

Modifications to the Trauma Recovery and Empowerment Model (TREM) for Substance-Abusing Women with Histories of Violence: Outcomes and Lessons Learned at a Colorado Substance Abuse Treatment Center

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A growing body of literature demonstrates the co-occurrence of posttraumatic stress disorder and substance use disorder for females seeking substance abuse treatment. Nonetheless, relatively few trauma-specific treatments have been implemented or evaluated with this population. In this quasi-experimental study (N = 170), the Trauma Recovery and Empowerment Model (TREM) was modified for use in an existing residential substance abuse program. Women who participated in the TREM showed significantly better outcomes than those who received treatment-as-usual on trauma-related symptoms, although not on alcohol

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or drug use. TREM appears to be a promising model that can be embedded in a residential substance abuse treatment setting. Implications for practice and further research are discussed.

A growing body of literature documents the co-occurrence of posttraumatic stress disorder (PTSD) and substance use disorders in individuals seeking substance abuse treatment. Studies reveal that 11–60% of those entering substance abuse treatment have current PTSD diagnoses (Clark, Masson, Delucchi, Hall, & Sees, 2001; Hien, Nunes, Levin, & Fraser, 2000; Najavits et al., 2003; Sharkansky, Brief, Peirce, Meehan, & Mannix, 1999). Additionally, 25–55% report symptoms indicating the likelihood of a current PTSD diagnosis (Brown, Recupero, & Stout, 1995; Clark et al.) and 60–89% report a severely violent traumatic event in their lifetime (Clark et al.; Farley, Golding, Young, Mulligan, & Minkoff, 2004; Hien et al.; B. A. Miller & Downs, 1993; Rice et al., 2001).

PTSD and trauma place a particular burden on females entering substance treatment, with women reporting significantly higher rates of sexual abuse (Brown et al., 1995; Clark et al., 2001; Hien et al., 2000; Najavits et al., 2003; Rice et al., 2001), physical abuse (Brown et al.; Hien et al.; Najavits et al.), and PTSD (Brown et al.; Hien et al.; Najavits et al.) than men. Furthermore, studies demonstrate that individuals with histories of PTSD and trauma are less likely to benefit from treatment and experience poorer substance abuse and mental health outcomes (Easton, Swan, & Sinha, 2000; Ouimette, Finney, & Moos, 1999) and more psychosocial complications than individuals who enter treatment without histories of PTSD and trauma. Specialized trauma interventions hold promise in improving the effectiveness of treatment for this population. Preliminary findings on the effectiveness of integration of trauma-specific interventions in substance abuse treatment settings suggest that substance abuse, mental health, and PTSD symptoms improve when trauma treatment is added (Brady, Dansky, Back, Foa, & Carroll, 2001; Cocozza et al., 2005; Fallot & Harris, 2002; Morrissey, Ellis et al., 2005; Morrissey, Jackson et al., 2005; Najavits, Weiss, Shaw, & Muenz, 1998; Rosenberg et al., 2001; Talbot et al., 1999; Zlotnick, Najavits, Rohsenow, & Johnson, 2003)

Given the documented need for specialized services, several trauma-specific treatments have been developed or adapted for women with co-occurring substance use disorders and PTSD, but the development and evaluation of these programs are still in their early years (Finkelstein et al., 2004). This study reports the findings from an agency in Colorado that implemented the Treatment Recovery and Empowerment Program (TREM) model into its substance abuse treatment program. TREM (Harris & The Community Connections Trauma Work Group, 1998) is a manualized group intervention originally designed for female trauma survivors with severe mental disorders (Fallot & Harris, 2002). TREM was developed in the early 1990s by Maxine Harris and clinicians at Community Connections, a mental health agency in Washington, D.C., with feedback from consumer-survivors on the appropriateness and helpfulness of each session (Fallot & Harris, 2004a). The 33-session intervention extends over nine months, with individuals meeting weekly for 75-minute group sessions that focus on psycho-education, cognitive restructuring, survivor empowerment, skill-building, and peer support (Fallot & Harris, 2004a). It has been modified for use with men and adolescent girls. In addition, abbreviated versions of 24–29 sessions have since been developed by the authors (Finkelstein et al., 2004). The TREM intervention

has been adopted in a number of programs throughout the country, including outpatient mental health agencies, residential and outpatient substance abuse treatment programs, residential therapeutic communities, correctional facilities, and homeless and domestic violence shelters (Harris, 2005).

Despite its increasing use in a variety of settings, only preliminary studies of the effectiveness of the curriculum have been conducted. These studies suggest that the intervention is effective in improving psychiatric and health-related outcomes in female participants enrolled in services at mental health agencies. In the findings from two pilot studies, both clinicians and participants reported decreases in the participants' psychiatric symptoms, including those directly associated with PTSD; increases in overall functioning; decreases in hospitalization and emergency room use; increases in safety; and decreases in HIV risk behavior. Both of these preliminary outcome studies involved small numbers of participants (14 in each), were non-experimental, and lacked control groups (Fallot & Harris, 2004b).

The overall goal of this study was to evaluate the efficacy of TREM therapy compared to treatment-as-usual (TAU) in a nonrandomized, quasi-experimental study of 170 women with co-occurring substance use disorders, mental illness, and trauma histories at a Colorado substance abuse treatment center. The women were compared on trauma symptoms and other related outcomes at 6 and 12 months after intake. Based on the promising results from the TREM pilot studies, we expected that the women who received the TREM intervention would show more improvement than the women who received TAU in severity of trauma-related symptoms (such as post-traumatic stress symptoms and dissociation), trauma coping, sense of safety, and current exposure to abuse and stress, as well as in trauma-linked domains, such as alcohol and drug use, mental health symptoms, physical health, and social role functioning.

STUDY HISTORY AND OVERVIEW

The Women, Co-occurring Disorders and Violence Study (WCDVS) was a national, multisite study funded by the U.S. Department of Health and Human Services' Substance Abuse and Mental Health Services Administration from 1998 through 2003. WCDVS investigators designed and implemented a research protocol to evaluate the effectiveness of integrated services for women affected by substance abuse and mental illness who were also victims of violence. This longitudinal, quasi-experimental study included follow-up interviews to assess outcomes and services utilization at 6 and 12 months following treatment entry. Detailed descriptions of the study design, target population, and study outcomes have been published elsewhere (Cocozza et al., 2005; McHugo, Kammerer et al., 2005; Morrissey, Ellis et al., 2005; Morrissey, Jackson et al., 2005).

METHODS

Adaptation and Implementation of TREM

Arapahoe House, Inc.'s, New Directions for Families (NDF) is a residential program for substance-dependent women with co-occurring mental illness and their dependent children (ages 0–12). The expected length of stay in the program is 4 months, followed by outpatient continuing care. The programming at NDF is divided into three phases, the first two of which occur during residential treatment. Phase I of the

residential portion lasts 6 to 8 weeks and includes intensive treatment activities and parenting skills development. In Phase II, women work or attend school during the day and participate in treatment and parenting activities at night. Phase III begins after women transition out of the program back into the community and begin receiving continuing care services.

Trauma-specific services were delivered using an adaptation of the TREM model. With the assistance of the curriculum developers, project staff condensed the 33-session TREM curriculum into a 24-session format for use in NDF. (In most cases, sessions that were excluded contained material that was presented elsewhere in the residential treatment programming.) In addition, project staff modified the original group format so that participants could join the group during selected sessions rather than adhering to the recommended closed group format where participants are unable to join the group after the first few sessions. This modification was essential to the curriculum's implementation in a residential setting with a fixed length of stay. A self-help workbook (Copeland & Harris, 2000) was used to orient women to the trauma material before they joined the TREM groups. The workbook was also found to be useful for women who were not quite ready to address their trauma in a group setting.

The TREM intervention was embedded in the larger intensive residential programming of NDF. During Phase I, the first sixteen sessions of TREM were delivered in groups meeting twice a week. The first sessions addressed topics related to gender identity, sexuality, interpersonal boundaries, and self esteem. Later sessions provided education about sexual, physical, and emotional abuse. Women attended these sessions after having completed required orientation sessions. There were three specific closed sessions that dealt directly with physical, sexual, and emotional abuse; new clients were not able to join the group during these sessions.

During Phase II, the remaining eight sessions of TREM were delivered in open group meetings once a week in the evenings. Participants entering this phase who had completed the first 16 TREM groups during Phase I could join during any of the sessions, with the expectation that they would ultimately complete all eight Phase II sessions. These sessions focused on family, relationships, destructive behaviors, and skill-building topics such as decision making and communication.

Treatment-As-Usual

The Intensive Residential Treatment (IRT) program served as the place of recruitment for the TAU condition. IRT is a short-term (2–3 week), mixed gender residential program for individuals with substance abuse and co-occurring mental illness. IRT aims to quickly provide integrated treatment for substance use and mental health disorders and then transfer individuals to outpatient treatment and other continuing care services in the community.

IRT was selected as a comparison site because it represents the usual residential substance abuse treatment funded by the state's public treatment system. Both NDF and IRT are designed to serve substance-dependent individuals, including those with co-occurring mental health disorders. Both programs employ motivational interviewing, and both work under the assumption that residential treatment should be followed by outpatient continuing care.

Random assignment to the two programs was not possible because of funding and referral constraints. Child welfare contracts, in particular, required that counties have the ability to refer clients to the program of their choice. We used well-defined study

eligibility requirements for recruitment from each of the two programs to minimize group differences.

Eligibility and Sampling

Eligibility criteria for the WCDVS stipulated that women must be 18 years of age or older, have a DSM-IV Axis I and/or Axis II psychiatric disorder (American Psychiatric Association, 2000) and a DSM-IV substance abuse disorder (one diagnosis had to be current and the other could have been assigned within the past 5 years), have a history of physical and/or sexual abuse, and have had at least two distinct treatment episodes within the mental health and substance abuse services systems (Giard et al., 2005). The Colorado site also required study participants to have a current diagnosis of substance dependence and have custody of, or a strong likelihood of regaining custody of, a child 12 years old or younger.

Women entering residential treatment at the experimental or comparison sites were provided information about study eligibility criteria. After obtaining informed consent to participate in research, trained interviewers administered the cross-site and local-site protocol to each of the participants. Initially, 190 women consented to participate in the study and completed the baseline interview at the Colorado site. Of these, 170 women completed both the 6- and 12-month follow-up interviews, for a response rate of 89%. This report includes only these 170 women; 64 women were in TREM and 106 women were in TAU. The average follow-up rate was higher for the TREM group (96%) than for the TAU group (86%), which was a statistically significant difference ($\chi^2 = 4.0$, $df = 1$, $p = .05$). There were no significant differences on demographic or outcome measures for the 20 subjects who dropped out of the study compared to those who completed the follow up interviews.

MEASURES

Fidelity

The authors of the TREM curriculum developed a fidelity scale that measures how well treatment implementation matched the goals stated in the treatment manual (Fallot & Harris, 2001). A round of treatment was defined as a full 24-session TREM course. From each round, three sessions (excluding the first three orientation sessions) were randomly selected for audiotaping. There were 12 rounds, so 36 sessions were recorded. All of the tapes were reviewed by both a senior research associate and an NDF clinical supervisor. Of these recorded sessions, three tapes were inaudible to both coders and three tapes failed to be sent to the senior research associate; thus, only 30 sessions were in the final sample.

For each session, each coder rated different elements of the session's fidelity to the treatment (context items), as well as the counselor's presentation and level of interaction with the clients (group items). These items were then summed into two subtotals and a total score. Interrater reliability analyses showed high and significant correlations between the two coders on the context (Intra-class correlation [ICC]=1.00), group (ICC = .566, r [Pearson correlation] = .723, $p < .001$) and total scale scores (ICC = .559, $r = .717$, $p < .001$); hence, average scores were calculated for each session.

Attendance

While women in the intervention group were waiting to join the next open TREM session, they completed preparatory work using the TREM workbook. This work was reviewed in individual sessions with their counselors. It was permissible for a woman to both complete the workbook and attend the group session, and therefore, possible for her to attend all 24 TREM sessions and complete all 24 workbook sessions. Each client's chart contained a detailed dosage checklist describing all TREM services received. This checklist included the number of sessions completed in a group setting and/or by workbook. A total of 61 dosage checklists were collected for the 64 TREM clients.

Four women in the intervention group were deemed clinically inappropriate for group work on trauma and completed the TREM sessions using the workbook and individual counseling. If these clients finished the workbook session, they received credit for the group session.

Because a woman could both attend the group session and complete the corresponding workbook session, it was possible for her to be exposed to the same session twice. Thus for analysis, attendance was calculated in two ways: (1) all sessions were counted (i.e., sessions were double-counted) and (2) a specific group session and its corresponding workbook session were counted only as a single completed session (i.e., sessions were not double-counted).

Baseline Demographics

Basic demographic variables of age, race/ethnicity, marital status, number of children, pregnancy status, current employment, and education were explored, mainly for differences at baseline.

Outcomes

The WCDVS cross-site protocol was used to collect demographic information and assess six domains of functioning. These included personal history, substance abuse, mental health, trauma, services utilized, and consumer perceptions of services received (Giard et al., 2005). The sections of the protocol used for this analysis (trauma, substance use, and mental health) were mostly composed of preexisting instruments with published psychometric properties.

Trauma. Six of the trauma scales from the WCDVS cross-site protocol were selected for inclusion in this analysis. These scales, which are based on the Life Stressors Checklist-Revised (LSC-R; Wolfe, Kimerling, & Brown, 1993), were modified by the WCDVS cross-site measurement workgroup (McHugo, Caspi, et al., 2005; WCDVS Evaluation & Analysis Subcommittees & Coordinating Center, 2002). The Current Exposure to Interpersonal Abuse (CEIA) Scale is scored by summing the responses (1 = *yes*; 0 = *no*) to eight questions about emotional, physical, and sexual abuse experiences that may have occurred in the last 6 months (McHugo, Kammerer et al., 2005). The Current Exposure to Other Stressors (CEOS) Scale is scored by summing the responses (1 = *yes*; 0 = *no*) to 20 additional items about other stressful events (McHugo, Kammerer, et al.). The PTSD Symptom Scale (PSS) contains 17 symptoms of posttraumatic stress disorder

that respondents rate in terms of how often the symptom has bothered them during the past month (Foa, Cashman, Jaycox, & Perry, 1997). The ratings (from 1 = *not at all* to 4 = *almost always*) are summed to calculate a total score. A six-item Safety Scale was created for the WCDVS to measure how safe the respondents had felt during the past 6 months (Giard et al., 2005). The ratings (from 1 = *not at all* to 4 = *almost always*) are summed for a total score. A three-item Feeling Response—Dissociation Scale and a nine-item Feeling Response—Trauma Coping Index were created for the WCVDS by consumer consultants to examine respondents' strategies for coping with the traumatic events in their lives (Giard et al.). The respondent ratings (from 1 = *none of the time* to 5 = *all of the time*) are summed to calculate a total score.

Mental and physical health. Mental health symptoms were assessed using the Brief Symptom Inventory (BSI; Derogatis, 1993). The BSI assesses psychological symptom patterns in the past 7 days and contains 9 subscales and 3 global indices of mental distress. The Global Severity Index (GSI), a combination of information on the number of symptoms and the intensity of distress, is the most sensitive single indicator of a respondent's distress level and the most widely used score in the research literature. Published research on the BSI reports internal reliability estimates and test-retest reliability estimates greater than .80. An item from the cross-site WCDVS protocol was used to assess self-rated health. This item is a self-rating of one's overall physical health from 1 (*excellent*) to 5 (*poor*). The Social Role Functioning Index, modified from the BASIS-32 (Eisen, Wilcox, Leff, Schaefer, & Culhane, 1999), consists of 9 questions assessing the difficulty respondents have experienced in daily living and role functioning areas.

Substance use. The items used to assess alcohol and drug use were taken from a shortened version of the Addiction Severity Index (ASI; McLellan, Luborsky, Woody, & O'Brien, 1980). The ASI measures the severity of potential problems across seven areas commonly affected by alcohol and drug dependence. The WCDVS cross-site protocol included only the ASI alcohol and drug abuse composite items. Composite scores, ranging from 0 to 1, are based on level of use, related problems, and the perceived importance of treatment. Reported inter-rater reliability and test-retest rates for the ASI have been found to be acceptable. Investigations have demonstrated the validity of the instrument, and intercorrelations between the subscales have demonstrated that they measure independent domains (McLellan, Luborsky, & Cacciola, 1988).

Analyses

We used independent *t*-tests (for continuous dependent variables) and chi-square tests (for categorical dependent variables) to assess initial baseline differences between the two groups, TREM and TAU, on demographic and outcome measures. Analyses of covariance (ANCOVA) were used to predict 6- and 12-month outcome measures, controlling for the baseline outcome measure and any other relevant covariates highlighted in the tests of group differences. A dummy variable representing assignment in the TREM or TAU group was also included in each model. We calculated effect sizes (Cohen's *d*) for all outcome variables. Finally, outcome variables were regressed onto the baseline outcome measure and a dose variable measuring the number of TREM sessions that each TREM participant received. The dose analysis focused only on TREM participants and the specific impact of trauma treatment dose on the outcome

Table 1. Summary of Fidelity Analysis for TREM Groups (N = 30)

| | Mean | Sessions with high score (%) ^a |
|--------------------------|------|---|
| Context items | | |
| Training | 3.5 | 53 |
| Assessment | 4.0 | 100 |
| Support | 3.7 | 47 |
| Context subtotal | 3.7 | 47 |
| Group items | | |
| Structure | 4.5 | 100 |
| Training | 4.9 | 100 |
| Content | 4.6 | 100 |
| Control | 4.8 | 100 |
| Activity | 2.8 | 27 |
| Question/comment ratio | 4.7 | 90 |
| Session structuring | 4.0 | 70 |
| General psycho-education | 4.2 | 83 |
| Trauma education | 4.3 | 77 |
| Empowerment/affirmation | 4.5 | 87 |
| Positive problem-solving | 2.9 | 43 |
| Leader style | 4.4 | 83 |
| Goal achievement | 4.9 | 97 |
| Group subtotal | 4.4 | 83 |
| Total scale score | 4.2 | 73% |

^aHigh score ≥ 4 .

variables. Results for all analyses are reported at the conventional $p < .05$ and $p < .01$ significance levels.

RESULTS

Adherence

Table 1 shows the results of the fidelity analysis. The total scale mean score was 4.2 out of a maximum of 5; about three-quarters (73%) of the sessions met ideal requirements for fidelity to the TREM model as dictated by the authors.

Attendance

On average, women in the intervention group received 11.8 TREM group sessions ($SD = 5.3$) and completed 4.5 TREM workbook sessions ($SD = 2.6$). Because a woman could both attend the group session and complete the corresponding workbook session, it was possible for her to be exposed to the same session twice. When we counted a specific group session and its corresponding workbook session as a single completed session, the women attended an average of 14.9 TREM sessions ($SD = 6.1$), i.e., 63% of the sessions.

Baseline Group Differences

Table 2 shows the descriptive statistics and significant group differences for the study variables. These data demonstrate that the intervention group differed significantly from the comparison group on several variables. Demographically, the TREM participants were significantly younger and more likely to be pregnant at the time of the baseline interview compared to the TAU participants. On outcome measures, the TREM participants exhibited fewer PTSD symptoms and less dissociative behavior, were better able to cope with their trauma, had less severe mental health symptoms, had fewer difficulties with social role functioning, and had less severe problems with alcohol abuse than the TAU participants.

Table 2. Baseline Descriptive Statistics and Group Differences for the Study Variables (N = 170)

| | TAU | | TREM | | p-value |
|------------------------------|------|------|------|------|---------|
| | Mean | % | Mean | % | |
| Demographic variables | | | | | |
| Age (years) | 32.7 | | 29.0 | | .001** |
| Education (years) | 11.7 | | 11.1 | | .084 |
| Race/ethnicity | | | | | |
| White | | 55.7 | | 48.4 | .890 |
| Black | | 17.0 | | 20.3 | |
| Hispanic | | 14.2 | | 17.2 | |
| American Indian | | 7.5 | | 9.4 | |
| Other | | 5.7 | | 4.7 | |
| Marital status | | | | | |
| Never married | | 18.9 | | 35.9 | .069 |
| Married | | 18.9 | | 15.6 | |
| Living with partner | | 27.4 | | 26.6 | |
| Divorced or separated | | 34.9 | | 21.9 | |
| Pregnant | | 6.0 | | 22.0 | .002** |
| Children under 18 | 2.4 | | 2.4 | | .750 |
| Currently employed | | 18.9 | | 10.9 | .150 |
| Outcome variables | | | | | |
| PSS | 25.1 | | 18.2 | | .000** |
| Feelings—Dissociation Scale | 2.9 | | 2.5 | | .013* |
| Feelings—Trauma Coping Index | 1.9 | | 1.7 | | .031* |
| Safety Scale | 1.9 | | 1.9 | | .600 |
| CEIA Scale | 1.3 | | 1.0 | | .180 |
| CEOS Scale | 3.7 | | 3.2 | | .140 |
| GSI | 1.35 | | .97 | | .001** |
| SRF Scale | 20.1 | | 16.7 | | .006** |
| Overall physical health | 3.2 | | 3.1 | | .680 |
| ASI Alcohol Composite Index | .32 | | .19 | | .011* |
| ASI Drug Composite Index | .18 | | .19 | | .820 |

Note. Desired direction for domain improvement on all outcome scales was down.

PSS = Posttraumatic Symptom Scale.

CEIA = Current Exposure to Interpersonal Abuse.

CEOS = Current Exposure to Other Stressors.

GSI = Global Severity Index from Brief Symptom Inventory.

SRF = Social Role Functioning.

*p < .05. **p < .01.

Outcomes

The extent of the between-group baseline differences supported the inclusion of covariates to control for these differences in the ANCOVA. We chose variables in Table 1 with p -values of .10 or less as potential covariates and performed correlation analyses between these potential covariates and the baseline outcome measures to check for multicollinearity. The correlations among the demographic variables and between the demographic variables and the baseline outcome measures were weak ($r = .4$ or less). The strongest correlations were between the GSI and the PSS, the Feelings—Dissociation Scale, the Feelings—Trauma Coping Index, the Safety Scale, and the Social Role Functioning Index ($r = .7$ or greater). In addition, the PSS, the Feelings—Dissociation Scale, the Feelings—Trauma Coping Index, and the Safety Scale were significantly correlated with each other ($r = .5$ or greater).

Tables 3 and 4 present the findings of the ANCOVAs for the outcome variables at the 6- and 12-month follow-up interviews. Both tables report unadjusted and adjusted means for models in which we used covariates; these covariates are listed in parentheses. Based on the correlation analyses, the covariates chosen were age (years), pregnancy (pregnant/not pregnant), education (years), marital status (recoded as dummy variables: single, married/living together, divorced), PSS baseline score, and GSI baseline score. We entered PSS baseline scores and GSI baseline scores in the models separately, as they were strongly correlated. In addition, we did not use PSS baseline scores or GSI baseline scores in models in which there was strong collinearity of either of these variables with the baseline outcome measure.

On the 6-month outcome measures, the findings in Table 3 provide partial support of the effectiveness of TREM. Specifically, TREM had the strongest impact on symptoms of dissociation and sense of safety at the 6-month follow-up. However, there were no differences between the groups on mental and physical health or on alcohol and drug use.

The findings in Table 4 give stronger support for the effectiveness of TREM on outcomes at 12 months. Specifically, TREM seemed to improve dissociative symptoms, trauma coping, sense of safety, and mental health symptoms. There were no differences between the groups on physical health or on alcohol and drug use.

Dosage Analysis

We were interested in how the number of TREM sessions received affected outcomes. In regression analyses of 6-month outcomes, controlling for dosage and the baseline outcome measure, greater dosage predicted significant decreases in GSI scores ($p = .006$) and Social Role Functioning scores ($p = .001$). At 12 months, greater dosage yielded significant decreases in PSS scores ($p = .043$), GSI scores ($p = .047$), and Social Role Functioning scores ($p = .017$). Thus, having a greater number of TREM sessions appeared to have a significant effect on symptoms of posttraumatic stress and mental health symptoms but no effect on alcohol or drug use.

DISCUSSION AND LESSONS LEARNED

The main purpose of this study was to examine the effects of TREM on substance-abusing women's trauma symptoms, mental and physical health, and alcohol and drug abuse. Few studies have been done on the effectiveness of TREM, and those studies

Table 3. Unadjusted and Adjusted Means for 6-Month Outcome Measures with Baseline Covariates and Effect Sizes (N = 170)

| Outcome measure | Baseline covariates | Group | Baseline | | Six-month | | p-value | Effect size |
|------------------------------------|-------------------------------|-------|----------|-------|-----------|-------|---------|-------------|
| | | | M | Adj-M | Unadj-M | Adj-M | | |
| Trauma | | | | | | | | |
| PSS | (PSS) | C | 25.1 | 19.93 | 21.13 | 19.93 | .361 | .43 |
| Feelings—Dissociation Scale (F-DS) | (F-DS, age, preg., educ., MS) | I | 18.2 | 18.16 | 16.07 | 18.16 | .007** | .63 |
| Feelings—Trauma Coping Index | (None) | I | 2.9 | 2.51 | 2.56 | 2.51 | | |
| Safety Scale (SS) | (SS, age, preg., educ., MS) | C | 2.5 | 2.09 | 2.00 | 2.09 | .075 | .29 |
| CEIA | (None) | C | 1.9 | 1.70 | 1.70 | — | | |
| CEOS | (CEOS, PSS) | I | 1.7 | 1.56 | 1.56 | — | | |
| Mental & physical health | | | | | | | | |
| Global Severity Index (GSI) | (GSI) | C | 1.9 | 1.69 | 1.69 | 1.69 | .030* | .48 |
| Social Role Functioning Scale | (None) | I | 1.9 | 1.46 | 1.45 | 1.46 | .115 | .25 |
| Overall physical health | (None) | C | 1.3 | 1.09 | 1.09 | — | | |
| Alcohol & substance abuse | | | | | | | | |
| ASI Alcohol Composite Index | (CEOS, PSS) | I | 1.0 | 0.75 | 0.75 | — | | |
| ASI Drug Composite Index | (GSI) | C | 3.7 | 3.38 | 3.54 | 3.38 | .075 | .50 |
| | | I | 3.2 | 2.80 | 2.52 | 2.80 | | |
| | | C | 1.35 | 1.02 | 1.09 | 1.02 | .274 | .44 |
| | | I | 0.97 | 0.91 | 0.78 | 0.91 | .059 | .30 |
| | | C | 20.1 | 18.14 | 18.14 | — | | |
| | | I | 16.7 | 15.91 | 15.91 | — | | |
| | | C | 3.2 | 3.12 | 3.12 | — | | |
| | | I | 3.1 | 2.94 | 2.94 | — | | |
| | | C | 0.32 | 0.10 | 0.10 | — | | |
| | | I | 0.19 | 0.05 | 0.05 | — | | |
| | | C | 0.18 | .058 | .058 | .056 | .091 | .30 |
| | | I | 0.19 | .037 | .037 | .039 | | |

Note. Desired direction for domain improvement on all scales was down.
 C = comparison group (TAU); I = intervention group (TREM).
 M = mean; Unadj-M = unadjusted mean; Adj-M = adjusted mean.
 PSS = Posttraumatic Symptom Scale.
 preg. = pregnant/hot pregnant.
 educ. = years of education.
 MS = marital status.
 CEIA = Current Exposure to Interpersonal Abuse Scale.
 CEOS = Current Exposure to Other Stressors Scale.
 p* < .05. *p* < .01.

Table 4. Unadjusted and Adjusted Means for 12-Month Outcome Measures with Baseline Covariates and Effect Sizes (N = 170)

| Outcome measure | Baseline covariates | Group | Baseline | | 12 Month | | p-value | Effect Size |
|-------------------------------------|-------------------------------|-------|----------|---------|----------|--|---------|-------------|
| | | | M | Unadj-M | Adj-M | | | |
| Trauma | | | | | | | | |
| PSS | (PSS) | C | 25.1 | 20.04 | 18.71 | | .249 | .47 |
| Feelings—dissociation Scale (F-DS) | (F-DS, age, preg., educ., MS) | I | 18.2 | 14.15 | 16.45 | | .007** | .61 |
| Feelings—trauma coping Index (TCI) | (TCI, age, preg., educ., MS) | I | 2.5 | 2.00 | 2.09 | | .003** | .54 |
| Safety Scale (SS) | (SS, age, preg., educ., MS) | I | 1.7 | 1.49 | 1.51 | | .030** | .38 |
| GEIA | (None) | I | 1.9 | 1.46 | 1.69 | | .289 | .17 |
| GEOS | (None) | I | 1.0 | 0.74 | — | | .347 | .15 |
| Mental & physical health | | | | | | | | |
| Global Severity Index (GSI) | (GSI, age, preg., educ., MS) | C | 1.35 | 1.12 | 1.06 | | .021* | .58 |
| Social Role Functioning Scale (SRF) | (SRF, age) | C | 20.1 | 18.69 | 18.09 | | .073 | .51 |
| Overall physical health | (None) | I | 16.7 | 15.05 | 16.03 | | .085 | .28 |
| Alcohol & substance abuse | | | | | | | | |
| ASI Alcohol Composite Index | (None) | I | 3.2 | 3.25 | — | | .067 | .28 |
| ASI Drug Composite Index | (None) | I | 3.1 | 2.95 | — | | .329 | .30 |

Note. Desired direction for domain improvement on all scales was down.
 C = comparison group (TAU); I = intervention group (TREM).
 M = mean; Unadj-M = unadjusted mean; Adj-M = adjusted mean.
 PSS = Posttraumatic Symptom Scale.
 preg. = pregnant/hot pregnant.
 educ. = years of education.
 MS = marital status.
 GEIA = Current Exposure to Interpersonal Abuse Scale.
 GEOS = Current Exposure to Other Stressors Scale.
 *p < .05, **p < .01.

have focused on clients in mental health settings. To our knowledge, this study was the first to examine the effectiveness of TREM using data on clients in a substance abuse treatment setting.

Women in the intervention group showed greater improvements on mental health symptoms, dissociative symptoms, sense of personal safety, and ability to cope with trauma compared with those in the comparison group. For these significant findings, effect sizes ranged from .38 to .63. These are principally in the medium range (.33 to .55), with several findings (dissociation, mental health symptoms) in the higher range (.56 and higher; Lipsey, 1990). Among TREM participants, an increased dose of intervention was related to greater improvements on posttraumatic stress symptoms, mental health symptoms, and social role functioning.

Contrary to expectations, we observed no intervention effect for alcohol or drug abuse. Since both intervention and comparison groups had equal exposure to substance abuse treatment, it was not surprising that both groups showed improvements. However, prior studies of the impact of trauma-specific interventions raised our expectations of a differential group change that we did not find in this study, and this is not easily explained. Recent studies of women with co-occurring mental health and substance use disorders who received specialized treatment as part of the WCDVS study found that trauma-specific interventions led to significant improvements in substance use at the 6-month follow-up but not at the 12-month follow-up, although the substance use did not revert to baseline levels (Morrissey, Ellis et al., 2005; Morrissey, Jackson et al., 2005). In the present study, we saw a similar pattern, except that there was a reduction in alcohol and drug use at 6 months and a leveling off of this reduction at 12 months (with no reversion to baseline levels) in both groups, not just in the intervention group.

To some degree, we could interpret the absence of group differences positively. Historically, substance abuse treatment providers have been concerned that “diluting” substance abuse treatment by simultaneously addressing peripheral issues would exert a negative effect on primary substance abuse outcomes. Our failure to detect group differences at the follow-up interviews suggests that addressing trauma within a substance abuse treatment experience does not adversely impact substance abuse treatment effectiveness and does improve mental health functioning and trauma related-symptoms.

This study had several weaknesses, the most significant of which was the lack of random assignment and the use of a nonequivalent group design. The TREM women differed from the TAU women on several sociodemographic variables at baseline and demonstrated less severity on some key measures of trauma and psychopathology. While strict eligibility requirements were intended to reduce the possibility of significant differences between the groups, it is evident that some systematic partiality in group assignment took place.

Because a sizeable proportion of the women referred to the study were involved with the child welfare system, it is possible that women with more serious mental health and trauma symptoms were perceived by case workers to be unlikely to regain custody of their children during recovery and were therefore referred to the TAU program, which did not accept children. Conversely, case workers may have referred women whom they perceived more likely to regain custody of their children to the TREM program rather than to the TAU program. Self-selection by women into treatment programs also may have biased the sample. It is possible that women who had more flagrant mental health and trauma symptoms chose a shorter residential stay

(i.e., the TAU program) because of a lower tolerance for group living settings, or because they preferred to receive treatment without the added burden of caring for their children. The correlation analyses and introduction of the significant group differences into the ANCOVAs were intended to begin to statistically control for the known group differences. However, our findings should be interpreted as suggestive and point to the need for additional rigorous study of the effectiveness of trauma interventions generally and TREM specifically.

Despite these limitations, our findings suggest that TREM holds promise for positively affecting trauma-related outcomes in this population of substance dependent women with co-occurring mental illness and histories of interpersonal violence. The differences between the two groups on key trauma-related outcomes are compelling, particularly in light of the complex needs of the study population.

The integration of TREM into a residential substance abuse setting stimulated some interesting program implementation insights. Because residential treatment is characterized by clients continually entering and leaving with variable lengths of stay, implementing curricula designed for closed groups can be particularly challenging. Designating particularly sensitive sessions closed to newcomers and using individual sessions and the self-help workbook (for women deemed too troubled for the group, and/or for those who were waiting to join an open session) were found to be essential to minimizing disruption to the group while maintaining the expected intensity of the residential programming. Nonetheless, the open group format required group facilitators to be particularly sensitive to issues of trust with group members, especially as new members entered the group.

In summary, the incorporation of TREM into residential substance abuse treatment appears to be both practical and effective in reducing trauma-related outcomes without compromising substance abuse outcomes. The widespread availability of the curriculum and its supporting materials allow treatment providers to tailor the intervention to the individual needs of women while ensuring fidelity to a treatment model. The use of TREM in residential substance abuse settings appears to hold great promise in responding to co-occurring substance abuse and PTSD.

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