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Parent and Youth Engagement in Court-Mandated Substance Use Disorder Treatment

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Abstract

While juvenile drug courts (JDCs) require treatment *participation*, youth and parent *engagement* in treatment cannot be mandated. We compared youths' and parents' self-reports of engagement in Risk Reduction Therapy for Adolescents (RRTA) and Treatment as Usual (TAU) in JDCs. Parents and youth receiving RRTA were more likely than those receiving TAU to report high engagement in treatment. High parent engagement in RRTA early in treatment predicted fewer missed appointments and lower youth substance use at 3 months. Emphasizing therapeutic techniques that increase parent engagement, as utilized in RRTA, could lead to improved participation and clinical outcomes in court-mandated treatment settings.

Engagement in youth substance use disorder (SUD) treatment is associated with increased treatment participation and other positive clinical outcomes (Hogue, Dauber, Stambaugh, Cecero, & Liddle, 2006; Robbins, Turner, Alexander, & Perez, 2003; Shelef, Diamond, Diamond, & Liddle, 2005; Tetzlaff et al., 2005), particularly when both the parent(s) and youth are engaged. Family-based treatments are among the most empirically validated approaches for targeting adolescent SUDs (Tanner-Smith, Wilson, & Lipsey, 2013). Not surprisingly, these treatments emphasize strong engagement from both the parents and youth (Rowe, 2012). Parent and youth engagement in court-mandated treatment is of clinical significance, given both the emphasis on engagement in family-based SUD treatments and calls to incorporate such treatments into justice settings, such as juvenile drug courts (JDCs; Belenko & Logan, 2003; Henggeler, McCart, Cunningham, & Chapman, 2012). Although JDC programs require youth participation in treatment, the potential impact of such a mandate on actual treatment engagement of both parents and youth is unclear. Thus, this study examines (a) if a family-based SUD treatment can effectively facilitate parent and

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youth engagement when treatment has been mandated by a JDC, and (b) whether the previously identified associations between engagement and clinical outcomes are maintained in the JDC setting.

Parent and Youth Engagement in SUD Treatment

Treatment engagement refers to the family's active participation in treatment and recovery (Hornberger & Smith, 2011). Engagement includes a positive working relationship and therapeutic alliance between the therapist and family (Green, 2006; Liddle, 1995). Signs of high engagement include feelings of trust, concurrence on treatment goals, and continuous effort aimed at achieving those goals (Cunningham & Henggeler, 1999). Higher engagement is theorized to motivate families to continuously and actively participate in treatment and pursue agreed-upon goals despite the emotional, intellectual, and practical demands that doing so often requires (Cunningham & Henggeler, 1999; Liddle, 1995).

Treatment engagement is theorized to be part of the mechanisms of change in family-based therapies for youth SUDs. Higher family engagement has been associated with greater participation in treatment, including higher treatment retention and attendance (Hawley & Weisz, 2005; Robbins et al., 2003). Results are not always consistent, however. For example, in the Cannabis Youth Treatment (CYT) study (Dennis et al., 2002), parent engagement predicted session attendance, but youth engagement did not (Shelef et al., 2005).

Meta-analyses also have revealed small to medium effects of engagement on youth clinical outcomes (Karver, Handelsman, Fields, & Bickman, 2006; McLeod, 2011). High parent engagement, measured using a therapeutic alliance scale early in Multidimensional Family Therapy (MDFT), was associated with reductions in youth substance use and "acting out," while improvement in youth engagement by the middle of treatment was associated with reductions in externalizing behaviors at the six-month follow-up (Hogue et al., 2006). In the CYT study, higher youth engagement in MDFT treatment, measured using the Working Alliance Inventory (WAI, Horvath & Greenberg, 1989), was associated with reduced substance use and relapse by six months (Tetzlaff et al., 2005), particularly when parents also reported high engagement in MDFT (Shelef et al., 2005). In a different sample using MDFT, however, only parent engagement predicted substance use reductions (Hogue et al., 2006). These differences highlight the need for studies that further explore the relations between engagement in family-based SUD treatment and youth clinical outcomes.

Parent and Youth Engagement in SUD Treatment in JDCs

JDC programs are increasingly used as a justice-based response to substance use and co-occurring behavior problems in youth. Modeled after the success of adult drug courts, JDC programs require SUD treatment for youth along with regular drug testing and frequent court appearances (National Association of Drug Court Professionals, 1997). However, the effect of JDCs has been much more variable than the effect of adult drug courts (Marlowe, 2011). To address this, researchers have called for efforts to augment JDC programs with evidence-informed SUD interventions, particularly family-based interventions (Belenko & Logan, 2003; Henggeler et al., 2012). However, family-based treatments rely on strong

parent and youth engagement, which could be more difficult to achieve effectively in a court-mandated setting. For example, in the context of JDCs, parents and youth might feel forced into therapy to avoid worse sanctions. Even among families who comply with court-ordered treatment requirements, achieving and maintaining engagement might be difficult if there is perceived coercion and/or a lack of trust. Indeed, evidence suggests that most JDC programs only minimally engage parents and youth, and few studies have evaluated the impact of engagement on outcomes in those settings (Stein, Deberard, & Homan, 2013).

Current Study

Thus, this descriptive study posed two questions: (1) Can a family-based SUD treatment in JDC effectively facilitate parent and youth engagement? (2) What is the effect of youth and parent engagement, if any, on treatment participation and clinical outcomes in the JDC setting? To answer these questions, secondary data were obtained from an existing trial of a family-based intervention for youth in JDC. Outcomes included treatment participation of youth and parents (i.e., missed appointments) and youth substance use. We hypothesized that both parents and youth could be engaged in a family-based treatment in the context of JDC. We also hypothesized that high engagement would be associated with greater treatment participation and improved substance use outcomes relative to low engagement.

Method

Study Design

This is secondary analysis of data from a randomized controlled trial conducted in two JDCs (Letourneau, McCart, Asuzu, Mauro, & Sheidow, 2013; Letourneau, McCart, Sheidow, & Mauro, *In Press*). Parent-youth dyads newly enrolled in the JDC programs were invited to participate in a randomized controlled trial comparing the experimental family-based SUD intervention (i.e., Risk Reduction Therapy for Adolescents [RRTA]) to SUD treatment as usual (TAU). All youth newly enrolled in JDC and their parents were referred to research staff for recruitment, and those who consented were assigned to the treatment conditions via simple randomization stratified by gender. Additional information regarding the randomized controlled trial procedures and JDC recruitment has been reported elsewhere (Letourneau *et al.*, 2013; see Letourneau *et al.*, *In Press*, for CONSORT figure). Researchers collected clinical data face-to-face from youth at quarterly intervals, including baseline (which was pre-treatment, at the point of entry to JDC), 3-, and 6-months post-baseline. Researchers also collected monthly engagement ratings from youth and parents via phone interviews conducted by research assistants starting on the first month of therapy. Initially, those ratings were collected from parents only; however, because parents were rarely involved in TAU, youth reports were later added to the monthly assessment protocol. The authors' institutional review board approved all study procedures.

Participating Juvenile Drug Courts

JDCs integrate judicial and therapeutic interventions to comprehensively address the needs of substance-abusing juvenile offenders. The National Association of Drug Court Professionals (1997) has specified several guidelines for the conduct of JDC programs.

While the study initially intended to recruit participants from one JDC, a second JDC site was recruited following a sudden closing of the original court (for additional information, see Letourneau et al., *In Press*). All guidelines were followed by the two JDCs participating in this study. For example, each JDC was administered by a broad-based team of professionals that included a judge and representatives from other disciplines (e.g., treatment providers, probation officers, prosecution, and defense attorneys). Each JDC mandated parent and youth compliance with substance use treatment and also provided close oversight of each case through regular, often weekly, status hearings. Rewards or sanctions were dispensed quickly to youth based on the results of their drug screens and behavior in other key domains (e.g., family and school). Participants who volunteered for the study had the same expectations of treatment compliance regardless of which intervention they received following randomization (i.e., RRTA or TAU). Participants who chose to end RRTA and exit the study could still receive TAU without prejudice.

Intervention Conditions

RRTA—This family-based treatment incorporates contingency management and cognitive behavioral strategies to reduce youth substance use and sexual risk behaviors (McCart, Sheidow, & Letourneau, 2014). Treatment lasts approximately 6 months, with weekly 1.5-hour office-based sessions. Preliminary outcomes associated with RRTA have been promising (Letourneau et al., 2013; Letourneau et al., *In Press*). RRTA participation included youth and parent attendance at each session. As a component of RRTA, therapists used several basic strategies to facilitate high engagement (Cunningham & Henggeler, 1999; Tuerk, McCart, & Henggeler, 2012). Following an initial 12-hour RRTA workshop and additional training, three female masters' level therapists delivered the treatment to families and continuously problem-solved barriers to attendance. In addition, therapists actively collaborated with parents and youth in treatment planning, ensuring their alignment with all treatment goals. Further, therapists were closely supervised to ensure they remained strength-focused in their interactions with families (Letourneau et al., 2013; Letourneau et al., *In Press*).

TAU—The typical JDC-mandated treatment services were delivered by state- or privately-funded treatment agencies in outpatient youth group sessions that lasted 1–1.5 hours and ranged in frequency from 1–4 sessions/week for approximately 6 months. Individual sessions were added as needed; parents were rarely involved in the sessions, per parent report. Intervention foci included substance use reduction, conflict resolution, and anger management.

Participants

Participants included 105 youth and parents who chose to participate in the study and were randomly assigned to RRTA ($n = 45$) or TAU ($n = 60$). Youth were predominantly male (83.8%) with a mean age of 14.9 ± 0.14 years (range=11–17). One third of youth self-identified as non-Latino White (33.3%), 29.5% identified as non-Latino Black, and 30.5% identified as Latino. All parents and youth were English-speaking. Primary caregivers were predominantly mothers (76.2%) or fathers (16.2%), with a mean age of 42.5 ± 0.87 years and a median household income in the range of \$20,001–30,000. Almost all youth (93.3%)

self-reported substance use in the last 90 days and 31.1% tested positive for a substance at the baseline research assessment. Occasionally, a youth was arrested for selling drugs and had not used recently. Nevertheless, JDC staff determined that the likelihood of future use was high for these youth and therefore they were referred to the program. In our sample, 7% of youth ($n=7$) did not report substance use in the last 3 months and also tested negative for substances via urinalysis at baseline; this was balanced for RRTA ($n=2$; 4.4%) and TAU ($n=5$; 8.3%), indicating no between group differences ($p\text{-value}=0.70$). Gender, which was used in the stratified randomization, was balanced across the two conditions; there were eight (13.3%) females in TAU and 9 (20.0%) females in RRTA ($p\text{-value}=0.36$). Consistent with randomization, if engagement differed by these characteristics, balance across groups indicates that it would not be differential by intervention status. There were no statistically significant differences between the intervention conditions in demographic or baseline clinical characteristics, including substance use (Letourneau *et al.*, In Press).

Measures

Family Engagement Measure—The Family Engagement Measure (FEM) was developed for families to report on standard engagement techniques (Henggeler et al., 2012; Tuerk, McCart, & Henggeler, 2012). For example, items assess whether the therapist and family agreed on treatment goals, whether the family trusted the therapist, and whether the therapist sought ongoing feedback from family members throughout treatment. Each of the 30 FEM items was rated on a four-point scale, from “never” to “almost always,” and asked about the informant’s experience during the past month. Youth and the primary parent were asked these items separately. The internal consistency of the FEM in the current sample was high (Cronbach’s $\alpha>0.93$). As in other studies (Shelef et al., 2005), self-reported engagement scores were right-skewed, indicating a potential ceiling effect. Thus, each month, engagement was denoted as high if all 30 items were endorsed as “almost always”; otherwise, engagement was categorized as low (i.e., dichotomized).

Youth- and parent-reported engagement was measured monthly starting on the first month of treatment, allowing us to describe engagement over time. Substantial effort was made to collect FEMs from parents and youth; when contact could not be made, engagement was coded as low. When a parent indicated that he or she was not involved in treatment, lack of parental participation was denoted on the FEM and parent engagement was assigned as low. Due to a change in protocol early in the study, two youth in the RRTA condition were never administered the FEM.

Missed appointments—Therapists recorded the total number of missed appointments at the end of therapy. We used tertiles to categorize the data into 0–1, 2–5, and 6 or more missed appointments.

Youth substance use—Substance use was assessed via youth self-report and urine drug screens (UDS) at 3- and 6-months post-baseline. Timeline follow-back (F90) methodology (Sobell, Sobell, Leo, & Cancilla, 1988) captured youth self-reported substance use in the last 90 days, including alcohol, marijuana, cocaine, opiates, and poly-substance use. Given low endorsement rates, a dichotomous variable was used to indicate any self-reported substance

use in the last 90 days. The UDS tested for marijuana (THC), cocaine, opiates, methamphetamine, and amphetamine use. A dichotomous variable indicated any positive UDS.

Analytic Plan

First, engagement was described in the two treatment conditions. Specifically, summary statistics compared the proportion of youth and parents in each condition that completed a monthly FEM, the mean score among those completing a FEM, and proportion meeting high engagement criteria. Logistic regression measured between-group differences in the odds of completing a FEM each month, and t-tests measured between-group FEM mean differences. Separate analyses were conducted for parents and youth.

Second, due to low parent involvement in TAU, relations between engagement and the participation/clinical outcomes were examined among families in RRTA only.

Though 45 youth were randomized to RRTA, one youth never started treatment and another was administratively withdrawn for staff safety reasons; these two youth were excluded from further analyses. Fisher's exact tests measured associations between parent and youth engagement at months 1–3 and tertiles of missed appointments.

Finally, analyses examined associations between both youth and parent engagement at months 1–3 and youth substance use outcomes at the 3- and 6-month assessments using Fisher's exact tests for each of the months. Analyses were conducted using Stata 13SE (StataCorp, 2013).

Results

FEM collection from youth and parents was attempted monthly (Table 1). Associations between engagement and the participation/clinical outcomes were assessed only among families receiving RRTA (Table 2).

Parent Engagement in Treatment

Across months, an average of 37.3 (82.9%) parents in RRTA reported being involved in treatment (i.e., completed a FEM), compared to an average 7.2 (12.0%) of parents in TAU (see Table 1). Parents in RRTA were more likely than parents in TAU to report being involved in treatment throughout the assessment period (odds ratio (OR)=37.0, 95% confidence interval (CI)=23.5–58.4, $p < 0.001$). The primary reason for not completing a FEM for RRTA families was inability of the researcher to contact the parent, while the primary reason for not completing a FEM for TAU was the parent not being involved in treatment.

Among parents who completed a FEM, average FEM scores across the monthly assessments were significantly lower for TAU ($M_{TAU}=109.70 \pm 3.11$) than RRTA ($M_{RRTA}=114.09 \pm 0.68$; difference=-4.39; $t=-2.13$; $p=0.034$). On average, 17.3 (38.4% of total; 46.4% of those with any FEM) RRTA parents were classified as having high engagement each month, compared to only 2.8 (4.7% of total; 39.5% with any FEM) TAU parents. In RRTA, the

proportion of parents reporting high engagement increased from the first to the third month of treatment and then held relatively stable through the 6-month FEM. In TAU, the proportion of parents reporting high engagement increased slightly over time, but remained relatively low compared to RRTA.

Youth Engagement in Treatment

Across months, an average of 33.8 (75.2%) youth in RRTA reported being involved in treatment (i.e., completed a FEM) each month compared to 37.7 (62.8%) youth in TAU (see Table 1). RRTA youth were more likely than TAU youth to report being involved in treatment throughout the assessment period (OR=1.80, 95% CI=1.27–2.56, $p=0.001$). The primary reason for not completing a FEM in both RRTA and TAU conditions was researcher inability to contact youth.

Among youth who completed a FEM, average FEM scores across the monthly assessments were significantly lower for TAU ($M_{TAU}=106.62 \pm 1.08$) than RRTA ($M_{RRTA}=112.06 \pm 0.87$; difference=-5.44; $t=-3.87$; $p<0.001$). On average, 13.8 (30.7% of total; 40.9% of those with any FEM) RRTA youth were classified as having high engagement each month compared to 11.5 (19.2% of total; 30.5% with any FEM) TAU youth. In RRTA, the proportion of youth reporting high engagement increased from the first to the third month of treatment, but then decreased by the 6-month assessment. In TAU, the proportion of youth reporting high engagement increased over time, but was generally lower than RRTA except at the 6-month assessment.

Association between Engagement in RRTA and Treatment Participation

Missed treatment appointments ranged widely (range=0–40, inter-quartile range=1–9), with a mean of 5.7 (SD=7.7) and a median of 3.0 missed appointments. High parent engagement at month 1 was significantly associated with fewer missed appointments (see Table 2). None of the 15 parent-youth dyads with 6 or more missed appointments were highly engaged at month 1 (p -value=0.03). Two thirds of parents who missed 6+ appointments also reported low engagement in months 2 and 3. Youth engagement in months 1–3 was not associated with missed appointments.

Association between Engagement in RRTA and Substance Use Outcomes

By month 2 of RRTA, 17 parents (37.8%) reported high engagement. Though not statistically significant at the $p<0.05$ level, all youth with highly engaged parents by month 2 had a negative UDS (p -value=0.13) and only 2 reported any substance use at the 3-month assessment (p -value=0.15). Youth with highly engaged parents by month 2 also reported no substance use at the 6-month assessment (F90 p -value=0.065).

High parent and youth engagement at month 3 was significantly associated with lower youth substance use at the 3-month assessment. Specifically, youth who were not using substances (based on separate UDS and self-reported substance use assessments) at month 3 were significantly more likely to be designated as having high versus low parent engagement (UDS $p=0.037$; self-reported F90 $p=0.032$) and high versus low youth engagement (UDS

$p=0.046$; self-reported F90 $p=0.034$). Parent or youth engagement at month 3 was not associated with youth substance use at the 6-month assessment.

Discussion

This descriptive study sought to determine if a family-based SUD treatment in JDC (i.e., RRTA) could effectively facilitate parent and youth treatment engagement. In addition, the study examined whether previously identified relations between engagement and clinical outcomes are also achieved in JDC settings. In general, youth and parents in the RRTA condition reported higher levels of engagement relative to their counterparts in the TAU condition. These findings suggest that a family-based SUD treatment can achieve good involvement and engagement in treatment, even in the context of JDC procedures that mandate youth and (often) parent treatment compliance. Group-based SUD treatments commonly provided as TAU in JDCs do not typically require parent participation, nor do they take active steps to build collaborative relations between parents and therapists. Thus, the low levels of engagement among parents in TAU might simply reflect the absence of any *opportunity* for parents to engage in their child's treatment rather than a low interest in doing so. Our findings indicate that when parents are provided a family-based SUD treatment that encourages parental involvement, they are much more likely to engage in the treatment process.

Because few parents were involved in TAU, we limited assessment of the relationship between engagement and outcomes to RRTA participants. High parent engagement by month 1 was associated with fewer missed appointments, consistent with previous studies where only parent (but not youth) engagement was associated with attendance or retention (Hawley & Weisz, 2005; Robbins et al, 2008; Shelef et al., 2005). This finding likely reflects the fact that parents exert greater control over treatment attendance than do youth. It is reasonable to hypothesize that fewer missed appointments might predict other positive outcomes, such as reduced overall treatment duration, faster achievement of treatment gains, and the avoidance of court sanctions, although those associations would need to be tested in future studies with larger samples.

In addition, high parent engagement by month 2 seemed to be associated with lower youth substance use at month 3 that was sustained until month 6, though those associations were only marginally significant in the current small sample. High parent and youth engagement in RRTA at month 3 were significantly associated with lower substance use at month 3 (as assessed via UDS and youth self-report), which is consistent with previous research (Hogue et al., 2006; Shelef et al., 2005; Tetzlaff et al., 2005). However, as these were concurrent assessments of engagement and outcomes at month 3, it could be that the order of causality was reversed – that is, that symptom improvement led to higher ratings of engagement. Achieving reduced substance use can be associated with several positive outcomes, such as reduced risk for court sanctions based on positive screens and reduced risk for new drug-related charges. Emphasizing and obtaining high engagement in the first month could lead to higher attendance, and in the first two months could lead to improved outcomes that could potentially be maintained throughout the treatment period.

Findings from this study should be interpreted in light of its limitations. The original study protocol aimed to recruit a larger sample size, but due to the unexpected closing of the original JDC, the final sample was smaller than intended (Letourneau *et al.*, *In Press*). The randomization scheme did not adjust for these unforeseen circumstances, which could have led to fewer participants in RRTA than in TAU. Analyses were restricted by the small sample size once it was (necessarily) limited to RRTA cases, and longitudinal regressions did not converge. Also due to the small sample and skewness of the FEM, we were unable to make finer-grained distinctions between levels of engagement. While the JDC judge and supervisor closely monitored youth treatment attendance, we were unable to obtain dosage and treatment information for youth in TAU. Therefore, we had to rely on parent report of engagement instead of TAU-therapist reported attempts at engaging TAU parents. We were also unable to explore between-site differences, as well as potential confounding by parent characteristics or assess moderators that have been found to influence the relationship between engagement and outcomes, such as ethnicity (Flicker, Turner, Waldron, Brody, & Ozechowski, 2008). Future studies should replicate findings from this descriptive study using larger samples to formally test mediation of engagement and assess moderation of other demographic or clinical characteristics, such as differences across therapists or JDC sites.

Despite these limitations, the study has several strengths that build the literature supporting engagement as an important component of family-based SUD treatment for youth. Our sample targeted a hard-to-reach yet clinically significant population of youth and parents, all of which were court-mandated to youth SUD treatment in JDC. The study collected repeated measures of engagement over time from both youth and parents. Another strength of this study was the use of multi-method assessment of youth substance use and multi-responder measures of engagement.

Findings from this study indicate that JDC-involved parents and youth can be engaged in a family-based SUD treatment when the treatment design actively supports parent engagement. Low parent engagement in JDC TAU could be partially driven by structural factors, such as TAU not facilitating parent involvement in adolescent group therapy. Emphasizing engagement in the first two months of RRTA seems to improve attendance and reduce youth substance use. Therapists should emphasize engagement techniques (e.g., Cunningham & Henggeler, 1999; Tuerk et al., 2012) to improve attendance and to potentially reduce youth substance use earlier in treatment. As parent involvement is crucial in JDCs (Asmus & Colombini, 2007), courts should implement effective interventions that engage both parents and youth in adolescent SUD treatment in an ultimate effort to improve youth outcomes.

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Table 1

Proportion of monthly FEMs collected (column %) and level of engagement in a court-mandated substance use disorder treatment

	Parent			Youth		
	Total n (col %)	RRTA n (col %)	TAU n (col %)	Total n (col %)	RRTA n (col %)	TAU n (col %)
Total	105 (100.0)	45 (100.0)	60 (100.0)	105 (100.0)	45 (100.0)	60 (100.0)
Any FEM						
Mean	44.5 (42.4)	37.3 (82.9)	7.2 (12.0)	71.5 (68.1)	33.8 (75.2)	37.7 (62.8)
Month 1	48 (45.7)	39 (86.7)	9 (15.0)	67 (63.8)	34 (75.6)	33 (55.0)
Month 2	43 (41.0)	39 (86.7)	4 (6.7)	73 (69.5)	36 (80.0)	37 (61.7)
Month 3	48 (45.7)	38 (84.4)	10 (16.7)	72 (68.6)	36 (80.0)	36 (60.0)
Month 4	41 (39.0)	37 (82.2)	4 (6.7)	76 (72.4)	35 (77.8)	41 (68.3)
Month 5	43 (41.0)	38 (84.4)	5 (8.3)	76 (72.4)	35 (77.8)	41 (68.3)
Month 6	44 (41.9)	33 (73.3)	11 (18.3)	65 (61.9)	27 (60.0)	38 (63.3)
High FEM						
Mean	20.2 (19.2)	17.3 (38.4)	2.8 (4.7)	25.3 (24.1)	13.8 (30.7)	11.5 (19.2)
Month 1	10 (9.5)	9 (20.0)	1 (1.7)	14 (13.3)	9 (20.0)	5 (8.3)
Month 2	18 (17.1)	17 (37.8)	1 (1.7)	23 (21.9)	15 (33.3)	8 (13.3)
Month 3	25 (23.8)	21 (46.7)	4 (6.7)	29 (27.6)	19 (42.2)	10 (16.7)
Month 4	22 (21.0)	19 (42.2)	3 (5.0)	24 (22.9)	11 (24.4)	13 (21.7)
Month 5	21 (20.0)	19 (42.2)	2 (3.3)	32 (30.5)	16 (35.6)	16 (26.7)
Month 6	25 (23.8)	19 (42.2)	6 (10.0)	30 (28.6)	13 (28.9)	17 (28.3)

Note: FEM = Family Engagement Measure; RRTA = Risk Reduction Therapy for Adolescents; TAU = Treatment as Usual.

Table 2
Associations between parent and youth engagement in Risk Reduction Therapy for Adolescents and treatment outcomes

		3-month outcomes		6-month outcomes		Missed appointments, tertilese			
		UDS+ ^a n (col. %)	F90+ ^b n (row. %)	UDS+ ^c n (row. %)	F90+ ^d n (row. %)	0-1 n (row. %)	2-5 n (row. %)	6+ n (row. %)	
Parent Engagement									
Month 1									
High	9 (20.9)	0 (0.0)	1 (11.1)	1 (11.1)	1 (11.1)	5 (55.6)	4 (44.4)	0 (0.0) *	
Low	34 (79.1)	4 (11.8)	10 (29.4)	3 (8.8)	5 (14.7)	9 (26.5)	10 (29.4)	15 (44.1)	
Month 2									
High	17 (39.5)	0 (0.0) ^a	2 (11.8) ^a	0 (0.0)	0 (0.0) ^o	7 (41.2)	5 (29.4)	5 (29.4)	
Low	26 (60.5)	4 (15.4)	9 (34.6)	4 (15.4)	6 (23.1)	7 (26.9)	9 (34.6)	10 (38.5)	
Month 3									
High	21 (48.8)	0 (0.0) *	2 (9.5) *	3 (14.3)	4 (19.0)	9 (42.9)	7 (33.3)	5 (23.8)	
Low	22 (51.2)	4 (18.2)	9 (40.9)	1 (4.5)	2 (9.1)	5 (22.7)	7 (31.8)	10 (45.5)	
Youth Engagement									
Month 1									
High	9 (20.9)	0 (0.00)	1 (11.1)	1 (11.1)	1 (11.1)	4 (44.4)	2 (22.2)	3 (33.3)	
Low	34 (79.1)	4 (11.8)	10 (29.4)	3 (8.8)	5 (14.7)	10 (29.4)	12 (35.3)	12 (35.3)	
Month 2									
High	15 (34.9)	0 (0.0)	2 (13.3)	1 (6.7)	1 (6.7)	6 (40.0)	5 (33.3)	4 (26.7)	
Low	28 (65.1)	4 (14.3)	9 (32.1)	3 (10.7)	5 (17.9)	8 (28.6)	9 (32.1)	11 (39.3)	
Month 3									
High	19 (46.3)	0 (0.0) *	2 (10.5) *	1 (5.3)	2 (10.5)	5 (26.3)	9 (47.4)	5 (26.3)	
Low	22 (53.7)	4 (18.2)	9 (40.9)	2 (9.1)	3 (13.6)	8 (36.4)	5 (22.7)	10 (45.5)	

^a
n=39;

^b
n=42;

^c
n=38;

^d
n=41;

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^e n=43;
^{*} p-value<0.05;
^o p-value<0.1;
[^] p-value<0.2;

col. % = column percentage UDS+ = positive urine drug screen; F90+ = any self-reported substance use in the last 90 days. Missed appointments were reported by each therapist at the end of treatment, and categorized into tertiles of 0–1, 2–5, or 6 more total missed appointments.