ARTICLE IN PRESS

BETH-00755; No of Pages 13; 4C:

Available online at www.sciencedirect.com

ScienceDirect

Behavior Therapy xx (2017) xxx–xxx

ELSEVIER

Behavior Therapy

www.elsevier.com/locate/bt

The Long-Term Effects of Group-Based Psychological Interventions for Children With Tourette Syndrome: A Randomized Controlled Trial

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This randomized controlled trial examined the long-term effects of group-based psychological interventions on measures of tic severity, self-reported quality of life (QOL), and school attendance. Children (*n* = 28) with Tourette syndrome (TS) were assessed 12 months after completing a course of either group-based Habit Reversal Training (HRT) or Education.

Both groups demonstrated long-term improvement in tic severity and QOL, which included significant continued improvement during the follow-up (FU) period. Both groups also showed significant posttreatment improvement in school attendance. Further research is required to explore potential therapeutic mechanisms, independent or mutual, which may underlie long-term symptom improvements.

Keywords: habit reversal training; Tourette syndrome; children; long-term follow-up; psychoeducation

Tourette Syndrome (TS) is a neurodevelopmental disorder characterized by the presence of both motor and phonic tics. It is often associated with

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Full trial protocol available on request by contacting the corresponding author.

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Please cite this article as: Julia Dabrowski, et al., The Long-Term Effects of Group-Based Psychological Interventions for Children With Tourette Syndrome: A Randomized Controlled Trial, *Behavior Therapy* (2017), https://doi.org/10.1016/j.beth.2017.10.005

psychiatric comorbidity, social and emotional difficulties, impaired school functioning, and a diminished quality of life (Robertson, 2012; Storch et al., 2007).

Approximately 50% of individuals with TS present with a diagnosis of comorbid obsessive-compulsive disorder (OCD) or attention-deficit/hyperactivity disorder (ADHD; Abramovitch, Dar, Mittelman, & Wilhelm, 2015; Bloch et al., 2006; Gaze, Kepley, & Walkup, 2006). These co-occurring conditions can often compound the degree of functional, social, and emotional impairment, affecting the individual's overall quality of life (QOL; Specht et al., 2011; Storch et al., 2007). Indeed, research has shown that individuals with TS exhibit a significantly reduced QOL when compared to the non-TS population (Eddy et al., 2011; McGuire, Hanks, Lewin, Storch & Murphy, 2013; Müller-Vahl et al., 2010; Storch et al., 2007).

SCHOOL FUNCTIONING

Storch et al. (2007) noted that the presence of school functioning difficulties is a key contributor to poor self-reported QOL in children with TS. This is unsurprising given that children spend a considerable portion of their daily lives at school. Poor classroom concentration, difficulties with practical tasks (e.g., handwriting), and social isolation and bullying, have all been found to be common school-related issues experienced by children with TS (Debes, Hjalgrim & Skov, 2010; Packer, 2005). A fifth of children have been shown to experience a level of tic severity that made functioning at school at times unfeasible, affecting school attendance (Leckman et al., 1998). These findings suggest that an improvement in tic severity may lead to an improvement in school attendance rates; however, this is yet to be formally evaluated as a TS treatment outcome in children.

TREATMENT

Treatment guidelines endorse behavioral therapy (BT) and psychoeducation as first-line interventions for tic reduction in mild to moderate TS (Steeves et al., 2012; Verdellen et al., 2011). Habit Reversal Training (HRT; Azrin & Nunn, 1973) is arguably the most empirically supported behavioral approach, demonstrating medium to large treatment effects that are equivalent to effect sizes seen in drug trials of antipsychotic medication (Dutta & Cavanna, 2013; McGuire et al., 2014). HRT includes self-monitoring and awareness-building components that aim to attune the patient's awareness to the premonitory urge in order to facilitate early tic detection. Patients are then taught to apply a specific physically incompatible movement or sound, termed the "competing response," in order to effectively block the production of the tic. HRT can be combined with relaxation training and functional analysis to create a multicomponent intervention: the Comprehensive Behavioural Intervention for Tics (CBIT; Woods, 2008).

Psychoeducational interventions aim to target impairing psychosocial and comorbid difficulties by resolving misunderstanding around the diagnosis and alleviating anxiety (Cutler et al., 2009). Psychoeducation in a group format has been reported, in which topics included self-esteem, school, anger, attention, and OCD (Murphy & Heyman, 2007). Group delivery offers the added benefit of peer support and sharing of information among individuals.

Building on this, adaptations have been made to behavioural treatments to broaden the focus on the individual's quality of life. Storch et al. (2012) developed a modular treatment protocol (Living with Tics) that incorporates HRT with psychoeducation, problem solving, distress tolerance, and modules about coping at school, with the aim of improving tic-related impairment and resilience. Preliminary findings have highlighted the effectiveness of the Living with Tics intervention for improving QOL in children (McGuire et al., 2015).

TREATMENT OUTCOMES

Evidence supports the efficacy of CBIT in reducing tic severity when delivered face-to-face as an individual treatment with both children and adults (Piacentini et al., 2010; Wilhelm et al., 2012), as well as via telehealth (Himle et al., 2012; Ricketts et al., 2016). There is also emerging evidence for the efficacy of group-based HRT, which aims to increase the availability of behavioral interventions (Yates et al., 2016).

Despite the strong body of evidence supporting behavioral therapy for TS, few studies have investigated the long-term durability of therapeutic gains following these interventions. Of those studies that have carried out follow-up (FU) assessments, Wilhelm et al. (2003) report the longest FU period (10 months) and describe a maintenance of posttreatment improvement, while Woods et al. (2011) found continued improvements for TS-related psychosocial symptoms at 6 months posttreatment. At present, no FUs have been conducted beyond 10 months. Due to the waxing and waning nature of tics, short-term follow-ups may indirectly capture fluctuations in the natural course of symptom presentation and longer observation periods have been recommended (Roessner et al., 2011). It should also be noted that much of the available FU data suffer high attrition rates (~30%) and have been limited to "treatment

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