



Factors associated with academic achievement in children with recent-onset seizures

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KEYWORDS

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Summary Children with chronic epilepsy are more at risk for achievement problems than either children without seizures or children with other chronic disorders. Factors that lead to such problems in children with epilepsy, however, are not well understood. Exploring these factors is important because academic underachievement can lead to poor social outcomes and contribute to underemployment or unemployment in adulthood. This descriptive, cross-sectional study investigated a group of children who had been diagnosed with seizures approximately 12 months previously, providing the opportunity to describe relationships among family and child characteristics; parent, child, and teacher responses; and child academic achievement at the same point in time across the sample. Seventy-two children had standardized test total battery scores, 101 had a teacher's rating of performance, and 67 had scores for both. Data were analyzed using multivariable regression. Child adaptive competency and seizure severity were associated with higher teacher ratings of academic performance ($\beta = 0.73$, $p < 0.0001$ and $\beta = 2.38$, $p = 0.0182$, respectively). Child adaptive competency was associated with higher total battery scores ($\beta = 0.73$, $p < 0.0001$). Contrary to findings in studies of children with chronic epilepsy, mean academic achievement in this sample of children with recent-onset seizures was in the average range; however, 25% of the children were at or below one standard deviation below the mean on the teacher's rating of performance and 10% on the total battery. It is therefore important for health professionals and educators to regularly assess the child's academic functioning and school performance to identify those at risk for problems. Health professionals and educators need to collaborate on assessment and interventions to help maximize child academic success.

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Introduction

Children with chronic epilepsy have been shown to be more at risk for learning and academic achievement problems in school than either children with-

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out seizures or children with other chronic disorders, such as asthma.^{1–5} Factors that lead to these school problems in children with epilepsy, however, are not well understood.^{6,7} An inherent problem with previous studies is that they were often conducted several years after the onset of seizures, thereby overlooking potentially important information about the trajectory of academic performance. In many studies, the time between onset of seizures and when academic skills were assessed varied considerably within the sample, making it difficult to explore when academic problems began or how family and child psychosocial factors were related to academic achievement. No reported studies have investigated academic performance in children with recent-onset seizures, although such a sample could yield data important to guide intervention and prevention efforts.

This descriptive, cross-sectional study examined a group of children who had been diagnosed with seizures approximately 12 months previously, providing the opportunity to describe relationships among family and child characteristics; child responses; and child academic achievement at the same point in time across the sample. Because this is a population that has been understudied and about which relatively little is known, we did not hypothesize effects of these factors on the outcome variables; rather, the intent was to describe relationships in this unique sample.

The double ABCX model of family adjustment⁸ was used as a source theory for the study. This model has been used in prior research by Austin and colleagues to help explain psychosocial factors related to adjustment in children with epilepsy and asthma.^{9,10} The model considers adaptive resources and perceptions of or responses to a chronic health condition as factors in adaptation to the condition. Relevant to the current study, included in adaptation is the degree to which a child performs satisfactorily in school and is able to meet the demands of the academic environment. The theoretical model used in this study (Fig. 1) combined factors from the double ABCX model and other variables from the literature shown to be associated with academic achievement in epilepsy; however, the degree of proximity of these variables to child academic achievement was not hypothesized. We considered both illness and psychosocial factors in determining their relationships to academic achievement in a group of children with recent-onset seizures. The etiology of achievement problems is likely the result of many variables. Among those, the variables most relevant to this study include family characteristics (socioeconomic status and family resources), child characteristics (illness characteristics (illness

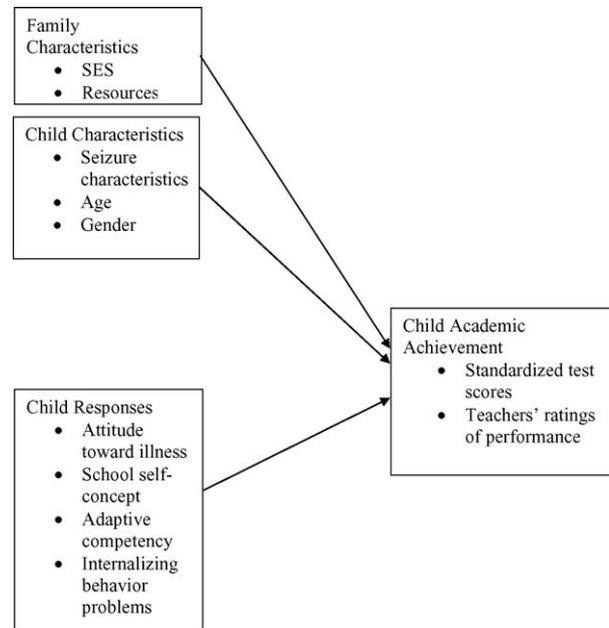


Figure 1 Predictive model of academic achievement in children with seizures.

characteristics, age, gender), and child responses (attitude toward illness, school self-concept, adaptive competency, and internalizing behavior).

Family characteristics measured in this study were socioeconomic status (SES) and family resources. In the general population, SES is strongly associated with educational accomplishments and attainment in children.^{11,12} Verna and Campbell¹³ found that SES had an indirect influence on achievement in gifted children since high-SES families have the financial capital to provide intellectual resources that can promote achievement.¹³ Specific to epilepsy, but not to achievement, Mitchell et al.³ found that level of parental education was among the best SES predictors of IQ in a group of 78 children with epilepsy. *Family resources* appear to play an important role in buffering the untoward effects of epilepsy on child academic achievement. Austin et al.^{10,14} found in a study of family characteristics of children with epilepsy and behavior problems that children with the most problems came from families with low family mastery.

Child characteristics, including illness variables, age, and gender, have been studied in relation to academic underachievement in children with epilepsy in past studies, but findings have been mixed. Longer duration of the condition,¹⁵ higher seizure frequency,^{15–18} and younger age at onset of seizures have been associated with higher rates of academic underachievement.^{19–21} Huberty et al.²² and Mitchell and colleagues,³ however, found no relationship between seizure variables and achievement in children with epilepsy. Younger age at onset of

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