<i>n</i> = 141)			TAU (<i>n</i> = 72)		
	Mean	SD	N	Mean	SD	N
SA Treatment	30.67	37.38	141	39.00	69.62	72
TARGET Groups	3.41	3.38	141	00.00	00.00	72
Total sessions	34.08	38.82	141	39.00	69.62	72

although the difference was not statistically significant (TARGET mean 34.1; TSU mean 39.0; Mann-Whitney $z = -0.35$). Thus, most experimental group participants did not receive an adequate “dose” of TARGET. Of the 141 people randomly assigned to TARGET, 34% did not attend a single group session, primarily due to slowness of recruitment causing lengthy delays in starting some of the first TARGET groups. Another 22% came to three or fewer sessions, and 17% attended four to six sessions. Only 27% of participants attended seven to nine sessions, and thus received an approximately full dose of TARGET treatment. This article compares outcomes of the TARGET and TSU groups as randomized, using intent-to-treat principles.

RESULTS

Attrition

Follow-up rates for the TARGET and TSU groups were comparable. Of the 213 participants, 6-month interviews were obtained on 147 (69%) and 12-month interviews on 176 (83.5%). There were no significant differences between the rates by group (TSU 29% attrition at 6 months compared to 32% for TARGET; TSU 15% at 12 months compared to 18% attrition for TARGET). Although the 6-month rate is low, the study yielded acceptable rates overall, and we used of statistical techniques to employ all available data and to check for patterns of missing data, described below. Other than interviews that could not be completed because of attrition, the rates of missing data elements were very low—that is, 0.5% for the most sensitive outcome variables (substance use).

Data Analysis

Table 3 presents the mean values of the major outcome variables at each data collection wave. To examine the impact of the TARGET treatment on each outcome variable, hierarchical linear modeling (HLM, also known as mixed regression models, see Bryk & Raudenbush, 1987, 1992; Hedeker, Gibbons, Waternaux, & Davis, 1989) was employed. When applying HLM to analyze longitudinal data, participants represent level two data, and observations at baseline, 6-months and 12-months, nested within individual participants, represent level one data. Unlike repeated ANOVA, which only includes participants for whom complete data are available, HLM allows us to use all the available information for estimation, including those who

TABLE 3. Means and Standard Deviations by Group by Time

	TARGET			TSU		
	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
PRIMARY STUDY OUTCOMES						
Post Traumatic Cognitions Inventory						
Baseline	3.82	1.05	141	3.79	1.06	72
6-month	3.20	1.18	91	3.37	1.15	50
12-month	3.18	1.26	106	3.38	1.17	59
Anxiety Symptom Index						
Baseline	4.89	2.44	141	4.72	2.42	72
6-month	2.64	2.59	96	2.78	2.52	51
12-month	2.86	2.51	115	2.63	2.41	60
Depressive Symptom index						
Baseline	4.87	1.54	141	4.99	1.42	72
6-month	3.26	2.19	96	3.49	2.23	51
12-month	3.08	2.26	115	3.15	2.17	60
Self-efficacy index						
Baseline	3.48	1.40	140	3.82	1.35	72
6-month	3.27	1.63	95	3.44	1.64	50
12-month	3.50	1.59	111	3.26	1.70	57
SUBSTANCE USE OUTCOMES						
Substance frequency index						
Baseline	.12	.15	141	.11	.14	72
6-month	.05	.12	96	.04	.10	51
12-month	.06	.13	115	.05	.11	60
% Drink alcohol to intoxication						
Baseline	48%		141	43%		72
6-month	29%		96	22%		51
12-month	30%		115	18%		60
% Use any drug						
Baseline	51%		141	44%		72
6-month	33%		96	27%		51
12-month	39%		115	28%		60
% Substance abuse						
Baseline	63%		141	58%		72
6-month	40%		96	35%		51
12-month	45%		115	35%		60

do have missing follow-up interviews. The SAS MIXED program (SAS Institute, 1999) was used to obtain the HLM estimates for continuous outcomes variables, such as the post-traumatic cognitions inventory (PTCI). For dichotomized outcomes, such as any substance abuse, the generalized estimating equation (GEE) procedure (Liang & Zeger, 1986), which also

takes into account the correlated cluster data, was applied. The SAS GENMOD program (SAS Institute, 1999) was used to obtain the GEE estimates. For each outcome analysis, one model was first fit with a time effect only to estimate the overall change for both groups. Next, a model was estimated with time, group (TARGET or TSU), and time by group terms. In these models, past arrests was added as a control variable, since it was the only baseline measure on which the groups differed significantly. The two-way group by time interaction term from the second model is of primary interest, because it represents the extent to which group differences vary across the 1-year follow-up period.

Change Over Time and by Treatment Condition

Results from the time effect models suggest that, in general, participants from both groups show positive progress over time for all primary outcomes except self-efficacy and for all substance use outcomes (Table 3). However, none of these outcomes showed significant group by time effects, except that self-efficacy showed a marginally significant group by time effect favoring the TARGET condition ($z = 1.89, p = 0.061$), as shown in Figure 1. An examination of the change over time within each treatment condition indicates that over the course of the study, the TARGET group did not decline with respect to self-efficacy ($z = 0.07, p = 0.99$); unlike the TSU condition, which did significantly decline ($z = -0.4, p = .027$)

Gender and Ethnic Group Differences

Subgroup analyses were conducted to investigate whether gender or ethnicity affected treatment outcomes. For the TARGET group, White participants were found to improve more on the PTCI than other participants ($z = -3.12, p < 0.022$), even after adjusting for education. Another difference emerged, with respect to substance use between experimental conditions. Specifically, compared to non-White males in the TSU group ($n = 15$), non-White males who were assigned to TARGET group ($n = 20$) were more likely to drink to intoxication or use illegal substances at the 12-month follow-up ($z = 2.52, p < 0.012$). This finding is illustrated in Figure 2.

Missing Data

Since HLM results are only valid where missing data are missing at random, the pattern mixture analysis (Hedeker & Gibbons, 1997) was

FIGURE 1. Random Regression Results, Self-Efficacy Index (SEI), Controlling for Past Arrests

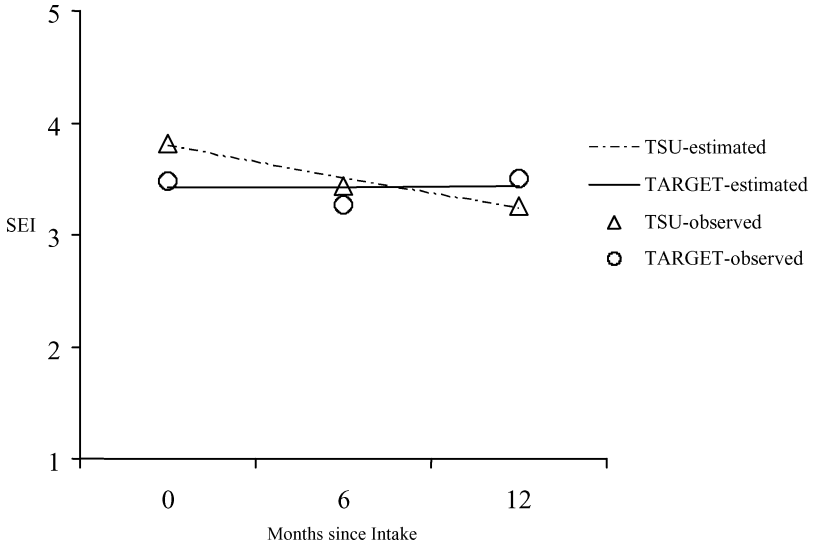
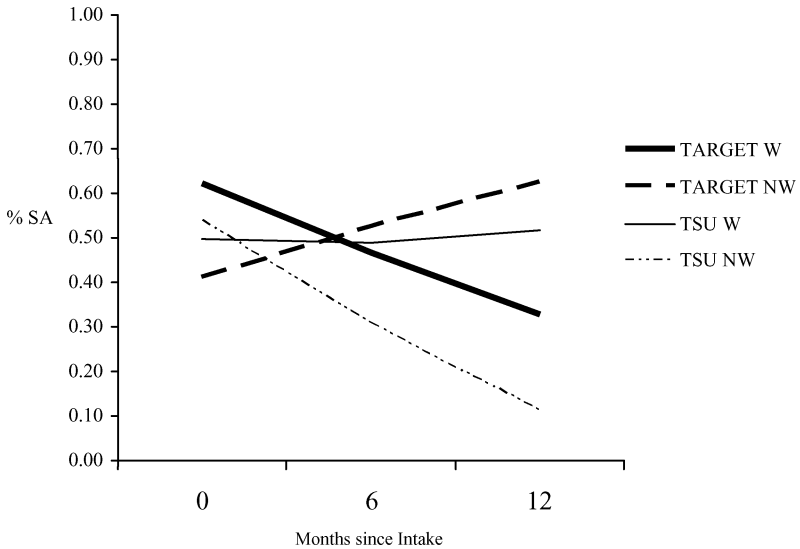


FIGURE 2. Random Regression Results for Substance Abuse (SA), Males only, White and Non-White, Controlling for Past Arrests



conducted to determine whether the pattern of missing data has any impact on the treatment outcomes. Participants with complete data were compared to those with any missing observations (i.e., a missed follow-up interview). Because there were no significant three-way interactions of group by time by incomplete data, it may be concluded that the outcomes were not affected by the pattern of missing data.

Efficacy Analyses

Because of concern about the low levels of attendance, efficacy analyses in addition to the intent-to-treat analyses were conducted on all outcome variables. Specifically, only TARGET participants who received graduation certificates ($n = 39$) were compared to the TSU group to test efficacy. Results for the efficacy analyses were not different from the results from the intent-to-treat analyses.

DISCUSSION

This first randomized trial of the brief TARGET model with substance abuse outpatients reveals consistent reductions in post-traumatic stress, anxiety, depression, and substance use over a 12-month period. Compared to trauma sensitive usual care, one favorable outcome was identified for the TARGET group, for self-efficacy related to substance abstinence. As reported by clinicians being trained in TSU and TARGET prior to the study, trauma survivors in substance abuse treatment who do not receive trauma treatment may successfully reduce substance use, only to find it more difficult to face trauma symptoms. Results from this study indicate that the TARGET intervention helped participants to maintain their self-efficacy regarding substance use abstinence following treatment, while the comparison group's self-efficacy declined. Although this finding was not mirrored in the measures of self-reported substance use (where both groups reported comparable decreases in actual substance use), self-efficacy has been shown in other studies to be a protective factor associated with reduced risk of relapse (e.g., McKay et al., 2005). The self-regulation stress management skills taught by TARGET thus warrant investigation as a potential contributor to relapse prevention.

Although the trauma-sensitive usual care group, overall, did not fare better on any of the outcomes studied, an interaction effect of gender, ethnicity, and treatment condition for self-reported substance abuse was

significant. Non-White men in trauma-sensitive usual care were less likely to use drugs or drink to intoxication over time. By contrast, non-White men in the TARGET condition actually reported an increase in substance use. This finding, as well as the superiority of TARGET with respect to post-traumatic cognitions only among White participants, suggests that gender and ethnicity may play important roles in addressing trauma symptoms with adults in substance abuse treatment. However, the number of participants in these subgroups is very small, and these results must be interpreted with great caution.

Overall, there are additional reasons that the study findings warrant caution. First, the total dose of TARGET treatment received by the experimental group was very low. Conducting a randomized trial with closed groups proved to be extremely challenging. Eventually, the randomization procedures were altered to ensure that fewer experimental participants would leave the treatment agency prior to TARGET start-up, but in the early part of the study, many of the experimental participants attended few or no sessions. Although the efficacy analysis did not show differences between TARGET graduates and participants in the comparison group, the power for these analyses was low due to the small number of TARGET graduates ($N = 39$), so these analyses may have understated the true efficacy of TARGET. Failures to graduate from TARGET occurred primarily because participants concluded or discontinued all of their services at the agency prior to the full course of TARGET, not as a reaction to the groups or the TARGET protocol. A better test of TARGET among persons mandated to treatment by the courts, parole, child welfare, or employers (as many of the participants were mandated) would therefore involve using TARGET as a *component* of mandated treatment, rather than as an additional group.

Second, and perhaps most importantly, it should be emphasized that TARGET was not contrasted with usual care, but trauma-sensitive usual care. It was not possible for us to restrict trauma sensitivity to TARGET participants because counselors for TARGET also had to conduct other groups and individual counseling. The best alternative was to provide trauma-sensitivity training for all staff members, to provide all participants with a similar level of trauma sensitivity in their substance abuse services. Counselors could not be prohibited from formally referring to the FREEDOM steps or using the handouts or other tangible materials from TARGET in non-TARGET groups. Fidelity checks were conducted to ensure that TARGET was delivered as intended, but it was not possible to determine that TSU did not use TARGET. Participating counselors reported that several core TARGET components were available in the TSU

model: providing clients with an understanding of the impact of trauma, using safety planning, and teaching “focusing” techniques (ways that clients can remind themselves of their current situation and surroundings in order to avoid feelings of being out of control). Indeed, a focus group performed with group leaders following the study revealed that counselors felt most strongly that these skill and education components were very beneficial for their clients. Thus, the overall weakness of findings appear to be at least partially related to contamination of the comparison group treatment with TARGET principles and techniques. Third, although the sample size for the ethnic and gender subgroups are very small, possible reasons for the increased substance use among non-White male experimental group participants have been carefully examined. Although no definitive conclusions can be drawn, two explanations that warrant further study. One possibility is that the result is unrelated to the TARGET treatment itself. Although the women TARGET group leaders were culturally mixed, all male TARGET group leaders were White. Thus, while all White male TARGET participants had a group leader of the same race, none of the African American or Latino men did. Furthermore, although all women had female group leaders, men in TARGET groups often had female group leaders. It is possible that male participants’ reactions to group leaders who were female and not of their ethnicity caused, at least in part, the negative results for this subpopulation.

Alternatively, the TARGET intervention may require further adaptation for various cultural groups. Different ethnic groups may respond differently to trauma treatment and need culturally specific interventions. Baseline differences between ethnic groups in the post-traumatic cognitions inventory may indicate that White participants had significantly higher scores in self-blame and negative views of self. The greater degree of change in post-traumatic cognitions in the TARGET condition for White, versus African American or Latino, participants may reflect a good fit for the TARGET model with White clients’ need for help with post-traumatic negative self-perceptions. For other men, however, sustained abstinence from drugs and alcohol may require refinement in the TARGET intervention.

Overall, these findings suggest that trauma-sensitive services are associated with sustained improvements in psychosocial, substance use, and traumatic stress outcomes in a treatment sample of substance abusers. The skills-based trauma-focused intervention provided by TARGET may additionally enhance clients’ sustained sense of efficacy in achieving sobriety, and for some the ability to reduce the intensity of beliefs associated with having been traumatized. Adaptations of TARGET and the context

in which it is delivered (e.g., therapist-client gender-ethnicity matching) warrant systematic research in order to provide a clearer definition of its efficacy and limitations, as well as to ensure that TARGET is carefully tailored to each gender and to specific cultural groups.

REFERENCES

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Beck, A. T., Steer, R. A., & Garbin, M. G. (1988). Psychometric properties of the *Beck Depression Inventory*: Twenty-five years of evaluation. *Clinical Psychology Review, 8*(1), 77–100. (DOI: 10.1016/0272-7358(88)90050-5)
- Blake, D. D., Weathers, F. W., Nagy, L. M., & Kaloupek, D. G. (1995). The development of a clinician-administered PTSD scale. *Journal of Traumatic Stress, 8*(1), 75–90. (DOI: 10.1007/BF02105408)
- Brown, G. R., & Anderson, B. (1991). Psychiatric morbidity in adult inpatients with childhood histories of sexual and physical abuse. *American Journal of Psychiatry, 148*(1), 55–61.
- Read, J. P., & Kahler, P. J., Read, J. P., & Kahler, C. W. (2003). Comorbid posttraumatic stress disorder and substance use disorders: Treatment outcomes and role coping. In P. C. Ouimette & P. J. Brown (Eds.), *Trauma and substance abuse: Causes, consequences, and treatment of comorbid disorders* (pp. 171–188). Washington, DC: American Psychological Association.
- Brown, P. J., Stout, R. L., & Gannon, J. P. (1998). Substance use disorder-PTSD comorbidity: Patients' perceptions of symptom interplay and treatment issues. *Journal of Substance Abuse Treatment, 15*(5), 445–448.
- Bryk, A. S., & Raudenbush, S. W. (1987). Application of hierarchical linear models to assessing change. *Psychological Bulletin, 101*(1), 147–158. (DOI: 10.1037/0033-2909.101.1.147)
- Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA: Sage.
- Dansky, B. S., Brady, K. T., Saladin, M. E., Killeen, T., Becker, S., & Roitzsch, J. C. (1996). Victimization and PTSD in individuals with substance use disorders: Gender and racial differences. *American Journal of Drug and Alcohol Abuse, 22*(1) 75–93.
- Dansky, B. S., Saladin, M. E., Brady, K. T., Kilpatrick, D. G., & Resnick, H. S., (1995). Prevalence of victimization and posttraumatic stress disorder among women with substance use disorders: Comparison of telephone and in-person assessment samples. *International Journal of the Addictions, 30*(9), 1079–1099.
- Dennis, M. L., Scott, C. K., Godley, M. D., & Funk, R. (1999). Comparisons of adolescents and adults by ASAM profile using GAIN data from the Drug Outcome Monitoring Study (DOMS): Preliminary data tables. Chestnut Health Systems, Bloomington, IL.
- Deykin, E. Y., & Buka, S. L. (1997). Prevalence and risk factors for posttraumatic stress disorder among chemically dependent adolescents. *American Journal of Psychiatry, 154*(6), 752–757.

- Foa, E. B., Ehlers, A., Clark, D. M., Tolin, D. F., & Orsillo, S. M. (1999). The Posttraumatic Cognitions Inventory (PTCI): Development and validation. *Psychological Assessment, 11*(3), 303–314. (DOI: 10.1037/1040-3590.11.3.303)
- Ford, J. D., & Russo, E. (2006). Trauma-focused, present-centered, emotional self-regulation approach to integrated treatment for post-traumatic stress and addiction: TARGET. *American Journal of Psychotherapy, 60*, 335–355.
- Goff, D. C., Brotman, A. W., Kindlon, D. J., Waites, M., & Amico, E. (1991). Self-reports of childhood abuse in chronically psychotic patients. *Psychiatry Research, 37*(1) 73–80. (DOI: 10.1016/0165-1781(91)90107-Z)
- Hedeker, D., & Gibbons, R. D. (1997). Application of random-effects pattern-mixture models for missing data in longitudinal studies. *Psychological Methods, 2*(1), 64–78. (DOI: 10.1037/1082-989X.2.1.64)
- Hedeker, D., Gibbons, R. D., Waternaux, C., & Davis, J. M. (1989). Investigating drug plasma levels and clinical response using random regression models. *Psychopharmacology Bulletin, 25*(2), 227–231.
- Kelly, J. F., McKellar, J. D., & Moos R. (2003). Major depression in patients with substance use disorders: Relationship to 12-step self-help involvement and substance use outcomes. *Addiction, 98*(4), 499–508. (DOI: 10.1046/j.1360-0443.2003.t01-1-00294.x)
- Kessler, R. C., Sonnega, A., Bromet, E. J., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 52*(1), 1048–1060.
- Liang, K. Y., & Zeger, S. L. (1986). Longitudinal data analysis using generalized linear models. *Biometrika, 73*, 13–22.
- McKay, J. R., Folz, C., Stephens, R. C., Leahy, P. J., Crowley, E. M., & Kissin, W. (2005). Predictors of alcohol and crack cocaine use outcomes over a 3-year follow-up in treatment seekers. *Journal of Substance Abuse Treatment, 28*, S73–S82. (DOI: 10.1016/j.jsat.2004.10.010)
- Najavits, L. M., Weiss, R. D., Shaw, S. R., & Sarah, R. (1997). The link between substance abuse and posttraumatic stress disorder in women: A research review. *American Journal on Addictions, 6*(4), 273–283.
- Ouimette, P. C., Brown, P. J., & Najavits, L. M. (1998). Course and treatment of patients with both substance use and posttraumatic stress disorders. *Addictive Behaviors, 23*(6), 785–795. (DOI: 10.1016/S0306-4603(98)00064-1)
- Palacios, W. R., Urmann, C. F., Newel, R., & Hamilton, N. (1999). Developing a sociological framework for dually diagnosed women. *Journal of Substance Abuse Treatment, 17*(1/2), 91–102. (DOI: 10.1016/S0740-5472(98)00054-3)
- Pelcovitz, D., van der Kolk, B., Roth, S., Mandel, F., Kaplan, S., & Resick, P. (1997). Development of a criteria set and a structured interview for disorders of extreme stress (DESNOS). *Journal of Traumatic Stress, 10*(1), 3–16. (DOI: 10.1023/A:1024800212070)
- Rose, S. M., Peabody, C. G., & Stratigeas, B. (1991). Undetected abuse among intensive case management clients. *Hospital and Community Psychiatry, 42*(5), 499–503.
- SAS Institute. (1999). SAS/STAT user's guide (Vol. 2., Version 8). Cary, NC: Author.
- Steinberg, M. (1997). Assessing posttraumatic dissociation with the Structured Clinical Interview for DSM-IV Dissociative Disorders. In J. P. Wilson & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 429–447). New York: Guilford Press.

- Stewart, S. H., Conrod, P. J., Pihl, R. O., & Dongier, M. (1999). Relations between posttraumatic stress symptom dimensions and substance dependence in a community-recruited sample of substance-abusing women. *Psychology of Addictive Behaviors, 13*(2), 78–88. (DOI: 10.1037/0893-164X.13.2.78)
- Stewart, S. H., Pihl, R. O., Conrod, P. J., & Dongier, M. (1998). Functional associations among trauma, PTSD, and substance-related disorders. *Addictive Behaviors, 23*(6), 797–812. (DOI: 10.1016/S0306-4603(98)00070-7)
- Triffleman, E. G., Marmar, C. R., Delucchi, K. L., & Ronfeldt, H. M. (1995). Childhood trauma and posttraumatic stress disorder in substance abuse inpatients. *Journal of Nervous and Mental Disease, 183*(3), 172–176.
- Wasserman, D. A., Havassy, B. E., & Boles, S. M. (1997). Traumatic events and posttraumatic stress disorder in cocaine users entering private treatment. *Drug and Alcohol Dependence, 46*(1/2), 1–8. (DOI: 10.1016/S0376-8716(97)00048-3)