American Journal on Intellectual and Developmental Disabilities
Stepped Cognitive-Behavioral Therapy for Depressive and Externalizing Symptoms in Autistic Anxious Children
--Manuscript Draft--

Manuscript Number:	AJIDD-D-23-00045R1
Article Type:	Research Report
Keywords:	stepped-care; anxiety; Autism; Treatment; children
Corresponding Author:	Eric A. Storch, PhD Baylor College of Medicine Houston, TX UNITED STATES
First Author:	Catherine E Rast
Order of Authors:	Catherine E Rast
	Andrew G Guzick, PhD
	Keaton Soileau
	Orri Smarason
	Leandra Berry
	Robin Goin-Kochel
	Wayne K Goodman
	Sophie Schneider
	Alison Salloum
	Eric A. Storch, PhD
Manuscript Region of Origin:	UNITED STATES
Abstract:	Despite the strong evidence basis for the treatment of anxiety in autistic youth, accessibility remains a significant challenge. Stepped care addresses this gap, although there is limited research into its broad effects in autistic youth with anxiety. In this project 76 autistic youth with anxiety entered parent-led-bibliotherapy for 12 weeks; 44 stepped-up to receive therapist-led-CBT. Those who did not step-up entered a maintenance phase. Youth were assessed for externalizing and depressive symptoms at mid-treatment, post-treatment, and 3-months after treatment (3MFU). Focal symptoms decreased across groups at all timepoints; those who entered maintenance experienced greater decreases. At 3MFU there were no differences between groups. Parents were assessed for depression, anxiety, and stress at the same timepoints; no significant changes were observed.

Effects of Stepped Cognitive Behavioral Therapy on Child Depressive and Externalizing Symptoms

in Autistic Children with Anxiety

Abstract

Despite the strong evidence basis for the treatment of anxiety in autistic youth, accessibility remains a significant challenge. Stepped-care addresses this gap, although there is limited research into its broad effects in autistic youth with anxiety. In this project 76 autistic youth with anxiety entered parent-led-bibliotherapy for 12 weeks; 44 stepped-up to receive therapist-led-CBT. Those who did not step-up entered a maintenance phase. Youth were assessed for externalizing and depressive symptoms at mid-treatment, post-treatment, and 3-months after treatment (3MFU). Focal symptoms decreased across groups at all timepoints; those who entered maintenance experienced greater decreases. At 3MFU there were no differences between groups. Parents were assessed for depression, anxiety, and stress at the same timepoints; no significant changes were observed.

Keywords: stepped-care, anxiety, autism

Effects of Stepped Cognitive Behavioral Therapy on Child Depressive and Externalizing Symptoms in Autistic Children with Anxiety

Autistic youth often struggle with a range of emotional and behavioral concerns, among the most common being anxiety disorders. Autistic youth experience higher levels of anxiety than those in community samples (MacNeil et al., 2009; Vasa et al., 2020), with at least 40% meeting criteria for a co-occurring anxiety disorder (Perihan et al., 2020; Salloum et al., 2022; Sharma et al., 2021; Ung et al., 2014). Notably, co-occurring anxiety may result in decreased quality of life (Adams et al., 2020; Howe et al., 2022), including increased sleep disturbance and defiance-related behaviors (Vasa et al., 2020), as well as decreased engagement in school (Howe et al., 2022). Therefore, it is critical to create and implement interventions that address anxiety in autistic youth, as well as assess their potential impact on associated symptoms.

Cognitive behavioral therapy (CBT) is the gold-standard psychotherapy for anxiety in both autistic (Perihan et al., 2020; Sharma et al., 2021; Storch et al., 2022; Ung et al., 2014) and non-autistic youth (Reynolds et al., 2012; Salloum et al., 2022). Despite the demonstrated efficacy of CBT, there remain barriers to accessing care, including difficulty navigating the healthcare system, systemic barriers, financial difficulty, and family circumstances (Reardon et al., 2017).

Stepped-care models have been suggested to increase accessibility to evidence-based treatments (Salloum et al., 2022). In a stepped-care format, initial treatment consists of brief, low-intensity interventions, and then those who need additional care are allocated (or "stepped-up") to higher-intensity interventions involving therapist-led sessions (Salloum et al., 2022). Stepped-care interventions have important benefits, including decreased time with a therapist, and subsequently lowered cost, decreased disruption from everyday activities, and – in the case of parent-led stepped interventions – parental periodic reminders of learned skills (Creswell et al., 2017; Thirlwall et al., 2013). Parent-led interventions are one method of adapting CBT delivery for autistic youth with anxiety (Cook et al., 2019). Increased

parental involvement in interventions for autistic youth have also been shown to decrease family accommodation (Byrne et al., 2022), a factor known to maintain anxiety symptoms (Lebowitz et al., 2012). Outside of autism, stepped-care models have been effective at reducing the primary target symptom in youth with anxiety, OCD (Aspvall et al., 2021; Rapee et al., 2017; Torp et al., 2015), and those experiencing trauma (Salloum et al., 2022).

[redacted] and colleagues (redacted) found that stepped-care CBT reduced anxiety in autistic youth with anxiety and that these results were maintained at a three-month follow up. In this work, 74 participants underwent 12 weeks of parent-led therapist-assisted (PLTA) therapy with four 45-minute parent-only sessions providing support, encouragement, and psychoeducation. Participants who responded to treatment transitioned to a 12-week maintenance phase. Those who did not respond to PLTA stepped-up to receive family-based individual CBT, which consisted of 10 sixty-minute therapist-led sessions over 12 weeks. At the end of the second 12 weeks for both the maintenance phase and those who stepped-up to receive individual CBT and completed care, participants completed a post-treatment assessment. At the post-assessment, those who entered the maintenance phase had faster rates of improvement of anxiety symptoms relative to those who stepped-up (redacted). Three months after the post-treatment assessment, participants were reassessed and there were no statistically significant group differences in anxiety scores. This suggests that a stepped-care model is an effective model of care for reducing anxiety in autistic youth.

Although the reduction of anxiety is central to determining the efficacy of anxiety-focused treatment, it is additionally important to note secondary symptom reductions, such as depression and externalizing symptoms, in order to determine the overall impact of treatment. This is particularly true in an autistic population where psychiatric comorbidity is high (Mutluer et al., 2022). These symptoms, and their resulting interference with daily functioning, are often the reasons *why* families ultimately seek treatment (Becker et al., 2011). Evidence suggests that, because of the multi-faceted components of CBT, secondary concerns may change as a result of treatment. Indeed, a recent meta-analysis determining treatment

outcomes of CBT for youth with anxiety found that, in addition to improvement in anxiety symptoms, youth experienced reduced depressive symptoms, externalizing behaviors, as well as improved general functioning (Kreuze et al., 2018). These results were maintained during follow-up. However, due to high rates of co-occurring disorders in autistic youth (Mutluer et al., 2022) it is important to further consider these possible secondary symptom reductions in an autistic population. Wood and colleagues (2020) found that, among a sample of 66 autistic youth with anxiety, an adapted CBT program for anxiety resulted in decreased anxious and depressive symptoms on the Child Behavior Checklist (CBCL), as well as the broader internalizing behaviors subscale (adding somatic complaints, withdrawn/depressive symptoms subscales). Similar reductions in internalizing symptoms among autistic youth with anxiety were also observed by Storch and colleagues (2013). Bemmer and colleagues (2021) found decreases in mood-disorder symptoms, anxiety, and distress following a modified social anxiety CBT intervention for autistic youth. Additionally, some evidence suggests that externalizing behaviors are reduced following CBT for autistic youth with co-occurring anxiety (Storch et al., 2015; van Steensel & Bögels, 2015). Collectively, the literature demonstrates the positive and lasting impact that CBT for anxiety can have on co-occurring symptoms/behaviors in youth with autism. However, it is important to confirm these findings in a stepped-care model, particularly for those who only received parent-led intervention, as the lowered intensity of care may not have as significant broadband effects. Furthermore, it is important to provide evidence that such secondary symptom reductions are maintained at follow-up.

When evaluating the overall impact of treatment, it is important to consider potential implications for the family unit as a whole. The majority of parents with autistic youth experiencing anxiety report that anxiety may limit their family's activities (Howe et al., 2022) and may contribute to general parental stress (Howe et al., 2022; Kerns et al., 2015). Child anxiety is also positively associated with impairment and dysfunction in the home, such as difficulties getting along with parents and siblings (Langley et al., 2004). Additionally, there is a positive relationship between child conduct problems and parenting stress and depression (Raulston et al., 2021), as well as child internalizing symptoms, including depression and

anxiety, and parenting stress and dysfunction (van Oort et al., 2010). Therefore, treatments that reduce externalizing symptoms, as well as targeted symptom categories (e.g., anxiety), may have desirable ancillary effects, such as decreases in parental stress and depression. Indeed, some studies have observed decreased parental trait anxiety (Reaven et al., 2015) and psychological distress (Keeton et al., 2013; Lavallee et al., 2019) after treatment for their child's anxiety. Such results should be confirmed following anxiety treatment for autistic youth, particularly in parent-led approaches where they are more intimately involved in therapy (Iniesta-Sepúlveda et al., 2021; Lebowitz et al., 2012, 2016; Stewart et al., 2008; Storch et al., 2007).

Overall, prior research has indicated a link between treatment of anxiety in youth and improvement in other domains of behavior and functioning. However, there has been limited research investigating if these findings can generalize to autistic youth receiving treatment for anxiety, as well as whether other psychosocial domains improve following a lower intensity, parent-led bibliotherapy. We sought to address this gap via three primary aims. First, we assessed whether (a) child depressive and externalizing symptoms and (b) parental stress and depressive symptoms improved following stepped-care CBT for anxiety in autistic youth. Based on the multi-faceted approach of CBT, past literature (Keeton et al., 2013; Lavallee et al., 2019; Storch et al., 2015; van Steensel & Bögels, 2015) and the established association between anxiety and these other domains, we predicted that such symptom dimensions would improve. Second, we examined whether such improvements were maintained at a three-month follow-up. We predicted that improvements in youth depressive and externalizing symptoms, as well as parental stress and depressive symptoms would be maintained. Third, because of the unique stepped-care method of treatment, we explored if parents and children who entered maintenance versus step up experienced similar gains in secondary outcomes (i.e., child-reported depression, externalizing symptoms, and parental stress and depressive symptoms) at completion of the program and the three-month follow-up.

Method

Participants

Participants and their legally authorized representative (LAR) were recruited through engagement within the community, including autism database newsletters, referrals from established autism centers, various social media platforms, and the SPARK research match database [redacted]).

Inclusion criteria for the child to participate included: (a) age 4-14 years old. The upper age limit was chosen as it was believed that a parent-led intervention may be less appropriate for 15 year old and older youth; (b) previous formal primary diagnosis of autism or baseline score of ≥ 65 on the Social Responsiveness Scale-Second Edition, (SRS-2; Constantino & Gruber, 2012); (c) clinically significant symptoms of anxiety or OCD, scoring ≥ 4 on the Anxiety Disorders Interview Schedule Child/Parent Version (Silverman & Albano, 1996), with Autism Spectrum Addendum (ASA) to further identify anxieties related to autism (Kerns et al., 2017) *and* score >12 on the Pediatric Anxiety Rating Scale (RUPP, 2002); (d) anxiety or OCD significantly limits functioning, severity score above 3 on the CGI-Severity; (e) ≥ 70 IQ by the Differential Ability Scales, Second Edition (Beran, 2007) or Wechsler Abbreviated Scale of Intelligence, Second Edition (Wechsler, 2011); (f) participant and LAR provided consent and assent to participate.

Exclusion criteria were: (a) DSM-5 diagnosis through the administration of the Mini International Neuropsychiatric Interview for Children and Adolescents (Sheehan et al., 2010) of the following disorders: bipolar disorder, psychotic disorder, or intellectual disability; (b) active suicidal/homicidal ideation, or self-harm that requires immediate medical intervention; (c) currently in treatment for anxiety with an external psychotherapist; (d) changes to medication related to either introduction of or decreasing/increasing dosage of said medication (for more information see redacted).

Procedures

All procedures were approved by the local Institutional Review Board. Prior to the COVID-19 pandemic, services were held in-person in a clinical setting and then transitioned to telehealth to abide by

safety protocols. The LAR provided written consent for both themselves and their child, and the child's written or verbal assent was also collected. Each participant (child and LAR) completed a three to four-hour baseline assessment, with an independent evaluator (IE), to determine if the eligibility criteria had been fulfilled. This interview included determining diagnoses through the Anxiety Disorders Interview Schedule and selected sections of the Mini International Neuropsychiatric Interview for Children and Adolescents (Sheehan et al., 2010). Thereafter, the participants completed additional assessments consistent with the timeline of the study that occurred at mid-treatment, post-treatment, and three months after treatment. Upon completion of each assessment, participants were compensated $40. IEs were either master-level trainees or doctoral-candidate clinicians who received substantial training in administering the appropriate evaluations and were supervised by a licensed psychologist. IEs had weekly supervision, where clinician-administered assessments were discussed, including diagnostic criteria and the Clinical Global Impressions ratings (-Improvement and –Severity). All assessments administered by IEs for this study were audio-recorded to ensure the quality of data collection. Parent report and clinician report measures (no child report) were used in analyses.

As noted above, treatment consisted of two phases. Initially all parents entered parent-led, therapist-assisted CBT. This involved meeting with a therapist 4 times over the course of 12 weeks. Throughout the 12-weeks, parents were asked to work through the lessons and accompanying workbook found within *Helping Your Anxious Child* (Rapee et al., 2017). The parent who provided consent, and completed all self-report measures, was the same parent that attended the vast majority of their child's therapy sessions. After 12 weeks, all participants were evaluated by an IE. Participants who responded (score ≤ 2 on the CGI-Severity and ≥ 6 on the CGI-Improvement) entered the maintenance phase. The maintenance phase consisted of continuing parent-led CBT at the participant's own pace. Non-responders stepped-up to receive individual therapist-led CBT. This consisted of 10 one-hour therapist-led sessions over 12 weeks. Therapists were masters-level or advanced doctoral-candidate clinicians and were supervised by a licensed clinician. All participants were assessed at the completion of the maintenance

phase (12-weeks after entering the maintenance phase) or completion of individual therapist-led treatment. All participants were assessed once more three months following the completion of treatment. At these timepoints (mid-treatment, post-treatment and 3-month follow up) parents completed measures relating to their child's behaviors and mental health (e.g., RCADS-P, CBCL) as well as personal well-being (e.g., DASS-21). Complete information regarding procedures is described in [redacted].

Measures

Revised Child Anxiety and Depression Scale- Parent Version (RCADS-P)

The RCADS-P is a 47-item revision of the Spence Children's Anxiety Scale to evaluate child anxiety and depression based on DSM-IV criteria, including questions pertaining to disorders such as Major Depressive Disorder and Generalized Anxiety Disorder (Chorpita et al., 2000; Spence, 1998). Each item ranges from 0 to 3 based on a four-point scale, 0= *never*, 1= *sometimes*, 2= *often*, and 3= *always* (Chorpita et al., 2000). The RCADS-P Depression subscale was used for the present report. The RCADS-P was administered at pre-, mid- and post-treatment, as well as at the three-month follow up. The RCADS-P has demonstrated good psychometric properties, including convergent, discriminate, and known groups validity (Chorpita et al., 2005). The RCADS has also demonstrated acceptable convergent validity (based on significant positive correlations) with the Anxious/Depressed CBCL subscale, Multidimensional Anxiety Scale for Children, and Pediatric Rating Scale and acceptable discriminate validity (based on non-significant correlations) with the CBCL thought problems and social problems subscales (Ebesutani et al., 2010; Sterling et al., 2015) and test-retest reliability (Kaat & Lecavalier, 2015) in autistic youth. Internal reliability in this sample at baseline was excellent ($\alpha = 0.92$). Only parent report of depression was utilized to maintain the same informant across all measures.

Child Behavior Checklist (CBCL)

The CBCL is a 112-item parent-rated measure that assesses child problem behaviors and adaptive behavior (Achenbach, 1999). Items are based on a three-point scale ranging from 0 to 3 with 0=*not true*,

1=*somewhat or sometimes true* and 2= *very true*. For the current report, the externalizing subscale was utilized for analyses. The CBCL was administered at all three time points (pre-treatment, mid-treatment, post-treatment, three-month follow-up). The CBCL demonstrates good discriminant validity between youth with autism and youth with autism and emotional and behavioral disorders (Pandolfi et al., 2012). Furthermore, externalizing and internalizing subscales were factorially confirmed within a sample of autistic youth (Pandolfi et al., 2012), supporting construct validity of the measure. The internal reliability of the internalizing subscale ($\alpha = 0.89$) and externalizing subscale ($\alpha = 0.90$) at baseline was good.

Depressive, Anxiety, and Stress Symptoms-21 item version (DASS-21)

The DASS-21 consists of 21 items measuring the severity and frequency of depression, anxiety, and stress symptoms over the past week. The DASS-21 is the shortened version of the DASS (Lovibond & Lovibond, 1995, 1996). Items are based on a four-point scale, 0 = *Did not apply to me at all*, 1 = *Applied to me to some degree, or some of the time*, 2 = *Applied to me a considerable degree or a good part of the time*, 3 = *Applied to me very much, or most of the time.* Parents completed this measure as a self-report. This measure was used at all three time points. The DASS-21 has been shown to have good psychometric properties, including divergent validity with the Physical Component Summary and Positive Mental Health Scale and convergent validity with the Mental Component Summary score, Beck Depression Inventory, Beck Anxiety Inventory, and the State-Trait Anxiety Inventory – Trait Version (Antony et al., 1998; Bibi et al., 2020; Sinclair et al., 2012). Internal reliability in this sample at baseline was excellent ($\alpha = 0.94$).

Analysis Plan

Little's test indicated the data were missing completely at random, $\chi^2 (7) = 4.25$, *p* = .75. That said, there was a high proportion of dropout among families who were enrolled during the beginning of the COVID-19 pandemic (66% of families compared with 26% among families who began during the

pandemic), resulting in a high rate of missing data (29-30% per measure), and thus a maximum likelihood approach was used to estimate missing data.

Multilevel modeling was used to determine rates of change across treatment, with separate models run for post-treatment (after Step 1 and maintenance or after Step 1 and Step 2) and 3-month follow-up final assessment points. Models were re-run for each dependent variable of interest (RCADS-P Depression, DASS-Stress, DASS-Depression, and CBCL-Externalizing). Simulation studies have identified sample sizes of 50+ with 5+ repeated measures as ideal for multilevel modeling, with particular advantages for increasing sample (rather than assessment points; Maas & Hox, 2005). This study included 76 enrolled participants with 4 assessments per participant, and thus was considered adequately powered. Data were analyzed using SPSS Version 27.

Results

Sample description and demographics

Ninety-six participants were screened between January 2019 through November 2020 with a confirmed diagnosis of ASD and co-occurring symptoms of anxiety or OCD. Following screening, 11 were found to be ineligible, 2 unwilling to participate, and 6 lost to follow-up. Seventy-six entered treatment, ($n = 76$). Of those 76, 12 dropped out, 44 stepped-up and 20 entered the maintenance phase. See Fig 1 (originally published in redacted) for full CONSORT diagram. Ages ranged from 4-14 (*M* age = 10.39 years, *SD* = 2.86 years) with a majority identifying as male (84.4% male, 15.6% female). See Table 1 for complete participant (child and parent) demographics. At baseline, there were no differences between children who stepped-up on the CBCL-Externalizing scale (M= 14.63, SD= 9.31) relative to those who entered the maintenance phase (M= 13.00, SD= 8.78), t(62) = -0.64, *p*=0.525. Additionally, there were no differences in RCADS-P Depression Scores between those who stepped-up (M= 6.4, SD= 3.97) and those who entered the maintenance phase (M= 4.44, SD= 2.77), t(61) = -1.91, *p*=0.06). Additionally, there were no statistically significant differences between full-scale IQ in those who

stepped-up (N=31, M= 103.06, SD= 16.4, R=77 to 131) and those who stepped down (N=14, M= 104.07, SD= 19.55, R= 70 to 151), t(43) = 0.180, p=0.858. Lastly, there were no statistically significant differences in the verbal composite IQ between those who stepped-up (N=13, M= 102.57, SD= 17.84, R= 68 to 136) and those who entered the maintenance phase (N=30, M= 100.69, SD= 22.911, R= 59 to 128), t(41) = -0.290, p= 0.796.

There were no statistically significant baseline differences between parent DASS-21 Stress scores between parents whose children stepped-up (M=5.26, SD= 3.74) and those whose children entered the maintenance phase (M=4.56, SD= 3.54), t(62) = -0.688, p= 0.292. Additionally, there were no statistically significant baseline differences between parent DASS-21 Anxiety scores between parents whose children stepped-up (M=1.89, SD= 2.37) and those whose children entered the maintenance phase (M=1.50, SD= 2.52), t(62) = -0.583, p= 0.562. Lastly, there were no statistically significant baseline differences between parent DASS-21 Depression scores between parents whose children stepped-up (M=2.30, SD= 2.67) and those whose children entered the maintenance phase (M=1.44, SD= 2.43), t(62) = -1.185, p= 0.24. These scores are all considered to be within the normal range (Antony et al., 1998).

Change across treatment

Post-treatment outcomes: In the model predicting post-treatment R-CADS-P Depression and CBCL-Externalizing scores, results echoed findings from the primary anxiety analysis (redacted); significant linear decline in RCADS-P Depression and CBCL-Externalizing scores were found across the whole sample, indicating improvement in depressive and externalizing symptoms, RCADS-P Dep: b = -4.35, p < .001; CBCL-Ext: b = -9.10, p < .001. There was also an overall significant positive quadratic trend for both, RCADS-P Dep: b = 1.62, p = .006; CBCL-Externalizing: b = 3.40, p = .006. In other words, participants experienced steep initial improvement during parent-led bibliotherapy followed by a relative decline in the rate of improvement. Those who entered maintenance phase after parent-led bibliotherapy experienced more rapid improvements in RCADS-P Depression, b = 4.32, p = .003, and CBCL-

Externalizing scores, $b = 7.77$, $p = .011$, as well as a more positive quadratic trajectory (i.e., steeper improvement initially followed by a decline in the rate of improvement through post-treatment), RCADS-P Dep: $b = $ -2.14, $p = .003$; CBCL-Ext: $b = -3.36$, $p = .023$. In contrast, DASS subscales did not show significant change through post-treatment or a quadratic trajectory of this change, nor were these effects moderated by step status. Please see Table 2 for a summary.

Three-month follow-up analysis: RCADS-P Depression showed significant linear decline through the three-month follow-up period, $b = -2.58$, $p = .001$, as well as a positive quadratic effect, $b = 0.59$, $p = .020$. Step up/maintenance phase status after parent-led bibliotherapy no longer moderated the rate of change significantly. CBCL-Externalizing scores also showed a significant linear decline, $b = -4.67$, $p = .006$, though a significant quadratic trend was not found when analyses extended through the three-month follow-up, $b = 0.88$, $p = .11$. Neither of these effects were moderated by the step up/maintenance phase status after parent-led bibliotherapy. DASS subscales did not show significant linear or quadratic change through three-month follow-up, and these effects were not moderated by step up/maintenance status. Please see Table 2 for a summary.

Discussion

This study examined secondary effects of a stepped-care CBT model for autistic youth with anxiety disorders that included parent-led CBT as an initial low-intensity intervention. In this anxiety-focused treatment, there were decreases in child depressive and externalizing symptoms, regardless of whether they initially stepped-up from parent-led to individual CBT or if they entered maintenance. Child depressive and externalizing symptoms continued to decline through the three-month follow-up period across these groups. However, there were no changes in parental depression and stress over the course of the study. This suggests the efficacy of a stepped-care model for reducing both primary and secondary concerns for autistic youth. Importantly, this extends previous findings that stepped-care CBT for autistic youth with anxiety provides secondary benefits, such as improved mood and decreased depression

(Bemmer et al., 2021; Storch et al., 2013; Wood et al., 2020). This suggests that, for a meaningful portion of autistic youth with anxiety, standard-care CBT was not required to achieve significant improvements. This can ultimately improve access to care for autistic youth with anxiety through both the lowered cost of stepped-care models (Salloum et al., 2022) and decreased need for time-intensive therapist-guided CBT, as this stepped-care model began with parent-led bibliotherapy.

However, there were differences in the *rate* of improvement between those who entered the maintenance phase and those who stepped-up. As might be expected, we found that those who entered the maintenance phase (and thus were classified as responders based on anxiety improvement) improved more rapidly than those who stepped-up following parent-led CBT. However, stepped status did not continue to moderate the rate of improvement at the three-month follow up, in that following the completion of treatment, both groups had similar improvements in both youth depression and externalizing symptoms. These results mirror the outcomes and rate of decline for anxiety symptoms in this sample (redcated). Overall, this suggests that the stepped-care model of care for autistic youth with anxiety provides adequate care that lessens secondary symptoms, such as depression and externalizing symptoms. Importantly, the stepped status does not influence the ultimate gains made during treatment, as assessed by three-months following the completion of assessment. Patients may receive a less time and cost intensive therapy (parent-led bibliotherapy) without compromising their quality of care and overall treatment gains. This is especially important to consider in light of the growing need for therapists and inadequate availability of providers (Marques et al., 2020). A stepped-care model allows participants to receive necessary, effective care that not only reduces the target symptom (i.e., anxiety) but additional symptoms and behaviors that may impact quality of life.

Contrary to our hypothesis, there were no significant changes in parental stress and depression at both the post-treatment assessment and three month follow up. This may have resulted from a relatively low baseline level of parental stress, suggesting a floor effect. The intervention may not have impacted

parental stress sufficiently, especially as the initial phase required parent-led treatment. Finally, the COVID-19 pandemic may have influenced overall stress levels, independent of treatment.

Overall, these results also support the utility of telehealth therapy for autistic youth with anxiety, as therapy was conducted both in-person and virtually due to the COVID-19 pandemic. Previous literature has demonstrated that tele-health treatment is as efficacious in person (Ellison et al., 2021; Sutherland et al., 2018). Tele-delivered therapy may decrease access barriers as well as increase the comfort of youth in participating in therapy (Kalvin et al., 2021). However, some aspects of CBT for anxiety in this population must change, such as the nature of exposure, and social reciprocity during therapy, particularly in autistic youth with social anxiety (Kalvin et al., 2021). With proper communication, and adaptations, such as further involvement of parents, teletherapy for autistic youth with anxiety seems to be effective, as evidenced by this project and others (e.g., Byrne et al., 2022; Estabillo et al., 2022)..

Despite these generally promising results, several study limitations should be noted. First, this study occurred during the COVID-19 pandemic, which required treatment to be provided both in-person and virtually. Second, the COVID-19 pandemic was also associated with increased anxiety and distress (Daly & Robinson, 2021), which may have influenced findings. On balance, demonstrated child effects are even more impressive when considering this. Second, due to limitations of study design, all results relied on parent report. Some evidence suggests that parent-report and child-report on mental health symptomology may be inconsistent, with correlations around 0.5 for the RCADS (Muris et al., 2003). As such, future research should investigate if these scores are maintained in both child and clinician-report. Third, inclusion in the study precluded individuals with cognitive functioning in the lower range. Therefore, these results may not be generalizable to this cohort of autistic children and adolescents with anxiety. Fourth, this study did not include a control condition. Future research should consider including an active comparator condition to bolster conclusions that some individuals benefit from low-intensity care. Lastly, there was relatively high attrition, particularly during the transition from in-person to

telehealth care, with 12 families dropping out during parent-led bibliotherapy, 1 family during maintenance, and 16 families during stepped-up individual CBT. However, these rates of attrition are similar to other stepped-care projects (Salloum et al., 2022).

Overall, these data provide support for the broad effects of stepped-care treatments for autistic youth with anxiety. Youth depressive and externalizing symptoms were reduced following treatment and maintained three-months after completion of treatment, despite not being the direct target of treatment. Additionally, stepped status did not moderate symptom improvement at the three-month follow up, similar to results found in this sample for anxiety (redacted). Importantly, these symptoms often influence quality of life along with anxiety in adolescents (Armstrong et al., 2015; Williamson et al., 2021). Therefore, noting these symptom reductions strengthens the support of this care model. Additionally, stepped-care models can be cost effective, as patients are able to conserve resources without sacrificing the quality of their care (Chatterton et al., 2019). Future studies should further investigate the potential reduced financial burden on families and the therapy-system, as well as randomized designs that compare stepped-care and standard CBT. Additionally, future projects should determine predictors of response in order to preemptively determine which families may benefit by immediately receiving more intensive care.

Compliance with Ethical Standards

This study involved human participants and it was approved by the Institutional Review Board at the corresponding author's institution. Informed consent and permission for the child to participate was obtained from all parent participants. Written or verbal assent was obtained from child participants when it was possible.

References

Achenbach, T. M. (1999). The Child Behavior Checklist and related instruments. In *The use of psychological testing for treatment planning and outcomes assessment, 2nd ed* (pp. 429–466). Lawrence Erlbaum Associates Publishers.

Adams, D., Clark, M., & Simpson, K. (2020). The Relationship Between Child Anxiety and the Quality of Life of Children, and Parents of Children, on the Autism Spectrum. *Journal of Autism and Developmental Disorders*, *50*(5), 1756–1769. https://doi.org/10.1007/s10803-019-03932-2

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment*, *10*, 176–181. https://doi.org/10.1037/1040-3590.10.2.176

Armstrong, D., Lycett, K., Hiscock, H., Care, E., & Sciberras, E. (2015). Longitudinal Associations Between Internalizing and Externalizing Comorbidities and Functional Outcomes for Children with ADHD. *Child Psychiatry & Human Development*, *46*(5), 736–748. https://doi.org/10.1007/s10578-014-0515-x

Aspvall, K., Andersson, E., Melin, K., Norlin, L., Eriksson, V., Vigerland, S., Jolstedt, M., Silverberg-Mörse, M., Wallin, L., Sampaio, F., Feldman, I., Bottai, M., Lenhard, F., Mataix-Cols, D., & Serlachius, E. (2021). Effect of an Internet-Delivered Stepped-Care Program vs In-Person Cognitive Behavioral Therapy on Obsessive-Compulsive Disorder Symptoms in Children and Adolescents: A Randomized Clinical Trial. *JAMA*, *325*(18), 1863–1873. https://doi.org/10.1001/jama.2021.3839

Becker, K. D., Chorpita, B. F., & Daleiden, E. L. (2011). Improvement in Symptoms Versus Functioning:

How Do Our Best Treatments Measure Up? *Administration and Policy in Mental Health and*

Mental Health Services Research, *38*(6), 440–458. https://doi.org/10.1007/s10488-010-0332-x

Bemmer, E. R., Boulton, K. A., Thomas, E. E., Larke, B., Lah, S., Hickie, I. B., & Guastella, A. J. (2021).

Modified CBT for social anxiety and social functioning in young adults with autism spectrum

disorder. *Molecular Autism*, *12*(1), 11. https://doi.org/10.1186/s13229-021-00418-w

Beran, T. N. (2007). Elliott, C. D. (2007). Differential Ability Scales (2nd ed.). San Antonio, TX: Harcourt

Assessment. *Canadian Journal of School Psychology*, *22*(1), 128–132.

https://doi.org/10.1177/0829573507302967

Bibi, A., Lin, M., Zhang, X. C., & Margraf, J. (2020). Psychometric properties and measurement invariance

of Depression, Anxiety and Stress Scales (DASS-21) across cultures. *International Journal of*

Psychology, *55*(6), 916–925. https://doi.org/10.1002/ijop.12671

Byrne, G., Ghráda, Á. N., & O'Mahony, T. (2022). Parent-Led Cognitive Behavioural Therapy for Children

with Autism Spectrum Conditions. A Pilot Study. *Journal of Autism and Developmental Disorders*.

https://doi.org/10.1007/s10803-022-05424-2

Chatterton, M. L., Rapee, R. M., Catchpool, M., Lyneham, H. J., Wuthrich, V., Hudson, J. L., Kangas, M., &

Mihalopoulos, C. (2019). Economic evaluation of stepped care for the management of childhood

anxiety disorders: Results from a randomised trial. *Australian & New Zealand Journal of*

Psychiatry, *53*(7), 673–682. https://doi.org/10.1177/0004867418823272

Chorpita, B. F., Moffitt, C. E., & Gray, J. (2005). Psychometric properties of the Revised Child Anxiety and

Depression Scale in a clinical sample. *Behaviour Research and Therapy*, *43*(3), 309–322.

https://doi.org/10.1016/j.brat.2004.02.004

Chorpita, B. F., Yim, L., Moffitt, C., Umemoto, L. A., & Francis, S. E. (2000). Assessment of symptoms of

DSM-IV anxiety and depression in children: A revised child anxiety and depression scale.

Behaviour Research and Therapy, *38*(8), 835–855. https://doi.org/10.1016/S0005-

7967(99)00130-8

Constantino, J. N., & Gruber, C. P. (2012). *Social responsiveness scale: SRS-2* (p. 106). Torrance, CA:

Western psychological services.

Cook, J. M., Donovan, C. L., & Garnett, M. S. (2019). Parent-mediated cognitive behavioural therapy for

young children with high-functioning autism spectrum disorder and anxiety: A randomized

control trial. *Early Child Development and Care*, *189*(1), 119–134.

https://doi.org/10.1080/03004430.2017.1303684

Creswell, C., Violato, M., Fairbanks, H., White, E., Parkinson, M., Abitabile, G., Leidi, A., & Cooper, P. J.

(2017). Clinical outcomes and cost-effectiveness of brief guided parent-delivered cognitive

behavioural therapy and solution-focused brief therapy for treatment of childhood anxiety

disorders: A randomised controlled trial. *The Lancet Psychiatry*, *4*(7), 529–539.

https://doi.org/10.1016/S2215-0366(17)30149-9

Daly, M., & Robinson, E. (2021). Psychological distress and adaptation to the COVID-19 crisis in the

United States. *Journal of Psychiatric Research*, *136*, 603–609.

https://doi.org/10.1016/j.jpsychires.2020.10.035

Ebesutani, C., Bernstein, A., Nakamura, B. J., Chorpita, B. F., Weisz, J. R., & The Research Network on

Youth Mental Health*. (2010). A Psychometric Analysis of the Revised Child Anxiety and

Depression Scale—Parent Version in a Clinical Sample. *Journal of Abnormal Child Psychology*,

38(2), 249–260. https://doi.org/10.1007/s10802-009-9363-8

Ellison, K. S., Guidry, J., Picou, P., Adenuga, P., & Davis, T. E. (2021). Telehealth and Autism Prior to and in

the Age of COVID-19: A Systematic and Critical Review of the Last Decade. *Clinical Child and

Family Psychology Review*, *24*(3), 599–630. https://doi.org/10.1007/s10567-021-00358-0

Estabillo, J. A., Moody, C. T., Poulhazan, S. J., Adery, L. H., Denluck, E. M., & Laugeson, E. A. (2022).

Efficacy of PEERS® for Adolescents via Telehealth Delivery. *Journal of Autism and Developmental Disorders*, *52*(12), 5232–5242. https://doi.org/10.1007/s10803-022-05580-5

Howe, S. J., Baraskewich, J., & McMorris, C. A. (2022). Anxiety in Autistic Youth: Understanding the Impact on Child, Caregiver, and Family Quality of Life. *Journal of Child and Family Studies*. https://doi.org/10.1007/s10826-022-02277-2

Iniesta-Sepúlveda, M., Rodríguez-Jiménez, T., Lebowitz, E. R., Goodman, W. K., & Storch, E. A. (2021). The Relationship of Family Accommodation with Pediatric Anxiety Severity: Meta-analytic Findings and Child, Family and Methodological Moderators. *Child Psychiatry and Human Development*, *52*(1), 1–14. https://doi.org/10.1007/s10578-020-00987-6

Kaat, A. J., & Lecavalier, L. (2015). Reliability and Validity of Parent- and Child-Rated Anxiety Measures in Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, *45*(10), 3219–3231. https://doi.org/10.1007/s10803-015-2481-y

Kalvin, C. B., Jordan, R. P., Rowley, S. N., Weis, A., Wood, K. S., Wood, J. J., Ibrahim, K., & Sukhodolsky, D. G. (2021). Conducting CBT for Anxiety in Children with Autism Spectrum Disorder During COVID-19 Pandemic. *Journal of Autism and Developmental Disorders*, *51*(11), 4239–4247. https://doi.org/10.1007/s10803-020-04845-1

Keeton, C. P., Ginsburg, G. S., Drake, K. L., Sakolsky, D., Kendall, P. C., Birmaher, B., Albano, A. M., March, J. S., Rynn, M., Piacentini, J., & Walkup, J. T. (2013). Benefits of Child-Focused Anxiety Treatments for Parents and Family Functioning. *Depression and Anxiety*, *30*(9), 865–872. https://doi.org/10.1002/da.22055

Kerns, C. M., Kendall, P. C., Zickgraf, H., Franklin, M. E., Miller, J., & Herrington, J. (2015). Not to Be Overshadowed or Overlooked: Functional Impairments Associated With Comorbid Anxiety

Disorders in Youth With ASD. *Behavior Therapy*, *46*(1), 29–39.

https://doi.org/10.1016/j.beth.2014.03.005

Kerns, C. M., Renno, P., Kendall, P. C., Wood, J. J., & Storch, E. A. (2017). Anxiety Disorders Interview

Schedule–Autism Addendum: Reliability and Validity in Children With Autism Spectrum

Disorder. *Journal of Clinical Child & Adolescent Psychology*, *46*(1), 88–100.

https://doi.org/10.1080/15374416.2016.1233501

Kreuze, L. J., Pijnenborg, G. H. M., de Jonge, Y. B., & Nauta, M. H. (2018). Cognitive-behavior therapy for

children and adolescents with anxiety disorders: A meta-analysis of secondary outcomes.

Journal of Anxiety Disorders, *60*, 43–57. https://doi.org/10.1016/j.janxdis.2018.10.005

Langley, A. K., Bergman, R. L., McCracken, J., & Piacentini, J. C. (2004). Impairment in Childhood Anxiety

Disorders: Preliminary Examination of the Child Anxiety Impact Scale–Parent Version. *Journal of*

Child and Adolescent Psychopharmacology, *14*(1), 105–114.

https://doi.org/10.1089/104454604773840544

Lavallee, K., Schuck, K., Blatter-Meunier, J., & Schneider, S. (2019). Transgenerational improvements

following child anxiety treatment: An exploratory examination. *PLOS ONE*, *14*(2), e0212667.

https://doi.org/10.1371/journal.pone.0212667

Lebowitz, E. R., Panza, K. E., & Bloch, M. H. (2016). Family accommodation in obsessive-compulsive and

anxiety disorders: A five-year update. *Expert Review of Neurotherapeutics*, *16*(1), 45–53.

https://doi.org/10.1586/14737175.2016.1126181

Lebowitz, E. R., Panza, K. E., Su, J., & Bloch, M. H. (2012). Family accommodation in obsessive–

compulsive disorder. *Expert Review of Neurotherapeutics*, *12*(2), 229–238.

https://doi.org/10.1586/ern.11.200

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the depression anxiety stress scales (2nd ed.)*.

Psychology Foundation of Australia.

Lovibond, S. H., & Lovibond, P. F. (1996). *Manual for the depression anxiety stress scales*. Psychology

    Foundation of Australia.

MacNeil, B. M., Lopes, V. A., & Minnes, P. M. (2009). Anxiety in children and adolescents with Autism

    Spectrum Disorders. *Research in Autism Spectrum Disorders*, *3*(1), 1–21.

    https://doi.org/10.1016/j.rasd.2008.06.001

Marques, L., Bartuska, A. D., Cohen, J. N., & Youn, S. J. (2020). Three steps to flatten the mental health

    need curve amid the COVID-19 pandemic. *Depression and Anxiety*, *37*(5), 405–406.

    https://doi.org/10.1002/da.23031

Muris, P., Meesters, C., & Spinder, M. (2003). Relationships between child- and parent-reported

    behavioural inhibition and symptoms of anxiety and depression in normal adolescents.

    Personality and Individual Differences, *34*(5), 759–771. https://doi.org/10.1016/S0191-

    8869(02)00069-7

Mutluer, T., Aslan Genç, H., Özcan Morey, A., Yapici Eser, H., Ertinmaz, B., Can, M., & Munir, K. (2022).

    Population-Based Psychiatric Comorbidity in Children and Adolescents With Autism Spectrum

    Disorder: A Meta-Analysis. *Frontiers in Psychiatry*, *13*, 856208.

    https://doi.org/10.3389/fpsyt.2022.856208

Pandolfi, V., Magyar, C. I., & Dill, C. A. (2012). An initial psychometric evaluation of the CBCL 6–18 in a

    sample of youth with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *6*(1),

    96–108. https://doi.org/10.1016/j.rasd.2011.03.009

Perihan, C., Burke, M., Bowman-Perrott, L., Bicer, A., Gallup, J., Thompson, J., & Sallese, M. (2020).

    Effects of Cognitive Behavioral Therapy for Reducing Anxiety in Children with High Functioning

    ASD: A Systematic Review and Meta-Analysis. *Journal of Autism and Developmental Disorders*,

    50(6), 1958–1972. https://doi.org/10.1007/s10803-019-03949-7

Ramirez, A. C., Grebe, S. C., McNeel, M. M., Limon, D. L., Schneider, S. C., Berry, L. N., Goin-Kochel, R. P., Cepeda, S. L., Voigt, R. G., Salloum, A., & Storch, E. A. (2020). Parent-led, stepped-care cognitive-behavioral therapy for youth with autism and co-occurring anxiety: Study rationale and method. *Brazilian Journal of Psychiatry*, *42*, 638–645. https://doi.org/10.1590/1516-4446-2020-0897

Rapee, R. M., Lyneham, H. J., Wuthrich, V., Chatterton, M. L., Hudson, J. L., Kangas, M., & Mihalopoulos, C. (2017). Comparison of Stepped Care Delivery Against a Single, Empirically Validated Cognitive-Behavioral Therapy Program for Youth With Anxiety: A Randomized Clinical Trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, *56*(10), 841–848. https://doi.org/10.1016/j.jaac.2017.08.001

Raulston, T., Kosty, D., & Mcintyre, L. (2021). Mindful Parenting, Caregiver Distress, and Conduct Problems in Children With Autism. *American Journal on Intellectual and Developmental Disabilities*, *126*, 396–408. https://doi.org/10.1352/1944-7558-126.5.396

Reardon, T., Harvey, K., Baranowska, M., O'Brien, D., Smith, L., & Creswell, C. (2017). What do parents perceive are the barriers and facilitators to accessing psychological treatment for mental health problems in children and adolescents? A systematic review of qualitative and quantitative studies. *European Child & Adolescent Psychiatry*, *26*(6), 623–647. https://doi.org/10.1007/s00787-016-0930-6

Reaven, J., Washington, L., Moody, E. J., Stern, J. A., Hepburn, S. L., & Blakeley-Smith, A. (2015). Examining the Relationship Between Parental Anxiety and Treatment Response in Children and Adolescents with Autism Spectrum Disorder and Anxiety. *Journal of Autism and Developmental Disorders*, *45*(8), 2464–2473. https://doi.org/10.1007/s10803-015-2410-0

Reynolds, S., Wilson, C., Austin, J., & Hooper, L. (2012). Effects of psychotherapy for anxiety in children and adolescents: A meta-analytic review. *Clinical Psychology Review*, *32*(4), 251–262. https://doi.org/10.1016/j.cpr.2012.01.005

RUPP. (2002). The Pediatric Anxiety Rating Scale (PARS): Development and Psychometric Properties. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*(9), 1061–1069. https://doi.org/10.1097/00004583-200209000-00006

Salloum, A., Lu, Y., Chen, H., Quast, T., Cohen, J. A., Scheeringa, M. S., Salomon, K., & Storch, E. A. (2022). Stepped Care Versus Standard Care for Children After Trauma: A Randomized Non-Inferiority Clinical Trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, *61*(8), 1010-1022.e4. https://doi.org/10.1016/j.jaac.2021.12.013

Sharma, S., Hucker, A., Matthews, T., Grohmann, D., & Laws, K. R. (2021). Cognitive behavioural therapy for anxiety in children and young people on the autism spectrum: A systematic review and meta-analysis. *BMC Psychology*, *9*(1), 151. https://doi.org/10.1186/s40359-021-00658-8

Sheehan, D. V., Sheehan, K. H., Shytle, R. D., Janavs, J., Bannon, Y., Rogers, J. E., Milo, K. M., Stock, S. L., & Wilkinson, B. (2010). Reliability and validity of the Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID). *The Journal of Clinical Psychiatry*, *71*(3), 313–326. https://doi.org/10.4088/JCP.09m05305whi

Silverman, W. K., & Albano, A. M. (1996). *Anxiety disorders interview schedule for DSM-IV: Child version*. Oxford University Press.

Sinclair, S. J., Siefert, C. J., Slavin-Mulford, J. M., Stein, M. B., Renna, M., & Blais, M. A. (2012). Psychometric Evaluation and Normative Data for the Depression, Anxiety, and Stress Scales-21 (DASS-21) in a Nonclinical Sample of U.S. Adults. *Evaluation & the Health Professions*, *35*(3), 259–279. https://doi.org/10.1177/0163278711424282

Spence, S. H. (1998). A measure of anxiety symptoms among children. *Behaviour Research and Therapy*, *36*(5), 545–566. https://doi.org/10.1016/S0005-7967(98)00034-5

Sterling, L., Renno, P., Storch, E. A., Ehrenreich-May, J., Lewin, A. B., Arnold, E., Lin, E., & Wood, J. (2015).

Validity of the Revised Children's Anxiety and Depression Scale for youth with autism spectrum

disorders. *Autism*, *19*(1), 113–117. https://doi.org/10.1177/1362361313510066

Stewart, S. E., Beresin, C., Haddad, S., Egan Stack, D., Fama, J., & Jenike, M. (2008). Predictors of Family

Accommodation in Obsessive-Compulsive Disorder. *Annals of Clinical Psychiatry*, *20*(2), 65–70.

https://doi.org/10.3109/10401230802017043

Storch, E. A., Arnold, E. B., Lewin, A. B., Nadeau, J. M., Jones, A. M., De Nadai, A. S., Jane Mutch, P.,

Selles, R. R., Ung, D., & Murphy, T. K. (2013). The Effect of Cognitive-Behavioral Therapy Versus

Treatment as Usual for Anxiety in Children With Autism Spectrum Disorders: A Randomized,

Controlled Trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, *52*(2), 132-

142.e2. https://doi.org/10.1016/j.jaac.2012.11.007

Storch, E. A., Geffken, G. R., Merlo, L. J., Jacob, M. L., Murphy, T. K., Goodman, W. K., Larson, M. J.,

Fernandez, M., & Grabill, K. (2007). Family Accommodation in Pediatric Obsessive–Compulsive

Disorder. *Journal of Clinical Child & Adolescent Psychology*, *36*(2), 207–216.

https://doi.org/10.1080/15374410701277929

Storch, E. A., Lewin, A. B., Collier, A. B., Arnold, E., De Nadai, A. S., Dane, B. F., Nadeau, J. M., Mutch, P.

J., & Murphy, T. K. (2015). A Randomized Controlled Trial of Cognitive-Behavioral Therapy versus

Treatment as Usual for Adolescents with Autism Spectrum Disorders and Comorbid Anxiety.

Depression and Anxiety, *32*(3), 174–181. https://doi.org/10.1002/da.22332

Storch, E. A., Schneider, S. C., Olsen, S. M., Ramirez, A. C., Berry, L. N., Goin-Kochel, R. P., McNeel, M.,

Candelari, A. E., Guzick, A. G., Cepeda, S. L., Weinzimmer, S., Voigt, R. G., Quast, T., Goodman,

W. K., & Salloum, A. (2022). Stepped-Care Cognitive Behavioral Therapy in Children on the

Autism Spectrum with Co-occurring Anxiety. *Journal of Autism and Developmental Disorders*.

https://doi.org/10.1007/s10803-022-05775-w

Sutherland, R., Trembath, D., & Roberts, J. (2018). Telehealth and autism: A systematic search and

    review of the literature. *International Journal of Speech-Language Pathology*, *20*(3), 324–336.

    https://doi.org/10.1080/17549507.2018.1465123

Thirlwall, K., Cooper, P. J., Karalus, J., Voysey, M., Willetts, L., & Creswell, C. (2013). Treatment of child

    anxiety disorders via guided parent-delivered cognitive–behavioural therapy: Randomised

    controlled trial. *The British Journal of Psychiatry*, *203*(6), 436–444.

    https://doi.org/10.1192/bjp.bp.113.126698

Torp, N. C., Dahl, K., Skarphedinsson, G., Thomsen, P. H., Valderhaug, R., Weidle, B., Melin, K. H., Hybel,

    K., Nissen, J. B., Lenhard, F., Wentzel-Larsen, T., Franklin, M. E., & Ivarsson, T. (2015).

    Effectiveness of cognitive behavior treatment for pediatric obsessive-compulsive disorder: Acute

    outcomes from the Nordic Long-term OCD Treatment Study (NordLOTS). *Behaviour Research*

    and Therapy, *64*, 15–23. https://doi.org/10.1016/j.brat.2014.11.005

Ung, D., Selles, R., Small, B., & Storch, E. (2014). A Systematic Review and Meta-Analysis of Cognitive-

    Behavioral Therapy for Anxiety in Youth with High-Functioning Autism Spectrum Disorders. *Child*

    Psychiatry and Human Development, *46*. https://doi.org/10.1007/s10578-014-0494-y

van Oort, F. V. A., Verhulst, F. C., Ormel, J., & Huizink, A. C. (2010). Prospective community study of

    family stress and anxiety in (pre)adolescents: The TRAILS study. *European Child & Adolescent*

    Psychiatry, *19*(6), 483–491. https://doi.org/10.1007/s00787-009-0058-z

van Steensel, F. J. A., & Bögels, S. M. (2015). Cbt for anxiety disorders in children with and without

    autism spectrum disorders. *Journal of Consulting and Clinical Psychology*, *83*(3), 512.

    https://doi.org/10.1037/a0039108

Vasa, R. A., Keefer, A., McDonald, R. G., Hunsche, M. C., & Kerns, C. M. (2020). A Scoping Review of

    Anxiety in Young Children with Autism Spectrum Disorder. *Autism Research*, *13*(12), 2038–2057.

    https://doi.org/10.1002/aur.2395

Wechsler, D. (2011). *Wechsler Abbreviated Scale of Intelligence—Second Edition* [dataset].

https://doi.org/10.1037/t15171-000

Williamson, A. A., Zendarski, N., Lange, K., Quach, J., Molloy, C., Clifford, S. A., & Mulraney, M. (2021).

Sleep problems, internalizing and externalizing symptoms, and domains of health-related quality

of life: Bidirectional associations from early childhood to early adolescence. *Sleep*, *44*(1),

zsaa139. https://doi.org/10.1093/sleep/zsaa139

Wood, J. J., Kendall, P. C., Wood, K. S., Kerns, C. M., Seltzer, M., Small, B. J., Lewin, A. B., & Storch, E. A.

(2020). Cognitive Behavioral Treatments for Anxiety in Children With Autism Spectrum Disorder:

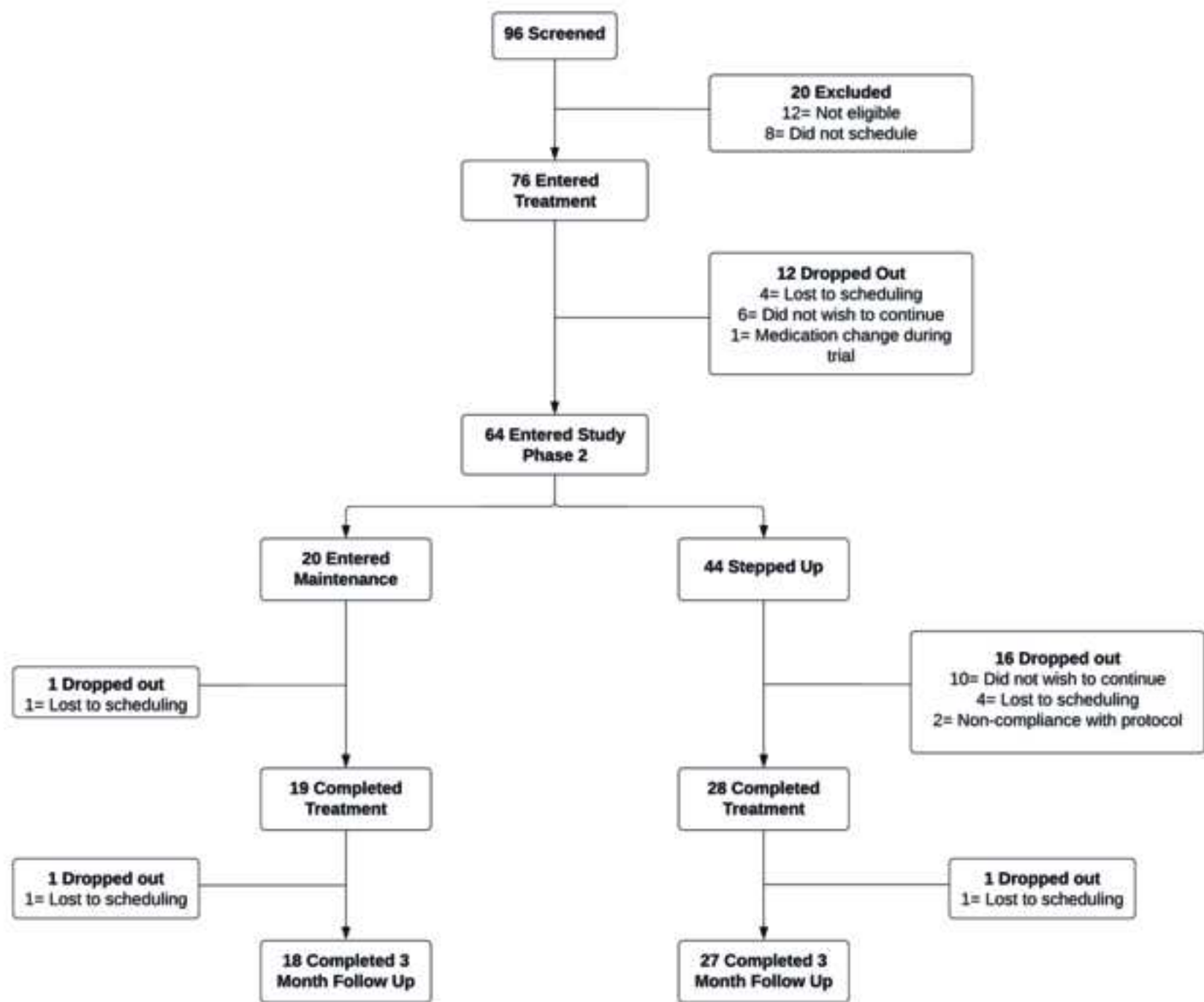A Randomized Clinical Trial. *JAMA Psychiatry*, *77*(5), 474–483.

https://doi.org/10.1001/jamapsychiatry.2019.4160

Table 2

Fixed and Random Effects of Final Models

	RCADS-P-D		CBCL-E		DASS-S		DASS-D		DASS-A	
	Post	3 M FU	Post	3 M FU	Post	3 M FU	Post	3 M FU	Post	3 M FU
Fixed effects	*b*	*b*	*b*	*B*	*b*	*b*	*b*	*B*	*b*	*b*
Intercept	4.74***	4.55***	13.26***	12.83***	4.37***	4.34***	1.37*	1.38*	1.47*	1.45
Step Status [a]	1.7	2	1.37	1.84	0.97	1.06	0.97	1.05	0.41	0.48
Linear time	-4.35***	-2.58*	-9.10***	-4.67**	-0.92	-0.9179	-0.23	-0.43	-0.52	-0.35
Time*time	1.62**	0.59*	3.40**	0.88	0.34	0.34151	0.18	0.27	0.24	0.13
Step Status*time	4.31**	1.35	7.77*	2.91	1.3	1.29633	1.65	0.85	0.86	0.15
Step Status*time* time	-2.14**	-0.42	-3.36*	-0.58	-0.5	-0.4993	-0.94	-0.45	-0.52	-0.091
Random effects										
Residual	3.63***	4.13***	15.45***	19.31***	5.45***	5.49***	3.14***	3.59	2.45***	3.23***
Intercept	8.54***	8.47***	59.46***	55.62***	5.42***	5.65***	3.03***	2.96	3.23***	3.12***
Time	0.39	-- [b]	4.67	0.63	0.52	0.38	-- [b]	-- [b]	-- [b]	-- [b]
Time*time	-- [b]	-- [b]	-- [b]	-- [b]	-- [b]	-- [b]	0.065	0.031	0.11 [b]	-- [b]

+p<.06; ++p=.050 *p < .05, **p < .01, *** p < .001

a Step status refers to a binary variable of whether the participant participated in steps 1 and 2 vs. step 1 and maintenance

Table 2

Click here to access/download;Table;Table 2.docx ⬇

b Random effect was redundant with other terms and not estimated

Note. PARS=; RCADS-P-D=Revised Child Anxiety and Depression Scale, Depression Subscale Parent Report; DASS-D = Depression, Anxiety, Stress Scale, Depression subscale; DASS-S= Depression, Anxiety, Stress Scale, Stress Subscale; DASS-A= Depression, Anxiety, Stress Scale, Anxiety Subscale; CBCL-E = Child Behavior Checklist, Extenalizing Symptoms Subscale

Table 1

Baseline Characteristics and Demographics

	Full sample, N=76	*Step 1 responder, N=18*	*Step 1 Non-responder, N=46*	*Difference btw[a]*	*Effect size [95% CI[b]]*
Primary diagnosis, N (%)				*χ2 (1) = 5.57*	
Specific phobia	*15 (20%)*	*5 (28%)*	*4 (9%)*		*OR 4.03 [0.94, 17.29]*
Social anxiety	*12 (16%)*	*3 (17%)*	*7 (15%)*		*OR 1.11 [0.25, 4.88]*
Separation anxiety	*21 (28%)*	*3 (17%)*	*16 (35%)*		*OR 0.38 [0.094, 1.49]*
Generalized anxiety disorder	*16 (21%)*	*5 (28%)*	*10 (22%)*		*OR 1.38 [0.40, 4.82]*
Obsessive–compulsive disorder	*4 (5%)*	*0 (0%)*	*4 (9%)*		*N/A*
Other specified anxiety disorder	*8 (11%)*	*2 (11%)*	*5 (11%)*		*OR 1.03 [0.18, 5.83]*
Major Depressive Disorder	*10 (13.2%)*	*1 (5.6%)*	*6 (13%)*	*χ2 (1) = 0.745*	
PTSD	*2 (2.6%)*	*0 (0%)*	*1 (2.2%)*	*χ2 (1) = 0.398*	
Tic Disorders	*10 (13.2%)*	*3 (16.7%)*	*7 (15.2%)*	*χ2 (1) = 0.021*	

ADHD	51 (67.1%)	15 (83.3%)	29 (63%)	χ2 (1) = 2.479	
Conduct Disorder	4 (5.3%)	2 (11.1%)	2 (4.3%)	χ2 (1) = 1.01	
ODD	18 (23.7%)	3 (16.7%)	9 (19.6%)	χ2 (1) = 0.071	
Age, M (SD)				t (62) = 1.09	OR .30 [− .25, .85]
Child gender, N (%)				χ2 (1) = 0.071	OR 0.82 [0.78, 1.80]
Male	63 (83%)	15 (83.3%)	37 (80.4%)		
Female	13 (17%)	3 (16.7%)	9 (19.6%)		
Race				χ2 (1) = 0.10c	OR 1.22c [0.55, 2.72]
White	57 (75%)	13 (72.2%)	35 (76.1%)		
Black or African American	6 (7.9%)	1 (5.6%)	4 (8.7%)		
Asian	5 (6.6%)	0 (0%)	5 (10.9%)		
American Indian or Alaskan Native	1 (1.3%)	1 (5.6%)	0 (0%)		
Mixed race	6 (7.9%)	3 (16.7%)	2 (4.3%)		
Other	1 (1.3%)	0 (0%)	0 (0%)		
Ethnicity				χ2 (1) = 0.071	OR 1.14 [0.51, 2.58]

Hispanic or Latino	26 (34.2%)	6 (33.3%)	14 (30.4%)
Not Hispanic or Latino	50 (65.8%)	12 (66.7%)	32 (69.6%)
Parent Information			$\chi2 (1) = 1.232$
Relationship to Child – Biological Parent	72 (94.7%)	18 (100%)	43 (93.5%)
Relationship to Parent – Adoptive Parent	2 (2.6%)	0 (0%)	2 (4.3%)
Relationship to Parent - Other	2 (2.6%)	0 (0%)	1 (2.2%)
Parent Gender			$\chi2 (1) = 0.181$
Male	10 (13.2%)	2 (11.1%)	7 (15.2%)
Female	66 (86.8%)	16 (88.9%)	39 (84.8%)
Child Living Arrangements			$\chi2 (4) = 2.143$
Live with both biological parents (same residence)	60 (78.9%)	16 (88.9%)	35 (76.1%)
Lives with both biological parents (different residences)	3 (3.9%)	1 (5.6%)	2 (4.3%)
Lives with single parent	10 (13.2%)	1 (5.6%)	6 (13.0%)
Lives with mother and stepfather	2 (2.6%)	0 (0%)	2 (4.3%)
Other	1 (1.3%)	0 (0%)	1 (2.2%)

Note. *p < .05; **p < .01; ***p < .001

[a]Tested with χ^2 for categorical variables to test proportion differences and t tests for continuous variables

[b]*OR*s in the education comparisons were calculated by comparing the odds of being a Step 1 responder in the identified race/educational group vs. the other groups (e.g., the odds of participants with mothers with a bachelor's degree responding to Step 1 vs. the odds of participants with another level of education responding to Step 1). *ORs* in the race category were calculated as White vs. non-White because of the small number of non-White participants, and thus limited statistical power to compare to other groups individually

[c]Refers to White vs. non-White comparison because of the limited sample identifying as non-White