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Risk reduction for substance use and trauma-related psychopathology in adolescent sexual assault victims: Findings from an open trial

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Abstract

Limited attention has been paid to the development and evaluation of interventions that reduce risk for substance use, while also targeting trauma-related psychopathology among maltreated adolescents. Risk Reduction through Family Therapy (RRFT) is a multi-component treatment that integrates principles and interventions from existing empirically supported treatments. The purpose of the current study was to evaluate the feasibility of implementation and initial efficacy of RRFT through an open pilot trial involving a small sample (N=10) of female adolescents (aged 13–17 years) who had experienced at least one memorable sexual assault in their lifetime. Measures of substance use and substance use risk factors (e.g., family functioning), PTSD, and depression symptoms were assessed pre-and post-treatment as well as at 3 month and 6 month post-treatment follow-up assessments. Results demonstrated reductions in multiple areas, including substance use and related risk factors, PTSD, and depression symptoms, which were maintained through follow-up. Clinical implications and future directions with this line of research are discussed.

Keywords

adolescents; trauma; sexual assault; treatment; substance use; PTSD; depression

Data from large community and clinical samples indicate that childhood sexual assault (CSA) significantly increases risk for a range of negative outcomes during adolescence, including the development of alcohol and drug abuse disorders, Posttraumatic Stress Disorder (PTSD), and depression, as well as comorbidity of these disorders (Kilpatrick et al., 2003). It is also noteworthy that a natural recovery process and resiliency have been observed among this population; not all adolescents who experience CSA meet diagnostic criteria for disorders, such as substance abuse and PTSD. Thus, a range of possible trajectories can follow CSA (Danielson et al., 2010).

Efforts dedicated to improve the empirical understanding of pathways to substance abuse and trauma-related psychopathology among adolescents have revealed specific risk and

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resiliency factors for such outcomes. These factors can be considered in the context of Ecological Systems Theory (Bronfenbrenner, 1979), which proposes that the individual, family, peer, school, and community environments (i.e., each level of a youth's ecology) play a role in psychological development. For example, maladaptive coping strategies (Carrigan et al., 2008), participation in family activities (Lewis & Petry, 2005), and association with substance using peers (Guo et al., 2002) have been identified as significant risk factors for adolescent substance abuse. Utilizing this ecological framework, interventions can be used to alter or reduce these risk factors—as well as bolster resiliency factors. A similar approach can be taken with risk reduction for trauma-related psychopathology, which also would involve targeting factors such as coping (Krause et al., 2008) and family environment (Hanson et al., 2006).

While progress has been made in the treatment of CSA-related PTSD and depression, significantly less is known about clinical treatment and prevention of substance use among CSA victims—and about how to target or reduce risk for these heterogeneous outcomes using a comprehensive approach. Given the significant associations between substance abuse, PTSD, and other negative sequelae (e.g., revictimization risk), an empirical question remains as to whether targeted prevention efforts can reduce risk of such problems developing over time among adolescents with subsyndromal or minimal symptoms. Thus, an ecologically-based, early intervention tailored to this population, which addresses the individual, family, and community variables that have been identified as risk and resiliency factors for adolescent substance abuse and trauma-related psychopathology is warranted.

Risk Reduction through Family Therapy (RRFT; Danielson, 2007) is a multi-component, family-focused treatment that integrates principles and interventions from existing empirically supported treatments for adolescent substance abuse, including Multisystemic Therapy (MST; Henggeler, et al., 2002) and for PTSD and depression symptoms, including Trauma-Focused Cognitive-Behavioral Therapy (TF-CBT; Cohen, Mannarino, & Deblinger, 2006). Given that the RRFT model targets a *population* at risk for development or exacerbation of problems related to PTSD or substance abuse (i.e., adolescents with a CSA history), rather than a *diagnosis* per se (e.g., 'PTSD' or 'substance abuse'), some heterogeneity in symptom presentation is expected. Thus, RRFT can either be used as a prevention/risk reduction tool or intervention. The purpose of the current study was to evaluate the feasibility of implementation and initial efficacy of RRFT through an open pilot trial with a small sample of CSA victims. We hypothesized reductions would be reported in substance use (among using adolescents), substance use-related risk factors (e.g., increased family cohesion), and PTSD and depression symptoms at post-treatment and that these treatment gains would be maintained through six-month follow-up.

Method

Participants

Participants included ten female adolescents (mean age=15.0, *SD*=1.7, range=13–17 years). Four were African American, five were Caucasian, and one was Hispanic. All participants were recruited through an urban university-based clinic specializing in the treatment of child and adult trauma. Inclusion criteria for the study were adolescents who: a) were between 12–17 years; b) had experienced at least one memorable sexual assault (defined as unwanted/forced vaginal or anal penetration by an object, finger, or penis; oral sex; or touching of one's genitalia) in their lifetime; and c) were not mentally retarded (i.e., able to understand and engage in treatment). Three adolescents reported single incident events and seven reported a series of sexual assaults by the same perpetrator. In addition, four of the adolescents had experienced multiple sexual assaults (i.e., sexual assaults that occurred at different points in time by different perpetrators). The relationship of the adolescent to the

perpetrator for the first incident (or series of incidents) was as follows: 6 were assaulted by family members and 4 were assaulted by non-family members. For the four adolescents who experienced second incidents, one was assaulted by a family member and the rest were assaulted by non-family members. Time since most recent sexual assault ranged from 3 weeks to 9 years (mean=2.8 years, *SD*=3.05).

Therapists

Two participants were treated by the first author, a licensed clinical psychologist. The remaining 8 participants were treated by master's level clinical psychology graduate students completing a predoctoral psychology internship. Each therapist received structured, didactic training on the RRFT intervention and manual prior to implementing the treatment. On-going training was provided through weekly supervision and feedback on randomly selected audio-taped sessions.

RRFT Treatment Protocol

RRFT was developed to reduce risk of substance abuse and other high-risk behaviors and trauma-related psychopathology in adolescents who have been sexually assaulted. RRFT capitalizes on identification of empirically-demonstrated risk and resiliency factors for substance abuse and trauma-related psychopathology within an ecological framework. The manual targets 7 primary, overlapping components (see Table 1). For the Substance Abuse (primarily based on MST principles and interventions) and PTSD (primarily based on TF-CBT principles and interventions) components, the therapist has the option of taking a prevention approach or a treatment approach—depending on the symptoms of the adolescent and family. The content and skills addressed in each component are derived from empirically supported interventions (e.g., contingency management for substance abuse symptoms, exposure therapy for PTSD symptoms). The goal within the components is to reduce risk factors and bolter resiliency factors that exist for each individual youth at each level of her or his ecology (e.g., assist the youth in joining positive, structured school or community activities, increase youth's in spending more time with non-using peers). Table 1 provides a brief overview of content addressed in each component. The order in which the components are administered is determined by needs of the youth and family and based on severity of problems. On average, the RRFT protocol is administered through weekly, 60–90 minute sessions. However, therapists are encouraged to do phone check-in's with families between sessions, particularly when new skills have been taught, when the family is experiencing a crisis, and when a trauma narrative has begun in session. Duration of treatment is dependent on the symptom level of the youth. Therapy can be provided in either an office-based format or a community setting.

Dependent Measures

A *Time Line Follow Back* Interview (TLFB; Miller, 1991), which is a well-established method of collecting substance use information from adolescents, was conducted with each participant to identify specific amounts of alcohol and drugs consumed by individuals over the past 90 days. Data collected is used to calculate the percentage of substance using days, as well as an average number of alcohol/drugs used per substance using day. *Urine drug screens* were collected to validate self-reported substance use.

The UCLA PTSD Index for DSM-IV-Adolescent & Caregiver versions (Steinburg, Brymer, Decker, & Pynoos, 2004) is a widely used instrument that assesses all 17 DSM-IV symptom criteria for PTSD with excellent psychometric properties. Using a cutoff score of 38, sensitivity has been found to be .93 and specificity to be .87 in detecting accurate PTSD diagnoses (Steinberg et al., 2004). *The Child Depression Inventory* (CDI; Kovacs, 1983) is a 27-item self-report inventory that assesses symptoms of depression in children. The measure

has good internal consistency (alpha's range from .83 to .89) and validity (Carey et al., 1987). The cohesion and conflict subscales from the *Family Environment Scale* (FES) (Moos & Moos, 1986) were used to measure social and environmental characteristics of families, as these aspects of family environment have been specifically linked with substance use-related risk (e.g., Hawkins, Catalano, & Miller, 1992). These FES subscales are widely used and have good psychometric properties.

A measure of *Ecological Functioning* was developed for this study to assess risk and resiliency factors at each level of a youth's ecology relevant to substance abuse risk. This brief, semi-structured interview was conducted with adolescents and caregivers. Items focused on the following: consistent school and/or work attendance, family activity participation level (e.g., "Name one activity your family participates in on a weekly basis"), social activity participation level (e.g., school activities, community activities), and whether the youth spends time regularly with at least one non-substance using peer. Clinician ratings on this measure at pretreatment were based primarily on the reports of the youth and caregiver; however, posttreatment ratings included clinician's knowledge/observation of these behaviors.

As a measure of *Treatment Satisfaction*, the participants were asked to rate their perceived utility of each RRFT treatment component at post-treatment assessment on a scale of 1–5, with 5 being the most positive rating for the component and 1being the worst rating. For *Treatment Adherence*, sessions were audiotaped of clients who consented to taping (90% of cases) and reviewed by the RRFT treatment developer (first author). Treatment adherence also was monitored through weekly individual supervision with the treatment developer. Further, participants were asked to complete an RRFT adherence checklist immediately following each session. The first author reviewed submitted checklists.

Procedure

All youth presenting to the clinic were screened for eligibility criteria (described above) through a weekly staffing with clinic faculty and therapists after youth had completed an initial intake session. Adolescents deemed eligible, and their (non-offending) caregivers, were approached at the feedback session (i.e., where assessment results and treatment recommendations were presented) by the principal investigator (first author) or a project coordinator and the treatment study was described to them. Of the families approached, only one caregiver refused, because the adolescent was not going to remain in her physical custody. Once the youth was moved into a different family placement, the youth and the new guardian consented to participation. All legal guardians provided written consent and adolescents provided written assent. Participants and their caregivers then completed a baseline assessment, which included the measures noted above and provision of a urine drug screen by the adolescent. Assessment measures were re-administered at post-treatment, 3-, and 6-month follow-up by the project coordinator. Given that RRFT utilizes a clinical pathways approach that is partially based on symptomatology of the youth, length of treatment varied. Participants were compensated for completing each assessment but were not paid to attend sessions. All procedures were approved by MUSC's Institutional Review Board. All state mandatory reporting laws were followed; however, no breaches of confidentiality occurred in the current study as all incidents of assault had been previously reported to the appropriate authorities.

Data Analysis

Descriptive statistics regarding treatment and all dependent measures were calculated for each time point. In addition, data analyses were conducted to explore whether there was evidence of improvement on key outcomes over time among the adolescents. Small sample

sizes have been shown to yield biased standard errors, which can lead to unreliable effects in tests of significance (Maas & Hox, 2004). Therefore, analyses centered on calculation of Cohen's *d* effect sizes with 95% confidence intervals and linear slope estimates, as opposed to formal significance testing. Effect size estimates were corrected for small sample bias using the formula specified by Hedges and Olkin (1985). Multilevel Longitudinal Models (MLMs) were used to estimate the direction and rate of change (i.e., linear slope) for each outcome variable over time. An important feature of the current data is the nesting of four repeated measurements (i.e., pre-treatment, post-treatment, 3-month follow-up, 6-month follow-up; level-1) within youth (level-2). MLMs model the dependency in outcome variance attributable to the nested data structure (Singer & Willett, 2003). These models also allow for missing time points and variably spaced observations. Further, MLMs have been shown to produce good slope estimates with as few as 10 cases at level-2 (Maas & Hox, 2004). HLM software (version 6.04; Raudenbush et al., 2004) was used to perform all MLMs. To account for variability in the length of time between measurement occasions, outcomes were modeled according to a linear time predictor computed as the number of months elapsed between baseline and subsequent assessments (Singer & Willett, 2003). For each MLM, a random effect was modeled for the intercept (initial status), and a fixed effect was modeled for the slope.

Results

Treatment Descriptives

Treatment length ranged from 14–34 sessions (mean length=24 sessions, *SD*=8.0). All of the youth had been receiving some form of pharmacotherapy prior to the beginning of treatment, which was not discontinued during the study; however, none of the adolescents received simultaneous psychosocial therapy during the open trial. Treatment completers were defined as having completed 5 out of the 7 RRFT treatment components. Nine participants completed all seven components and one participant completed five components. Based on review of audiotapes, supervision, and treatment fidelity checklists, therapists adhered to the RRFT model 95% of the time.

Treatment Outcomes

Substance Use—Four of the 10 youth (40%) reported using substances prior to treatment on the TLFB (1 reporting regular cocaine use, 2 reporting marijuana use, and 1 reporting regular alcohol use). Frequency of substance use at each time point is reported in Table 2, demonstrating reductions in use among the participants at the end of treatment and through 6-month follow-up. Of the six not using substances prior to treatment, none initiated use during the course of treatment or through the 6-month post-treatment follow-up, according to both self-report and urine analysis.

Family Functioning (as Measure of Substance Use-Related Risk)—The mean scores and standard deviations for scores on the FES Cohesion and Conflict scales are presented in Table 3. Unbiased Cohen's *d* effect sizes were computed reflecting the degree of change from the pre-treatment mean scores on these scales to the mean scores at post-treatment, 3-month and 6-month follow-up. For these calculations, positive effect sizes reflect an increase and negative effect sizes reflect a decrease in scores over time. Effect sizes on the FES scales ranged from small to large (see Table 3). The corresponding confidence intervals were wide. Further, almost all of the confidence intervals included values that ranged from positive to negative, suggesting a less stable pattern of change on these outcome scales. The MLMs revealed negative linear slopes on the youth-report ($\beta = -0.60$) and caregiver-report ($\beta = -0.19$) versions of the FES Conflict scale, indicating that the mean scores on these scales decreased from pre-treatment to 6-month follow-up.

Conversely, the MLMs revealed positive linear slopes on the youth-report (β = 0.73) and caregiver-report (β = 0.31) versions of the FES Cohesion scale, indicating that the mean scores on these scales increased from pre-treatment to 6-month follow-up.

Improvements to other important areas of ecological functioning related to substance abuse risk (per the *Ecological Functioning Measure* described above) were observed as follows: 60% of youth reported consistently attending school or GED classes and/or working at pre-treatment versus 90% at post-treatment and 6-month follow-up; 10% reported consistently engaging in at least one positive family activity per week at pre-treatment versus 100% at post-treatment and 6-month follow-up; 10% reported consistently engaging in at least one structured social activity per week at pre-treatment versus 90% at post-treatment and 70% at 6-month follow-up; 10% reported spending time with at least one friend that does not use alcohol or drugs at pre-treatment versus 100% at post-treatment and 6-month follow-up.

PTSD and Depression—The mean scores and standard deviations for scores on the UCLA PTSD Index, and CDI at pre-treatment, post-treatment, 3-month and 6-month follow-up are presented in Table 3. Large mean effect sizes were observed on the youth- and caregiver-report versions of the UCLA PTSD Index and on the CDI. The effect sizes for these scales had wide confidence intervals, which is common for small samples. Nevertheless, the values specified by the confidence intervals were always negative, suggesting that there were meaningful reductions in PTSD and depression symptoms over time. The MLMs revealed negative linear slopes on the youth-report (β = −1.66) and caregiver-report (β = −0.76) versions of the UCLA PTSD Index and on the CDI (β = −1.23), indicating that the mean scores on these scales decreased from pre-treatment to 6-month follow-up. In general, the slope estimates provide evidence for rather marked reductions on the scales measuring symptoms of PTSD and depression over the course of treatment and follow-up.

Treatment Satisfaction—Nine out of the ten participants completed the ratings on their perceptions of the utility of specific RRFT treatment components. The mean scores and standard deviations were as follows: Psychoeducation (M=3.89, SD=.93), Coping/Family Communication (M=4.78, SD=.44), Substance Abuse (M=4.56 SD=.73), PTSD (M=4.33, SD=1.11), Healthy Dating/Sexual Decision Making (M=4.78, SD=.44), and Sexual Revictimization Risk Reduction (M=4.44, SD=.42).

Discussion

The current study offers promising results from an open trial of RRFT, which is based on an ecological model and integrates existing empirically supported interventions for substance abuse, PTSD, and depression. Specifically, findings indicate that successful administration of RRFT, which occurred in the current study in both community and office-based settings, is feasible. Reductions were reported in substance use (among substance using adolescents in the sample) and substance use-related risk factors (among all adolescents in the sample), as evidenced by modest improvements in family cohesion and conflict levels and by improvements in other areas of ecological functioning (e.g., increases in school/work attendance). In addition, large effects were found with regard to improvements in PTSD and depression symptoms; these effect sizes were equal to or greater than effect sizes reported for improvements in PTSD and depression symptoms resulting from other existing empirically supported treatments for trauma-exposed youth, including TF-CBT and Cognitive Behavioral Interventions for Trauma in Schools (CBITS). Treatment gains across all outcomes on average were maintained through the six-month follow-up. This is especially noteworthy for the youth whom had reported substance use at pre-treatment, as

relapse rates are high among adolescent populations, particularly once an intervention focusing on substance use has been removed (Cornelius et al., 2002).

One of the most salient findings of the study was that, although treatment gains are reported at the individual level, improvements in family-level variables were less pronounced. Specifically, the linear slopes of the longitudinal models for the FES subscales suggest that adolescents and caregivers both perceived a modest increase in family cohesion, as well as a modest decrease in family conflict level, over the course of treatment and through post-treatment assessment. These modest findings are particularly noteworthy as the RRFT model is intended to target such family-level variables and to lead to significant improvements in this area. Nonetheless, the moderate effect sizes yielded in the current study for these family environment variables are consistent with effect sizes that have been reported in the literature (Curtis et al., 2004). One possible explanation for the modest changes in family functioning in the current study is that, among adolescents presenting with significant pretreatment PTSD and depression symptoms, multiple RRFT study therapists noted that an increased level of 'typical' adolescent behaviors appeared to parallel improvement in PTSD and depression symptoms (e.g., increased interest in spending more time away from home). In turn, more opportunities for conflicts around social privileges may have resulted. Regardless of the reason for the modest findings, the RRFT manual, particularly in the area of family communication and involvement, was refined based on the results of this open pilot study and feedback from study therapists. Examples of revisions made include adding anticipatory guidance for expected and developmentally appropriate behavior changes among adolescents at various ages and increasing joint youth-caregiver sessions to further practice healthy youth-parent communication patterns and family-level problem-solving. These revisions are currently being evaluated through a NIDA-funded randomized controlled trial (RCT), comparing RRFT to usual care in a larger sample of adolescents.

Several strengths of the current study build upon the existing literature in this area. First, the intervention studied involves family members and other caregivers when appropriate, which has been found to serve a beneficial role in targeting substance abuse in adolescents (Waldon & Turner, 2008). Second, following a clinical pathways approach, in which youth of varying symptom levels are included, is more representative of a "real world" adolescent sexual assault population (Danielson et al., 2010). Third, for youth who reported significant PTSD symptoms, which involved 90% of the sample, the use of exposure to trauma-related cues through the creation of a trauma narrative was included. This provides initial evidence that exposure approaches can be used with youth who are also receiving treatment for substance use-related problems, which has been called into question in the literature (Nace, 1988).

The most significant limitation of the current study is that no control condition was used, which prevents conclusions regarding whether the effects of RRFT exceed that of usual care of this population or natural recovery from traumatic event exposure over time. As noted above, our research team currently has an RCT underway for this purpose. In addition, heterogeneity in symptom presentation among participants -- particularly pretreatment substance using levels -- limited our ability to uncover signals of efficacy. However, the varying level of symptoms among participants in the current study is representative of the multiple trajectories of adolescents with a sexual assault history—and serves as the cornerstone for the rationale for RRFT, which focuses on a population rather than a particular disorder. Nonetheless, the impact of this treatment needs to be examined and replicated in a larger sample and in comparison with control condition.

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Table 1

RRFT Components and Content

Component	Content
Psychoeducation	• Provide information about: a) prevalence of sexual assault and other forms of traumatic events; b) reactions to such traumatic events; c) the relation between substance use and other risky behaviors and trauma-related psychopathology. • Discuss family focus of treatment and begin to set family rules. Set treatment goals. • Introduce RRFT treatment model and components. • Emphasize importance of regular attendance and consistent participation, even when symptoms begin to improve.
Coping	• Provide an overview of helpful vs. unhelpful coping • Skills building in: a) feelings identification and expression; b) relaxation techniques; c) distress tolerance skills building; d) understanding the connection between thoughts, feelings, and behaviors; e) thought changing; f) problem solving
Family Communication	• Review/establish family rule (e.g., chores, curfews, substance use, etc.), including privileges earned for following rules and consequences for not adhering to rules. Adolescent and siblings are actively engaged in this process. • Skills building in: a) active listening; b) effective speaking (e.g., use of I statements, use of non-blaming language, reduction of caregiver 'over explaining'/lecturing vs. interaction discussion • Role-play of "hot-spots": re-occurring arguments in the household (what typically happens and then re-playing with new skills taught)
Substance Abuse	• Treatment: Determination of specific risk factors that appear to be motivating the substance use in the youth and development of interventions surrounding these factors with the adolescent and caregiver, such as: • Contingency management (use of rewards and consequences as tied to random drug tests and breathalyzers) • Increase caregiver and school monitoring (e.g., helping parent modify work schedule) • Increase in participation in positive, monitored community-based activities (e.g., YMCA, church youth group, school sports or clubs, part-time to full-time jobs) so as to increases opportunities for meeting non-using peers and to find fun activities to replace substance-related activities • Realistic refusal skills • Completion of the PTSD component (e.g., when a motivating factor for substance use is related to avoidance of trauma-related memories and feelings) • Harm reduction approach is taken with youth who are ambivalent about ceasing use to get "foot in the door" and movement towards change • Prevention: Reduction of present risk factors for substance use and increase in resiliency factors (e.g., increase time spent with non-using peers).
PTSD	• Treatment: Review of PTSD symptoms; Exposure to trauma-related memories and cues and addressing inaccurate and unhelpful beliefs regarding trauma through creation of trauma narrative; Sharing trauma narrative with family members. • Prevention: Skills building in recognition of future potential PTSD symptoms, particularly avoidance. How to address avoidance behaviors.
Healthy Dating and Sexual Decision Making	• Interactive discussion and skills building in: a) healthy vs. unhealthy relationships; b) factors considered when engaging in sexual activity (e.g. how does participant decide how far to go with a partner); c) psychoeducation on sexually transmitted diseases, particularly HIV, and consistent condom use; d) role-playing of assertiveness in dating (e.g., condom insistence); e) importance of on-going communication between adolescent and caregiver on these topics.
Revictimization Risk Reduction	• Psychoeducation regarding risk for revictimization

Component	Content
	• Identification of risky situations, people, and places (e.g., review scenarios of risky situations and role-playing of how to respond in these situations)

Table 2

Substance Use at Pre- and Post-treatment Among Participants Reporting Use (N=4)

		Substance(s)	TLFB-% days[1]	TLFB-uses/day[2]
Participant				
1				
	Pretreatment	Cocaine, Alcohol	40	3
	Posttreatment	None	0	0
	3-month	None	0	0
	6-month	None	0	0
2				
	Pretreatment	Marijuana	27	1
	Posttreatment	None	0	0
	3-month	None	0	0
	6-month	None	0	0
3				
	Pretreatment	Marijuana	1	1
	Posttreatment	Marijuana	1*	1*
	3-month	None	0	0
	6-month	None	0	0
4				
	Pretreatment	Alcohol (hard liquor)	27	4
	Posttreatment	None	0	0
	3-month	None	4	1.5
	6-month	None	7	1

[1] Percent number of days of substance use over the past 90 days as reported on the Time Line Follow Back Survey (TLFB).

[2] Average number of drinks/drugs per using day as reported on the TLFB Survey.

* The participant reported smoking marijuana one time during treatment, which fell in the beginning of the 90 days of the TLFB Survey. The participant had not completed the Substance Abuse component at this point in treatment, reported the marijuana use incident to the therapist in the next session, and did not report use since that time (urine analysis was negative at post-treatment as well).

Table 3

Descriptive Statistics and Effect Sizes for PTSD, Depression, and Family Functioning Scales

	Pre	Post	3-Month FU	6-Month FU	Pre vs. Post	Pre vs. 3-Month FU	Pre vs. 6-Month FU
Outcome	***M (SD)***	***M (SD)***	***M (SD)***	***M (SD)***	***ES* (95% CI)**	***ES* (95% CI)**	**ES (95% CI)**
UCLA-A	39.80 (12.01)	16.90 (12.19)	13.50 (12.34)	12.50 (9.12)	−1.81 (−2.85, −0.77)	−2.07 (−3.15, −0.98)	−2.45 (−3.61, −1.29)
UCLA-C	36.20 (16.35)	19.71 (9.59)	18.60 (10.55)	21.60 (10.39)	−1.18 (−2.13, −0.23)	−1.23 (−2.18, −0.27)	−1.02 (−1.95, −0.09)
CDI	64.00 (12.09)	47.38 (8.78)	45.00 (9.94)	41.10 (7.64)	−1.51 (−2.50, −0.51)	−1.64 (−2.66, −0.63)	−2.17 (−3.27, −1.06)
FES-Coh-A	38.90 (20.69)	49.80 (13.16)	55.90 (10.75)	52.60 (13.67)	0.60 (−0.29, 1.50)	0.99 (0.06, 1.92)	0.75 (−0.16, 1.65)
FES-Coh-C	50.44 (8.41)	55.78 (5.97)	57.90 (8.63)	54.10 (5.76)	0.70 (−0.20, 1.60)	0.84 (−0.08, 1.75)	0.49 (−0.40, 1.38)
FES-Con-A	54.40 (14.16)	45.40 (11.54)	44.50 (8.97)	45.10 (8.29)	−0.67 (−1.57, 0.23)	−0.80 (−1.71, 0.11)	−0.77 (−1.68, 0.14)
FES-Con-C	44.56 (6.35)	40.89 (11.25)	43.60 (8.13)	40.20 (9.75)	−0.38 (−1.27, 0.50)	−0.13 (−1.00, 0.75)	−0.51 (−1.40, 0.38)

Note. $N = 10$; FU = follow-up; *ES* = effect size, CI = confidence interval.

UCLA-A=UCLA PTSD Index-Adolescent Report; UCLA-C= UCLA PTSD Index-Caregiver Report; CDI=Children's Depression Inventory; FES-Coh-A=Family Environment Scale-Cohesion-Adolescent Report; FES-Coh-C= Family Environment Scale-Cohesion-Caregiver Report; FES-Con-A= Family Environment Scale-Conflict Scale-Adolescent Report; FES-Con-C= Family Environment Scale-Cohesion-Caregiver Report.