HHS Public Access

Author manuscript

J Child Psychol Psychiatry. Author manuscript; available in PMC 2015 April 10.

Published in final edited form as:

J Child Psychol Psychiatry. 2012 April ; 53(4): 410–419.

Group Cognitive Behavior Therapy for Children with High-Functioning Autism Spectrum Disorders and Anxiety: A Randomized Trial

Judy Reaven, Ph.D., **Audrey Blakeley-Smith, Ph.D.**, **Kathy Culhane-Shelburne, Ph.D.**, and **Susan Hepburn, Ph.D.**

University of Colorado, Anschutz Medical Campus, School of Medicine

Abstract

Background—Children with high-functioning autism spectrum disorders (ASD) are at high risk for developing significant anxiety. Anxiety can adversely impact functioning across school, home and community environments. Cognitive behavior therapies (CBT) are frequently used with success for children with anxiety symptoms. Modified CBT interventions for anxiety in children with ASD have also yielded promising results.

Methods—Fifty children with high-functioning ASD and anxiety were randomized to group CBT or Treatment as Usual (TAU) for 12 weeks. Independent Clinical Evaluators, blind to condition, completed structured interviews (Anxiety Disorders Interview Schedule – Parent Version; ADIS-P) pre- and post-intervention condition.

Results—Forty-seven children completed either the CBT or TAU condition. Results indicated markedly better outcomes for the CBT group. Significant differences by group were noted in Clinician Severity Ratings, diagnostic status, and clinician ratings of global improvement. In the intent-to-treat sample, ten of 20 children (50%) in the CBT group had a clinically meaningful positive treatment response, compared to 2 of 23 children (8.7%) in the TAU group.

Conclusions—Initial results from this rigorously designed treatment study suggest that a group CBT intervention specifically developed for children with ASD may be effective in decreasing anxiety. Limitations of this study include small sample size, lack of an attention control group, and use of outcome measures normed with typically developing children.

Keywords

autism; anxiety; CBT; group

INTRODUCTION

Youth with autism spectrum disorders (ASD) are at increased risk for developing co-occurring mental health conditions, and anxiety symptoms are among those most commonly

Correspondence to: Judy Reaven, Ph.D., University of Colorado, Anschutz Medical Campus, School of Medicine, JFK Partners, C-234, 13121 E. 17th Avenue, Aurora, CO 80045, judy.reaven@ucdenver.edu, 303-724-7646 (phone), 303-724-7661 (fax).

Conflict of Interest: Reaven, Blakeley-Smith and Hepburn will receive royalties for the Facing Your Fears program (2011).

reported (Brereton, Tonge & Einfeld, 2006; Skokauskas & Gallagher, 2011). In fact, high rates of co-morbid psychopathology have been found in a population-derived sample (Simonoff et al., 2008), as well as community and clinic-based samples of youth with ASD (Bruin, Ferdinand, Meester, Nijs & Berheij, 2007; Leyfer et al., 2006). A majority of children in these samples met diagnostic criteria for a DSM Axis I diagnosis (72–80%), and anxiety disorders were among the most commonly reported concurrent diagnoses.

The impact of anxiety symptoms may be felt across contexts and can interfere significantly with a child's ability to participate in home, school and community settings (Russell & Sofronoff, 2005). The presence of significant anxiety symptoms place individuals at risk for unemployment, substance abuse, and other psychiatric problems (Velting, Setzer, & Albano, 2004). Anxious youth may experience marked difficulties in social interaction and in family relationships. They may also perform below their ability level, affecting overall school performance and participation in after school activities (Langley, Bergman, McCracken, & Piacentini, 2004; Weissman, Antinoro, & Chu, 2009; Wood, 2006). Furthermore, anxiety may exacerbate the core-deficits of ASD, magnifying social inappropriateness, repetitive questioning, and ritualized behavior (Brereton et al., 2001; Greenway & Howlin, 2010). In the general population, very few children with clinical anxiety experience recovery without intervention (Hudson, Krain & Kendall, 2001), and given the vulnerability of children with ASD, the same may be true for them (Brereton et al., 2001).

Cognitive-behavioral treatments (CBT) are well-established, highly researched evidenced-based treatments, and are considered to be the gold standard psychosocial treatment for anxiety in children and adults (Olatunji, Cisler, & Deacon, 2010; Silverman, Pina & Viswesvaran, 2008; Walkup, et al., 2008). As CBT has been increasingly identified as an effective treatment approach for mental health symptoms in typically developing youth, researchers have begun applying CBT approaches to other populations, including youth with ASD, with encouraging findings. The results of individual case studies (Reaven & Hepburn, 2003; Sze & Wood, 2007), small group studies (Reaven et al., 2009; White, Ollendick, Scahill, Oswald & Albano, 2009), and randomized clinical trials (Chalfant, Rapee, & Carroll, 2007; Sofronoff, Attwood, & Hinton, 2005; Sung et al., 2011; Wood et al., 2009) have demonstrated reductions in anxiety after the implementation of modified CBT techniques.

Clinician-researchers using CBT with children with ASD and anxiety recognize that the social, cognitive and linguistic complexities of children with ASD may limit the accessibility of therapeutic interventions (Reaven et al., 2009). For example, challenges with motivation, social understanding and imagination, atypical ways of demonstrating or reporting anxiety, difficulties with self-regulation, the presence of rigid thought processes, and poor generalization abilities may all impede therapeutic understanding (Ozsivadjian & Knott, 2011). To address these challenges, common modifications to protocols for children with ASD include: concrete and visual teaching strategies, multiple choice lists, drawing, creative outlets for expression, and video modeling for hard-to-teach concepts (Moree & Davis, 2010; Reaven et al., 2009). Finally, incorporation of children's special interests and an emphasis on parent participation have been suggested as important to include in treatment protocols for youth with ASD (Moree & Davis, 2010; Reaven et al., 2009; Wood et al.,

2009). Parent involvement may be particularly beneficial for children with ASD, as their participation may enhance generalizability of skills across settings (Puleo & Kendall, 2010; Reaven, 2011).

Both individual (Wood et al., 2009) and group CBT treatment modalities (Chalfant et al., 2007; Reaven et al., 2009; Sofronoff et al., 2005) have been effective for children with ASD, although head-to-head comparisons have yet to occur. Some researchers suggest a combination of both individual and group modalities in order to provide children with ASD explicit as well as incidental social practice in protective and supportive settings (White et al., 2009). Previous group CBT treatment studies for youth with ASD have emphasized anxiety management strategies such as relaxation techniques and cognitive strategies, rather than graded exposure approaches (Sofronoff et al., 2005; Sung et al., 2011), a key ingredient of CBT interventions for anxiety (Kendall & Hedtke, 2006). Other researchers implemented CBT protocols originally developed for typically developing children, and modified them for youth with ASD (Chalfant et al., 2007). Woods and colleagues (2009) used a modular approach to target friendship skills and adaptive behavior deficits, in addition to targeting anxiety symptoms. Parents were included in several of these programs (Chalfant et al., 2007; Sofronoff et al., 2005; Woods et al., 2009); anxiety education was a focus of their participation. Parents were also encouraged to serve as “co-therapists” or coaches, to support the delivery of interventions.

The purpose of the present study was to extend our previous work, examining the efficacy of a family-focused group CBT program developed specifically for children with ASD and clinical anxiety, allowing for the presence of additional co-occurring mental health symptoms. In the initial treatment study using the Facing Your Fears (FYF) protocol (Facing Your Fears: Group Therapy for Managing Anxiety in Children with High-Functioning Autism Spectrum Disorders; Reaven, Blakeley-Smith, Nichols & Hepburn, 2011), results indicated significant reductions in parent-reported anxiety symptoms for children with ASD, relative to a wait list control group (Reaven et al., 2009). Limitations (i.e., lack of random assignment and independent evaluation) limited the generalizability of these findings. The current study was designed to correct these difficulties by implementing randomized assignment and using Independent Clinical Evaluators (ICEs) blind to condition to conduct pre- and post-assessments. It was hypothesized that children who received the active treatment (FYF) would demonstrate reductions in anxiety severity, decreases in the number of pre-treatment anxiety diagnoses, and display overall improvement in anxiety symptoms from baseline levels, relative to children in the Treatment-As-Usual (TAU) condition.

METHODS

Participants

The intent-to-treat (ITT) sample included 50 youth with ASD between the ages of 7 and 14 years with a participating parent. There were no pre-treatment differences in the demographic composition of the two groups. See Table 1.

Participants were recruited through IRB-approved study announcements which were mailed to local parent groups, schools, and clinics. Project clinicians also conducted several

community outreach activities to build awareness of the study for families and educators. Informed consent and assent was obtained for all participants prior to collecting any data. See Figure A (Consort Flow Diagram).

Inclusion criteria for child participants was: (1) *chronological age between 7–14 years;* (2) *a confirmed diagnosis of an ASD,* determined by one of three expert clinical psychologists (JR, SH, ABS) based upon review of a recent (within one year or newly administered) Autism Diagnostic Observation Schedule (ADOS; Lord et al., 1999) and the Social Communication Questionnaire (SCQ; Berument, et al., 1999); (3) *speaking in full, complex sentences* (required for completion of Module III of the ADOS), and as reflected in recent standardized cognitive assessment[1], and (4) *clinically significant symptoms of anxiety*, defined as a score above the clinical significance cutoff on separation (SEP) social (SOC) and/or generalized anxiety (GAD) subscales of the Screen for Child Anxiety and Related Emotional Disorders—parent version (SCARED; Birmaher et al., 1999).

Participants were excluded: (1) *if the child's primary psychiatric symptoms were determined by the ICE to be reflective of another condition such as depression or psychosis.* (2) *if the child did not demonstrate "group readiness" in the first three sessions of FYF*, as demonstrated by the child's ability to separate from his parent without marked disruptive outbursts; and (3) *if one parent could not commit to attending 80% of sessions.*

Procedure

This study was completed in compliance with the Colorado Multiple Institutional Review Board. Families initiated contact with the research clinic and a research assistant explained the goals and procedures of the study. If the study was of interest to the parent, the research assistant reviewed the inclusion criteria and conducted a brief telephone screen for eligibility. If the child was a potentially eligible participant, the family was invited to the research clinic for one or two sessions in which they completed the ASD diagnostic measures (e.g., ADOS and SCQ), standardized cognitive testing (if available either through previous research visits or school testing), the SCARED (completed separately with parents and children), and additional measures not reported in this study. If a child met diagnostic criteria for an ASD, spoke in full, complex sentences, and obtained scores above the clinical significance cutoff on SEP, SOC, and/or GAD subscales of the *SCARED*, the parent was invited for an additional session to complete an ADIS-P. Families were compensated for their participation in the assessment activities.

Once a cohort of 8–12 eligible families was qualified and pre-intervention measures collected, participants were randomly assigned to either the TAU or FYF condition using a computer-generated assignment system. Families not randomized to the FYF intervention were offered an opportunity to participate in the intervention at the end of the TAU condition. The intervention conditions began an average of 12 days (4–18 days) after completion of the pre-intervention measure (ADIS-P). Parents were asked to report on the child's medications and other treatments received throughout the study period, regardless of

[1]Verbal IQ cutoff was originally set at 80; clinicians evaluated participants who had a VIQ less than 80 to determine appropriateness for participation. Three treatment completers had VIQs below 80 (range: 70–80).

condition assignment. Attendance and acceptability measures were collected only from the FYF participants. Each condition was 12–16 weeks long, to accommodate family schedules and provide 12 therapy sessions for the FYF condition. Intervention time period was matched within each cohort.

Within two to six weeks of the last session of the FYF condition or the equivalent time period for the TAU condition, the ADIS-P was re-administered by an ICE, who was unaware of the participant's treatment condition. Families were specifically instructed not to tell the ICE whether they were in the FYF or TAU condition. At approximately 3 and 6 months after the post-intervention assessment, parents and youth who received the FYF treatment were asked to complete the SCARED by mail.

Attendance—Twenty-four children entered the FYF intervention and 3 dropped out for a completion rate of 87.5%. Approximately 85% of children missed one session or less.

Conditions

Treatment-As-Usual (TAU): Families assigned to TAU maintained their current intervention programs and were allowed to pursue new programs as they wished during the 4-month intervention period. The families were contacted monthly to track the services and medications their child received (See Table 1). Of the 23 youth in the TAU condition, 6 (26.1%) took medications targeting anxiety symptoms, 16 (69.6%) participated in social skills interventions, 6 (26.1%) participated in bully-proofing programs through school, 4 (17.4%) participated in individual psychosocial interventions targeting coping or emotion regulation, and 2 (8.7) participated in family-focused interventions to address behavioral issues. After approximately 12 weeks (time matched to FYF group), the families completed post-intervention measures and were invited to participate in an upcoming FYF group. Ninety-three percent of families agreed (25 children) and enrolled in a FYF group.[2]

Facing Your Fears (FYF): The intervention consisted of 12 multi-family group sessions, 1 ½ hours in duration, supported by a set of manuals for the facilitators, parents, and youth. Groups were comprised of three to six children and parents, with a mode of 4. Each session included large-group activities (children and parents together), small-group activities (children together; parents together), and dyadic work (parent/child pairs). One clinical psychologist led each group, supported by two co-therapists (trainees in clinical psychology). Thirteen clinicians facilitated 12 groups over the course of the study. New group facilitators participated in an introductory training and were provided with the FYF manual and selected research articles, and received ongoing supervision by co-authors of the FYF intervention (JR & ABS).

The FYF intervention was written and developed specifically for children with ASD. However, the FYF program incorporated the important components of prior empirically supported programs (e.g., *Coping Cat*; Kendall & Hedtke, 2006), while making appropriate adaptations for youth with high-functioning ASD. CBT components such as graded

[2]Results of their participation in FYF will be presented elsewhere.

exposure, relaxation and deep breathing, strategies for emotion regulation, and use of cognitive self-control (Kendall, 1994; Silverman et al., 2008) were included in the FYF intervention. Given the social, emotional, communication and cognitive challenges of children with ASD, the delivery of the core concepts was modified to enhance accessibility of the material (see below).

Child Component: The 12 group sessions included: (1) an introduction to anxiety symptoms and common CBT strategies, (2) a focus on the implementation and generalization of specific strategies to treat anxiety (i.e., expanding calming and relaxing activities, recognizing automatic negative thoughts and developing coping statements). Children and parents were also engaged in graded exposure tasks (facing fears a little at a time). Finally, FYF included opportunities for social skills development embedded within group activities and exposure hierarchies (Reaven et al. 2011).

Parent Component: Core components were: (1) psycho-education regarding anxiety symptoms and CBT strategies; (2) parent coaching to support child participation, (3) discussion of the interaction between parental anxiety, parenting style and the maintenance of anxiety symptoms; and (4) discussion of the social and communicative challenges inherent in ASD and how these challenges may contribute to a protective parenting style (Reaven & Hepburn, 2006). Two types of “protection” were discussed: “adaptive” and “excessive”. “Adaptive protection” was defined as the ability to understand a child’s cognitive, physical, and emotional difficulties and strengths, and appropriately titrate exposure to challenging environmental events based on the child’s abilities. Parents who “excessively” protect may inadvertently limit their child’s exposure to anxiety-provoking situations by allowing the child to avoid anxious situations, even when the child possesses the requisite skills to be successful, thus maintaining anxious symptoms (Reaven & Hepburn, 2006).

Modifications for Children with ASD: To maintain attention and enhance participation, careful pacing of each session, a token reinforcement program for in-group behavior, and provision of visual structure and predictability of routine were put in place. Additional adaptations included: 1) use of worksheets combined with multiple choice lists; 2) written examples of core concepts; 2) hands-on activities; 3) emphasis on creative outlets for expression; 4) focus on strengths and special interests; 5) multiple opportunities for repetition and practice; 6) video modeling and a specific video activity (e.g., creating movies) to enhance generalization of concepts; and (7) a detailed parent curriculum (Reaven et al., 2011).

Eligibility Measures

Diagnosis of ASD: Diagnostic status was determined by expert clinical review of the ADOS (Lord et al, 1999), the SCQ (Berument et al., 1999) and documented using a symptom checklist based on the DSM-IV TR (APA, 2004). In all 50 ITT cases, a clinical psychologist (SH or ABS) also reviewed the data and either concurred or flagged the case for a consensus discussion. Three cases were flagged and consensus was reached; all three children met criteria for an ASD.

The *ADOS* is a semi-structured, play-based direct assessment of social and communicative behaviors indicative of ASD. All lab personnel were trained to 85% reliability on the full range of scores. Assessments were videotaped and reliability assessed for 28% of ADOS administrations; kappa on ASD classification (on/off spectrum) was .92. The *SCQ* is a 40 item parent report measure that taps history and current symptoms of autism. The SCQ has good specificity (.80) and sensitivity (.96), (Berument et al., 1999).

Screening for Cognitive Functioning: All potential participants lacking standardized cognitive testing within the past three years were administered the *Wechsler Abbreviated Scales of Intelligence* (WASI; Wechsler, 2002) to help determine eligibility.

Screening for Anxiety Symptoms: The *SCARED (parent and child versions)* was used primarily as an eligibility measure to determine whether the youth presented with elevated symptoms of SEP, SOC or GAD. It was also used as an outcome measure for follow up at 3 and 6 months post-intervention because of ease of administration. The *SCARED (*Birmaher et al., 1999) is a 41-item inventory with five anxiety subscales (Panic, GAD, SEP, SOC, and School Anxiety) and a Total Score on a scale of 0–2. The SCARED was modified so that parents and children reported on symptoms over the past two weeks rather than the past 3 months. In addition, items were read to children and visual cues were provided to aid comprehension.

Outcome Measures—*The Anxiety Disorders Interview Schedule for Children-Parent Version* (ADIS-P; Silverman & Albano, 1996) was administered before and after the intervention period for children in both conditions (FYF vs. TAU). The ADIS-P has been used in intervention research for children with and without ASD (Walkup et al., 2008; Wood et al., 2009). It is a best-practice, semi-structured psychiatric interview that assesses the presence of anxiety disorders as well as other co-occurring mental health conditions. ICEs, blind to the participant's condition, conducted the interviews with the parent, determined relevant diagnostic classifications across DSM-IV categories, and provided summary codes of severity and interference, called "Clinician Severity Ratings" (CSRs, 0=no symptoms, 8=very severe impairment).

ADIS-P administration training involved scoring above 80% reliability on clinical diagnoses and CSRs on three videotaped administrations of the ADIS-P and three live administrations (serving as the interviewer). The ADIS-P was administered by clinical psychologists (n=4) and advanced trainees in psychology (n=2) in a standardized manner before and after the intervention period. Agreement of CSRs with consensus ratings was adequate for all anxiety disorders studied (Intraclass correlation: SEP: .82; SOC: .88; Specific phobia (SpP): .86; GAD: .84. Reliability of clinical diagnoses determined from the ADIS-P were assessed in 16 (37.2% of interviews) by a second ICE, consensus was obtained if there was disagreement, and all kappas were over .84.

The Clinical Global Impressions Scale – Improvement ratings (CGIS-I; Guy & Bonato, 1976) were compiled by ICEs after the participants had completed all study activities and were in the follow-up phase of the project. These ratings were derived in a manner very similar to the methods described in previous studies (Walkup et al., 2008; Woods et al.,

2009). The ICE reviewed a de-identified record that included the ADIS-P and the SCARED data obtained before and after the FYF and TAU conditions. The ICE provided a rating on a scale of 1–7 concerning the overall impression of improvement during that time period (i.e., 1 indicated “very much improved”, 4 indicated “no change,” and 7 indicated “very much worse”). Children obtaining CGIS-I of 1 or 2 were considered to be positive treatment responders. The ICE was completely blind to treatment condition. Agreement between the ICE and the consensus improvement ratings was .86.

RESULTS

Of the 50 participants in the ITT sample, there were 47 treatment-completers. Due to issues with timing and administration of ADIS-P interviews, 43 participants completed ADIS-P data before treatment (n=20 for FYF; n=23 for TAU). See Table 1 for participant characteristics of the ITT sample. Three participants dropped out of the FYF condition prior to the completion of the FYF intervention. To account for the attrition, a “last observation carried forward (LOCF)” procedure was implemented. That is, baseline data was carried forward for the three participants and substituted for outcome data to allow the participants’ data to remain in the analyses. The LOCF procedure may result in a conservative estimate of true effect size, but is appropriate for an ITT sample, to limit bias that could result by analyzing treatment completers only.

Pre-treatment comparisons of participant characteristics

The comparability of the two intervention groups prior to treatment was assessed using chi-square tests for categorical variables and t-tests for continuous variables. There were no statistically significant differences in the two groups on demographic or diagnostic variables before intervention (See Table 1).

Psychiatry complexity of participants

Children in both conditions were psychiatrically complex; there were no significant differences between groups in the number of psychiatric diagnoses. Psychiatric diagnoses (in addition to ASD) ranged from 1–7 (M= 5.10) for children in the FYF condition, and 2–8 (M=4.65) for children in the TAU condition. The most common non-anxiety diagnostic categories were Attention Deficit Hyperactivity Disorder, Disruptive Disorders, and Mood Disorders.

Adherence to FYF Intervention

Trained research assistants watched videotaped or live sessions and completed a checklist rating the therapists’ adherence to the FYF protocol. Of the 144 intervention sessions conducted (12 groups, 12 sessions each), 42 sessions were coded for fidelity (i.e., 29.2%): 82% met criteria of including 85% or more of the required session elements and 97.6% met criteria of including 80% or more of required session elements. Reliability of fidelity checklists was completed on 28% of sessions by two independent coders and was found to be excellent (ICC= .96).

Acceptability of the FYF Intervention

Parents and children completed a Satisfaction Questionnaire post-intervention. Thirty-four children and 38 parents completed the measure within two weeks of finishing the intervention.[3] Parents rated 17 different activities and children rated 10 different activities; on average, 72% of respondents found the activities overall to be “very helpful”. Only an average of 4.7% parents and 9.9% children found the activities “not helpful” overall.

Medications

Medication use was comparable by treatment condition. During the 3-month treatment period, no medications targeting anxiety or mood were added or terminated in either group; however, there were dosage reductions reported for two children in the FYF condition and 1 child in the TAU condition (See Table 1).

Treatment Outcome

ITT analyses were conducted for three outcome variables: (1) CSRs generated for the four principal diagnoses by the ICE blind to the child’s assigned condition; (2) diagnostic status of the principal anxiety diagnoses per ADIS-P criteria; and (3) CGIS-Improvement ratings. For the three children who dropped out, baseline scores were carried forward to post-FYF/post-TAU. Separate analyses were conducted for the ITT sample and for treatment completers. All statistically significant group differences were maintained across both analyses.

Clinician Severity Ratings (CSRs)—ANCOVA was used to test group differences in anxiety severity and interference, using pre-intervention CSRs as the covariate. CSR ratings are presented in Table 2. In the ITT analysis, significant differences by group were found for post-intervention CSRs in all four principal diagnoses: SEP, $F(1, 40) = 4.21$, $p = .047$; SOC, $F(1, 40) = 6.04$, $p = .02$; SpP, $F(1, 40) = 14.45$, $p = .0001$; and GAD, $F(1, 40) = 8.11$, $p = .007$. CSRs were lower in the FYF group post-intervention. Effect sizes ranged from medium to large.

Diagnostic Status of Principal Anxiety Disorders—ANCOVA was used to test group differences in the number of principal anxiety disorders by group, with the baseline number of anxiety diagnoses entered as a covariate. For the ITT sample, children in the FYF condition demonstrated a significant reduction in overall number of anxiety disorders, $F(1, 42) = 5.39$, $p = .03$. A significant reduction in diagnostic status did not occur in the TAU condition.

Chi-square tests were used to assess group differences in the absence/presence of principal anxiety diagnoses at post-intervention. There was a statistically significant reduction in GAD diagnoses in the FYF group, $X^2(1,42)=6.64$, $p=.01$; effect size = .85, reflecting a large effect. There were no differences by group in diagnostic status for the remaining principal diagnoses: SEP, $X^2(1,42) = .48$, $p=.49$; SOC, $X^2 (1,42) = .13$, $p=.72$; or SpP, $X^2(1,42) = 1.01$, $p=.32$.

[3]Participants in the TAU Condition who completed the FYF Intervention are also included.

CGIS-Improvement ratings—CGIS-I scores of 1 or 2 reflected "a clinically meaningful improvement in anxiety severity", consistent with the work of other researchers in this area (Walkup et al., 2008; Woods et al., 2009). For the ITT sample, ten of 20 children (50%) in the FYF group and 2 of 23 children (8.7%) in the TAU group obtained a CGIS-I reflecting a positive treatment response, which is a statistically significant difference by group, $X^2(1,42) = 9.07$, $p = .003$., with a large effect size (d=1.03).

Follow-up

Families in the FYF condition completed the SCARED at 3 and 6 months post-treatment to determine whether reductions in anxiety symptoms were maintained over time. *Parent Report Forms:* Of the 24 parents in the FYF condition who completed the SCARED at baseline, 21 completed them at post-intervention (data were imputed for the 3 children who dropped out, as baseline scores were carried forward). Three-month follow-up parent report was obtained for 20 parents (83.3% of ITT sample); 6-month follow-up reports were obtained from 15 parents (62.5%). *Child Report Forms:* Of the 24 children in the FYF condition who completed the SCARED at baseline, 16 (67%) completed the measure at 3 months and 12 (50%) completed the SCARED at 6-months post-intervention. For those returning the follow-up measures, post-intervention reductions appeared to be maintained at both 3 and 6 months. See Figure B.

DISCUSSION

Three treatment outcome variables were used to assess the efficacy of the FYF intervention: (1) change in anxiety severity and interference of principal diagnoses; (2) change in diagnostic status of principal diagnoses; and (3) global rating of improvement in anxiety. Children with high-functioning ASD who participated in the FYF intervention demonstrated significant reductions in anxiety severity and interference, according to across all four principal anxiety diagnoses: SEP, SOC, GAD and SpP. Additionally, participants who received the FYF intervention met diagnostic criteria for significantly fewer overall number of anxiety diagnoses post-intervention compared with participants in the TAU condition. Upon closer examination of each specific anxiety diagnosis, as a group, children in the FYF intervention were significantly less likely to meet diagnostic criteria for GAD compared with children in the TAU condition. Finally, participants in the FYF condition were significantly more likely to meet criteria for a positive treatment response post-treatment relative to participants in the TAU condition. In fact, the 50% improvement rate obtained for participants in the FYF condition was generally consistent with the results of other studies examining the efficacy of CBT (59.7%; Walkup et al., 2008). Reductions in anxiety symptoms appeared to be maintained at 3 and 6 months follow-up for the FYF group, according to a smaller sample of respondents. Given the overall psychiatric complexity of the current sample, the demonstrated gains on the outcome measures are noteworthy.

These findings suggest that a family-focused group CBT intervention developed specifically for youth with ASD may be effective for managing anxiety symptoms. The results are consistent with our previous work (Reaven et al., 2009) as well as the work of other researchers who have demonstrated reductions in anxiety symptoms following the delivery

of modified CBT interventions (Chalfant et al. 2006; White et al., 2009; Wood et al., 2009). Overall improvement in anxiety symptoms in this study suggests that group treatment for youth with ASD may be a feasible and effective modality, and particularly valuable in a challenging economic climate. As increasing numbers of youth with ASD and co-occurring anxiety present to outpatient clinics across the country, clinicians may be turning to group treatments as a way to meet the high demand for services.

It is also notable that significant reductions in GAD diagnoses for participants occurred following the FYF intervention. This finding is salient given that the majority of participants in this study met diagnostic criteria for a GAD diagnosis pre-intervention. Previous research has cited challenges with treatment motivation in participants with a sole diagnosis of GAD (Wood et al., 2009).

Limitations and Future Directions

Although the current study implemented a fairly rigorous experimental design (randomized assignment, ICE), limitations remain: the sample was primarily Caucasian and relatively small, outcome measures normed with typically developing children were used, and there was lack of a control group comparable in facilitator time and attention to active treatment. Additionally, multiple statistical comparisons were conducted on a relatively small number of participants; therefore, caution should be used when interpreting results. Although participants who received the FYF intervention experienced significant reductions in severity and interference across all four principal anxiety diagnoses, they continued to meet diagnostic criteria for SEP, SOC and SpP diagnoses post-intervention. The extent to which additional treatment components (e.g., specific social skills modules) are necessary to affect change should be explored, along with component analyses to provide information regarding the most critical treatment components for youth with ASD. Further, the FYF intervention was delivered in a group modality, and although the general pediatric literature indicates that group and individual treatment are relatively equivalent with regard to treatment outcome for youth with anxiety (Rapee, Wignall, Hudson, & Schniering, 2000), the extent to which this is true for youth with ASD is unclear. Head-to-head comparisons of group vs. individual treatment approaches for youth with ASD and anxiety are recommended. Finally, larger numbers of participants will allow future treatment trials to explore potential moderating variables for successful treatment response, such as age, intellectual functioning, severity of core autism symptoms, complexity of co-occurring psychiatric conditions, and the presence of parent psychopathology.

While the results reflected statistically significant changes in anxiety symptoms, determining clinical significance for this psychiatrically complex population is essential (Jacobson, Roberts, Berns & McGlinchey, 1999). Improvements in symptoms and decreases in anxiety severity may or may not be related to functional outcomes such as school attendance, participation in activities outside of school, improved social relationships, age level adaptive behaviors and/or quality of life. Ultimately, the most important measure of treatment outcome will likely need to include these functional measures of success.

CONCLUSION

The results of the current study indicated that children with high-functioning ASD, clinical anxiety and other psychiatric symptoms demonstrated significant reductions in anxiety symptoms following delivery of the FYF intervention. These positive findings contribute to a growing body of research demonstrating the benefits of modified CBT for children with ASD. More research is needed to identify key components of intervention programs, treatment responders, and the extent to which treatment gains observed in the short-term are maintained as youth with ASD transition into more complex social and academic environments.

Acknowledgments

The authors gratefully acknowledge the assistance of Mary Hetrick, Philip Kendall and Misoo Ellison, the families in this study, the support of Cure Autism Now and Autism Speaks. Additional support came in part from core grants awarded to JFK Partners, the University Center for Excellence in Developmental Disabilities at the University of Colorado Denver from the U.S. Department of Health and Human Services, through the Administration on Developmental Disabilities, Grant #90DD0561.

References

Berument SK, Rutter M, Lord C, Pickles A, Bailey A. Autism screening questionnaire: Diagnostic validity. British Journal of Psychiatry. 1999; 175:444–451. [PubMed: 10789276]

Birmaher B, Brent D, Chiapetta L, Bridge J, Monga S, Baugher M. Psychometric properties of the Screen for Child Anxiety Related Emotional Disorders (SCARED). Journal of the American Academy of Child and Adolescent Psychiatry. 1999; 38:1230–1236. [PubMed: 10517055]

Brereton AV, Tonge BJ, Einfeld SL. Psychopathology in children and adolescents with autism compared to young people with intellectual disability. Journal of Autism and Developmental Disorders. 2006; 36:863–870. [PubMed: 16897401]

Bruin E, Ferdinand R, Meester S, Nijs P, Verheij F. High rates of psychiatric co-morbidity in PDD-NOS. Journal of Autism and Developmental Disorders. 2007; 37:877–886. [PubMed: 17031447]

Chalfant A, Rapee R, Carroll L. Treating anxiety disorders in children with high-functioning autism spectrum disorders: A controlled trial. Journal of Autism and Developmental Disorders. 2007; 37:1842–1857. [PubMed: 17171539]

Greenaway R, Howlin P. Dysfunctional attitudes and perfectionism and their relationship to anxious and depressive symptoms in boys with autism spectrum disorders. Journal of Autism and Developmental Disorders. 40:1179–1187. [PubMed: 20182783]

Hudson JL, Krain A, Kendall PC. Expanding horizons: Adapting manual-based treatments for anxious children with comorbid diagnoses. Cognitive and Behavioral Practice. 2001; 8:338–346.

Jacobson N, Roberts L, Berns S, McGlinchey J. Methods of defining and determining the clinical significance of treatment effects, description, application and alternatives. Journal of Consulting and Clinical Psychology. 1999; 67:300–307. [PubMed: 10369050]

Kendall PC. Treating anxiety disorders in youth: Results of a randomized clinical trial. Journal of Consulting and Clinical Psychology. 1994; 62:100–110. [PubMed: 8034812]

Kendall, PC.; Hedtke, K. Coping Cat Workbook. 2. Ardmore, PA: Workbook Publishing; 2006.

Langley A, Bergman R, McCracken J, Piacentini J. Impairment in childhood anxiety disorders: Preliminary examination of the Child Anxiety Impact Scale-Parent Version. Journal of Child and Adolescent Psychopharmacology. 2004; 14:105–114. [PubMed: 15142397]

Leyfer O, Folstein S, Bacalman S, Davis N, Dinh E, Morgan J, Lainhart J. Comorbid psychiatric disorders in children with autism: Interview development and rates of disorders. Journal of Autism and Developmental Disorders. 2006; 36:849–861. [PubMed: 16845581]

Lord, C.; Rutter, M.; DiLavore, P.; Risi, S. Autism Diagnostic Observation Schedule – WPS Edition. Los Angeles, CA: Western Psychological Services; 1999.

Moree BN, Davis TE. Cognitive-behavioral therapy for anxiety in children diagnosed with autism spectrum disorders: Modification trends. Research in Autism Spectrum Disorders. 2010; 4:346–354.

National Institute of Mental Health. CGI: Clinical Global Impressions. In: Guy, W.; Bonato, RR., editors. Manual for the ECDEU Assessment Battery. 2. Chevy Chase, MD: National Institute of Mental Health; 1970. p. 12-1-12-6.Rev ed

Olatunji B, Cisler J, Deacon B. Efficacy of cognitive behavioral therapy for anxiety disorders: a review of meta-analytic findings. Child and Adolescent Psychiatric Clinics of North America. 2010; 33:557–577.

Ollendick, T.; March, J., editors. Phobic and anxiety disorders in children and adolescents: A clinician's guide to effective psychosocial and pharmacological interventions. New York: Oxford University Press; 2004.

Ozsivadjian A, Knott F. Anxiety problems in young people with autism spectrum disorder: a case series. Clinical Child Psychology and Psychiatry. 2011; 16:203–214. [PubMed: 21571763]

Puleo C, Kendall P. Anxiety disorders in typically developing youth: Autism spectrum symptoms as a predictor of cognitive-behavioral treatment. Journal of Autism and Developmental Disorders. 2011; 41:275–286. [PubMed: 20694508]

Rapee, R.; Wignall, A.; Hudson, J.; Schniering, C. Treating anxious children and adolescents: An evidenced-based approach. Oakland, CA: New Harbinger; 2000.

Reaven J. The treatment of anxiety symptoms in youth with high-functioning autism spectrum disorders: Developmental considerations for parents. Brain Research. 2011; 1380:255–263. [PubMed: 20875799]

Reaven J, Hepburn S. Cognitive-behavioral treatment of obsessive- compulsive disorder in a child with Asperger's syndrome: A case report. Autism. 2003; 7:145–164. [PubMed: 12846384]

Reaven J, Hepburn S. The parent's role in the treatment of anxiety symptoms in children with high-functioning autism spectrum disorders. Mental Health Aspects of Developmental Disabilities. 2006; 9:73–80.

Reaven J, Blakeley-Smith A, Nichols S, Dasari M, Flanigan E, Hepburn S. Cognitive behavioral group treatment for anxiety symptoms in children with high-functioning autism spectrum disorders: A pilot study. Focus on Autism and Other Developmental Disabilities. 2009; 24:27–37.

Reaven, J.; Blakeley-Smith, A.; Nichols, S.; Hepburn, S. Facing Your Fears: Group therapy for managing anxiety in children with high-functioning autism spectrum disorders. Baltimore: Paul Brookes Publishing; 2011.

Russell E, Sofronoff K. Anxiety and social worries in children with Asperger syndrome. Australian and New Zealand Journal of Psychiatry. 2004; 39:633–638. [PubMed: 15996146]

Silverman, W.; Albano, A. Anxiety disorders interview schedule for children for DSM-IV: (Child and parent versions). San Antonio, TX: Psychological Corporation/Graywind; 1996.

Silverman W, Ollendick T. Evidence-based assessment of anxiety and its disorders in children and adolescents. Journal of Clinical Child and Adolescent Psychiatry. 2005; 27:772–778.

Silverman W, Pina A, Viswesvaran C. Evidence-based psychosocial Treatments for phobic and anxiety disorders in children and adolescents, Journal Clinical Child & Adolescent Psychology. 2008; 37:105–130.

Simonoff E, Pickles A, Charman T, Chandler S, Loucas T, Baird G. Psychiatric disorders in children with autism spectrum disorders: Prevalence, comorbidity, and associated factors in a population-derived sample. Journal of the American Academy of Child and Adolescent Psychiatry. 2008; 47:921–929. [PubMed: 18645422]

Skokauskas N, Gallagher L. Mental health aspects of autistic spectrum disorders in children. Journal of Intellectual Disability Research. 201110.1111/j.1365-2788.2011.01423.x

Sofronoff K, Attwood T, Hinton S. A randomized controlled trial of a CBT intervention for anxiety in children with Asperger syndrome. Journal of Child Psychology and Psychiatry. 2005; 46:1152–1160. [PubMed: 16238662]

Sung, M.; Ooi, Y.; Goh, T.; Pathy, P.; Fung, D.; Lam, C. Effects of cognitive-behavioral therapy on anxiety in children with autism spectrum disorders: a randomized controlled trial. Child Psychiatry in Human Development. 2011. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/21660428

Sze K, Wood J. Cognitive behavioral treatment of comorbid anxiety disorders and social difficulties in children with high-functioning autism: A case report. Journal of Contemporary Psychotherapy. 2007; 3:133–143.

Velting O, Seltzer J, Albano A. Update on and advances in assessment cognitive-behavioral treatment of anxiety disorders in children and adolescents. Professional Psychology Research and Practice. 2004; 35:42–54.

Walkup J, Albano A, Piacentini J, Birmaher B, Compton S, Sherrill J, Kendall PC. Cognitive-behavioral therapy, sertraline, or a combination in childhood anxiety. The New England Journal of Medicine. 2008; 359:2753–2766. [PubMed: 18974308]

Weissman, A.; Antinoro, D.; Chu, B. Cognitive-behavioral therapy for anxious youth in school settings. Advances and challenges. In: Mayer, M.; Van Acker, R.; Lochman, J.; Gresham, F., editors. Cognitive-behavioral interventions for emotional and behavioral disorders: School Based Practice. New York: Guilford Press; 2009.

Weschler, D. Weschler Abbreviated Scales of Intelligence (WASI). San Antonio, TX: Psychological Corporation; 2002.

White SW, Ollendick T, Scahill L, Oswald D, Albano AM. Preliminary efficacy of a cognitive-behavioral treatment program for anxious youth with autism spectrum disorders. Journal of Autism and Developmental Disorders. 2009; 39:1652–1662. [PubMed: 19568924]

Wood J. Effect of anxiety reduction in children's performance and social adjustment. Developmental Psychology. 2006; 42:345–349. [PubMed: 16569172]

Wood J, Drahota A, Sze K, Har K, Chiu A, Langer D. Cognitive behavioral therapy for anxiety in children with autism spectrum disorders: A randomized, controlled trial. Journal of Child Psychology and Psychiatry. 2009; 50:224–234. [PubMed: 19309326]

Key Points

- Youth with ASD are at increased risk for developing clinically significant anxiety, and these symptoms may markedly impact home, school and community settings.
- CBT is an evidence-based psychosocial treatment for anxiety in children.
- Modified CBT approaches have yielded significant reductions in anxiety for youth with ASD.
- Participants in the FYF intervention demonstrated significant reductions in anxiety severity and greater overall improvement in anxiety, relative to participants in the TAU condition.
- These significant findings contribute to the literature demonstrating the benefits of modified CBT for youth with ASD.

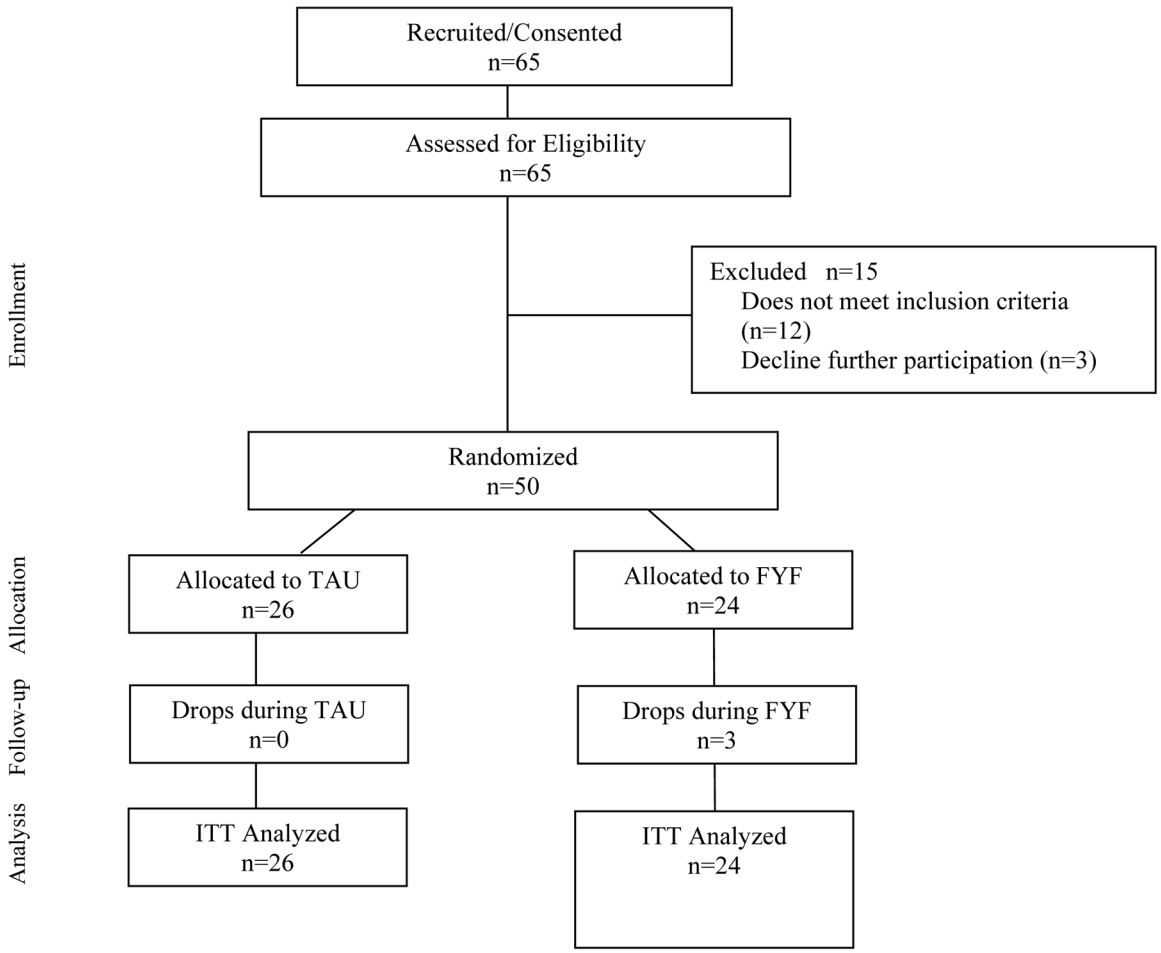
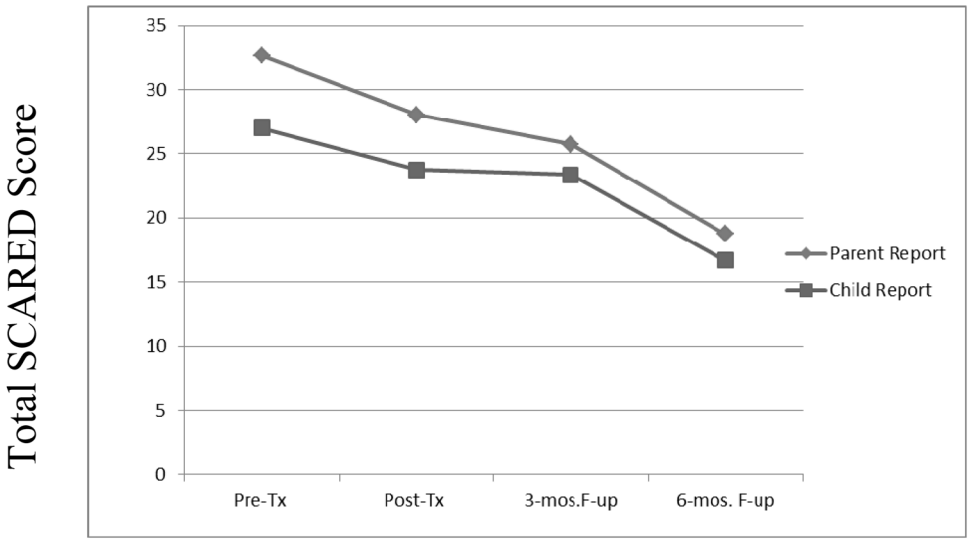


Figure A.
Consort Flow Diagram



Parent report	n=24	n=22	n=20	n=15
Child report	n=24	n=16	n=16	n=12

Figure B.

Parent and child report of Total Anxiety symptoms on the SCARED for the FYF condition: Pre-, Post-, 3-month and 6-month follow-up

Table 1

Participant Characteristics (n = 50)

	FYF n = 24	TAU n = 26	*t*	*p value*
Child age (mos.)				
Mean (sd)	125.75 (21.47)	125.00 (20.45)	.02	.90
Range	92 – 164	90 – 168		
Full Scale IQ Estimate				
Mean (sd)	107.08 (16.85)	102.23 (17.33)	1.01	.32
Range	70 – 139	70 – 134		
Verbal IQ Estimate				
Mean (sd)	107.00 (19.51)	100.73 (18.98)	1.33	.26
Range	65 – 133	67 – 134		
Nonverbal IQ Estimate				
Mean (sd)	109.67 (16.38)	105.04 (17.86)	1.33	.26
Range	75 – 133	70 – 134		
			x^2	*p value*
Child sex (male)	24 (100)	24 (92.3)	1.92	.17
Parents married	20 (83.3)	18 (69.2)	1.36	.24
Mothers graduated from college	15 (62.5)	15 (57.7)	.12	.73
Child ethnic background				
Caucasian	22 (91.7)	20 (76.9)	2.36 Yate's correction: 1.33	.12 Yate's p value: .08
Asian/Pacific Islander	0 (0)	1 (3.8)	n/a	n/a
African-American	1 (4.2)	2 (7.7)	.28	.60
Multi-racial	1 (4.2)	3 (11.5)	.92 Yate's correction: .19	.34 Yate's p value: .66
Autism Spectrum Disorder				
Autistic Disorder	16 (67.7)	15 (58.9)	.43	.51
PDD-NOS	0 (0)	3 (11.5)	n/a	n/a
Asperger Syndrome	8 (33.3)	8 (30.8)	.05	.83
Psychiatric Medication Use – Any	10	14	.74	.28
SSRI	5	7	.74	.28

	FYF n = 24	**TAU n = 26**	***t***	***p value***
Atypical Antipsychotic	4	3	.27	.45
Stimulant	5	4	.25	.45
Anticonvulsants	1	3	.92 Yate's correction: .19	.34 Yate's p value
Alpha-blockers	1	5	n/a	n/a
Mood stabilizers	0	1	n/a	n/a
Psychiatric Medications Stable across intervention period	23	23	.92	.34

Table 2

Clinician Severity Ratings (CSRs) for the FYF and TAU groups (n=43)

	Pre-Intervention		Post-Intervention		
Scale	**FYF N=20**	**TAU N=23**	**FYF N=20**	**TAU N=23**	**Cohen's d**
ADIS-P CSR					
Separation					
M	2.45	2.22	1.05	1.87	d = .74
SD	(2.33)	2.49	1.90	2.70	
Range	0–5	0–6	0–5	0–7	
Social					
M	3.85	3.70	2.40	3.61	d = .66
SD	2.13	2.36	2.30	2.55	
Range	0–6	0–7	0–5	0–7	
Specific phobia					
M	3.45	3.09	1.88	3.65	d = .70
SD	2.35	2.09	1.80	1.70	
Range	0–7	0–6	0–6	0–6	
Generalized anxiety					
M	4.46	5.09	2.55	4.61	d = .87
SD	2.02	1.44	2.50	1.70	
Range	0–7	0–7	0–6	0–7	
ADIS-P Principal Anxiety Diagnoses (SAP, SOC, GAD, SpP)					
M	2.90	2.91	2.25	2.83	d = .71
SD	.91	.95	.91	.98	
Range	1–4	1–4	1–4	1–4	