Computer-assisted cognitive behavioral therapy for children with epilepsy and anxiety: A pilot study

Jacquelyn B. Blocher [a], Mayu Fujikawa [b], Connie Sung [c], Daren C. Jackson [d], Jana E. Jones [d,*]

[a] Long Island University, Department of Psychology, Brookville, NY, USA
[b] University of Wisconsin-Madison, Department of Rehabilitation Psychology & Special Education, Madison, WI, USA
[c] Michigan State University, Department of Counseling, Educational Psychology and Special Education, East Lansing, MI, USA
[d] University of Wisconsin School of Medicine & Public Health, Department of Neurology, Madison, WI, USA

A B S T R A C T

Anxiety disorders are prevalent in children with epilepsy. The purpose of this study was to evaluate the efficacy, adaptability, and feasibility of a manual-based, computer-assisted cognitive behavioral therapy (CBT) intervention for anxiety disorders in children with epilepsy. Fifteen anxious youth (aged 8–13 years) with epilepsy completed 12 weeks of manualized computer-assisted CBT. The children and parents completed a semi-structured interview at baseline, and questionnaires assessing symptoms of anxiety, depression, and behavior problems were completed prior to treatment, at treatment midpoint, after treatment completion, and at three months posttreatment. There were significant reductions in the symptoms of anxiety and depression reported by the children at completion of the intervention and at the three-month follow-up. Similarly, the parents reported fewer symptoms of anxiety and a reduction in behavior problems. No adverse events were reported. This CBT intervention for children with epilepsy and anxiety disorders appears to be safe, effective, and feasible and should be incorporated into future intervention studies.

© 2012 Elsevier Inc. All rights reserved.

1. Introduction

Seizure disorders are the most common childhood neurologic condition, with 4–10% of children experiencing at least one seizure [1]. Children with epilepsy have higher rates of emotional and behavioral problems than their healthy peers [2–5]. More specifically, Pinquart and Shen [6] found that children with seizures are more likely to exhibit anxiety symptoms than children in the general population. The prevalence rates of anxiety disorders in children with epilepsy, as assessed by studies employing standardized psychiatric interviews, range from 13.0 to 48.5% [7–10]. As part of a large population-based investigation utilizing parental report, the 2007 National Survey of Children's Health found that children with a current seizure disorder were more likely to experience anxiety (17% v. 3%) and depression (8% v. 2%) than children without epilepsy [11].

The unpredictability of seizures and the associated sense of vulnerability may place children with epilepsy at risk for exaggerated fears and anxiety, especially about seizures [12,13]. Psychosocial stress and the severity of epilepsy also appear to impact the expression of anxiety and depression [14]. Additionally, Kanner [15] described the complex

relationship between anxiety disorders, mood disorders, and epilepsy which have all been linked to abnormalities in serotonin levels in the nervous system. This relationship may be further complicated by the potential adverse consequences of epilepsy medications. In children, anxiety can interfere with academic performance, social life, social skills, and general well-being [6]. Specifically, among children with epilepsy, Stevanovic et al. [16] reported that quality of life significantly decreases as symptoms of anxiety and depression increase. Symptoms of generalized anxiety, separation anxiety, and depression have a more significant impact on health-related quality of life when compared to other anxiety symptoms (e.g., panic and somatic symptoms), demographic variables, and epilepsy-related variables. Reilly et al. [17] suggested that epilepsy services should screen for anxiety and depression as part of a comprehensive assessment. Treatment of anxiety disorders in childhood might effectively prevent further serious mental illness. It might also reduce the societal costs of adverse health and social outcomes, such as reduced educational attainment, marriage instability, and low occupational and financial status [18]. If left untreated, anxiety in childhood can persist into adulthood, as evidenced by high rates of anxiety, depression, and suicide in adults with epilepsy [8].

Pharmacological and nonpharmacological interventions for psychiatric comorbidities in children with epilepsy are infrequent. When nonpharmacological interventions are introduced, the focus tends to be primarily on seizure reduction rather than on the reduction of symptoms of psychological disorders [19]. Understandably, the reduction of

seizures is often the primary focus of contact with health care providers. Emotional and behavioral problems, including anxiety and depression, are often underdiagnosed and undertreated in children with epilepsy [20]. To date, only two pediatric epilepsy intervention studies have addressed psychosocial and mood-related symptoms. One study focused on promoting the self-management of epilepsy and improving related psychosocial functioning [21]. The second study targeted subthreshold depressive symptoms in order to try to prevent the onset of a depressive disorder [22]. To our knowledge, there are no published intervention studies aimed at treating anxiety disorders in children with epilepsy [19].

Various studies have addressed the efficacy of cognitive behavioral therapy (CBT) in conjunction with medical comorbidities [23]. Keehn et al. [24] recently conducted a pilot study of children with autism and anxiety disorders, utilizing the Coping Cat, a manualized treatment protocol that has been demonstrated to be efficacious in randomized clinical trials [25–27]. The treatment protocol was modified for children with autism in ways that did not impact treatment fidelity. Keehn et al. [24] reported a clinically significant reduction in levels of anxiety in children with high-functioning autism spectrum disorder. Hudson et al. [28] provided suggestions and case examples to demonstrate the suitability of Coping Cat for treating anxiety disorders in children with comorbid diagnoses. Their case examples included children with spina bifida, selective mutism, and attention deficit/hyperactivity disorder (ADHD).

Recent research in the general psychiatric literature has sought to develop cost-effective and transportable CBT intervention programs [29–33]. Such programs have been delivered in innovative settings, such as primary care facilities, schools, and camps, and have made use of computers and the Internet [34–40]. These studies contribute to the widely recognized goal of disseminating evidence-based treatments from research to community settings [41]. Additional research is needed to reduce dissemination barriers and to improve the accessibility of CBT to children and adolescents [42].

In an effort to identify a nonpharmacological, effective, and feasible treatment for anxiety in children with epilepsy, this study utilized a computer-assisted CBT program, Camp Cope-A-Lot. This program, adapted from the Coping Cat manualized program, has been shown to be efficacious in reducing anxiety in youth in the general population [41]. This is the first time this type of CBT intervention has been used in children with epilepsy and anxiety disorders. The primary aim of this study was to determine the efficacy, adaptability, and feasibility of a computer-assisted CBT intervention as a treatment for anxiety disorders in children with epilepsy. We hypothesized that children and their parents would report reduced symptoms of anxiety over the course of a 12-week intervention, and that this reduction in anxiety symptoms would be maintained at the 3-month follow-up.

2. Methods

2.1. Participants

Children and their parents were recruited from a comprehensive epilepsy program in a pediatric neurology clinic at a tertiary care center. Selection criteria for children included the following: (a) a diagnosis of epilepsy for a minimum of 6 months, (b) chronological age between 8 and 13 years, (c) no MRI abnormalities other than atrophy, (d) no other developmental disabilities (e.g., intellectual disability or autism), (e) no other neurological disorders, (f) a current primary anxiety disorder, (g) no current nonpharmacological or pharmacological treatment of an anxiety disorder, and (h) a minimum of a first-grade reading level according to the Wide Range Achievement Test 4 (WRAT-4).

Twenty children met the *Diagnostic and Statistical Manual of Mental Disorders*, *Fourth Edition* (DSM-IV) [43] criteria for an anxiety disorder as determined by a semi-structured interview, *Kiddie-Schedule for Affective Disorders and Schizophrenia — Present and Lifetime Version*

(K-SADS-PL) [44]. The K-SADS-PL has been utilized in several studies of children with epilepsy to identify rates of psychiatric comorbidity [7–10]. In the current study, two interviewers were specially trained to administer the clinical interview (JBB, JEJ).

Three children qualified but declined to enroll, and two participants withdrew from the intervention due to scheduling conflicts. The remaining 15 children completed the 12-week intervention and the 3-month follow-up visit. One parent of each child participated in meetings with the child's therapist during weeks 1, 3, 7, and 12, and the 3-month follow-up visit. Fig. 1 is a flowchart depicting recruitment, enrollment, and follow-up.

2.2. Measures

2.2.1. Anxiety and depressive symptoms

Children were assessed at baseline, week 7, week 12, and 3 months posttreatment using reliable and valid self-report and parent proxy report measures. Anxiety self-report measures included the *Multidimensional Anxiety Scale for Children* (MASC) [45] and the *Screen for Child Anxiety Related Emotional Disorders* (SCARED) [46]. Depressive symptoms were measured using the *Children's Depression Inventory* (CDI) [47,48]. Parents' perceptions of their children's anxiety were measured using the SCARED, and the *Child Behavior Checklist* (CBCL) [49,50] was employed to measure parents' perceptions of their children's emotional and behavioral problems.

2.2.2. Parent and child satisfaction measures

Satisfaction questionnaires were developed for this study to collect feedback from parents and children upon completing the intervention. The parent questionnaire consisted of 12 questions rated on a Likert scale from 1 to 5 (1 = strongly disagree to 5 = strongly agree). The questionnaire items included overall satisfaction, improvement in the child's skills or knowledge, and the parent–therapist interaction. The child questionnaire consisted of two open-ended questions: (1) What did you like most about Camp Cope-A-Lot? and (2) What did you like least about Camp Cope-A-Lot? Additionally, the children were asked to rate their level of anxiety before and after the intervention on a 10-point scale (1 = lowest level of anxiety to 10 = highest level of anxiety).

2.3. Intervention

Camp Cope-A-Lot (CCAL) was developed as a manualized computer-assisted CBT treatment program for children (aged 7–13) with anxiety disorders [51]. In this study, the computer-assisted manualized intervention was delivered via computer and in the presence of a therapist in a medical center setting. The program is organized into 12 levels, one level administered per week, each lasting 50–60 min. Camp Cope-A-Lot is divided into two phases: skill building (levels 1–6) and skill practice (levels 7–12) (Fig. 2). The skill-building phase introduces basic concepts, such as relaxation training, identifying thoughts and feelings, problem solving, and self-reward. Approximately 30 min of the skill-building levels are delivered via computerized interactive activities. The therapist reinforces the concepts taught in the computer program with concrete examples and worksheets. The skill practice phase consists of exposure tasks in which the child implements the skills taught in the first six levels. Exposure tasks directly target the specific anxiety, worry, or fear that a child identifies. The levels in this phase consist of a 5-minute computer video demonstration of an exposure task. The child and therapist complete 1–2 exposure tasks together after each video. The child, parent, and therapist work together to plan and practice in-session and out-of-session exposure activities.

Camp Cope-A-Lot was modified, without compromising treatment fidelity, to make the intervention more flexible and more suitable to the needs of children with epilepsy. In particular, the program was adapted to accommodate different learning styles due to the high