

A karate program for improving self-concept and quality of life in childhood epilepsy: Results of a pilot study

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Abstract

The potential cognitive and psychosocial effects of childhood epilepsy have significant implications for a child's self-image and academic achievement. This study focuses on a 10-week karate program for children and adolescents with epilepsy aimed at increasing social confidence, self-concept, and quality of life, as well as reducing parental anxiety. Eleven children (8–16 years old) and their parents participated in this questionnaire study, and complete data were available for nine of these families. Measures consisted of the Piers–Harris Children's Self-Concept Scale, the Quality of Life in Childhood Epilepsy (QOLCE) questionnaire, and the Parental Stress Index. By parental report, significant improvement in memory function and largely positive trends in quality of life on multiple subscales were observed. By child report, intellectual self-esteem and social confidence also improved. Parental stress decreased, although not significantly, suggesting a potential benefit and indicating a role for future interventions targeting family anxiety.
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1. Introduction

Epilepsy is one of the most common neurological disorders affecting children, and the psychosocial consequences of living with this disorder are significant [1]. Children with epilepsy are at a substantial risk for attention and memory difficulties, as well as a poor self-concept [2–5]. The psychosocial and physical effects of epilepsy greatly impact a child's quality of life [6]. Variables such as frequent hospitalization, the unpredictability of seizures, and side effects from treatment can lead to increased stress for the child and the entire family. Prior research has shown a correlation between the way a child copes with her or his illness

and her or his overall self-concept [3,7–9]. These potential cognitive and psychological effects can consequently lead to a child's negative evaluation of self and affect the child's ability to meet his or her potential in both academic and social settings [10–14].

The risk for psychopathology in children with epilepsy is elevated three to six times above the risk in children unaffected by seizures [15], and it greatly surpasses psychiatric risk in other chronic pediatric conditions [16–18]. Negative self-esteem can lead to depression and poor psychosocial outcomes for children with epilepsy [1,19], and even in the absence of active seizures, these children are at risk for a poor health-related quality of life [20]. A recent review of the literature underscores the need for further emphasis on the development, research, and dissemination of behavioral interventions targeting this population [15].

Adolescence is an important time for psychological intervention in this population because of the increased

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risks for anxiety and depression [1,21–23] and the importance of identity formation and self-definition during this critical period [24]. In addition, adolescents with epilepsy are at an increased risk for difficulties with memory and concentration [4]. The stigma of epilepsy can also result in an underestimation of children's academic abilities on the part of teachers [25], further affecting their intellectual confidence and their attitudes toward their illness.

Martial arts programs have been shown to enhance self-esteem as a result of the activity's group experience [26,27]. Prior research examining the effects of karate instruction on children's attention and impulsivity reveals that significant improvement in participants' sustained attention can be achieved [28]. Observed increases in concentration and assertiveness are thought to result from the training and physical activity integral to karate.

Given the potential benefits of martial arts training to mental and physical health, and the current interest in research on psychosocial interventions for this population, a pilot study was undertaken to assess the effects of a martial arts program on children with epilepsy. The working hypothesis of the current study was that a karate program for a pediatric epilepsy peer group would engender a sense of control over their epilepsy as well as a feeling of social competence and that it would have a measurable effect on the children's perceived self-concept and parental reports of quality of life. A second aim was to assess whether perception of their children's competence in the karate program might reduce parental anxiety.

2. Methods

The karate program for Children with Epilepsy was offered to epilepsy patients aged 8–16, through the Massachusetts General Hospital for Children (MGHfC) Pediatric Epilepsy Program in collaboration with Clark's Self Defense of Newton, MA, USA. Patients were recruited based on their geographic proximity to the class and their physical capacity for the activities. Between September 2003 and April 2007, a series of 10-week, 1 hour/week Kempo karate form classes were offered to these patients. Quality of life, self-concept, and parental anxiety were assessed through questionnaire measures. Patients at various levels of karate training participated in each class, but only questionnaires from a child's first 10-week session were included in this study. Parents did not participate in the classes, but their mutual presence often allowed for informal support groups.

The administration of three measures was conducted at the onset of the first class and on completion of the tenth class. The two parental questionnaires issued were the Parental Stress Index Short Form, Third Edition (PSI/SF), a 36-item derivative of the PSI full-length test designed to assess stress in the parent/child dyad, and the Quality of Life in Childhood Epilepsy inventory (QOLCE), a 77-item measure validated to assess a child's day-to-day life functioning over five domains of health-related quality of life. The QOLCE allows for qualitative as well as scaled responses to questions. The one questionnaire completed by the children was the Piers–Harris Children's Self-Concept Scale 1 (PH-1), an 80-item questionnaire with a yes/no response format, designed to assess self-concept in children and adolescents. Although it was the children who ultimately responded to each question, three children required parental assistance completing the questionnaire because of their level of cognitive function.

Statistical analyses were performed using SPSS Version 11.5.

3. Results

3.1. Patient demographics

Fifteen patients from the Pediatric Epilepsy Program at MGHfC participated in the karate program between September 2003 and April 2006. Of these 15 patients, 11 children and their parents chose to participate in this research study during their first class enrollment. Of these 11 children, 9 were included in the analysis and 2 were excluded due to incomplete questionnaires at one of the time points. Pre- and postclass surveys were completed by 8 of these 9 children. Nine parents completed the QOLCE, and seven completed the PSI/SF, before and after the class. Of the nine patients completing part or all of the research questionnaires, five had complex partial seizures (CPSs), two had generalized tonic-clonic seizures (GTCSs), and two had absence seizures (ABSs). The known etiologies of the epilepsies included Sturge–Weber syndrome, communicating hydrocephalus, brain injury, and neurofibromatosis type 1. The remaining five children had idiopathic seizures. Patient age ranged from 8 to 16 years (average age = 10.6). Age at seizure onset ranged from 0.1 to 8.33 years (average age at onset = 5.0). All children beginning the karate program had epilepsy for at least 1 year prior to starting the class. Seven of the nine children were female.

Mean number of antiepileptic drugs (AEDs) and seizure frequency at 10 weeks did not change significantly from baseline, and dosage adjustments during this time were minimal. By parental report, one subject had a decrease in their seizure frequency over the course of the karate class that coincided with discontinuation of the AED clobazam, which was perceived to be exacerbating seizures and causing behavior and mood changes. This may have been a factor in this patient's improved total self-concept score over the course of this study.

3.2. Children's self-concept

Although statistical power cannot be demonstrated with our sample size, many items from the questionnaires did show a trend toward improvement over the course of the karate program. Children's self-report ($N = 8$) of their perception of intellectual and school status improved and approached significance (Wilcoxon's signed ranks, $P = 0.07$). Additional categories for which improved scores on the PH-1 were observed include anxiety, behavior, physical appearance and attributes, and total score, though none were significant. See Table 1 for mean pre- and post-intervention scores. The inconsistency index and response bias remained within the average range and decreased slightly, indicating the children's responses accurately represented their self-concept. Specifically, one of the patients to experience the most benefit, and subsequently continue in the karate program, was a female with seizures and mild hemiparesis.

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