Journal of Anxiety Disorders 25 (2011) 690–696

Contents lists available at ScienceDirect

Journal of Anxiety Disorders

CBT for childhood anxiety and substance use at 7.4-year follow-up: A reassessment controlling for known predictors

Connor Morrow Puleo*, Bradley T. Conner, Courtney L. Benjamin, Philip C. Kendall

Temple University, Department of Psychology, 1701 North 13th Street, Philadelphia, PA 19122, USA

ARTICLE INFO

Article history:
Received 5 November 2010
Received in revised form 5 March 2011
Accepted 8 March 2011

Keywords:
Cognitive-behavioral therapy
Child
Adolescent
Anxiety disorder
Substance abuse

ABSTRACT

A previous report suggested that successful cognitive behavioral therapy (CBT) for child anxiety reduced substance use problems at 7.4-year follow-up, but that report did not include predictors of: (a) substance use disorder (SUD; e.g., attention deficit-hyperactivity disorder symptoms, negative life events, family substance abuse, additional treatment), or (b) treatment outcome (e.g., severity of internalizing pathology, age). Analyses incorporating these factors tested previously reported findings in 72 participants (ages 15–22 at follow-up; 84% of the 7.4-year follow-up sample), using parent and youth diagnostic interviews and report measures. The majority of previously reported associations between less successful treatment and later substance use problems remained significant after controlling for known predictors of SUD and treatment outcome. Our findings bolster previous conclusions that effective CBT for child anxiety may have ameliorative effects on the target disorder and later substance use problems.

Childhood anxiety disorders are associated with strained peer and interpersonal relationships, academic difficulties, and reduced psychological wellbeing (Costello, Egger, & Angold, 2004; Verduin & Kendall, 2008). They are common, affecting approximately 18% of children (Kessler, Chiu, Demler, & Walters, 2005) and unlikely to remit without treatment (Pine, Cohen, Gurley, Brooks, & Ma, 1998). Rather, the detriments of child anxiety are both immediate and prolonged. In addition to disrupting early functioning, childhood anxiety is a significant risk factor for later negative sequelae, such as substance use disorders (SUDs; Kaplow, Curran, Angold, & Costello, 2001; Pine et al., 1998). Research suggests that childhood anxiety disorders typically precede the onset of SUDs (Merikangas et al., 1998), a primacy that is compelling given the high lifetime co-occurrence of these disorders (35–45%; Kessler et al., 1996) and the deleterious outcomes associated with SUDs (Toumbourou et al., 2007).

Cognitive behavioral therapy (CBT) for anxiety in youth is an efficacious treatment (Silverman, Pina, & Viswesvaran, 2008) with enduring effects (Glantz et al., 2009; Kendall & Kessler, 2002; Kessler et al., 2007). A previous randomized clinical trial (RCT) of CBT for child anxiety reported that treatment responders (i.e., those whose anxiety diagnoses were either (a) no longer present or (b) no longer the principal diagnosis following treatment) had reduced substance use and fewer associated problems compared to treatment non-responders at 7.4-year follow-up (Kendall, Flannery-Schroeder, Safford, & Webb, 2004). Compared to responders, non-responders drank more days per month, were more likely to have unwanted social, physical/psychological consequences from drug use, gave up more activities due to drug use, used larger amounts of drugs, and made more unsuccessful attempts to control their use. Substance dependence is often viewed as chronic, requiring long-term treatment (McLellan, Lewis, O'Brien, & Kleber, 2000). Thus, the claim that CBT for child anxiety may mitigate later substance use, which may in turn lower the risk of SUDs, requires re-examination.

The findings of Kendall et al. (2004) did not take into account important predictors of SUDs, such as inattention and impulsivity–hyperactivity, perceived negative life events, and family history of substance abuse. Research supports externalizing behavior and a family history of substance abuse as risk factors for later substance problems (Kendler, Davis, & Kessler, 1997; Reinherz, Giaconia, Hauf, Wasserman, & Paradis, 2000). Attention deficit hyperactivity disorder (ADHD) often predates adolescent substance use (Wilens, Biederman, Mick, Faraone, & Spencer, 1997). Likewise, increased negative life events have predicted SUDs even when controlling for other critical contributing factors such as genetic vulnerability (Connor, Hellemann, Ritchie, & Noble, 2009; Wills, Vacaro, & McNamara, 1992). Given these associations, it is unclear if the increased substance use of non-responders versus responders reported previously (Kendall et al., 2004) is attributable to their poor CBT treatment outcomes or to these other SUD risk factors.

Approximately 30–45% of children treated with CBT continue to meet diagnostic criteria for an anxiety disorder following treatment

* Corresponding author. Tel.: +1 215 204 7165; fax: +1 215 204 0565.
E-mail addresses: connor.puleo@temple.edu (C.M. Puleo), bconner@temple.edu (B.T. Conner), benja61@temple.edu (C.L. Benjamin), pkendall@temple.edu (P.C. Kendall).

0887-6185/$ – see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.janxdis.2011.03.005

Table 1
Displays demographic and diagnostic characteristics of the recontacted sample ($N = 72$).

Demographic and diagnostic characteristics	% ($N = 72$)	Substance use characteristics	% ($N = 72$)
Race		Alcohol	
Caucasian	85% (62)	Tried	81% (58)
African-American	6% (4)	Regular use[a]	46% (33)
Asian	3% (2)	Tobacco	
Self-identified as "Other"	6% (4)	Tried	59% (42)
Family income		Regular use[a]	31% (22)
Below $20,000	5% (3)	Marijuana	
$20,001–$39,999	28% (20)	Tried	39% (28)
$40,000–$59,999	33% (24)	Regular use[a]	22% (16)
$60,000–$79,999	25% (18)	Narcotics	
Above $80,000	9% (6)	Tried	16% (12)
Principle diagnoses at pretreatment		Regular use[a]	5% (4)
GAD	63% (45)	Current/past substance abuse disorder	19% (14)
Social phobia	17% (12)	Past substance dependence disorder	5% (4)
SAD	20% (15)	Negative consequences related to substance use	22% (16)
Comorbid diagnoses at pretreatment		Mean drinking days per month (SD)	
Specific phobia	48% (34)	Principle diagnosis no longer present	2.00 (4.51)
ADHD	14% (10)	Principle diagnosis still present	6.67 (9.51)
ODD	8% (6)	Principle diagnosis still principle	8.33 (11.33)
Mood disorder	14% (10)		
Additional therapy after treatment	48% (34)		
Child age 7.4-year follow-up	$M = 19.16$ (SD = 1.69) (range 15–22 years)		

GAD: generalized anxiety disorder; SAD: separation anxiety disorder; ADHD: attention-deficit hyperactivity disorder; and ODD: oppositional defiant disorder.
[a] Regular use indicates once a month or more.

(Cartwright-Hatton, Roberts, Chitsabesan, Fothergill, & Harrington, 2004). Older child age and greater internalizing pathology, but not diagnostic comorbidity, have been associated with poorer treatment outcomes (Crawford & Manassis, 2001; Rapee, 2003; Southam-Gerow, Kendall, & Weersing, 2001). Given that internalizing symptoms are also related to increased SUD risk (King, Iacono, & McGue, 2004), it seems plausible that the association between poor treatment response and later substance misuse may be a spurious association resulting from the association of internalizing symptoms with both these outcomes. Similarly, child age might account for both a child's treatment response and later substance use given that older youth are speculated to have a more chronic or developmentally "non-normative" anxiety (Southam-Gerow et al., 2001) that might also increase their risk for SUDs.

The present study tested whether previously reported associations between differential CBT outcomes and substance use at 7.4-year follow-up would hold after (a) controlling for predictors of SUDs (i.e., ADHD symptoms, negative life events, family substance abuse history), and (b) controlling for predictors of CBT outcome (internalizing pathology, older age). The receipt of additional treatment between the post and 7.4-year follow-up assessment was also included as a novel control variable. Additional treatment may reflect the child's exposure to factors related to increased SUD risk, such as life stressors or emerging child or family psychopathology, or serve as a protective factor against such risk. We hypothesized that previously reported findings would be strengthened by the inclusion of these control variables.

1. Methods

The present data set, consistent with the initial report, was from prior studies: an earlier 7.4-year follow-up (Kendall et al., 2004) and the original randomized clinical trial (Kendall et al., 1997). Ninety-four youth (62% male), ages 9–13 years ($M = 11 \pm 1.34$) at treatment), presented for initial intake at an outpatient child anxiety clinic and met criteria for a principal diagnosis of social phobia ($n = 17$; formerly avoidant disorder), separation anxiety disorder ($n = 22$), or generalized anxiety disorder ($n = 55$; formerly overanxious disorder). Children were excluded from the initial sample if they displayed psychotic symptoms and/or if they were taking antianxiety or antidepressant medications.

Sample demographic, diagnostic, and substance use characteristics are summarized in Table 1. Principal diagnoses were assigned via structured interviews administered separately to parents and child. Seventy-two of 94 original participants provided the necessary information at intake and completed substance use assessments at 7.4-year follow-up. There were no significant differences in treatment response, referral source, child age, or child ethnicity for those who did versus did not participate in the long term follow-up. However, nonparticipating children were more likely to be male and from a lower income bracket (Kendall et al., 2004).

1.1. Measures

1.1.1. Anxiety disorders interview schedule for children (ADIS-C) and for parents (ADIS-P)

The ADIS-C and ADIS-P (Silverman & Albano, 1997), structured interviews of child mental disorders with high interrater and retest reliability (Silverman & Nelles, 1988; Silverman & Eisen, 1992), were administered independently to parent(s) and child pre- and post-treatment. When parent and child report differed, diagnoses were based on parental report.[1] Clinicians made severity ratings (CSRs), ranging from not interfering to clinically interfering, for each diagnostic category, providing an additional continuous measure of endorsed symptoms. CSRs from the ADIS-P ADHD subsection were used as a continuous quantifier of ADHD pathology in the present analyses.

1.1.2. Family history

At intake, parents responded to the question "not including the child, is there anyone in your family with a substance abuse problem?"

1.1.3. Child behavior checklist (CBCL)

The 118-item CBCL (Achenbach & Edelbrock, 1991) is a pretreatment parent report of child problems with documented validity,

[1] In the case of one adolescent, parent report approached but did not reach a diagnosis. For this youth, the diagnosis was given based on the adolescent's report.