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Behavior Therapy for Tics in Children: Acute and Long-Term Effects on Psychiatric and Psychosocial Functioning

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Abstract

Children (n = 126) ages 9 to 17 years with chronic tic or Tourette disorder were randomly assigned to receive either behavior therapy or a control treatment over 10 weeks. This study examined acute effects of behavior therapy on secondary psychiatric symptoms and psychosocial functioning and long-term effects on these measures for behavior therapy responders only. Baseline and end point assessments conducted by a masked independent evaluator assessed several secondary psychiatric symptoms and measures of psychosocial functioning. Responders to behavior therapy at the end of the acute phase were reassessed at 3-month and 6-month follow-up. Children in the behavior therapy and control conditions did not differentially improve on secondary psychiatric or psychosocial outcome measures at the end of the acute phase. At 6-month posttreatment, positive response to behavior therapy was associated with decreased anxiety, disruptive behavior, and family strain and improved social functioning. Behavior therapy is a tic-specific treatment for children with tic disorders.

Keywords

Tourette disorder; tics; behavior therapy; secondary outcomes

Tourette disorder involves multiple motor tics and at least 1 vocal tic that have been present ≥1 year.[1] Tics are the primary symptom of Tourette disorder, but affected individuals often experience co-occurring psychiatric symptoms[2] and psychosocial sequelae (eg, family disturbances, impaired quality of life).[3-5]

Various pharmacological treatments exist for Tourette disorder, including traditional and atypical antipsychotics (eg, haloperidol, pimozide, risperidone) and alpha-agonists (eg, clonidine, guanfacine).[6] Although medications appear generally effective for reducing tics, their effect on co-occurring psychiatric symptoms and other psychosocial sequelae remains unclear. Few studies on the efficacy of medications for tics have evaluated the effect on secondary psychiatric/psychosocial outcomes beyond assessment of global functioning.[7-12] Most studies of medication for Tourette disorder have small sample sizes, limiting the ability to evaluate secondary effects, and those that have evaluated secondary effects have yielded mixed findings. Some studies have shown no effect on co-occurring obsessive-compulsive disorder or attention-deficit/hyperactivity disorder (ADHD) symptoms,[13-15] and others have shown improvements in ADHD symptoms.[16-18] In sum, these results suggest that broader effects of medication for Tourette disorder on co-occurring psychiatric symptoms and specific indices of psychosocial functioning are incomplete and understudied.

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Another treatment option to reduce tic severity is behavior therapy. One approach, known as habit-reversal training, was developed nearly 40 years ago[19] and is supported by numerous studies.[20] Habit-reversal training involves teaching the patient to recognize the onset of tics and the premonitory urges that precede them. When such an urge appears, patients are instructed to engage in a "competing response" (ie, a movement that physically prevents the tic from occurring) for 1 minute or until the urge to tic diminishes.

More recently, our group has enhanced habit-reversal training by adding a function-based intervention component, which involves identifying contextual factors that exacerbate tics (eg, specific settings or social reactions that worsen tics) and developing specific behavioral strategies for reducing contact or improving the patient's ability to cope with these factors. This combined behavioral treatment (ie, habit-reversal training plus function-based interventions) has been labeled *comprehensive behavioral intervention for tics* (ie, behavior therapy)[21] and was recently tested in a large-scale multisite randomized controlled trial. In this study, 126 children ages 9 to 17 years were randomized to 8 sessions (over 10 weeks) of either behavior therapy (n = 61) or a psychoeducation and supportive therapy control condition (n = 65).[22] Assessment by masked independent evaluators showed a significant reduction in tic severity and tic-related impairment along with an improvement in global functioning at the end of 10 weeks of treatment for those receiving behavior therapy compared to those receiving supportive therapy. In the behavior therapy group, 53% (n = 32) of participants were classified as having achieved a positive response compared to 19% (n = 12) of participants in the control condition. Participants showing a positive response were reassessed at 3 and 6 months posttreatment. Of those available for reassessment at the 6-month point (n = 23), 87% maintained their positive response.

Despite the documented utility of habit-reversal training as a treatment for tics going back over 40 years, widespread adoption of the intervention has not occurred.[23] Reasons for this are likely because of limited large-scale empirical support for this intervention. In addition, popular press and professional writings have questioned whether behavioral procedures could produce worsening of psychiatric and psychosocial outcomes in the child and increased family strain.[24] For example, it has been suggested that behavior modification procedures applied to tics could cause increases in aggressiveness, irritability, and symptoms of obsessive-compulsive disorder.[25] Likewise, popular press articles and books on Tourette disorder have suggested that teaching a child techniques to "suppress" tics may result in increased family conflict, decreased selfesteem, heightened anxiety, greater inability to concentrate, and increased depression.[26,27]

Unfortunately, and similar to the psychopharmacological treatment literature, the generalized effects of habit-reversal training on broader psychiatric and psychosocial indices have rarely been evaluated systematically. As a result, concerns about possible negative effects of interventions, such as behavior therapy for tics, have not been adequately tested.

In the current study, data from the comprehensive behavioral intervention for tics trial[22] were used to test whether behavior therapy, in comparison to psychoeducation and supportive therapy, produces a differential response on measures of other psychiatric symptoms and/or indices of psychosocial functioning. In addition, exploratory analyses were

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conducted to assess changes in psychiatric symptom severity and psychosocial functioning across 3- and 6-month follow-up periods in participants whose tics showed a positive response in the acute phase.

Methods

This study was approved by the Human Subjects Institutional Review Boards at the University of California, Los Angeles; University of Wisconsin–Milwaukee; Johns Hopkins University; Yale University; University of Texas Health Sciences Center–San Antonio; and Massachusetts General Hospital/Harvard. The Consolidated Standards of Reporting Trials diagram was originally reported in Piacentini et al,[22] and the trial was registered on clinicaltrials.gov (identifier: NCT00218777). All participants and their parents provided written informed consent/assent.

Participants

As reported in Piacentini et al,[22] participants included 126 children and adolescents with a current diagnosis of Tourette disorder (n = 118, 94%) or chronic tic disorder (n = 8, 6%). The sample had a mean age of 11.7 years (range, 9-17) and was largely male (n = 99, 78.6%) and primarily white (n = 106, 84.1%). Full inclusion and exclusion criteria are described in Piacentini et al,[22] but exclusionary criteria of relevance to the current study include the following: IQ below 80; a lifetime diagnosis of pervasive developmental disorder, mania, or psychotic disorder; a current diagnosis of substance abuse/dependence; recent (ie, <6 weeks) initiation or change in psychotropic medication; presence of another psychiatric condition requiring more immediate treatment; and Yale Global Tic Severity Scale[28] total tic severity score <14 (<10 for children with chronic motor or vocal tic disorder) or >30 (those >30 could be approved by a cross-site case panel, and 15 participants with scores >30 were included). Children with a tic severity score <14 were excluded because the disorder was deemed too mild to warrant inclusion and because the baseline score needed to be high enough to offer room for measurable change. Those with tic severity scores >30 were initially excluded because the disorder was considered to be relatively severe, and study personnel wanted to review all available treatment options with the participant before deciding to randomize. Those with tic severity scores >30 who were ultimately randomized had either attempted trials of medication deemed adequate by the cross-site case panel or maintained their request to participate in the trial even after being informed of other treatment options.

Measures

Measures of co-occurring psychiatric symptoms—The ADHD Rating Scale is an 18-item scale derived from the ADHD criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (4th edition).[29] Each item is rated on a 4-point scale (0 = not present; 3 = severe), and the instrument has been shown to be sensitive to medication effects in children with Tourette disorder. The ADHD Rating Scale produces 3 scores, including a 9-item inattentive score, a 9-item hyperactivity score, and the 18-item total score. The 8-item companion scale, Disruptive Behavior Rating Scale,[30] was added to the ADHD Rating Scale as a measure of oppositional defiant behavior. Parents rate each of the 8 Disruptive Behavior

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Rating Scale items on a 0 to 3 scale, with higher numbers reflecting more frequent occurrences of the oppositional symptoms. The Disruptive Behavior Rating Scale has shown sensitivity to change in other treatment studies of children with Tourette disorder.[31]

The Child Behavior Checklist, an 118-item parent-report measure of child psychopathology, is one of the most extensively tested and normed rating scales available and possesses excellent psychometrics. T scores allow for normative comparisons across 2 general areas of functioning (ie, problem behavior and social competency) and 11 narrowband subscales.[32] In the current study, internalizing, externalizing, and total problems subscales were used as indicators of psychiatric symptoms, and the activities, school, social, and total competencies subscales were used as indicators of adaptive functioning.

The Children's Depression Inventory is a 27-item (rated 0-2) child self-report questionnaire assessing depressive symptoms over the preceding 2 weeks. Age and gender–based T scores are generated for a total depression score. Reliability and concurrent validity have been found to be high, and age- and gender-based norms are available.[33]

The Children's Yale-Brown Obsessive Compulsive Scale[34] is a 10-item, semi-structured interview used to assess the severity of obsessive and compulsive symptoms in youth ages 6 to 17 years. The scale includes 5 dimensions each for obsessions and compulsions (ie, time spent, interference, distress, resistance, and degree of control for obsessions and compulsive behaviors). Each item is rated on a 0- to 4-point ordinal scale (range, 0-40). The scale has good internal consistency as well as convergent and divergent validity.[34]

The Screen for Child Anxiety Related Emotional Disorders[35] is a self-report instrument used to screen for specific anxiety disorder symptoms in children, excluding obsessive-compulsive disorder. The instrument is completed separately by the child and his or her parent. A total score ≥25 would suggest an anxiety disorder diagnosis. The instrument possesses good internal consistency. [35,36]

Measures of psychosocial functioning—The Family Assessment Measure-III, Short Form [37] is a 14-item scale that is independently administered to the parent and affected child. The scale provides a global index of family function with higher scores reflecting greater impairment. The short form of the scale was derived from the original Family Assessment Measure–III, which has established internal consistency and construct validity.

The Caregiver Strain Questionnaire[38] assesses the extent to which the child's chronic condition has negatively affected the family. Parents rate the 21 items on a 0 to 5 scale. The questionnaire provides a 10-item subscale measuring objective strain (eg, demands on time, financial strain) and an 11-item subscale assessing subjective strain (eg, worry, embarrassment). The sum of all 21 items may be used as a total score. Acceptable psychometric properties have been reported.[38]

The Social Adjustment Scale—Self Report[39,40] assesses social adjustment across 3 major role areas (school behavior, 6 items; friends/spare time, 9 items; and family behavior, 6 items). A fourth domain, dating, is not recommended for children younger than age 12, so the two related items were omitted. Youth in this study rated the remaining 21 items on a 5-

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point scale with higher scores reflecting greater impairment. Separate scores were calculated for each of the 3 aforementioned role areas.

Procedures

After providing informed consent, all participants and their parents were assessed by an independent evaluator masked to treatment arm. These raters were trained to reliability on the study assessments and met regularly via teleconference with an assessment expert (Dr Scahill) to minimize assessor drift. Participants were screened for eligibility into the study and returned within 2 weeks to complete a baseline assessment. Eligible participants were randomly assigned to either the behavior therapy or psychoeducation and supportive therapy condition. Both treatments involved 8 weekly sessions over 10 weeks. For the assessment of acute-phase efficacy, independent evaluations were held at week 0 (baseline), week 5 (midpoint), and week 10 (endpoint). Measures of co-occurring psychiatric symptoms and psychosocial functioning were available at weeks 0 and 10. At week 10, participants whose tics showed positive treatment response (ie, a score of 1 = very much improved or 2 = much improved on the Clinical Global Impressions–Improvement Scale[41]) were given 3 booster sessions over the course of the next 3 months (1 per month). Those participants were reassessed by masked independent evaluators on measures of tic severity and a range of clinical outcomes at 3 and 6 months posttreatment.

Analytic Plan

Week 10 comparisons across groups—The intent-to-treat principle was applied, in which all randomized participants were included and analyzed in their assigned treatment. Treatment effect (behavior therapy vs psychoeducation and supportive therapy) from baseline to week 10 was tested with analysis of covariance. The model included fixed effects for treatment (2 levels), site, tic medication status (on/off), and baseline outcome measure. Treatment-by-baseline interactions were also examined and dropped from the models due to non-significance. The analysis of covariance model was used to provide adjusted means for the treatment groups that controlled for covariate (site and tic medication) differences.

Three- and 6-month follow-up data on acute-phase behavior therapy responders—Given the small number of participants showing a positive response to psychoeducation and supportive therapy (12 of 65), analysis of follow-up data focused on participants showing a positive response to behavior therapy (32 of 61). Adjustments for site and tic medication at baseline were also included in these analyses. The overall time effect as well as adjusted means at baseline, week 10, and 3-month and 6-month follow-up were reported within the behavior therapy group on all aforementioned outcome variables. Post hoc tests were conducted comparing change from baseline to 3-month follow-up and from baseline to 6-month follow-up regardless of the significance of overall time effect. All significance levels were set at 0.05 and adjusted with Bonferroni correction for multiple comparisons. All analyses were performed with SAS Version 9.1 (SAS Institute, Cary, North Carolina).

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Results

Acute-Phase Comparisons Between Behavior Therapy and Psychoeducation and Supportive Therapy Participants

Psychiatric symptoms—The 2 groups were similar in the magnitude of change from baseline to week 10 on the various outcomes. Overall, behavior therapy did not result in a differential change in co-occurring psychiatric symptoms relative to psychoeducation and supportive therapy after adjusting for baseline symptom scores (Table 1).

Psychosocial functioning—Across various measures of psychosocial functioning, behavior therapy did not produce a differential effect on psychosocial functioning relative to a psychoeducation and supportive therapy condition (see Table 1).

Long-Term Effects on Positive Responders to Behavior Therapy in the Acute Phase

Psychiatric symptoms—Participants in the behavior therapy group who demonstrated clinically meaningful tic reduction during the 10-week randomized trial showed improvements on some measures and no change on others at 3- and 6-month post-treatment follow-up assessments (see Table 2). There was no change across time on the ADHD Rating Scale–Total Score, inattentive subscale, or hyperactive/impulsive subscale. On the Disruptive Behavior Rating Scale, however, participants showing a positive response to behavior therapy demonstrated significant improvement in disruptive behavior from baseline to the 6-month follow-up. Results from the Child Behavior Checklist Internalizing, Externalizing, or Total Problem scales did not demonstrate improvement across time. Most participants were not in the clinical range at baseline on these Child Behavior Checklist measures, and there was no indication of symptom shift following improvement in tics. The Children's Depression Inventory did not change over time for positive responders to behavior therapy, but child self-report scores on the Screen for Child Anxiety Related Emotional Disorders showed a significant decrease in anxiety from baseline to 3 and 6 months posttreatment. The Children's Yale-Brown Obsessive Compulsive Scale also showed a significant decrease in total score at month 6 compared to baseline. Collectively, these results suggest that youth who show a positive response to behavior therapy may also show improvement in disruptive behavior and anxiety symptoms. Moreover, there is no evidence of worsening across a range of dimensional measures.

Long-term effects on psychosocial outcomes—Participants who responded positively to behavior therapy did not show improvement on the Child Behavior Checklist Activities, Social School, or Total Competency scales at the 6-month post-treatment follow-up. Likewise, there was no difference on the Family Assessment Measure–III Short Form parent or child score. However, subjective strain and total scores on the Caregiver Strain Questionnaire decreased over time with marginal significance (see Table 2). There was no change on the Caregiver Strain Questionnaire objective strain score. On the Social Adjustment Scale–Self Report, participants who showed a positive response to behavior therapy also demonstrated marginally significant improvement across time in the family subscale and significant improvement in the friends subscale at 3 and 6 months

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posttreatment. No significant changes across time were observed on the schoolwork subscale.

Discussion

The current study compared the effects of behavior therapy and psychoeducation and supportive therapy on secondary psychiatric and psychosocial outcomes following 10 weeks of treatment focused on tics. At the end of acute treatment, behavior therapy did not provide differential improvement or worsening on any secondary outcomes compared to a psychoeducation and supportive therapy condition, which did not include specific tic management strategies. These findings run contrary to beliefs that behavior therapy for tics are likely to yield adverse effects on disruptive behavior, attention, mood, and anxiety regulation, as well as increased family conflict. Indeed, these results suggest that behavior therapy has a relatively specific effect on tic symptoms, which is consistent with findings from several medication studies.[14-16]

Few prior treatment trials in youth with Tourette disorder have examined the longer term effects on concomitant psychiatric symptoms or broader psychosocial outcomes. In this trial, participants who showed a positive response to behavior therapy demonstrated improvement from baseline across multiple areas of functioning 6 months after treatment. There were notable decreases in symptoms of obsessive-compulsive disorder, disruptive behavior, and anxiety. Acute-phase positive responders to behavior therapy also reported improvement in social functioning with families and friends. Parents of participants who showed a positive response to behavior therapy reported a reduction in family strain in the same time frame. Taken together, these results do not support previous concerns that behavior therapy for tics may lead to undesirable emotional or psychosocial consequences.[25-27]

The analysis of short-term and downstream effects on co-occurring symptoms and psychosocial functioning is of interest, but there are inherent limitations due to the study design and sample selection. The behavior therapy study was designed and statistically powered to test the impact on tic severity in a 10-week trial. In addition, although children with ADHD, obsessive-compulsive disorder, or other anxiety disorders were not excluded, subjects were excluded if the co-occurring condition required more immediate treatment. Thus, few participants had elevated scores on these secondary symptom measures. Finally, psychoeducation and supportive therapy was specifically designed to provide support for the overall clinical condition and would be expected to have positive effects on behavior, emotional regulation, and family adaptation. Thus, it is not surprising that psychiatric symptom severity and broader psychosocial outcomes improved in both groups, and differences between the 2 treatment groups at week 10 were small. Given the uniformity and small magnitude of effects, it is unlikely that a larger sample would show group differences on these outcomes.

Another point worthy of consideration is that 10 weeks may not have been sufficient to detect improvement in secondary psychiatric symptoms and psychosocial functioning in these treatment groups. It is possible that behavior therapy may produce differential change in secondary symptoms and psychosocial functioning compared to psychoeducation and

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supportive therapy in the follow-up phase. Because we offered behavior therapy to participants who failed to achieve a positive response to psychoeducation and supportive therapy in the acute trial, group comparisons after the acute phase were not possible. In the absence of the control group for the longer term outcome, it is not certain that observed benefits within the behavior therapy group can be attributed to the treatment itself. These limitations notwithstanding, our findings provide reassurance to families and clinicians who may be concerned that behavioral intervention for tics could lead to negative downstream effects. Future studies designed to evaluate the effectiveness of behavior therapy in broader samples of youth with Tourette disorder may provide additional insight into the ancillary benefits of behavior therapy.

In summary, the preliminary data reported here suggest that acute-phase behavior therapy is a relatively tic-specific treatment. The participants who showed a positive response to behavior therapy also exhibited improvements in some measures of secondary psychiatric symptoms and psychosocial functioning up to 6 months after the treatment ended. These data suggest that behavior therapy for Tourette disorder may be useful as part of an overall treatment package in youth with Tourette disorder—including those with common co-occurring conditions. However, behavior therapy for tics is not intended to replace more specific treatments for disruptive behavior, obsessive-compulsive disorder, or other anxiety disorders.

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Table 1

Adjusted Means and Standard Deviations on Co-Occurring Psychiatric Symptoms and Psychosocial Outcomes Across Groups at 10-Week Assessment

	CBIT		PST			
Measure	**Week 0**	**Week 10**	**Week 0**	**Week 10**	***t* Value**	***P* Value**
Secondary psychiatric symptoms						
Attention Deficit/Hyperactivity Disorder Rating Scale						
Inattentive score	9.68 (7.26)	8.58 (6.85)	8.67 (7.54)	7.57 (6.85)	$t(113) = -0.17$	.86
Hyperactive score	6.71 (6.28)	6.56 (6.32)	5.42 (5.57)	4.66 (5.78)	$t(113) = 1.2$	.23
Total score	16.39 (12.4)	15.14 (12.30)	14.1 (12.2)	12.26 (11.66)	$t(113) = 0.57$	.57
Disruptive Behavior Rating Scale	6.64 (5.11)	6.01 (5.51)	5.85 (4.81)	5.27 (5.07)	$t(112) = -.06$	.96
Child Behavior Checklist						
Internalizing problems	53.64 (11.06)	51.2 (9.84)	53.48 (11.64)	51.9 (9.96)	$t(105) = 0.23$	.52
Externalizing problems	49.41 (10.55)	51.27 (10.63)	48.51 (10.25)	48.90 (10.91)	$t(105) = 1.59$	.12
Total problems	53.10 (9.90)	52.71 (9.65)	52.82 (10.10)	51.52 (10.65)	$t(102) = 1.14$	.26
Children's Depression Inventory						
Total Score	44.1 (8.20)	41.3 (6.89)	43.16 (6.44)	41.8 (7.01)	$t(109) = 1.0$	.32
Screen for Child Anxiety Related Emotional Disorders						
Parent	13.01 (8.50)	9.81 (7.68)	13.33 (8.75)	11.27 (9.07)	$t(111) = 0.64$	.52
Children	17.66 (11.08)	10.26 (11.55)	19.20 (9.60)	12.77 (10.19)	$t(111) = 0.79$	.43
Children's Yale-Brown Obsessive Compulsive Scale						
Total score	5.95 (7.58)	4.28 (7.28)	7.19 (7.54)	5.73 (7.80)	$t(105) = -.31$	.75
Secondary psychosocial functioning						
Child Behavior Checklist						
Activities subscale	47.23 (9.18)	49.20 (10.08)	47.38 (9.56)	47.92 (9.45)	$t(106) = 0.9$	.37
Social subscale	49.62 (10.18)	49.37 (9.50)	49.49 (9.50)	48.59 (9.00)	$t(102) = 0.65$	.51
School subscale	45.70 (9.51)	44.42 (9.38)	45.63 (8.50)	44.78 (8.97)	$t(102) = 0.41$	.68
Total competency	48.33 (10.59)	48.04 (11.42)	47.88 (9.81)	47.20 (9.59)	$t(102) = 0.55$	.58
Family Assessment Measure–III, Short Form						
Parent total	23.9 (5.13)	23.9 (4.86)	22.7 (5.04)	22.0 (4.53)	$t(107) = 1.59$	.12
Child total	25.3 (5.10)	23.6 (5.94)	26.8 (6.07)	25.4 (25.4)	$t(107) = 1.19$	.31

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	CBIT		PST			
Measure	**Week 0**	**Week 10**	**Week 0**	**Week 10**	***t* Value**	***P* Value**
Caregiver Strain Questionnaire						
Objective strain score	16.8 (7.75)	16.3 (6.66)	18.4 (8.82)	17.8 (7.7)	$t(105) = 0.56$	.58
Subjective strain score	24.6 (7.34)	23.0 (7.05)	25.6 (7.25)	24.3 (6.9)	$t(105) = 0.44$	.66
Total score	41.4 (14.0)	39.2 (13.1)	44.0 (15.2)	42.0 (13.9)	$t(105) = 0.52$	.60
Social Adjustment Scale–Self Report						
Family	10.08 (3.34)	8.95 (3.02)	9.95 (3.22)	9.24 (2.77)	$t(106) = 1.24$	.22
Friends	16.97 (3.74)	14.8 (3.61)	17.15 (11.02)	15.52 (5.92)	$t(107) = 1.38$	.17
School	10.1 (2.83)	9.52 (2.53)	10.37 (2.71)	9.55 (2.77)	$t(87) = 0.60$	.55

CBIT, comprehensive behavioral intervention for tics; PST, psychoeducation and supportive therapy.

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Table 2

Adjusted Means and Standard Deviations on Psychiatric Symptom Measures and Psychosocial Outcomes Across Time for Participants Showing a Positive Response to Behavior Therapy

Measure	Week 0	Week 10	Month 3	Month 6	*F* Value (df)	*P* Value
Secondary Psychiatric Symptoms						
Attention Deficit/Hyperactivity Disorder Rating Scale						
Inattentive score	8.47 (7.08)	7.26 (6.10)	7.65 (6.22)	8.23 (6.83)	$F(4, 22) = 0.46$	.76
Hyperactive score	5.38 (5.12)	5.03 (5.15)	4.41 (4.84)	4.49 (4.29)	$F(4, 26) = 0.59$	.67
Total score	13.94 (10.91)	12.38 (10.34)	12.20 (10.14)	12.02 (9.39)	$F(4, 24) = 0.40$	.8
Disruptive Behavior Rating Scale	5.92 (4.81)	5.14 (4.49)	5.09 (3.74)	4.42^{b} (5.15)	$F(4, 24) = 2.37$	.026
Child Behavior Checklist						
Internalizing problems	52.17 (12.15)	50.10 (7.65)	48.07 (8.67)	47.78 (11.66)	$F(3, 26) = 1.60$	.21
Externalizing problems	48.22 (9.42)	49.30 (9.65)	48.14 (9.21)	47.38 (7.83)	$F(3, 26) = 0.74$	.54
Total problems	51.58 (9.34)	50.67 (7.95)	49.9 (8.06)	48.17 (7.83)	$F(3, 26) = 1.04$	.39
Children's Depression Inventory						
Total score (T score)	41.51 (9.67)	39.1 (3.6)	39.82 (5.25)	38.81 (4.35)	$F(4, 23) = 0.71$	.11
Screen for Child Anxiety Related Emotional Disorders						
Parent	11.18 (7.49)	7.48 (4.04)	7.28 (5.53)	7.69 (5.63)	$F(4, 25) = 2.08$	.11
Child	15.30 (11.58)	8.16 (11.04)	9.51^{a} (9.90)	8.07^{b} (8.16)	$F(4, 27) = 5.53$	.002
Children's Yale-Brown Obsessive Compulsive Scale						
Total score	6.13 (7.00)	3.07 (6.19)	3.77 (2.78)	2.29^{b} (7.84)	$F(4, 27) = 4.69$	.005
Secondary psychosocial functioning						
Child Behavior Checklist						
Activities subscale	46.99 (9.61)	47.50 (9.37)	48.40 (10.87)	46.56 (8.14)	$F(3, 18) = 0.38$	.77
Social subscale	50.87 (8.89)	49.52 (7.53)	48.72 (8.71)	50.06 (7.99)	$F(3, 25) = 1.18$	.34
School subscale	47.06 (9.27)	45.76 (8.79)	44.37 (9.11)	44.85 (8.90)	$F(3, 24) = 2.12$	.13
Total competency	50.11 (9.23)	48.30 (9.33)	48.64 (10.92)	49.93 (8.56)	$F(3, 20) = .59$	.63
Family Assessment Measure–III, Short Form						
Parent total	23.92 (4.50)	22.92 (4.73)	22.52 (4.82)	22.44 (5.62)	$F(3, 25) = 1.92$	.15
Child total	23.87 (4.42)	21.87 (4.48)	22.36 (4.24)	22.53 (5.23)	$F(3, 25) = 2.67$	.07
Caregiver Strain Questionnaire						

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Measure	Week 0	Week 10	Month 3	Month 6	*F* Value (df)	*P* Value
Objective strain score	16.45 (7.64)	14.85 (6.55)	14.44 (4.57)	13.44 (5.09)	$F(3, 24) = 2.08$	.13
Subjective strain score	24.12 (6.53)	22.71 (5.89)	20.79 (6.06)	21.05 (6.34)	$F(3, 21) = 2.76$	.07
Total score	40.80 (13.11)	38.15 (11.14)	35.59 (9.91)	34.53 (10.74)	$F(3, 23) = 2.98$	.05
Social Adjustment Scale–Self Report						
Family	8.82 (2.27)	8.14 (2.46)	8.14 (2.59)	7.91 (1.64)	$F(3, 27) = 2.25$	.11
Friends	16.07 (3.21)	14.10 (2.59)	13.34[a] (3.12)	13.26[b] (2.11)	$F(3, 27) = 12.06$	<.0001
School	10.15 (2.84)	9.41 (2.30)	9.32 (2.61)	9.84 (4.22)	$F(3, 11) = 0.63$	.61

[a]Estimates at posttreatment month 3 and

[b]month 6 showed significant improvement from baseline.