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Caregiver Involvement in Sexual Risk Reduction with Substance Using Juvenile Delinquents: Overview and Preliminary Outcomes of a Randomized Trial

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Abstract

Background—Substance using juvenile offenders have some of the highest rates for engaging in risky sexual behaviors compared to other adolescent subgroups.

Methods—An overview of the literature on sexual risk behaviors among these youth is provided, including the empirical support for including caregivers/parents as critical partners in sexual risk reduction efforts with this population. In particular, there is (a) evidence that family factors contribute to adolescent sexual risk, (b) emerging support for caregiver focused interventions that target adolescent sexual risk, and (c) established support for caregiver focused interventions that target other complex adolescent behavior problems. In addition, this paper presents preliminary results from a randomized controlled trial evaluating a family-based intervention for substance using juvenile delinquents that combines contingency management (CM) for adolescent substance use with a novel sexual risk reduction (SRR) protocol. Results through six months post-baseline (corresponding with the end of treatment) are presented for intervention fidelity and outcomes including number of intercourse acts (Sex Acts), use of condoms or abstinence (Safe Sex), and obtaining HIV testing (Testing).

Conclusions—In comparison to youth focused group substance abuse treatment, the CM-SRR intervention was associated with significantly greater therapist use of SRR techniques and greater

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caregiver involvement in treatment sessions (supporting treatment fidelity) and significantly lower increases in Sex Acts (supporting treatment efficacy). There were also higher odds for Safe Sex and for Testing, although these results failed to reach statistical significance. Findings add to the growing literature supporting the feasibility and efficacy of caregiver focused interventions targeting sexual risk behaviors among high-risk adolescent populations.

Keywords

HIV prevention; sexual risk; juvenile offenders; substance use; randomized controlled trial

Youth sexual risk behaviors are related to death and disability, as well as economic and social problems, and consequently have been a national public health priority for decades (Centers for Disease Control and Prevention [CDC], 2012). By some measures, the public health focus on sexual risk behaviors has been successful. For example, in large-scale epidemiological surveys of high school students, youth reported lower lifetime and current history of sexual intercourse, fewer sexual partners, less use of alcohol or drugs prior to intercourse, and greater use of condoms and other forms of birth control over time (CDC, 2012).

SEXUAL RISK REMAINS HIGH AMONG DELINQUENT AND SUBSTANCE ABUSING YOUTH

Despite the decline in sexual risk behaviors among high school students in recent years, such salutary changes have not been achieved with higher risk youth. In particular, delinquent and substance abusing youth are characterized by excessive sexual risk behaviors and related negative health outcomes (Houck et al., 2006; Teplin et al., 2005; Teplin, Mericle, McClelland, & Abram, 2003). For example, in 1997, 49% of male high school students reported ever having sexual intercourse and 33% reported having intercourse in the past 30 days (CDC, 2012). By comparison, 90% of male youth detained in a juvenile justice facility between 1995 and 1998 reported ever having sexual intercourse and 61% reported having intercourse in the past 30 days (CDC, 2012; Teplin et al., 2003). Within the broader population of delinquent youth, those who abuse substances present even higher risk (Kotchick, Shaffer, & Forehand, 2001). For example, relative to delinquent youth who report no substance use, those with high levels of substance use have 64% more sex partners and are 55% less likely to use condoms (Malow, Dévieux, Rosenberg, Samuels, & Jean-Gilles, 2006).

The elevated rates of sexual risk behaviors among delinquent and substance abusing youth directly impact their risk for negative health outcomes. For example, in 2008, the prevalence rates of chlamydia and gonorrhea among a community sample of male adolescents aged 15-19 were 0.7% and 0.3%, respectively, whereas for male youth entering correctional facilities the rates were 6.4% and 1.1%, respectively (CDC, 2009; Malow et al., 2006). The rates of HIV among delinquent and substance abusing youth have not been adequately estimated, but it is widely assumed that these youths' risk behaviors and elevated STD rates increase their risk for HIV infection (Marvel, Rowe, Colon-Perez, DiClemente, & Liddle, 2009).

Most Prevention Programs Targeting High Risk Youth Overlook Caregivers

Given substantial and ongoing risk behaviors, developing and disseminating effective HIV/STD prevention programs aimed at delinquent and substance abusing youth are national priorities (Marvel et al., 2009; Teplin et al., 2005) and numerous interventions have been developed, particularly for delinquent youth. Tolou-Shams, Stewart, Fasciano and Brown (2010) identified 16 published HIV preventive interventions that specifically targeted juvenile offenders. Of these 16 programs, 15 were delivered while youth were in juvenile justice facilities, 12 were delivered in youth group formats, and just 2 involved youths' caregivers. Results consistently indicated that the interventions had moderate effects on HIV knowledge and attitudes, with less consistent and weaker effects identified for post-release sexual risk behaviors. Tolou-Shams and colleagues suggested that the failure to substantively involve caregivers in most of these interventions might partly account for the modest results. They reaffirmed this conclusion after attempting their own intervention targeting affect management, self-efficacy, and condom-use skills among substance abusing delinquent youth (Tolou-Shams, Houck, Tarantino, Stein, & Brown, 2011). The intervention was delivered to small groups of youth across five 2-hour sessions, was not integrated with the youth's court-mandated substance abuse treatment, and did not involve caregivers. Results failed to support effects of the intervention over an attention control condition. The authors suggested that more intensive interventions, particularly those including family members, might be needed to effectively address delinquent youths' sexual risk behaviors.

Despite the elevated rates of sexual risk behaviors engaged in by substance abusing delinquent youth, few interventions specifically target this population. Apart from the study reported above (Tolou-Shams et al., 2011), Marvel and colleagues (Marvel et al., 2009) identified just four other published preventive interventions that specifically targeted the sexual risk behaviors of substance using juvenile offenders. Three of these were delivered to youth in juvenile justice settings, all four involved group formats, none included youths' caregivers and just one was associated with relevant behavioral changes (e.g., increased condom use; Magura, Kang & Shapiro, 1994). Marvel and colleagues suggested that the failure to address family influence on youth sexual risk behaviors might account for the absence of stronger results, and they described an ongoing evaluation of a family-based intervention targeting sexual risk among drug court involved youth. However, results pertaining to sexual risk outcomes have not yet been published (C. Rowe, personal communication, July 26, 2012). Thus, more research involving rigorous evaluations of family-based sexual risk reduction interventions for substance abusing juvenile offenders seems warranted.

Why Involve Caregivers in Adolescent Sexual Risk Reduction?

The recommendation to include family members in sexual risk reduction efforts (Donenberg, Paikoff, & Pequegnat, 2006; Donenberg, Wilson, Emerson & Bryant, 2002; Marvel et al., 2009; Tolou-Shams et al., 2011; Tolou-Shams et al., 2010), especially those targeting high-risk delinquent and substance abusing youth, is consistent with and grounded in research findings in several areas. As described more fully below, these areas include (a) research demonstrating that adolescent sexual risk taking is influenced by several family-level factors; (b) research supporting family-based HIV/STD preventive interventions for

more general populations of youth; and (c) research demonstrating the superiority of family-based interventions for other complex problem behaviors including serious delinquency and substance abuse. Moreover, it is recognized that caregivers often bear or share the responsibilities and burdens that can accompany youth sexual risk behaviors (Pequegnat & Szapocznik, 2000). Thus, caregivers have a significant stake in altering such behaviors, as well as the ability to repeat messages about safe sexual behaviors at different times in a child's development, and to reiterate such messages with their other children who might also be at elevated risk. For all of these reasons, substantive inclusion of caregivers seems important to the success of sexual risk reduction programs targeting high-risk youth.

Adolescent sexual risk taking is complex and influenced by family factors—It is well established that sexual risk behavior in adolescence is influenced by multiple factors at both the individual and family level. For example, at the individual level, unsafe sexual behaviors have been associated with low self-efficacy (Hutchinson, Jemmott, Jemmott, Braverman, & Fong, 2003) and depression, anxiety, and substance use (Murphy et al., 2001). At the family level, adolescent unsafe sexual behaviors have been associated with high parental permissiveness and low parental monitoring (Donenberg, et al., 2002) and poor caregiver-child communication (Hutchinson et al., 2003; Tinsley, Lee, & Sumartogo, 2004). Effective strategies for reducing youth sexual risk behaviors should attend to these factors and their interplay (Pequegnat & Szapocznik, 2000). Importantly, interventions should focus intensely on empowering caregivers to obtain the resources and skills needed to more effectively parent and manage their children.

Family-based interventions demonstrate promise with adolescent sexual risk behaviors—Families are considered the most important system from which children learn about sexual health. Supporting this contention are findings from surveys and focus groups indicating that youth want to receive information from and have conversations with their parents about sexual development (Nystrom, Duke & Victor, 2013) and that most youth actually do receive substantial information (e.g., regarding birth control and STDs) from their parents (Donaldson, Lindberg, Ellen, & Marcell, in press). Moreover, as noted above, several studies have identified associations between specific parenting characteristics such as communication, monitoring and supervision and specific adolescent sexual behaviors such as delays in sexual activity, fewer sexual partners, greater use of contraceptives, and reduced risk of STD transmission among youth (Aspy et al., 2007; Baptiste, Tolou-Shams, Miller, McBride, & Paikoff, 2007; Crosby et al., 2006; Perrino, Gonzalez-Soldeville, Pantin & Szapocznik, 2000).

Although few family focused sexual risk reduction interventions have specifically targeted substance using juvenile offenders, several have targeted adolescent populations with other HIV/STD risk factors (e.g., African American ethnicity and/or urban residence). These interventions, delivered in school or community settings, have been associated with positive outcomes, including increased condom use (DiIorio, McCarty, Resnicow, Lehr, & Denzmore, 2007), increased condom use self-efficacy (Dancey et al., 2009), and decreased exposure to opportunities for sexual encounters (McBride et al., 2007). Thus, it appears that caregivers are invested in addressing youth sexual development, that caregivers have or can

develop skills to effectively reduce youth sexual risk taking, and that youth are amenable to talking with their caregivers about sexual health and risk related issues.

Family-based interventions effectively address other complex behaviors—

There exists a robust literature on effective interventions aimed at reducing youth substance use and addressing other serious behavior problems. Several reviews have documented an emerging evidence base of promising adolescent substance abuse treatments (e.g., Bukstein, 2000; Liddle & Dakof, 1995; McBride, VanderWaal, Terry, & Van Buren, 1999; National Institute on Drug Abuse [NIDA], 1999; Waldron & Turner, 2008). In each of these, family-based intervention models were identified as achieving strong results. For example, NIDA (1999) cited three models as evidence-based treatments for adolescent drug abuse, including Multisystemic Therapy (Henggeler, Schoenwald, Borduin, Rowland & Cunningham, 2009), multidimensional family therapy (Liddle et al., 2001), and contingency management delivered in a family-based method (Azrin et al., 1996). Family-based interventions have also been validated and cited as effective treatments for youth with violent and serious criminal behavior (Elliott, 1998; Henggeler & Sheidow, 2012; U.S. Department of Health and Human Services, 2001). Thus, in the context of evidence-based interventions, caregivers can achieve substantial improvement in serious youth behavior problems that, like sexual risk behaviors, are complex, influenced by family factors, and associated with serious consequences for youth and their families.

In summary, after three decades of HIV/STD prevention research, a heightened focus on caregivers has resulted in several published family focused adolescent sexual risk reduction interventions, many of which demonstrate some evidence of success. However, it remains true that few caregiver focused interventions target very high risk youth such as substance abusing juvenile offenders, fewer still have been rigorously evaluated, and findings thus far have been modest. Thus, more work in this area is clearly needed. Preliminary data from an ongoing trial, described next, begins to address these gaps by evaluating a family-based sexual risk reduction intervention for youth participating in juvenile drug courts.

PRELIMINARY RESULTS FOR A SEXUAL RISK REDUCTION INTERVENTION

A randomized controlled trial is underway to test a family-based intervention for reducing sexual risk behaviors and substance use among youth in juvenile drug courts. The experimental intervention combines a sexual risk reduction (SRR) protocol developed by the investigators with contingency management (CM), an evidence-based substance abuse treatment (Henggeler et al., 2012). The current report presents preliminary trial results for this CM-SRR intervention, focusing specifically on SRR intervention feasibility and efficacy through 6-months post-recruitment, which corresponds with the end of the CM-SRR intervention. We hypothesized that, relative to youth in the usual treatment control condition, youth in the CM-SRR condition would (a) report receiving more SRR treatment components, supporting intervention feasibility and fidelity and (b) report less frequent sex acts, more frequent use of condoms or periods of abstinence, and greater likelihood of obtaining HIV testing, supporting intervention efficacy.

Method

Design and Procedures—We used a randomized design with intent-to-treat analyses to evaluate the experimental CM-SRR intervention in comparison with usual treatment, with randomization stratified to balance treatment conditions on youth gender. Outcomes were assessed in terms of sexual behavior and HIV testing. Subjects completed self-reports of their sexual behavior at the time of their recruitment into the study (baseline), and 3 and 6 months post-recruitment, and completed self-reports of HIV testing at baseline and 6 months post-recruitment. The assessments were administered by research assistants at times and places convenient to families, most often at the family's home. Youth and caregivers also reported on therapist fidelity to the sexual risk reduction intervention via brief telephone assessments conducted after each month of active treatment. Families were compensated \$30 for each completed assessment and \$5 per telephone-based fidelity assessment. The Johns Hopkins University Institutional Review Board approved this study, and the investigators obtained a federal Certificate of Confidentiality to further protect participants.

Youth aged 12 to 17 years and newly referred to one of two juvenile drug courts and their caregivers were eligible to participate in this study, provided that both the youth and caregiver(s) were fluent in English and did not have severe or profound mental retardation as detected by referral source or interviewer. More specifically, youth and caregivers were informed of the study by study staff during initial juvenile drug court procedures and again when families called to schedule youths' court mandated pretreatment evaluations. Members of the juvenile drug court (e.g., judges, drug court coordinators, defense attorneys and prosecutors) were aware of and supported this project and occasionally directly referred youth and families to the study. However, to reduce the real or perceived risk of coercion, consent procedures were typically conducted in youths' homes (versus at court) and emphasized the voluntary nature of participation and the distinction between voluntary research procedures versus mandatory court procedures.

Of 118 eligible youth and families referred to the study at the time of this report, 98 (83%) consented to participate. Among the youth who consented to participate, two in the control group (usual treatment condition) dropped out following consent without providing any study data, and 15 (11 usual treatment condition, 4 CM-SRR) provided only baseline assessments. These youth were excluded from the current analyses, resulting in a sample of 81 youth for the present report.

Intervention Conditions

All youth in the study were participating in one of two juvenile drug courts, which followed national guidelines for the conduct of drug court programs (National Association of Drug Court Professionals, 1997). Specifically, youth were required to participate in outpatient substance abuse treatment and to complete frequent urine drug screens; center staff closely monitored youths' treatment progress and behavior in school, family and other domains; and youth were required to attend periodic status hearings where they received rewards or sanctions from the juvenile drug court judge based on behavior and drug screen results. Caregivers were expected to attend all youth court appearances. Youth and caregivers participating in this study were randomized to receive either the family-based CM-SRR

intervention or usual (i.e., outpatient substance abuse) treatment services that were typically available to juvenile drug court participants.

Contingency Management–Sexual Risk Reduction (CM-SRR)—The contingency management element of the intervention, which was originally developed for substance abuse intervention, is described extensively in a treatment manual (Henggeler et al., 2012). The CM-SRR is built upon the substance abuse intervention, adding a sexual risk reduction component to it, and has been described in detail elsewhere (McCart, Sheidow, & Letourneau, 2013). Briefly, the primary assumption of the CM-SRR intervention is that caregivers play a vital role in achieving and maintaining positive changes in adolescent behavior. Therefore, helping caregivers to develop the necessary skills to effectively parent their youth is a central focus of the CM-SRR model.

Youth and their caregivers attend all CM-SRR sessions together. The CM-SRR intervention lasts approximately six months, with weekly 60-to 90-minute, office-based sessions. The contingency management portion of the intervention is delivered during months 1-4 of treatment. The SRR portion of the CM-SRR intervention is delivered during months 5-6 of treatment and builds upon the strategies families have been taught during the contingency management for substance use portion of the intervention. The ultimate aims of the SRR intervention are to (a) reduce youth unsafe sexual behaviors as evidenced by reduced number of sexual partners and reduced frequency of sexual acts and (b) increase youth safe sexual behaviors as evidenced by increased periods of abstinence, increased use of condoms, and increased likelihood of HIV testing. Specific SRR intervention techniques were drawn from several primary sources, including a home-based family systems intervention for sexual risk reduction (Letourneau et al., 2013) and efficacious HIV intervention and prevention protocols (Hadley et al., 2009; Lightfoot, Rotheram-Borus, & Tevendale, 2007; NIMH Multisite HIV Prevention Trial, 1997).

There are nine core SRR components. These include (1) clinical assessments to evaluate the extent of sexual risk behaviors, (2) antecedent-behavior-consequence assessments of the youth's sexual risk behavior, (3) self-management planning to reduce sexual risk, (4) contingency contracting to set family expectations and rules regarding youth dating and safe sexual behavior, (5) education for youth and caregivers regarding normative sexual behavior, sexual risks, and HIV/STD prevention, (6) education for youth and caregivers regarding birth control options and resources, (7) referral of sexually active youth for HIV testing, (8) condom use skills training facilitated by the caregiver and therapist, and (9) development of emergency plans by youth and caregivers to address potential HIV/STD infection or pregnancy following unsafe sexual encounters. Urine drug screens were conducted at least weekly early in treatment, with the frequency declining as evidence supporting drug abstinence accumulated over the course of treatment. Three master's level therapists were hired and trained to deliver the CM-SRR intervention. An initial 12-hour workshop oriented the therapists to program philosophy and intervention methods. The second author, a clinical psychologist, reviewed session tapes and provided therapists with weekly individual supervision lasting one hour that aimed to promote adherence to treatment principles and develop solutions to clinical problems.

Usual treatment—Youth randomly assigned to the usual treatment control condition received those treatment services that are typically mandated by the court. At both juvenile drug courts, treatment services were provided by state or privately funded alcohol and drug treatment provider agencies. Across these agencies, service delivery method and intervention foci were quite consistent. At all settings, frequency and intensity of services were determined by initial assessment results. Outpatient group treatment sessions typically lasted 60-90 minutes and ranged in frequency from 1 to 4 sessions per week. Per drug court records, the duration of usual treatment typically did not exceed six months. Interventions focused on substance use reduction, peer influence, conflict resolution, anger management, and (when indicated) drug selling behavior. Therapists conducted additional individual and family sessions as needed. The theoretical orientations of the provider agencies were reported as cognitive-behavioral and systems theory. Interventions were not manualized and selection of material was left to the therapists' discretion. Urine drug screens were conducted at least weekly. Therapist-level information (e.g., terminal degree, level of training or supervision) was unavailable for the control condition.

Measures

Research instruments were administered confidentially by a research assistant, and all research measures with the exception of the demographics instrument were administered separately to youth and caregivers. The demographics questionnaire was typically completed with the youth and caregiver together, to facilitate accurate recall. Participants were informed that neither therapists nor juvenile justice authorities would be provided with any of their data and youth were additionally informed that their parents would not be notified of youth responses.

Demographic characteristics—A family demographic questionnaire assessed youth and caregiver age, race, ethnicity, gender, relationship and economic status as well as youth psychiatric and substance abuse treatment history. Aside from the demographic questionnaire

Therapist fidelity—Following each month of treatment, youth and caregivers were asked (separately) to indicate (a) whether they had been involved in treatment in the past month and, if so, (b) whether specific techniques corresponding to the nine core sexual risk reduction components were utilized in any of the preceding month's treatment sessions. Their responses were recorded on a specially developed SRR therapist adherence measure (SRR-TAM), which is composed of 27 core items each having a yes/no response. Items include, for example, "The therapist provided you and your caregiver with information on safe sex practices," and "The therapist helped you and your caregiver practice strategies to avoid unsafe sex." Internal consistency of the SRR-TAM was high, with Cronbach's alphas ranging from .96 to .97 for each study month.

Sexual risk behaviors—Sexual risk behaviors were assessed using a standardized set of items adapted from the international Project Accept HIV prevention trial assessment interview (Genberg et al., 2008). At baseline only, youth reported on their lifetime history of vaginal and anal intercourse. At the baseline, 3-month, and 6-month interviews items also

assessed whether the respondent had intercourse in the past 3 months and, if so, the number of intercourse acts and the number of times condoms were used.

HIV counseling and testing—Participation in HIV counseling and testing was also assessed using a standardized set of items adapted from Project Accept (Genberg et al., 2008). Baseline questions assessed participants' lifetime history of voluntary counseling and testing (e.g., "have you ever been tested for HIV") while parallel items at the 6-month interview assessed whether youth had been tested in the preceding 6 months.

Data Analysis Strategy for Outcomes

To examine potential differences in fidelity by condition, a generalized estimating equation (Liang & Zeger, 1986) was used to model SRR-TAM scores. In this model, a spline term at month 5 was included to model the change in mean scores from months 1-4 (i.e., prior to the introduction of SRR in the CM-SRR intervention) to months 5-6 (i.e., corresponding with the months of SRR intervention). An interaction term allowed for the change in mean scores to differ by condition.

The research design for the sexual behavior outcomes leads to a nested data structure with three repeated measurements of sexual risk behaviors (level-1) nested within youth (level-2). The first outcome is the count of sexual intercourse instances in the past three months or "sex acts." Youth with a lifetime history of sexual intercourse and no activity in the past three months have a value of 0 while youth with any activity in the past three months (regardless of lifetime history) have a value of 1. The second outcome comprises two components of safe sex. The first is condom use, computed as the percentage of sex acts in the past three months that included the use of a condom. Because 70% of the observations indicated 100% condom use, condom use was dichotomized to reflect 100% condom use or not. Youth with a lifetime history of sexual intercourse and no activity in the past three months were considered abstinent. As such, the final "safe sex" outcome reflects 100% condom use or abstinence in the previous three months. Youth who reported no sexual activity at baseline and none throughout this study ($n = 26$) were excluded from the Sex Acts and Safe Sex analyses.

The Sex Acts and Safe Sex outcomes were evaluated using mixed-effects regression models (Raudenbush & Bryk, 2002). At level-1, one dichotomous indicator was included to differentiate the 6-month assessment from the baseline assessment. At level-2, the intervention indicator (usual treatment = 0, CM-SRR = 1) was modeled as a main effect, and cross-level interactions were specified between condition and the level-1 terms. Planned comparisons provided significance tests for the difference in the group means at 3 and 6 months.

The research design for the dichotomous HIV Testing outcome, with just two measurement points for this study, lent itself to logistic regression. Specifically, a multivariate logistic regression was used to calculate the relative odds of having obtained HIV testing in the past 6 months for youth in the CM-SRR intervention and the usual treatment conditions, controlling for lifetime history of testing at baseline.

Results

Participant Characteristics and Baseline Sexual Experience

Demographic characteristics of youth and caregivers are presented in Table 1.

Groups did not differ significantly on any of these variables. We also examined youths' baseline sexual behaviors. The majority reported a lifetime history of vaginal or anal intercourse (63%), with a mean age of 13.2 years ($SD = 2.2$) for first intercourse and a mean number of 4.9 ($SD = 5.1$) lifetime sexual partners for those who were sexually active. Among sexually active youth, most (63%) reported having had intercourse in the past 3 months, with significantly more youth in the CM-SRR condition (84%) than the usual treatment condition (50%) reporting recent intercourse [$\chi^2(1) = 5.97, p < .05$]. Youth who reported intercourse in the past 3 months reported a mean of 4.7 ($SD = 5.1$) intercourse acts, a mean of 1.6 ($SD = 0.8$) sexual partners, and 80.4% reported always using condoms. Among all youth, 16% reported ever having been tested for HIV at baseline.

Therapist Fidelity

A maximum of six therapist adherence measures were collected from each youth and each caregiver, corresponding to the first six months of treatment. Most caregivers in the usual treatment condition indicated that they were *not* directly involved in their children's treatment and were therefore unable to report on treatment strategies used by their youth's therapist. Specifically, 52% of caregivers in the usual treatment condition were unable to complete any SRR-TAMs, 33% completed just one, 9% completed two, 2% completed three, and 4% completed all six. By comparison, all caregivers in the CM-SRR condition completed at least one SRR-TAM. Specifically, 3% completed just one, 3% completed two, 17% completed three, 3% completed four, 43% completed five, and 31% completed all six. These differences were statistically significant ($\chi^2(6) = 63.53, p < .001$).

Because caregivers in the usual treatment condition so frequently reported that they were not involved in their child's treatment, the SRR-TAM analysis is informed by youth fidelity ratings only. Results indicated that mean SRR-TAM scores increased from months 1-4 to months 5-6 by 1.37 points for the entire sample (95% CI: -1.48, 4.21). There was a statistically significant interaction by group with the change in mean score in months 5-6 being 6.5 points higher among youth in the CM-SRR condition than among youth in the usual treatment condition (95% CI: 2.29, 10.76). These results indicate that, relative to usual treatment therapists, CM-SRR therapists provided significantly more sexual risk reduction components in months 5 and 6, corresponding to timing of the SRR intervention.

Sex Acts

The mean number of sex acts among those who were sexually active increased for both conditions over time, from 5.9 to 9.3 for the CM-SRR condition and from 3.5 to 10.1 for the usual treatment condition. The mixed-effects regression model results are presented in Table 2 (see upper half of table, labeled Sex Acts).

The CM-SRR and usual treatment groups differed significantly at baseline, with the rate of sex acts for the CM-SRR group being 3.8 times greater than the rate for the usual treatment group (95% $CI_{ERR} = 1.76, 8.21$). The group means also differed significantly at month 3, at which time the rate of sexual intercourse for CM-SRR intervention group was 2.75 times the rate for the controls (95% $CI_{ERR} = 1.33, 5.69$). The group means did not differ significantly at month 6 (95% $CI_{ERR} = 0.77, 3.34$). Groups differed significantly in the change between baseline and month 6, with sex acts for the controls increasing significantly more than for the CM-SRR group. Specifically, although they both increased, the rate of change from baseline to month 6 for the group receiving CM-SRR was less than half the rate of change for the group receiving usual treatment ($ERR = 0.42$, 95% $CI_{ERR} = 0.27, 0.65$).

Safe Sex

The proportion of youth using safe sex strategies (among those who were sexually active) increased over time for youth in the CM-SRR condition (from 68% to 89%) and decreased over time for youth in the usual treatment condition (from 88% to 74%). The mixed-effects regression model results are presented in Table 2 (see bottom half of table, labeled Safe Sex). The CM-SRR and usual treatment group means for safe sex did not differ significantly at baseline (95% $CI_{OR} = 0.05, 1.64$), month 3 (95% $CI_{OR} = 0.09, 2.47$), or month 6 (95% $CI_{OR} = 0.38, 23.76$). The change in the odds of safe sex from baseline to month 6 was 10.2 times greater for youth in the CM-SRR condition relative to youth in the usual treatment condition, although this result failed to reach statistical significance ($p = .066$; 95% $CI_{OR} = 0.85, 122.19$).

HIV Counseling and Testing

Among participants with complete data ($n = 49$), youth in the CM-SRR condition had 44% higher odds of reporting HIV testing in the past 6 months than youth in the usual treatment condition after controlling for baseline history of HIV testing. However, this association was not statistically significant ($OR = 1.44$, 95% $CI_{OR} = 0.35, 5.96$).

Summary of Preliminary Study Results

These preliminary findings are modest, but encouraging. Feasibility was partly supported by an adequate recruitment rate (83%) for a study recruiting families to engage in an interventions related to adolescent sexual risk reduction, by evidence that caregivers were involved in nearly all SRR treatment sessions, and by the fact that CM-SRR youth reported receiving more SRR intervention components during the months when the SRR condition was implemented by their therapists. Treatment efficacy was partly supported by the finding that, while both groups increased in their number of sex acts over time, the rate of increase was significantly lower for youth in the CM-SRR condition. This suggests that the intervention might work to slow (but not reverse) normative increases in sexual intercourse acts in sexually active teens. In addition, whereas sexually active youth in the usual treatment condition reported less use of safe sex techniques (i.e., condom use/abstinence) over time, sexually active youth in the CM-SRR condition reported greater use of these techniques and also greater likelihood of obtaining HIV testing, although these differences did not reach a conventional level of significance. In combination, these results suggest that

sexual behavior is modifiable even among the highest risk youth, and that interventions specifically targeting such behaviors within the context of substance abuse treatment and doing so through youths' caregivers might improve upon youth focused substance abuse services. Limitations of this study include small sample sizes, especially when only sexually active youth were included in analyses, and brief follow-up. Whether current trends will solidify with the final, larger study sample and longer follow-up remains to be seen.

Conclusions

There is broad consensus on the importance of including parents or other caregivers in youth sexual risk reduction interventions, particularly for higher risk substance abusing delinquent youth. As reviewed earlier, the recommendation to substantively involve caregivers in such interventions is supported by research demonstrating the strong influence of family factors on youth sexual risk behavior and the achievement of robust outcomes by family focused programs targeting other serious behavior problems such as adolescent substance abuse and juvenile delinquency. Perhaps more fundamentally, caregivers have a strong stake in their children's well-being and this study has demonstrated their interest in being active participants in targeting their teens' sexual behavior. This study also demonstrates the feasibility of therapists conducting such an intervention with high-risk youth and their families. Involving caregivers in effective interventions might help improve youth outcomes and empower caregivers to continue to help high-risk youth to safely navigate their sexual development.

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Table 1**Baseline Youth and Caregiver Demographic Characteristics by Intervention Group**

Baseline Characteristics	CM-SRR % (n=35)	UT % (n=46)	Total % (n=81)
Age (mean years)	15.2	14.9	15.0
Gender (male)	80.0	87.0	84.0
Race			
White	57.1	43.5	49.4
Black	34.3	34.8	34.6
Other	8.6	21.7	16.1
Hispanic/Latino	31.4	34.8	33.3
Type of educational program [#]			
Academic-middle/high school	90.3	93.0	91.9
Other	9.7	7.0	8.1
Lifetime outpatient treatment			
Mental health problem	20.0	32.6	27.2
Substance use problem	14.3	6.5	9.9
Lifetime inpatient treatment			
Mental health problem	11.4	6.5	8.6
Substance use problem	8.6	4.4	6.2
Use of medication in the last year	34.3	37.0	35.8
Lifetime stay in detention facility	22.9	17.4	19.7
Lifetime stay in juvenile prison/correctional facility	5.7	4.4	4.9
Household annual income			
\$0-\$30,000	45.7	52.2	49.4
\$30,001-\$60,000	20.0	30.4	25.9
\$60,001-\$90,000	14.3	8.7	11.1
Greater than \$90,000	20.0	8.7	13.6
Primary caregiver			
Mother	77.1	80.4	79.0
Father	17.1	13.0	14.8
Other	5.7	6.5	6.2
Primary caregiver's co-habitation status			
Married/living (M/L) with child's other parent	34.3	19.6	25.9
M/L with someone other than child's other parent	22.9	17.4	19.8
Other	42.9	63.0	54.3
Primary caregiver currently working? (yes)	71.4	67.4	69.1
Primary caregiver's highest level of education			
Greater than high school graduate	60.0	51.1	55.0
High school graduate	22.9	35.6	30.0
Less than high school graduate	17.1	13.3	15.0

Note: CM-SRR = Contingency Management-Sexual Risk Reduction; UT = Usual treatment. Between-groups differences (Chi-square or Fisher's exact test) were *ns* for all variables at $p < .05$.

= proportion reflects the 74 youth enrolled in school at baseline.

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Table 2**Mixed-Effect Regression Models for Treatment Outcome Measures**

<i>Sex Acts</i>	β	<i>SE</i>	<i>df</i>	<i>p</i>	<i>ERR</i>	95% CI
Baseline						
UT	-0.245	0.262	53	0.355	0.783	0.46, 1.32
CM-SRR vs. UT	1.335	0.384	53	0.001	3.800	1.76, 8.21
Month 6 vs. Baseline						
UT	1.218	0.167	134	0.000	3.381	2.43, 4.71
CM-SRR vs. UT	-0.860	0.219	134	0.000	0.423	0.27, 0.65
<i>Safe Sex</i>	β	<i>SE</i>	<i>df</i>	<i>p</i>	<i>OR</i>	95% CI
Baseline						
UT	2.105	0.601	53	0.001	8.210	2.46, 27.42
CM-SRR vs. UT	-1.217	0.852	53	0.159	0.296	0.05, 1.64
Month 6 vs. Baseline						
UT	-0.818	0.795	151	0.305	0.441	0.09, 2.12
CM-SRR vs. UT	2.323	1.256	151	0.066	10.205	0.85, 122.19

Note. CM-SRR = Contingency Management-Sexual Risk Reduction; UT = Usual Treatment; *ERR* = Event Rate Ratio; *OR* = Odds Ratio; CI = Confidence Interval.