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First Evaluation of a Contingency Management Intervention Addressing Adolescent Substance Use and Sexual Risk Behaviors: Risk Reduction Therapy for Adolescents

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ABSTRACT

There is a need for interventions that comprehensively address youth substance use disorders (SUD) and sexual risk behaviors. Risk Reduction Therapy for Adolescents (RRTA) adapts a validated family-focused intervention for youth SUD to include sexual risk reduction components in a single intervention. In this first evaluation of RRTA, drug court involved youth were randomly assigned to RRTA ($N = 45$) or usual services (US; $N = 60$) and followed through 12-months post-baseline. RRTA included weekly cognitive behavior therapy and behavior management training and contingency-contracting with a point earning system managed by caregivers targeting drug use and sexual risk antecedents. Longitudinal models estimated within-group change and between-group differences through 6- and 12-month follow-up on outcomes for substance use, sexual risk behaviors, and protective HIV behaviors. Robust effects of the intervention were not detected under conditions of the study that included potent background interventions by the juvenile drug court. Considerations about future development and testing of sexual risk reduction therapy for youth are discussed, including the potential role of contingency management in future interventions.

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1. Introduction

Youth with substance use disorders (SUD) are a large and underserved population at high risk for deleterious outcomes and long-term costs for themselves, their families, and society. Roughly 2 million U.S. adolescents meet criteria for SUD (Godley et al., 2010). However, only about 200,000 U.S. youth received treatment for SUD in 2012 (Substance Abuse and Mental Health Services Administration, 2013). When left untreated, many youth with SUD continue abusing substances into adulthood, with detrimental effects pertaining to education, mental and physical health, and employment (Alford, Koehler, & Leonard, 1991; Brown, Myers, Mott, & Vik, 1994; Chan, Dennis, & Funk, 2008; Crowley, Mikulich, MacDonald, Young, & Zerbe, 1998; Godley, Godley, & Dennis, 2001; Henggeler, Clingempeel, Brondino, & Pickrel, 2002; Kaminer & Bukstein, 2008; Ringel, Ellickson, & Collins, 2007). Such outcomes cost society more than \$180 billion each year,

stemming from health care, drug-related crime, and reduced work productivity (Office of National Drug Control Policy, 2004). Even when youth do receive services for SUD, the vast majority of those services are not evidence-based (Fixsen, Blase, Duda, Naoom, & Van Dyke, 2010; McCarty et al., 2007; Santa Ana et al., 2008). Another concern is that the services for SUD among youth often are delivered in isolation from interventions for other common co-occurring problems.

One prevalent co-occurring problem among adolescents with SUD is sexually transmitted infection (STI), including HIV. Youth with SUD are 2–8 times more likely to acquire STI relative to their peers without SUD (Cook et al., 2006; Staras, Tobler, Maldonado-Molina, & Cook, 2011; Tapert, Aarons, Sedlar, & Brown, 2001). This increased risk is at least partially attributed to elevated rates of unsafe sexual behavior among adolescents with SUD (Belenko & Dembo, 2003; Bell et al., 2003). Compared to non-substance using adolescents, substance using youth initiate sexual activity at a younger age and engage in higher rates of unprotected sex (Houck et al., 2006; Malow, Dévieux, Rosenberg, Samuels, & Jean-Gilles, 2006). Among a national sample of high school seniors, the number of sexual partners increased across cohorts with substance use intensifying from no use to heavy use (Cavazos-Rehg et al., 2011). Further, longitudinal research shows that many youth with SUD continue displaying high rates of risky sexual behavior in adulthood (Khan, Berger, Wells, & Cleland, 2012; Strachman, Impett, Henson, & Pentz, 2009; Wu, Witkiewitz, McMahon, Dodge, & Conduct Problems Prevention Research Group, 2010). Experts have, therefore, called for

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interventions that target STI-related sexual risk behaviors among youth with SUD (Bell et al., 2003; Houck et al., 2006) and several such interventions have been developed. However, results do not clearly support the efficacy of these programs (Marvel, Rowe, Colon-Perez, DiClemente, & Liddle, 2009; Tolou-Shams et al., 2011).

For example, Tolou-Shams and colleagues developed and evaluated a group-based affect management intervention that aimed to improve juvenile drug court involved youths' self regulation in risky situations (e.g., when negotiating condom use), as well as increase motivation and skills for HIV prevention. Analyses from this small ($N = 57$) randomized controlled trial showed no statistically significant between-group differences at 3 months post-intervention on key outcomes including condom use, number of sexual partners, and substance use during sex, but trends for increased communication with partners about condom use and lower odds of using substances during sex in the experimental versus control treatment conditions. Tolou-Shams and colleagues hypothesized that a more intensive family-focused (vs. adolescent-only) intervention that integrated SUD treatment with sexual risk reduction intervention might yield better results.

Risk Reduction Therapy for Adolescents (RRTA) adapts a validated family-focused Contingency Management (CM) intervention for youth with SUD to include sexual risk reduction components in a single comprehensive treatment (McCart, Sheidow, & Letourneau, 2014).

The family-focused CM intervention for youth with SUD was developed and evaluated extensively by Henggeler, Cunningham, et al. (2012)³ and is based on a variation of the Community Reinforcement Approach (CRA; Budney & Higgins, 1998). It maintains a strong focus on caregiver involvement, an element previously shown critical for improving adolescent outcomes (Dowell & Ogles, 2010; Hawley & Weisz, 2005; Stanton & Shadish, 1997). It incorporates a contingency contracting procedure in which objective youth behavior including urine test results receive consequences based on a structured point system developed at the start of therapy in collaboration between the therapist, youth, and family members. Further, it incorporates cognitive behavioral strategies to help youth identify the antecedents (i.e., triggers) and consequences of their substance use and to develop plans for avoiding and/or managing substance use triggers.

Previous trials have shown that the family-based CM intervention improves outcomes among youth with SUD (Henggeler, McCart, Cunningham, & Chapman, 2012; Henggeler et al., 2006).⁴ In one recent study, Henggeler and colleagues compared the family-based CM intervention to usual treatment services in a multi-site randomized controlled trial focused on youth in juvenile drug courts (Henggeler, McCart, et al., 2012). Urine drug test results indicated that groups had similar rates of positive tests early in treatment, but that at later assessments CM was associated with significant reductions in marijuana use relative to the control condition.

Within the context of the family-based CM intervention, RRTA was designed to add new behavioral targets in addition to substance use reduction, specifically, sexual risk behaviors and HIV/STI testing. RRTA aims to reduce both substance use and sexual risk by targeting three factors that underlie those outcomes: maladaptive parenting, deficiencies in youth self-control, and low youth HIV/STI knowledge and skills. Specifically, maladaptive parenting (e.g., limited supervision, poor communication) predicts both substance use (Brown & Abrantes, 2006) and risky sexual behavior (Kotchick, Armistead, & Forehand, 2006) among youth. Conversely, when caregivers engage in adaptive parenting, adolescents exhibit reduced substance use (Henggeler et al., 2009; Huey, Henggeler, Brondino, & Pickrel, 2000) and healthier

sexual outcomes (Aspy et al., 2007; Crosby et al., 2006). A similar pattern exists between adolescent self-control (i.e., the ability to delay gratification and consider consequences before acting) and both substance use (Brody & Ge, 2001; Wills, Walker, Mendoza, & Ainette, 2006) and risky sex (Caspi et al., 1997; Cooper, Wood, Orcutt, & Albino, 2003). In addition, accurate HIV/STI knowledge positively affects motivation regarding healthy sexual decision-making (Swenson, Rizzo, & Romer, 2010), as does increased communication about HIV, particularly communication with parents (MacPhail, Pettifor, Moyo, & Rees, 2008). Thus, RRTA uses contingency contracting, cognitive-behavioral strategies, and skills-based practice to (a) improve caregivers' parenting skills, (b) build youths' self-control abilities, and (c) increase HIV/STI knowledge and interactive discussion for both parents and youth. The components of RRTA (described later) are derived from the aforementioned family-based CM intervention for youth SUD, with CM also providing the platform for strategies that target sexual risk reduction.

This study presents results from a small randomized controlled trial that compared RRTA, delivered as a treatment attached to juvenile drug court (JDC), with usual treatment services (US) provided to youth in the same JDCs. The JDC setting was chosen because of the research team's focus on justice-involved populations, the dire need for simultaneously reducing the high risk behaviors of drug use and risky sexual behaviors particularly among justice populations, and the direction of research funding opportunities specifically for justice populations and JDC-involved samples. While these settings provide a highly structured environment with monitoring, accountability, and often its own potent contingencies, research on juvenile court outcomes in fact shows mixed results (Aos, Miller, & Drake, 2006). We hypothesized that RRTA would be more effective than US at reducing both substance use and sexual risk behaviors among these drug court-involved youth.

2. Materials and methods

2.1. Design and procedures

A randomized design with intent-to-treat analyses evaluated the preliminary efficacy of RRTA for targeting key outcomes measured at baseline and 3-, 6-, 9-, and 12-month post-baseline. All youth were recruited from one of two JDCs.⁵ Given that more boys than girls present in juvenile justice populations including JDCs, youth gender was balanced across treatment conditions via stratified randomization. Youth assent and parent/caregiver consent procedures emphasized the voluntary nature of participation. Research assessments were typically conducted in families' homes and at times convenient to youth and parents. Families were compensated \$30 for each completed assessment. All procedures were approved by the lead author's institutional review board and a federal certificate of confidentiality was obtained to further protect participants and their data.

Of 137 eligible youth referred to the study (216 referred minus 79 ineligible), 114 (83%) consented, including 107 randomized cases and 7 nonrandomized "beta" cases (see CONSORT Fig. 1; ClinicalTrials.gov Identifier: NCT01511380). Of the 107 randomized cases, 105 ($N = 45$ for RRTA and 60 for US) provided useable data (i.e., completed at least the baseline assessment) for this study.

Most participating youth were boys (83.8%) between the ages of 11 and 17 ($M = 14.9, \pm 0.14$ years) who self-identified as heterosexual (90.4%). Youth self-identified in approximately equal proportions as non-Latino White (33.3%), non-Latino Black (29.5%), and Latino (30.5%). Their primary caregivers were predominantly biological or

³ While Dr. Henggeler's prior research has used a family-based treatment called Multisystemic Therapy (MST), the research cited here focuses on a different treatment called Contingency Management (CM). MST therapists sometimes use CM strategies, but the CM discussed in this paper is a standalone treatment separate from MST.

⁴ In some articles, the family-based aspect of this intervention was denoted by the label CM-FAM. It is the same intervention detailed in Henggeler, Cunningham, et al., (2012).

⁵ We originally planned to conduct the study at a single JDC with 160 participants; however, after 15 years of operation, the original JDC program was terminated unexpectedly. In response, we recruited a second JDC site for the trial, located in a nearby state. The delay and expense associated with moving the study to a distal location contributed to the study's small final sample size.

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