EXAMINING TEACHER KNOWLEDGE AND ATTITUDES ABOUT SCHOOL ISSUES FOR CHILDREN WITH EPILEPSY: A MIXED-METHOD INVESTIGATION

By

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

2009
ACKNOWLEDGEMENTS

This dissertation would never have seen completion without the help and support of so many individuals. First, this dissertation research was completed, in part, with funding from a grant provided by the Children’s Miracle Network. I’d also like to thank my parents Jeffrey and Joyce Loomis for providing me with the foundation and constant guidance that I needed to start and finish this endeavor. Their unwavering faith in me and stalwart support enabled my perseverance. I’d also like to thank the amazing group of “Mama” friends that I’ve been so lucky to have: Amy, Fitz, Wendy, Christy, Anita, Jen, Susan, Yady, Jill, Jamie, Angela, Elizabeth, and Deirdre. From watching my kiddos in times of great need to providing much-needed stress relief, your support has been priceless in so many ways. I’d also like to express my sincerest gratitude to my committee chair, Dr. Tina Smith-Bonahue, for her patience, guidance, and support throughout this long academic journey. Thanks are also in order for my other committee members: Dr. Paul Carney, Dr. Cynthia Griffin, and Dr. Nancy Waldron. I am so grateful to have had the benefit of each of your unique sets of expertise. Your knowledge helped make this multi-disciplinary project possible. I’d also like to thank the teachers who took the time to participate in my study, and the children with epilepsy and their families who candidly shared their thoughts with me. This study would not have been possible without them. Finally, I’d like to recognize the love and support of my husband, Kyle Roux, and my two children, Aidan and Nadia. You provide me with unlimited support, entertainment, and motivation. The inspiration you give me daily is the reason this research has flourished.
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Epilepsy is one of the most common diseases to affect the human nervous system, affecting approximately 0.5% of school-age children (Leppik, 2001; Kaleyias et al., 2005). Epilepsy has the potential to profoundly impact a child’s adjustment to school. A large body of literature documents that children with epilepsy are at an increased risk for cognitive impairment, learning disabilities, academic underachievement, special education placement, and behavioral and emotional problems (Williams, 2004). These findings have been well-supported by numerous other studies. The importance of successful adjustment to school for children with chronic illnesses in general is also well supported by the literature, yet many children with chronic illnesses, including epilepsy, continue to experience difficulties with school adjustment, even in the absence of cognitive impairment, learning disabilities, or behavior problems (Madan-Swain, Katz, & LaGory, 2004).

Among other factors, teacher knowledge and beliefs have been shown to be an important factor in determining teacher practices in the classroom. Thus, it follows that teachers’ beliefs and knowledge about pediatric epilepsy could have a significant impact
on their ability to positively influence the successful school adjustment in children with epilepsy. Overall, the few extant studies concerning teacher attitudes and knowledge about children with epilepsy suggest that while many teachers hold positive views about their students with epilepsy, some negative views persist. In addition, most teachers surveyed worldwide receive little to no formal training regarding epilepsy or the needs of student with epilepsy. Of the studies that have been conducted, few have assessed teachers’ knowledge about how epilepsy affects student’s academic achievement and classroom behavior, and rarely have teachers in the United States been studied. Additionally, while students with epilepsy are placed in special education more often than other students, special education teachers have not been studied as a group with respect to their knowledge and attitudes about students with epilepsy. Given the potential impact that teachers’ beliefs and knowledge can have on the school adjustment of children with epilepsy, further research in this area is needed.

Thus, the overall goal of this study was to gain a better understanding of teachers’ attitudes towards students with epilepsy, as well their knowledge of pediatric epilepsy and how it affects school performance. The present study focused on these questions but also explored how special educators compare to general educators when it comes to knowledge and attitudes about students with epilepsy. This study examined 316 teachers, who were asked to complete the Attitudes Towards Persons with Epilepsy Scale (ATPE), as well as a knowledge question addendum, which consisted of 7 open-ended questions. Results indicated that teacher’s knowledge about epilepsy was predicted by their attitudes about epilepsy, as well as their own ratings of their knowledge about epilepsy. That is, more accurate knowledge was related to having more positive attitudes about epilepsy.
Likewise, teachers’ attitudes about epilepsy predicted their knowledge about epilepsy. Significant differences were not found between the attitudes and knowledge of special education versus general education teachers, based on the results of quantitative analysis. A descriptive analysis of teachers’ responses, however, revealed some substantial differences in the knowledge held by special education teachers. This descriptive analysis also found significant gaps in teachers’ knowledge related to seizure first aid, recognition of seizure symptoms, and effects of epilepsy on students’ learning and behavior.
CHAPTER 1
REVIEW OF THE LITERATURE

Pediatric Epilepsy: A Brief General Discussion

Epilepsy is one of the most common diseases to affect the human nervous system, with a prevalence of 2.8 to 19.5 per 1,000 in the general population (Leppik, 2001; Kaleyias et al., 2005). This chronic condition affects approximately 0.5% of school-age children (Kaleyias et al., 2005). The hallmark feature of epilepsy is the onset of seizures, which can be defined as paroxysmal, time-limited events that result from abnormal activity in the brain (Leppick, 2001). Between seizures, neurological, sensory, and motor function is generally normal (Jambaque, Lassonde, & Dulac, 2001). Seizures can arise from specific regions of the brain (localization-related, or partial), or can be caused by a general biochemical dysfunction (generalized) (Leppick, 2001). Generalized seizures include tonic-clonic seizures, absence seizures (staring spells), as well as atonic and myoclonic seizures (motor). In addition, seizures can be classified as complex (impairing consciousness) or simple (not affecting consciousness) (Leppick, 2001). Observed behaviors during seizures can vary widely, from the well-known stiffening and jerking movements of a generalized tonic-clonic seizure to laughing, lip smacking, and repetitive motor movements, all of which are among the many characteristics of partial seizures (Leppick, 2001). The causes of epilepsy also vary widely, but may include brain lesions, genetic predisposition, and maturational phenomena in the nervous system (Jambaque, Lassonde, & Dulac, 2001). Causes of epilepsy within an individual may be single or multiple (Jambaque, Lassonde, & Dulac, 2001). Additionally, there are a number of epileptic syndromes, of which seizures are a hallmark feature, including Lennox-Gastaut
syndrome, Landau-Kleffner syndrome, and West syndrome, among others. In a large
number of epilepsy diagnoses, labeled *idiopathic*, the cause remains unknown.

Treatments for epilepsy also vary, depending on the type, severity, and frequency
of seizures. In most cases, the first course of action in treating epilepsy is anti-epileptic
drugs (AEDs) (Leppick, 2001). A number of drugs are available, and after drug therapy is
started, a patient’s number of seizures, side effects, and drug levels present in the blood
are closely monitored. Approximately 70-80% of cases of epilepsy can be effectively
managed by AEDs with few side effects. However, 500,000 to 800,000 cases in the
United States cannot be effectively controlled by medication. In these cases, epilepsy is
said to be *intractable*, and alternative treatments are attempted (Leppick, 2001). Other
treatment options include surgery, vagus nerve stimulation, and the ketogenic (high fat,
low protein and carbohydrate) diet (Leppick, 2001).

**Effects of Epilepsy on School Functioning**

Although all chronic medical conditions can potentially affect a child’s school
adjustment, neurological conditions such as epilepsy, which can affect both behavior and
cognition, may have more dramatic effects on education (Madan-Swain, Katz, & LaGory,
2004). The heterogeneity of epilepsy makes it an inherently complex condition. Thus, a
discussion of the effects of epilepsy on school functioning is also complex; the literature
in this area is fraught with disagreement and equivocal findings. For example, based on
the current literature, it is yet unclear whether or not repeated seizures themselves may
cause cognitive decline, or the underlying brain dysfunction which causes the seizures
triggers cognitive decline (Svboda, 2004). However, despite the many inconsistencies in
the literature in this area, some conclusions can be discerned from the wealth of
information available on the cognitive, academic, and behavioral effects of epilepsy.
Perhaps the most important conclusion is that epilepsy has great potential to affect the school functioning of a child. Indeed, a large body of literature documents that children with epilepsy are at an increased risk for cognitive impairment, learning disabilities, academic underachievement, special education placement, and behavioral and emotional problems (Williams, 2004). From an educator’s perspective, there is much to be learned about the many ways in which epilepsy can affect a child’s school experience.

**Impact of Epilepsy on Cognitive Functioning**

Epilepsy has a long-standing history of being associated with low cognitive functioning and mental retardation (MR). Indeed, epilepsy is more common in individuals diagnosed with mental retardation - approximately 25% of those with an MR diagnosis also have epilepsy. While cognitive ability can vary widely from individual to individual, as well as within an individual from year to year, the distribution of cognitive ability in children with epilepsy is generally skewed towards a slightly lower range (Svoboda, 2004). For example, one study of 72 children with epilepsy compared scores on measures of general cognitive ability with those of siblings without epilepsy. Results of the study indicated that the mean IQ for children with epilepsy fell within the average range and did not differ significantly from that of sibling controls. Subsequent follow-up studies of the same cohort of children with epilepsy indicated that, while the majority of patients with epilepsy did not experience significant changes in their IQ over time, a persistent decrease in IQ was found in 11% of the sample after four years (Bourgeois et al., 1983). The investigators concluded that their findings suggested that cognitive decline over time in children with epilepsy only occurs in a small fraction of the population. Other studies have confirmed that only a small subgroup of children with epilepsy show stable decreases in IQ (Cornaggia & Gobbi, 2001). However, as loss of cognitive
function is possible in children with epilepsy, children with epilepsy who appear to lose skills must be monitored closely (Cornaggia & Gobbi, 2001).

In general, difficulties with attention and memory are not uncommon in children with epilepsy (Bailet & Turk, 2000; Williams, 2004). The effects of epilepsy on memory may be transitory. For example, a child may experience post-ictal confusion directly after a seizure occurs, or they may forget everything that happened for a period of time before the seizure occurred. If a child experiences these types of after-effects of seizures during the school day, a child’s acquisition of academic skills could be negatively impacted, even though the effects of the seizure on memory are time-limited (Binnie, Channon, & Marston, 1990).

Often, the cognitive effects associated with epilepsy differ, depending on which type of epilepsy the child has. Therefore, the cognitive implications of childhood epilepsy are briefly summarized below, according to seizure type: generalized seizures (arising from a general biochemical dysfunction), partial (arising from specific regions of the brain), or epileptic syndromes (disorders in which seizures are a hallmark feature).

**Generalized seizures**

The cognitive effects of generalized seizures are highly variable (Svboda, 2004). In general, early onset of seizures, increased seizure frequency, repeated seizures, or status epilepticus are associated with brain damage and thus, poorer general cognitive function (Bourgeois, 1998; Svboda, 2004; Williams, 2004). Children with absence seizures (staring spells) tend to experience the least cognitive effects, although attention and memory may be adversely affected, especially during seizures.

Children with generalized epilepsies often demonstrate highly variable performance on cognitive tests, perhaps due to subclinical epileptiform activity. For
example, an individual child with generalized epilepsy may exhibit inconsistencies in
performance on similar cognitive measures administered at different times (Svboda,
2004). Few patterns are evident. Children with generalized seizures have consistently
demonstrated deficits in visual-spatial processing and sequencing (Giordani et al., 1985).
In addition, studies provide evidence that children with generalized epilepsies may
demonstrate difficulties with attention and memory. For example, Jambaque et al. (1993)
studied 18 children with idiopathic generalized epilepsy and found that they scored
significantly lower than controls on the visual memory subscale of Signoret’s Memory
Battery.

**Partial seizures**

Partial seizures have less of an effect on generalized intelligence than generalized
seizures; however, specific abilities may be affected (Svboda, 2004). Memory
difficulties, for example, are associated with seizures originating in the temporal lobes, as
well as in the frontal lobes (Jambaque et al., 1993; Williams, 2003; Svboda, 2004).
Jambaque et al. (1993) studied 42 children with partial epilepsy using Signoret’s memory
Battery, and noted that these children demonstrated marked deficits in both visual and
verbal memory tasks, and these deficits were related to hemispheric specialization. For
example, they found that children with left temporal lobe epilepsy performed
significantly worse than controls subjects on verbal memory tasks (though not on visual
tasks), while children with right temporal lobe epilepsy performed significantly worse
than controls on visual memory tasks (though not on verbal tasks). While memory
difficulties are frequently present in children with partial seizures, attention problems, in
general, are not as common in children with partial seizures as in those with generalized
seizures (Svboda, 2004).
Impaired cognitive ability is often associated with epileptic syndromes. The majority of children who experience significant cognitive decline are those with severe epileptic syndromes (Svboda, 2004). Children with Lennox-Gastaut syndrome, for example, experience significant cognitive decline and up to 90% of those affected present with cognitive impairment (Lhatoo & Sander, 2001).

In summary, the effects of epilepsy on cognitive functioning vary widely, depending especially on the type of epilepsy a child has. Children with epileptic syndromes commonly demonstrate impaired general cognitive ability, while children with generalized seizures and partial seizures are less likely to exhibit generalized impairments (Jambaque et al., 1993; Williams, 2003; Svboda, 2004). Specific types of cognitive functioning, however, such as memory and attention, are more common in children with generalized and partial seizures. Memory, in particular, may be notably affected in children with seizures localized in the temporal lobe (Jambaque et al., 1993; Williams, 2003; Svboda, 2004).

**Effects of antiepileptic drugs on cognition**

In addition to the many ways in which epilepsy itself can impair a child’s cognitive function, many medications used to treat epilepsy (antiepileptic drugs, or AED’s) are suspected to also affect cognitive function. Studies in this area, however, have produced inconclusive data (Bourgeois, 1998, Loring & Meador, 2004). Phenobarbital, an older AED, has been associated with a decrease in general cognitive ability, mainly owing to its detrimental effects on processing speed and attention (Loring & Meador, 2004). Chen, Kang, and So (1996) studied the effects of phenobarbital on general cognitive ability (using the Wechsler Intelligence Scale- Revised) and visual
motor ability (using the Bender-Gestalt test), and auditory event-related potentials in 25 children with newly diagnosed epilepsy. Children were assessed before beginning drug therapy and 6 and 12 months after beginning phenobarbital therapy. Although significant declines in WISC-R and Bender-Gestalt performance were not found, auditory event-related potentials were significantly reduced in children being treated with Phenobarbital. The authors suggested that reduced auditory evoked potentials indicated a decrease in cognitive function that was not necessarily evident on typical measures of cognitive ability one year after initiation of drug therapy.

Other older AED’s, such as carbamazepine and phenytoin appear to have a small effect on general intelligence, and modest effects on memory. Again, however, results of studies have been equivocal. Williams et al. (1998), for example, studied 37 children with epilepsy being treated with a variety of AED’s, including carbamazepine and phenytoin. Children were assessed before beginning treatment with AED’s and again six months later, using a variety of measures, including subtests of the Wechsler Intelligence Scale for Children (WISC-III), Wide Range Assessment of Memory and Learning (WRAML), and the Grooved Pegboard test (a measure of processing speed). Results indicated that children taking AED’s did not demonstrate significantly different performance on any measure of cognitive ability than control subjects (children with diabetes). The authors concluded that negative effects of AED’s on cognition were not present six months after initiation of drug therapy.

Newer AED’s have not been thoroughly studied with respect to cognitive side effects, and reports are based on side effects noted in various clinical trials of the drugs (Loring & Meador, 2004). Some newer AED’s have been noted to have side effects that
can negatively affect cognition. Some children taking topiramate, for example, were noted to experience difficulty with attention and concentration, forgetfulness, and impaired memory (Loring & Meador, 2004).

**Impact of Epilepsy on Academic Achievement**

Children with epilepsy are at increased risk for learning disabilities, although no distinct pattern of deficits has been identified (Sturniolo & Galletti, 1993; Williams, 2004). Children with epilepsy have been found to be at great risk for academic underachievement; that is, achieving below expectations, even in the absence of cognitive impairment or specific learning disabilities (Aldenkamp & Mulder, 1999, Bulteau et al., 2000). In one study of children with epilepsy, for example, Bailet and Turk (2000) found that children with epilepsy had significantly higher rates of grade retention and placement in special education than their siblings who did not have epilepsy. They examined 74 children with epilepsy, as well as a control group consisting of 13 children with migraines, as well as 23 healthy siblings of children with epilepsy. All children completed a neurocognitive test battery, which included measures of general cognitive ability, processing speed, memory, academic achievement, as well as teacher and parent ratings of behavior. The test battery was administered to subjects annually for three years. Children with epilepsy scored significantly lower than sibling controls on measures of academic achievement, including spelling, reading and mathematics.

Other studies have confirmed this finding (Williams, 2003). The risk for academic achievement appears across all academic subject areas, and appears to be highest in children with symptomatic epilepsy (Williams, 2004). Underachievement in children with epilepsy has been found in subjects including math, spelling, writing, reading, and general knowledge (Williams, 2003). At least one study has found that this pattern of educational
problems persists even in children who are on medication and are seizure free (Silanpaa, Jalava, Kaleva, & Shinnar, 1998).

One study of 78 children with epilepsy found that academic underachievement was frequent among children with epilepsy, ranging from 16% of the sample in reading to 50% of the sample in general knowledge (Mitchell, Chavez, Lee, & Guzman, 1991). In this study, children with epilepsy between the ages of 5 and 13 years were assessed using the Peabody Individual Achievement Test (PIAT), which measured reading, reading comprehension, spelling, mathematics, and general knowledge. Additionally, information regarding each child’s school history was also obtained from parents. As a group, academic achievement of the children with epilepsy was poor in all areas. For example, 55% of the group scored below the 25th percentile in reading comprehension and 41% were below the 25th percentile in mathematics.

Another study examined academic achievement over the course of four years in 98 children with epilepsy, and found that children with epilepsy consistently performed significantly worse in reading, math, language, and vocabulary than children with asthma (Austin, Huberty, Huster, & Dunn, 1999). The investigators examined results of group-administered achievement tests administered in the school setting, including the California Achievement Tests, the Iowa Tests of Basic Skills, and the Indiana Statewide Tests of Educational Progress. Scores were obtained at two different time-points, with follow-up assessment occurring four years after the initial assessment.

One study examined factors contributing to academic underachievement in children with epilepsy and found that attention difficulties were significantly related to low academic achievement (Williams et al., 2001). Sixty-five children with a diagnosis of
epilepsy were administered a battery of tests, including the Woodcock-Johnson Tests of Academic Achievement-Revised and the Wide Range Assessment of Memory and Learning. Children who performed poorly on measures of academic achievement also performed poorly on a measure of auditory attention.

**Impact of Epilepsy on Behavior**

Behavior in children with epilepsy has received much attention in the literature in recent years. This attention seems warranted, given that behavior problems are more common in children with epilepsy than in the general population, and also more common than in children with other chronic illness that do not affect the central nervous system (Dunn et al., 2002, Williams, 2004). It is estimated that one in every four children with epilepsy will be reported as having some type of behavior problem (Svoboda, 2004). This increased risk for behavior problems appears to be most pronounced for children with intractable seizures, additional neurological impairment, and family dysfunction (Williams, 2004). The most common behavior problem found in children with epilepsy is attention deficit hyperactivity disorder (ADHD) (Williams, 2004). In one retrospective study of children with epilepsy, 35% had been diagnosed with ADHD (Hempel, Frost, Ritter, & Farnham, 1995). Another retrospective study found that 37.3% of a sample of children with epilepsy met criteria for diagnosis of ADHD, inattentive type, while 29.3% met the diagnostic criteria for ADHD, hyperactive-impulsive type (Hausser et al., 1998). A recent review of findings of studies related to epilepsy and ADHD indicated that ADHD seems to be related to certain kinds of epilepsy, including frontal lobe seizures, childhood absence seizures, and Rolandic epilepsy (Parisi, Moavero, Verrotti, & Curatolo, 2009).

Additionally, children with epilepsy have also been noted to have increased symptoms of depression and anxiety (Caplan et al., 2005). A recent review of studies of
mood disorders in children with epilepsy indicated that such disorders are present in 12-26% of these patients (Caplan et al., 2005). Similarly, when Dunn, Austin, Caffrey, and Perkins (2003) studied teacher ratings of behavior for children with epilepsy, they found that children experiencing recurrent seizures had higher rates of internalizing problem behaviors, as well as higher total behavior problem scores than children not experiencing recurring seizures or children with asthma. In another study of teacher-reported behavior problems in children with epilepsy, children with new-onset seizures that had previously unrecognized seizures were more likely than children with asthma to demonstrate problems with internalizing behavior, somatic complaints, thought problems, and attention problems (Dunn, Harezlak, Ambrosius, Austin, & Hale, 2002). A number of studies have supported such results when teachers are asked to rate the behavior of children with epilepsy (Dunn, Ambrosius, Austin, & Hale, 2002).

**Effects of antiepileptic drugs on behavior:** Children taking AED’s are susceptible to behavior changes resulting from side effects of medication (Loring & Meador, 2004). Gabapentin was associated with an increased risk of behavioral changes, including hyperactivity, aggression, and irritability, even in the presence of improved seizure control (Loring & Meador, 2004; Lee, Steingard, Cesana, Helmers, Riviello, and Mikati, 1996). For example, Lee et al. (1996) studied seven children who were taking gabapentin for treatment of epilepsy. They collected data on behavior changes by conducting semi-structured telephone interviews with the children’s parents. Parents consistently reported temper tantrums, aggression directed towards others, hyperactivity, and defiance. These behaviors had either emerged after beginning treatment with gabapentin or intensified after treatment had been initiated. These behavior changes,
however, appeared reversible if the drug dosage was decreased or usage was discontinued. Additionally, Wolf, Shinnar, Kang, Gil, and Moshe (1996) reported on the case studies of three children taking gabapentin for treatment of epilepsy. Parents reported increased behavior problems after initiation of drug therapy, including hyperactivity, aggression, temper outbursts, and defiant behavior.

**Importance of School Adjustment for Children with Chronic Medical Conditions**

For all children, including those with chronic illnesses such as epilepsy, school adjustment is an important part of childhood. School adjustment for children with chronic illnesses has received an increased amount of attention in the literature in recent years, though much information published on this topic is based on anecdotal information and reports from experts in the area. Children spend a large percentage of their waking hours at school, and the skills they learn and practice there lay the foundation for adult life. Recent medical advances have increased the life expectancy and functional capability of many chronically ill children, including those with epilepsy. As a result, many children with chronic and serious medical conditions are now physically able to return to school and maintain regular school attendance (Sexson & Madan-Swain, 1993). Recent estimates suggest that 20% of children in the school aged population are affected by a chronic illness, of which 5% are severely compromised (Sexson & Dingle, 1997). In addition, federal legislation has mandated that all children with disabilities, including those with chronic medical conditions, be provided with a free and appropriate public education in the least restrictive environment (Lynch, Lewis, & Murphy, 1992). Thus, there has been growing recognition of the importance of facilitating school adjustment in children with chronic medical conditions.
Successful school reentry is critical for children with chronic illness. Although a child may be able to experience adequate academic achievement through homebound instruction, the school environment provides the child with an important milieu for social and emotional development (Sexson & Madan-Swain, 1993). At school, children have many opportunities to interact with peers and experience success, as well as increased independence and control over their environment (Davis, 1989). Children who are physically unable to attend school due to an illness or injury may experience a number of emotional difficulties, including lowered self-esteem and feelings of loneliness and isolation (Davis, 1989). Indeed, it has been suggested that integration into the school setting should be as much a part of overall management of pediatric chronic illness as medically oriented interventions (Sexson & Madan-Swain, 1993). While successful school reentry is a critical task for children with chronic illness, many students experience difficulties with this process. It is estimated that approximately 40% of children and adolescents with chronic illness in general experience school-related problems, which can be reflected in increased school absenteeism, academic performance, the psychological well-being of the child, and in interaction with peers (Bloch, 1986).

School attendance can be problematic for children with chronic illness, including epilepsy. In general, surveys of school attendance have shown that children with chronic illness miss more school than do their non-chronically ill peers (Fowler et al., 1985; Sexson & Madan-Swain, 1993). Parents of children with chronic illness report three main reasons for school absenteeism: (a) minor illnesses, such as colds or flu; (b) direct effects of the chronic illness; and (c) scheduled clinic visits (Fowler et al., 1985). However, a
great deal of variability exists between individuals where school attendance is concerned. One study reported that, while children with chronic illnesses generally missed more school than peers without illnesses, almost 5% of the sample with chronic illness had perfect attendance, while 10% of the group missed almost a quarter of the school year (Cook, Schaller, & Krischer, 1985). Specific diagnosis was not a good predictor of absenteeism. Rather, chronicity of the illness and family’s response to the illness were predictive of school attendance (Cook et al., 1985).

In addition to difficulties with school attendance, many children and adolescents with a chronic illness experience academic difficulties. In general (across a variety of illnesses), when compared to non-chronically ill peers, children with chronic illness demonstrate significantly lower levels of academic achievement (as measured by scores on standardized achievement tests and school grades), despite normal intelligence (Fowler et al., 1985, Sexson & Madan-Swain, 1993). Some children with chronic illness experience diagnosable learning disabilities, which may or may not be related to the illness. Effects of a chronic illness may exacerbate an already-present learning disability (Rynard, Chambers, Klinck, & Gray, 1998). Some chronic disorders, such as those involving the central nervous system (e.g. epilepsy) may negatively impact academic achievement on a larger scale than illnesses where the central nervous system remains unaffected (e.g., cystic fibrosis) (Taras & Potts-Datema, 2005). In addition, some illnesses, including epilepsy, may be associated with specific learning difficulties either as a result of the illness itself, or secondary to treatment (Katz, Kellerman, Rigler, Williams, & Siegel, 1977; Sachs, 1980; Deasy-Spinetta, 1993; Sexson & Madan-Swain,
1993; Rynard et al., 1998). Learning difficulties have been noted to be a major source of stress for parents of children with epilepsy (Cusher-Weinstein et al., 2008).

In addition to being a major cause of school absenteeism, physical effects of the illness itself or the treatment regimen may further complicate the process of school reentry (Sexson & Madan-Swain, 1993). Physical symptoms associated with the child’s illness or treatment may impair the child’s ability to function in the classroom, or hinder participation in other school activities, such as physical education or extracurricular sports (Deasy-Spinetta, 1993; Sexson & Dingle, 1997). Symptoms such as lethargy, chronic nausea, and fatigue can make it difficult for children to function optimally in school. In addition, some prescribed medications may be accompanied by side-effects (sedation, increased irritability, decreased attention span) that impair classroom functioning (Sexson & Dingle, 1997).

A number of other barriers to successful school reentry may exist for children with chronic illness (Sexson & Madan-Swain, 1993). These obstacles include variables specific to the individual child, such as social and emotional issues, as well as attitudes of significant adults (e.g., parents, teachers, and other school personnel). The child’s emotional response to chronic illness may complicate school reentry. Children with a chronic illness who have experienced a prolonged absence from school may feel “left out” of the school environment and may be anxious about returning. After a long absence from school, children may not have had much contact with their peers. In addition, children and adolescents may be concerned about how peers will react when they return to school, especially if the illness is accompanied by physical changes (e.g. hair loss, amputation). Physical changes associated with a chronic illness or secondary to treatment
may also have a negative impact on self esteem of the child with a chronic illness. Upon returning to school, many children and adolescents with a chronic illness fear ridicule from peers and teasing. Peers, especially in elementary school, may be worried about contagion and communicate this fear to the child with a chronic illness (Sexson & Madan-Swain, 1993). Henning and Fritz (1983) reported that children’s fears and worries about their physical appearance and disease were the most frequent causes for referral for school reentry interventions. Often, children with chronic illnesses are uncomfortable discussing the illness with classmates and teachers, and experience anxiety related to this difficulty (Sexson & Madan-Swain, 1993; Lynch et al., 1992). In some cases, anxiety about returning to school may escalate into school phobia and school refusal. Studies have reported a 10% incidence of school phobia in children with chronic illnesses, compared to 2% in the general population (Henning & Fritz, 1983).

**Impact of Attitudes of Significant Adults (Parents & Teachers) on School Adjustment of Children with Chronic Illnesses**

Attitudes of significant adults, including parents and teachers, may create noteworthy barriers to successful school adjustment for children with chronic illnesses. School personnel are often lacking adequate and accurate knowledge regarding a student’s medical condition, and this, in turn, can affect their beliefs and attitudes about the student in a negative way (Lynch et al., 1992). Frequently, teachers report that they have difficulty locating sources of reliable information about a child’s condition (Lynch et al., 1992). In addition, teachers who are surveyed often feel unprepared or uncomfortable handling potential medical problems in the classroom (Lynch et al., 1992; Sexson & Madan-Swain, 1993). It has been suggested that teachers may also view the child with a chronic illness differently than peers without an illness. Teachers may
unnecessarily lower expectations for children with a chronic illness, or may fail to recognize a child’s limitations (Sexson & Madan-Swain, 1993). However, although it has been widely suggested that teachers’ attitudes towards students with a chronic illness may have an impact on the child’s school adjustment, such a link has never been empirically investigated and a relationship remains unestablished. Studies examining the link between teacher knowledge and attitudes about children with chronic illnesses and students’ school adjustment are needed in order to clarify this relationship.

**The Role of Teacher Knowledge, Beliefs, and Attitudes**

Although teachers’ knowledge, beliefs, and attitudes with respect to children with chronic illnesses specifically has received relatively little attention in the literature, it is widely accepted that teacher knowledge and attitudes play a large role in determining classroom teaching practices and that understanding teacher beliefs is critical to improving teacher education and teaching practices (Pajares, 1992). Thus, the study of teacher beliefs and knowledge has been a popular focus of recent educational research, especially in the last 20 years (Pajares, 1992). The study of teacher knowledge and beliefs, although a large area of interest, has historically been somewhat difficult to draw conclusions from, mostly due to the complexities of defining such abstract constructs as “beliefs” and “knowledge” (Fang, 1996; Pajares, 1992).

**Defining Teacher Knowledge and Beliefs**

Throughout the study of teacher knowledge and beliefs, many definitions have emerged and there is little consensus. Beliefs can generally be defined as a conception of some reality that contains enough validity to satisfy the individual holding that belief (Richardson, 1996). Knowledge, however, is generally thought to be based on conclusive facts, objective, and open to critical examination and evaluation (Pajares, 1992).
Knowledge about a particular subject often has some supporting evidence and is more concrete than a belief (Richardson, 1996). It follows, then, that an individual’s knowledge about a given topic and beliefs about that topic may differ. For example, Ernest (1989) studied teachers’ knowledge of mathematics and found that different teachers can have similar knowledge about math, but teach math in very different ways. These differences, Ernest argued, were a result of teacher beliefs about teaching math. Beliefs, as opposed to knowledge, are generally thought of as having stronger affective and evaluative components (Nespor, 1987). Beliefs are considered to be very personal and highly unaffected by persuasion (Pajares, 1992). Teachers’ beliefs are formed by many different influences, including the subculture of their particular discipline, the quality of preservice teaching experiences, and the opportunity for reflection on the preservice teaching experience (Fang, 1996). The umbrella term “belief” also houses belief substructures, and among these are “attitudes”. Attitudes can be thought of as a structure of beliefs, organized around an object or a situation, and predisposed to action (Rokeach, 1968; Pajares, 1992). Attitudes have also been perceived merely as opinions that are acted upon and attitudes can differ, even within an individual’s belief system (Pajares, 1992). For example, in a study of White teachers teaching in desegregated schools, 40% of teachers who rated their school positively also stated that they would not allow their own child to attend the school (Bingham, Haubirch, White, & Zipp, 1990). Thus, attitudes are often context-specific and can have profound influence on behavior (Pajares, 1992).

Studying Teacher Knowledge and Beliefs

Although teacher knowledge and beliefs have been studied widely over the past few decades, very little attention has been given to teacher beliefs regarding children with chronic medical conditions, especially by researchers in educational disciplines. For the
purposes of the current review, a search of the relevant literature was conducted using computerized databases, including Medline, PsycLit, and ERIC. Key words (including “teacher”, “knowledge”, “beliefs”, “attitudes”, “epilepsy” “seizure disorder”, and “chronic illness”) were used in various combinations in order to search computerized databases. Searches using these terms often yielded large numbers of references; however, the vast majority of these references were articles or book chapters relating to teacher attitudes about very specific teaching practices or methods (i.e., a specific mathematics curriculum or developmentally appropriate behavior management techniques). Thus, references were not included in the review unless they involved a broad discussion or study of “teacher beliefs” in general or specifically concerned teacher beliefs about students with chronic illness or epilepsy. In addition, references for related articles were also examined in order to find relevant cited references. Studies which were frequently cited and published after 1980 were included in the current review. Results of these searches indicated that studies of teacher knowledge and beliefs have primarily focused on more traditional educational topics, such as beliefs related to teaching specific academic subjects, such as reading and mathematics (Fang, 1996; Pajares, 1992). More generally, research about teacher knowledge and beliefs has focused on how teacher behavior affects student behavior and student achievement, as these constructs are more easily measured than unobservable constructs, such as teachers’ cognitions (Fang, 1996). Researchers have conceptualized the relationship of teacher behavior on student achievement as circular; that is, teacher behavior affects student behavior, which, in turn, affects student behavior, and eventually, students’ achievement (Brophy & Good, 1986).
In the past, teacher beliefs have been studied using a variety of methods, including questionnaires, interviews, observations, surveys and rating scales (Fang, 1996). Each of these methods is appropriate and useful, depending on which kind of information a researcher is hoping to gather (Pajares, 1992). Studies of teacher beliefs and knowledge about students with chronic illnesses have relied almost exclusively on surveys and rating scales, however, very few of these scales have been subject to psychometric validation prior to their use (see Prpic et al., 2003; Dantas, Cariri, Cariri, & Filho, 2001; Bekiroglu et al., 2004; Hsieh & Chiou, 2001; Bishop & Slevin, 2004). Assessing teacher beliefs and knowledge is critical to understanding teaching practices related to a wide range of topics, including understanding how teachers view children with chronic illnesses and how these views, in turn, affect a child’s educational experience.

**General Conclusions Concerning Teacher Knowledge and Beliefs**

Studies indicate that most beliefs are formed by teachers early in their education, often before teachers begin formal educational training, and persist into their classroom practices (Pajares, 1992). In fact, research suggests that teachers develop a substantial percentage of their beliefs about teaching during their own early educational experiences (Pajares, 1992; Nespor, 1987). Because most preservice teachers already have extensive experience in the educational setting (as students themselves), they feel as though they are already “insiders” in this environment. Thus, the beliefs about teaching and education that were formed during their own early education can easily persist unchanged (Pajares, 1992). Teachers beliefs and theories about teaching have been developed mostly from personal experience (Richardson, 1996).
Teachers’ beliefs, once formed, have been shown to be highly impervious to change (Nespor, 1987; Pajares, 1992). Nisbett and Ross (1980) suggested that beliefs formed early in life, such as those teachers form about education, strongly influence judgments and actions later in life. The earlier beliefs are formed, the more they tend to persevere, as these beliefs influence perception and the processing of new information (Nisbett and Ross, 1980). In fact, individuals generally turn information conflicting with their beliefs into support for them, using cognitive “tricks” (Nisbett & Ross, 1980). Beliefs that are already formed color new experiences and information so that the new perspectives can be assimilated into the old; thus, early beliefs, even when discredited, tend to persist (Pajares, 1992).

Where children with chronic illnesses and physical disabilities are concerned, attitudes of teachers may be shaped by early experiences with particular conditions and also by societal impressions of such individuals (Livneh & Antonak, 1997). Livneh and Antonak suggest that attitudes towards individuals with epilepsy, in particular, are subject to the influence of widely-held societal stigma. As such, attitudes towards individuals with epilepsy may also be highly resistant to change. Indeed, in the scant literature regarding teacher attitudes toward children with chronic illnesses, researchers suggest that changing teachers’ beliefs towards children with chronic illnesses, including epilepsy, may require more than simply providing them with accurate information (Bishop & Slevin, 2004). While this appears to be a reasonable conclusion to be drawn from preliminary studies in this area, it has not been empirically evaluated.

**Teacher Knowledge and Attitudes Regarding Children with Epilepsy**

Given the substantial role that teacher knowledge and beliefs may play in promoting a child’s successful adaptation to school, it is an area that has received
increased attention in the literature recently. However, nearly all of these studies have been conducted by researchers in the disciplines of medicine and clinical psychology. Thus, the methods employed and underlying theory tend to differ from those guiding studies of teacher knowledge and attitudes in educational research. Unfortunately, very few studies of teacher knowledge and attitudes towards children with chronic illnesses have used measures proven to be psychometrically sound (i.e., with available reliability and validity data). Epilepsy, specifically, has been the subject of a number of such studies, most likely because it is a disorder that historically has been surrounded by much stigma. However, the vast majority of the studies conducted in this area with respect to children with epilepsy have been conducted outside the United States (Taiwan, Croatia, Zimbabwe, etc.), in countries where the educational system is much different from that of the U.S. However, discussion of these studies is relevant, given that they highlight a general lack of appropriate knowledge among teachers with respect to epilepsy.

Prpic et al. (2003) examined teachers’ attitudes about the capabilities and behavior of children with epilepsy in Croatia. A questionnaire consisting of “yes” or “no” questions was administered to 216 primary school teachers. Results of this study indicated that, although beliefs differed from teacher to teacher, teachers in general did not have an accurate perception of the capabilities of students with epilepsy.

Dantas, Cariri, Cariri, and Filho (2001) assessed teachers’ knowledge and attitudes about students with epilepsy in Brazil. They noted that teachers in Brazil do not generally receive any formal training concerning epilepsy during their pre-service education. Findings of the study indicated that most of the teachers had heard of epilepsy, but that few thought that they had taught a student with the illness. Most teachers in the
sample did not discriminate or object to having children with epilepsy in their classrooms. However, 6% of teachers did not believe that people with epilepsy were as intelligent as others, and 5% believed that epilepsy could be contagious. Nearly half of the sample did not know what to do if a student had a seizure in their classroom, and almost as many were unclear about what the clinical characteristics of a seizure were.

Similarly, Bekiroglu et al. (2004) surveyed 346 teachers in Turkey and found that almost 40% thought that all individuals with epilepsy had the same symptoms and nearly 18% thought that epilepsy was a psychological disease. As part of this study, the authors presented a seminar to teachers and measured their knowledge and attitudes both pre- and post-seminar. Both teachers’ attitudes and knowledge towards individuals with epilepsy were impacted positively by attendance at the seminar. For example, while many teachers in the sample were unsure of how to handle a child having a seizure in their classroom before the seminar (and had incorrect knowledge about how to handle such a situation), most demonstrated that they accurately knew how to handle such a situation after the seminar.

In 2001, Hsieh and Chiou compared Taiwanese preschool teachers’ attitudes towards students with epilepsy to those towards students with asthma and found that acceptance of children with epilepsy was significantly lower than that of children with asthma. They reported that 30% of the teachers believed that epileptic seizures were associated with insanity. Children with epilepsy were also not encouraged to play with other children as much as children with asthma. Teachers of children with epilepsy also reported being worried about negative feelings of parents of other children in the class, who might not want their child in class with a child who had epilepsy. The authors of this
study concluded that their findings may indicate that negative teacher attitudes towards
children with epilepsy may, in part, explain why children with epilepsy perform more
poorly in school than children with other chronic health conditions.

Only two recent studies have examined teacher beliefs with respect to epilepsy in
the United States. Bishop and Slevin (2004) recently surveyed teachers in the state of
Kentucky about their attitudes towards students with epilepsy, using an indirect, error-
choice attitude measurement scale developed for use with the general population, called
the Test of Knowledge About Epilepsy (KAE) (Antonak & Livneh, 1995). They surveyed
135 elementary and middle school teachers and found that teachers with more years of
experience and teachers who had taught a student with epilepsy had more positive
attitudes towards students with epilepsy. The researchers concluded that, based on the
results of this study, negative attitudes exist among a significant percentage of teachers
(29.6% of the sample) held generally negative beliefs about children with epilepsy,
reflected in their negative scores on the KAE. This finding prompted the authors to
suggest that concern is warranted and further research in this area necessary.

Bishop and Boag (2006) recently surveyed 512 elementary and middle school
teachers in the United States using the Attitudes Towards Persons with Epilepsy Scale
(ATPE), a psychometrically-sound rating scale designed for use with the general public
that assesses both attitudes and general knowledge about epilepsy. The investigators also
added attitude and knowledge items to the ATPE specifically about education (although
no data was presented on the reliability or validity of these additional items). They found
that teachers had generally positive beliefs about students with epilepsy, but had some
significant knowledge deficits with respect to general knowledge about epilepsy,
especially where the prognosis of epilepsy was concerned. Predictors of knowledge and attitudes about epilepsy were also examined. The study found that attitudes and knowledge were predicted by certain demographic variables, including years of teaching experience, higher levels of education, and higher self-reported knowledge of epilepsy. When asked, more than 90% of the teachers in this study also indicated that they would like more information about epilepsy and how to handle seizures in the classroom.

Overall, the few extant studies concerning teacher attitudes and knowledge about children with epilepsy suggest that while many teachers hold positive views about their students with epilepsy, some negative views persist. In addition, most teachers surveyed worldwide receive little to no formal training regarding epilepsy or the needs of student with epilepsy. Many teachers appear to hold inaccurate knowledge about how to handle seizures in the classroom. Of the studies that have been conducted, few have assessed teachers’ knowledge about how epilepsy affects student’s academic achievement and classroom behavior. Furthermore, teachers in the United States have not been extensively studied in any of the areas previously discussed; only two studies exists describing teacher attitudes and knowledge towards student with epilepsy in the United States. Given the potential impact that teachers’ beliefs and knowledge can have on the school adjustment of children with epilepsy, further research in this area is needed.

**Parent Perceptions of School Problems in Children with Chronic Medical Conditions**

Concerns and attitudes of parents of children with chronic illnesses, including epilepsy may also serve as a barrier (or support) to successful school adjustment (Sexson & Madan-Swain, 1993). Parental anxieties regarding sending their child back to school may make reentry difficult. Parents of children with a chronic illness may fear rejection
of their child by his or her peers, as well as worry about management of the child’s illness at school (Sexson & Madan-Swain, 1993). Additionally, some parents do not recognize the importance of school attendance for their chronically ill child, and insist upon homebound instruction (Sexson & Madan-Swain, 1993).

Although it is clear that epilepsy can have a profound impact on a child’s education, very little information is available to describe how parents of children with epilepsy view their child’s school experience. The majority of existing studies focus on examining strictly academic or behavioral school difficulties in children with epilepsy, and a few have examined teacher beliefs about students with epilepsy. Yet, the concerns of parents have been largely ignored. Most current information regarding parent perceptions is based on anecdotal reports and expert opinion, rather than empirical data. Parents’ perceptions of school difficulties are critical in determining the educational needs of children with epilepsy, because parents are in a unique position to judge their child’s educational experience, advocate for their child’s unique needs, and facilitate their child’s school adjustment. Often, parents’ views of their child’s educational needs and difficulties can differ dramatically from the perspectives of educators (Lynch, Lewis, and Murphy, 1993).

While no studies have directly examined parent perceptions of school problems in children with epilepsy, a few studies have assessed the perspectives of parents of children with chronic illnesses in general. Lynch, Lewis, and Murphy (1993) interviewed 72 parents of children with chronic illnesses (including some with epilepsy), and found that parents had a number of concerns related to their child’s schooling. These concerns included teachers’ misunderstanding of their child’s needs and misinformation about their
child’s illness and its classroom implications. Additionally, in a survey of parents of children with a variety of chronic illnesses (including epilepsy) that examined their perspectives of health care delivery during school, parents indicated additional concerns (Notaras et al., 2002). In this study, 56% of parents surveyed indicated that they did not feel as though teachers had enough knowledge to look after their chronically ill child during school hours. Such concerns could be particularly salient for parents of children with epilepsy, given that many children with epilepsy require medication while at school and could potentially have a seizure while at school.

Thus, while parent perceptions of school problems for children with epilepsy could provide important information about the educational experiences of children with epilepsy, there is currently very little information specifically about this topic.

**Purpose of the Study**

To date, only two studies have been published which examined the knowledge and attitudes of teachers in the United States about epilepsy using a reliable and validated questionnaire (Bishop & Slevin, 2004, Bishop & Boag, 2006). In order to draw firm, well-supported conclusions about teacher attitudes and knowledge regarding students with epilepsy in the United States, replication of these results is necessary. Since teacher attitudes and knowledge have a strong influence on classroom practice in other areas (i.e., reading instruction), it is expected that teacher attitudes and knowledge about epilepsy would influence classroom practice in dealing with children with epilepsy, as well. More importantly, only one of these studies included a measure that was specifically designed for teachers to elicit information about relevant educational issues. Based on the current literature, it is still unclear what teachers know about the specific educational issues faced by students with epilepsy. While one study has surveyed teachers on a small list of
educationally relevant issues, the format of the survey used 12 Likert-scale questions (on which there was no reported psychometric data) and provided only limited information about the quality of teachers’ knowledge (Bishop & Boag, 2006). Thus, important issues specific to teachers and education of children with epilepsy have been largely ignored and not thoroughly explored. More detailed information about teachers’ knowledge of educational issues for children with epilepsy is integral to the development of teacher education programs addressing these issues. Additionally, despite the numerous data which indicate that children with epilepsy are placed in special education more frequently than their peers, no studies have examined the differences in knowledge and attitudes about students with epilepsy between teachers who teach special education classes and those who teach regular education.

Thus, two main purposes for this study can be identified. First, one goal of this study was to quantitatively describe the current level of teachers’ knowledge about epilepsy and attitudes about epilepsy using a reliable measure, and to specifically address how specific teacher-related variables influence teacher attitudes and knowledge about epilepsy. It was anticipated that teachers would have some consistent gaps in their knowledge about epilepsy, but that attitudes towards students with epilepsy would generally be moderately positive. In addition, specific teacher-related variables, including years of teaching experience, frequency and intensity of contact with children with epilepsy, and teaching special versus general education were also examined with respect to their role in prediction of knowledge about epilepsy and attitudes towards students with epilepsy. When teachers of special education classes were compared to teachers of general education classes with respect to knowledge and attitudes about epilepsy, it was
expected that special education teachers would have more accurate knowledge about pediatric epilepsy, as they were likely to have more training and experience with children with epilepsy.

A second goal of this study was to conduct an in-depth examination of the quality of teachers’ knowledge about specific areas related to educational issues for children with epilepsy, as current studies of teacher knowledge about epilepsy have not thoroughly addressed these areas. Studies specifically examining teacher knowledge of pertinent educational issues for children with epilepsy are extremely limited, and this information is crucial to understanding where gaps in teacher knowledge about epilepsy lie. It has been suggested in the literature that a mixed-method approach, that incorporates methodology from both quantitative and qualitative methods, can provide more complete, broad answers to research questions (Johnson & Onwuegbuzie, 2004). A mixed-method approach was determined to be useful in the present study, as it was felt that a purely quantitative design would limit the ability of the researcher to adequately explore teachers’ knowledge about epilepsy. That is, a purely quantitative design would not allow teachers to express their knowledge about educational issues for children with epilepsy using their own words and explanations. It was felt that this type of design would limit the information gained by this study. Therefore, the exploratory nature of this part of the study called for a mixed-method design. As a result, this question was addressed using qualitative-inspired methods, to allow for the collection of more descriptive, thorough information on what teachers know about educational issues for children with epilepsy, and to better identify where consistent gaps in knowledge lie. This in-depth information
would contribute greatly to our understanding of school problems in children with epilepsy, and assist in the development of improved teacher education in this area.
CHAPTER 2
METHOD

The main focus of this study centered on examining several questions relating to teachers’ knowledge and attitudes about epilepsy, and, more specifically, educational issues unique to children with epilepsy. These questions were addressed using a mixed-method survey design, which included both objective, closed-ended questions and open-ended, descriptive questions.

Participants

Teachers

Participants in this portion of the study consisted of 317 teachers currently teaching public school grades Kindergarten through 12 in the state of Florida. Two-hundred-nineteen of the teachers studied were teaching special education and 98 teachers were teaching general education. Teachers were employed by one of three Florida counties participating in the study: Alachua County, Gilchrist County, and Hillsborough County. Permission was obtained first from the teachers’ employing districts, and second, from the principals at the teachers’ schools or the Director of Special Education for the district (procedures varied slightly between school districts). A total of 2,283 surveys were distributed to teachers and 317 were returned, creating a return rate of 13.8%. More specifically, in Alachua county, 586 surveys were distributed, and 83 were returned, resulting in a 14% return rate; in Gilchrist county, 97 surveys were distributed, and 28 were returned, resulting in a 29% return rate; and in Hillsborough county, 1600 surveys were distributed, and 206 were returned, resulting in a return rate of 13%.

Participation in the study was voluntary, and written consent was obtained from all participants. Teachers were not compensated for their participation in the study.
Measures

Attitudes Towards Persons with Epilepsy Scale

Teachers’ attitudes and knowledge about students with epilepsy were assessed using the Attitudes Towards Persons with Epilepsy Scale (ATPE), a 28-item questionnaire developed by Antonak (1992) for use with the general public (see Appendix A). The ATPE was developed to measure both attitudes towards individuals with epilepsy and general knowledge about epilepsy. Items for the scale were developed through a rigorous process of review of relevant literature and open-ended interviews with experts in the field of epilepsy, including neurologists and special educators (Antonak, 1990). According to Antonak (1990), studies of the measure’s psychometric properties suggest that it demonstrates good reliability, as well as sound construct and criterion validity. Reliability and validity of the ATPE was evaluated using data obtained from a sample of 253 individuals. The ATPE demonstrated good internal consistency, with a coefficient alpha of 0.97.

Epilepsy Knowledge Questionnaire Addendum

Teachers’ specific knowledge about epilepsy-related educational issues was further assessed using an addendum of seven open-ended questions developed by the researcher specifically for this study (see Appendix B). These questions were developed using a process that included review by an expert panel, collection of data from parents of children with epilepsy regarding their concerns related to school, and completion of a focus group consisting of teachers. These seven questions were attached to the end of the ATPE for teachers to complete.
Development of the epilepsy knowledge questionnaire addendum

Prior to the creation of the Epilepsy Knowledge Questionnaire Addendum, information was gathered from parents of children with epilepsy regarding their concerns about their child’s education and school experience. This information was obtained from the parents of 50 children between the ages of 5 and 17 years diagnosed with epilepsy. Participants were recruited for the study through the Pediatric Epilepsy clinic at the University of Florida (UF). Participants were approached by a clinic nurse or the attending physician during a routine clinic visit while waiting in an exam room and provided with information about the pilot study and asked if they would like to participate. If the parent agreed to participate, informed consent/assent was then obtained by the investigator. Fifty primary caregivers of children with epilepsy completed the parent questionnaire. Participation in the pilot study was voluntary. Parental consent was obtained in writing and verbal assent was obtained from minors before data collection began. All data collection was conducted in the patient’s exam room, as this location maximized privacy for each participant and allowed for the least distractions. Families participating in this portion of the study were not compensated for their participation.

Parents of children with epilepsy recruited for the study in clinic completed the Parent School Concerns Questionnaire. The Parent School Concerns Questionnaire is a 6-point Likert-type scale (6 = “Strongly Agree”, 1 = “Strongly Disagree”) developed by the investigator for the purposes of this study (see Appendix C). Questions on the survey relate to potential areas of school concern for parents of children with epilepsy (e.g., concerns about school’s handling of a seizure, their child’s interactions with peers, teacher’s handling of child’s absences, etc.). As part of instrument development, an
earlier pilot study was conducted to examine the content validity of the parent questionnaire items. The questionnaire was first reviewed by a panel of experts, including the principal investigator, a physician specializing in the care of children with epilepsy, a nurse practitioner specializing in the care of children with epilepsy, a university professor specializing in school psychology, and a university professor specializing in special education. A preliminary version of the Parent School Concerns Questionnaire was then administered to 10 parents of children (ages 5-17) with epilepsy, recruited in Epilepsy clinic during regular clinic visits. The first 10 parents to complete the questionnaire were also asked to respond verbally to several questions about the content of the questionnaire (ease of understanding, relevance to their child, questions they felt were missing, etc.), after they completed the Parent School Concerns Questionnaire. Results of this pilot study are summarized in Table 2-1.

Based on the concerns mentioned by parents of children with epilepsy and the current literature in the area, the researcher then developed a list of open-ended questions to include in the Epilepsy Knowledge Questionnaire Addendum. In order to establish content validity, the seven questions were critically reviewed for content by the principal investigator, a physician specializing in care of children with epilepsy, a university professor in school psychology, and a university professor specializing in special education. Questions were selected based on their reflection of areas deemed by both the professional literature and the professional experiences of the panel members. The panel agreed that the seven questions were consistent with the literature in this area.

Additionally, a focus group was conducted to further examine the validity of the additional seven questions. Three teachers from Alachua and Levy Counties in Florida
<table>
<thead>
<tr>
<th>SCPCE Questionnaire Items</th>
<th>Cumulative Score for Item</th>
<th>Percent Agreeing with Item</th>
<th>Percent Disagreeing with Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am confident that my child’s medications can be managed at school (e.g., given at the right time of day, given every day, etc.).</td>
<td>44</td>
<td>88</td>
<td>12</td>
</tr>
<tr>
<td>2. I feel like my child’s teacher (s) knows enough about epilepsy.</td>
<td>13</td>
<td>56</td>
<td>44</td>
</tr>
<tr>
<td>3. My child has difficulty with peers at school.</td>
<td>49</td>
<td>32</td>
<td>68</td>
</tr>
<tr>
<td>4. My child has difficulty making up school work when he or she is absent.</td>
<td>39</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>5. Having epilepsy makes school more difficult for my child.</td>
<td>-14</td>
<td>58</td>
<td>42</td>
</tr>
<tr>
<td>6. If my child has trouble learning, his school will know how to help him.</td>
<td>54</td>
<td>78</td>
<td>22</td>
</tr>
<tr>
<td>7. I am confident that someone at my child’s school can handle things if my child has a seizure at school.</td>
<td>85</td>
<td>88</td>
<td>12</td>
</tr>
<tr>
<td>8. I worry that if my child has a seizure at school, no one will know what to do.</td>
<td>44</td>
<td>34</td>
<td>66</td>
</tr>
<tr>
<td>9. Teachers feel like having my child in their classroom is a burden.</td>
<td>46</td>
<td>36</td>
<td>64</td>
</tr>
<tr>
<td>10. School personnel (teachers, guidance counselors, etc.) have made an effort to learn more about epilepsy because my child is at the school.</td>
<td>6</td>
<td>56</td>
<td>44</td>
</tr>
<tr>
<td>11. I feel like it is easy to communicate with the school about my child.</td>
<td>84</td>
<td>88</td>
<td>12</td>
</tr>
<tr>
<td>12. I feel like my child’s academic needs are being met at his school.</td>
<td>65</td>
<td>82</td>
<td>18</td>
</tr>
<tr>
<td>13. My child is included in all activities at school.</td>
<td>73</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>14. The school is willing to make changes to meet my child’s needs.</td>
<td>56</td>
<td>76</td>
<td>24</td>
</tr>
<tr>
<td>15. I feel like my child’s school listens to my concerns.</td>
<td>76</td>
<td>82</td>
<td>18</td>
</tr>
<tr>
<td>16. My child’s school has attempted to educate my child’s peers about epilepsy.</td>
<td>-29</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>17. I feel comfortable telling my child’s teachers that my child has epilepsy.</td>
<td>111</td>
<td>94</td>
<td>6</td>
</tr>
<tr>
<td>18. I feel like my child’s teacher treats him differently because he has epilepsy.</td>
<td>66</td>
<td>22</td>
<td>78</td>
</tr>
<tr>
<td>19. I believe other children at school treat my child differently because he has epilepsy.</td>
<td>65</td>
<td>22</td>
<td>78</td>
</tr>
<tr>
<td>20. I believe my child gets bullied (at school or on the bus) more often than other kids.</td>
<td>72</td>
<td>22</td>
<td>78</td>
</tr>
<tr>
<td>21. I feel like my child’s teacher(s) are uncomfortable with him/her having a seizure in the classroom.</td>
<td>25</td>
<td>38</td>
<td>62</td>
</tr>
</tbody>
</table>

*Note: Lower scores indicate higher levels of parental concern.*
participated in the focus group. During the focus group, the investigator met with the teachers as a group to discuss the study, obtain consent, and distribute a list of 15 questions about epilepsy and educational issues for children with epilepsy (see Appendix D). Focus group participants completed the longer questionnaire, and then met with the investigator. At this time, the investigator obtained feedback about the questions and used the focus group’s help to select six of the most salient questions to include in the addendum. For example, participants were asked if the questionnaire was easy for them to complete, if they found any of the questions confusing, and finally, which questions they felt were most important to include in the study. This information was then used to develop a final version of the six-question addendum that was used in the larger, qualitative study of teachers.

**Procedure**

First, three Florida school districts, (Alachua, Gilchrist, and Hillsborough Counties) were contacted in order to obtain permission to conduct research in the districts. All three districts had specific procedures in place for requesting to conduct research in their schools; all districts required the researcher to complete forms describing the study and send them in for approval. Due to differences in district preference, data collection procedures varied slightly according to school district. In Alachua and Levy Counties, upon receiving approval to conduct the study in the school districts and approval from individual school principals, packets were sent (or hand delivered, in locations that are within easy driving distance of the researcher) to each of the district’s participating schools, including envelopes to be distributed to each teacher. The envelopes contained a letter explaining the study, a written consent form, the ATPE, and
the six-question addendum. Teachers were asked to return the completed surveys to a
centralized location (usually the school’s front office) by a specified deadline (four weeks
after distribution of the surveys), where they were picked up by the principal investigator.
In Hillsborough County, only special education teachers were targeted, due to the large
size of the district, and the difficulty encountered finding adequate numbers of special
educators in Alachua and Levy counties. At the request of the district, survey packets
were distributed to special education team leaders at a district meeting and distributed by
team leaders to all special education teachers in the district. Teachers were asked to
complete the survey packet, then instructed to send the packet to the district special
education office by a specified deadline (via district mail), where the researcher later
retrieved them. Team leaders in Hillsborough County were sent a reminder e-mail about
the survey two weeks after the distribution, to be forwarded to teachers, reminding them
to complete the survey.

Research Questions and Analyses

This study examined several questions relating to teachers’ knowledge and
attitudes about epilepsy. In order to explore the relationships among all variables,
descriptive statistics and correlation coefficients were calculated. The first goal of this
study was to address the role of teacher-related variables in predicting teachers’
knowledge and attitudes about epilepsy. More specifically, the first research question
explored in this study was the following: Do teacher knowledge, teaching experience, and
familiarity with epilepsy predict teacher attitudes toward children with epilepsy?
“Teacher attitudes towards children with epilepsy” is defined as the subjects’ attitude
scale score on the ATPE. “Teacher knowledge” is defined as the subjects’ knowledge
scale score on the ATPE. “Teaching experience” is defined as the number of years subjects have been teaching. “Familiarity with epilepsy” is defined as subjects’ ratings of the frequency and intensity of their contact with persons with epilepsy, as well as their rating of their own knowledge about epilepsy.

The second research question explored in this study is the following: Do teacher attitudes, teaching experience, and familiarity with epilepsy predict teacher knowledge toward children with epilepsy? As with the first research question, “teacher knowledge” is defined as the subjects’ knowledge scale score on the ATPE. “Teacher attitudes towards children with epilepsy” is defined as the subjects’ attitude scale score on the ATPE. “Teaching experience” is defined as the number of years subjects have been teaching. “Familiarity with epilepsy” is defined as subjects’ ratings of the frequency and intensity of their contact with persons with epilepsy, as well as their rating of their own knowledge about epilepsy.

The third research question addressed by this study is as follows: Do attitudes differ between teachers who teach special education and those who teach general education? Again, “teacher attitudes” are defined as subjects’ scores on the attitude scale of the ATPE. Similarly, the fourth research question explored in this study is as follows: Do knowledge scores differ between teachers who teach special education and those who teach general education? “Teacher knowledge” is again defined as the subjects’ knowledge scale score on the ATPE.

The final goal of this study is to address the following question: What is the nature of the knowledge held by teachers in specific areas relevant to the school adjustment of children with epilepsy? This question was investigated by completing a descriptive
analysis of teachers’ written responses to the Knowledge Questionnaire Addendum.

Written responses to the six open-ended questions were read by the researcher and coded (i.e., classified into response categories and given a score).
CHAPTER 3
RESULTS

Teacher Demographic Results

This study examined several questions related to teachers’ knowledge and attitudes about epilepsy, and, more specifically, educational issues unique to children with epilepsy. Teachers participating in this study were asked to describe themselves with respect to several demographic variables. Demographic characteristics of teachers in the study sample are summarized in Table 3-1.

Table 3-1. Demographic Characteristics of Teachers in Study.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>38</td>
<td>12.1</td>
</tr>
<tr>
<td>Female</td>
<td>275</td>
<td>87.9</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor’s</td>
<td>150</td>
<td>47.3</td>
</tr>
<tr>
<td>Master’s</td>
<td>150</td>
<td>47.3</td>
</tr>
<tr>
<td>Specialist</td>
<td>10</td>
<td>3.2</td>
</tr>
<tr>
<td>Doctorate</td>
<td>7</td>
<td>2.2</td>
</tr>
<tr>
<td>Years Teaching Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 years</td>
<td>86</td>
<td>27.2</td>
</tr>
<tr>
<td>5-10 years</td>
<td>60</td>
<td>19.0</td>
</tr>
<tr>
<td>10-15 years</td>
<td>51</td>
<td>16.1</td>
</tr>
<tr>
<td>15-20 years</td>
<td>27</td>
<td>8.5</td>
</tr>
<tr>
<td>20+ years</td>
<td>92</td>
<td>29.1</td>
</tr>
</tbody>
</table>

Teachers were asked to indicate their gender, and their responses revealed that the sample for this study was overwhelmingly female (87.9%). Teachers were also asked to report their highest level of education achieved. Forty-seven percent of the sample reported having a Bachelor’s degree, while another 47% reported having a Master’s degree. Approximately 3% of the sample had attained a Specialist’s degree, and 2.2% had attained a Doctorate. The mean age of subjects participating in the study was 44 years of age, and ranged from 22 to 73 years of age. Approximately 27% of the sample had been
teaching between 0 and 5 years. Nineteen percent of the sample reported that they had been teaching between 5 and 10 years, 16.1% reported that they had been teaching between 10 and 15 years, 8.5% reported that they had been teaching between 15-20 years, and 29% reported that they had been teaching for over 20 years. In the interest of establishing external validity, demographic characteristics of participants in the current study were compared to the demographic characteristics of the general population of teachers in the state of Florida, obtained from the Florida Department of Education (2009). Statewide, 60.91% of teachers held a Bachelor’s degree, 35.4% held a Master’s degree, 2.41% held a Specialist’s degree, and 1.28% held a Doctorate. Thus, teachers in the current sample had a slightly higher level of education than teachers in the state of Florida in general. Statewide, 79% of teachers were female, while 21% were male. Thus, a slightly larger percentage of participants in the current study were female than in the state of Florida in general. With respect to teaching experience, data in the form of percentages could not be obtained from the state of Florida. However, the average amount of experience of teachers in the state of Florida was 12 years. For teachers in the current study, the mean experience rating was 2.93 on a 5-point scale, meaning teachers averaged near the higher end of 5-10 years of experience.

Finally, teachers were asked to rate their experience with people with epilepsy by providing ratings on three variables: Knowledge of Epilepsy, Frequency of Contact with Persons with Epilepsy, and Intensity of Contact with Persons with Epilepsy. All three variables were rated on a 6-point scale; Knowledge responses ranged from “no knowledge” to “extensive knowledge”, Frequency responses ranged from “very infrequent” to “very frequent”, and intensity responses ranged from “not at all intense” to
Table 3-2. Teachers’ Ratings of their Experience With Epilepsy

<table>
<thead>
<tr>
<th>Experience Rating</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of Epilepsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (No Knowledge)</td>
<td>29</td>
<td>9.1</td>
</tr>
<tr>
<td>2</td>
<td>110</td>
<td>34.8</td>
</tr>
<tr>
<td>3</td>
<td>83</td>
<td>26.3</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
<td>18.9</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
<td>7.9</td>
</tr>
<tr>
<td>6 (Extensive Knowledge)</td>
<td>9</td>
<td>2.8</td>
</tr>
<tr>
<td>Frequency of Contact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (Very Infrequent)</td>
<td>167</td>
<td>52.7</td>
</tr>
<tr>
<td>2</td>
<td>39</td>
<td>12.3</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>6.6</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>6.3</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>6.9</td>
</tr>
<tr>
<td>6 (Very Frequent)</td>
<td>47</td>
<td>14.8</td>
</tr>
<tr>
<td>Intensity of Contact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (Not At All Intense)</td>
<td>166</td>
<td>52.4</td>
</tr>
<tr>
<td>2</td>
<td>39</td>
<td>12.3</td>
</tr>
<tr>
<td>3</td>
<td>31</td>
<td>9.8</td>
</tr>
<tr>
<td>4</td>
<td>27</td>
<td>8.5</td>
</tr>
<tr>
<td>5</td>
<td>24</td>
<td>7.6</td>
</tr>
<tr>
<td>6</td>
<td>27</td>
<td>8.5</td>
</tr>
</tbody>
</table>

“very intense”. Teachers’ responses to these items are summarized in Table 3-2. With respect to knowledge ratings, the majority of teachers gave responses that fell on the lower end of the scale, with the greatest percentage of teachers rating their level of knowledge as either a 2 (34.8%) or 3 (26.3%). Only 2.8% of teachers felt as though they had “Extensive Knowledge” about epilepsy. Additionally, the majority of teachers in the sample also reported that their contact with persons with epilepsy was “very infrequent” (52.7%) and that their intensity of contact with persons with epilepsy was “not at all intense” (52.4%). Thus, based on this data, the teachers included in this sample characterize themselves as being relatively inexperienced in dealing with students with epilepsy.
Teachers’ Scores on the ATPE

Attitude Scale of the ATPE

Teachers’ scores on the Attitude Scale of the ATPE were analyzed to provide data on the sample’s general attitudes towards persons with epilepsy. To accomplish total scores on the Attitude Scale of the ATPE, weighted sums of item responses on the Attitude Scale were computed for each subject, with higher scores representing more positive attitudes. Responses to each item were on a 6-point Likert-type scale and ranged from “I disagree very much” to “I agree very much”. Possible scores on the Attitude Scale range from 21-126. For the current study, the mean Attitude score was 103.83 (SD= 9.49). Scores on the ATPE Attitude Scale for this sample ranged from 70 to 120. Attitude Scale scores frequencies for the sample are reported in Figure 3-1.

Figure 3-1. Teachers’ Scores on the ATPE Attitude Scale
Knowledge Scale of the ATPE

Teachers’ scores on the Knowledge Scale of the ATPE were also analyzed to provide data on the sample’s general knowledge about epilepsy. To accomplish total scores on the Knowledge Scale of the ATPE, weighted sums of item responses on the Knowledge Scale were computed for each subject, with higher scores representing more accurate knowledge. Responses to each item were on a 6-point Likert-type scale and ranged from “I disagree very much” to “I agree very much”. Possible scores on the Knowledge Scale range from 11-66. For the current study, the mean Knowledge score was 53.33 (SD= 7.196). Scores on the ATPE Knowledge Scale for this sample ranged from 20 to 66. Knowledge Scale scores frequencies for the sample are reported in Figure 3-2.

Figure 3-2. Teachers’ Scores on the ATPE Knowledge Scale
Bivariate Correlations

In order to examine relationships between all variables, Pearson Product Moment correlations were computed between all teacher-related variables. Table 3-3 summarizes the correlation matrix.

Significant positive correlations were found between a number of variables. The strongest correlations were found between teachers’ age and number of years teaching ($r=0.675, p=.01$), as well as between teachers’ Attitude Scale scores and Knowledge Scale Scores on the ATPE ($r=0.639, p=.01$). The latter finding suggests that more positive attitudes about epilepsy are related to having more accurate knowledge about epilepsy. A significant positive correlation was also found between variables related to teachers’ ratings of their personal experience with epilepsy, as reflected by personal ratings of their own knowledge of epilepsy, frequency of contact with persons with epilepsy, and the intensity of their contact with persons with epilepsy. In addition, teachers’ own rating of their knowledge about epilepsy was also significantly correlated with their scores on the ATPE Knowledge Scale ($r=0.310, p=.01$). This finding implies that teachers are relatively accurate at predicting their own level of knowledge about epilepsy.

Scores on the Knowledge Scale of the ATPE were also significantly correlated with teachers’ ratings of the frequency of their contact with persons with epilepsy ($r=0.261, p=.01$), as well as ratings of the intensity of their contact with persons with epilepsy ($r=0.276, p=.01$). Teachers’ ratings of the intensity of their contact with persons with epilepsy were also significantly correlated with Attitude Scale Scores on the ATPE ($r=0.161, p=.01$). These findings suggest that a relationship exists between scores on the Knowledge and Attitude Scales of the ATPE and teachers’ frequency and intensity of contact with persons with epilepsy.
Table 3-3. Correlation Matrix for Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
<th>Age</th>
<th>Edlevel</th>
<th>KNOWrat</th>
<th>FREQrat</th>
<th>INTrat</th>
<th>Yrteach</th>
<th>ClassType</th>
<th>ATPEAtt</th>
<th>ATPEKnow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1.00</td>
<td>-0.066</td>
<td>-0.088</td>
<td>-0.026</td>
<td>0.038</td>
<td>-0.014</td>
<td>0.021</td>
<td>0.110</td>
<td>-0.093</td>
<td>-0.084</td>
</tr>
<tr>
<td>Age</td>
<td>1.00</td>
<td>0.180 **</td>
<td>0.163 **</td>
<td>0.088</td>
<td>0.130 *</td>
<td>0.675 **</td>
<td>0.062</td>
<td>0.097</td>
<td>0.086</td>
<td></td>
</tr>
<tr>
<td>Edlevel</td>
<td>1.00</td>
<td>0.153 **</td>
<td>0.023</td>
<td>0.028</td>
<td>0.225 **</td>
<td>-0.186 **</td>
<td>0.024</td>
<td>0.060</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNOWrat</td>
<td>1.00</td>
<td>0.583 **</td>
<td>0.686 **</td>
<td>0.112 *</td>
<td>0.126 *</td>
<td>0.196 **</td>
<td>0.310 **</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREQrat</td>
<td>1.00</td>
<td>0.821 **</td>
<td>0.068</td>
<td>0.190 **</td>
<td>0.109</td>
<td>0.261 **</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTrat</td>
<td>1.00</td>
<td>0.054</td>
<td>0.160 **</td>
<td>0.161 **</td>
<td>0.276 **</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yr Teach</td>
<td>1.00</td>
<td>-0.045</td>
<td>0.016</td>
<td>0.021</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ClassType</td>
<td>1.00</td>
<td>0.081</td>
<td>0.106</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATPEAtt</td>
<td>1.00</td>
<td>0.639 **</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATPEKnow</td>
<td></td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
Additionally, class type (general education vs. special education) was significantly correlated with a number of other variables. Significant positive correlations were found between class type and teachers’ ratings of their frequency of contact with persons with epilepsy ($r=.190$, $p=.01$), class type and teachers’ ratings of their intensity of contact with persons with epilepsy ($r=.160$, $p=.01$), as well as teachers’ ratings of their own knowledge about epilepsy ($r=.126$, $p=.05$). Additionally, a significant negative correlation was found between class type and level of education ($r=-.186$, $p=.01$). These correlations suggest that a relationship exists between the type of class taught (general vs. special education) and these variables.

**Analysis of Variance**

One goal of this study was to compare special education teachers to general education teachers where attitudes and knowledge about epilepsy were concerned. In order to determine if significant differences existed between these two groups, a Univariate Analysis of Variance was completed using attitude scores on the ATPE and knowledge scores on the ATPE as dependent variables. Results of these analyses are summarized in Table 3-4 and Table 3-5. The mean ATPE Attitude score for general educators was 102.20 (SD=11.356), and the mean for special educators was 104.55 (SD=8.446). The mean ATPE Knowledge score for general educators was 52.19 (SD=9.202), and the mean for special educators was 53.84 (SD=6.045).

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Type</td>
<td>1</td>
<td>242.307</td>
<td>2.078</td>
<td>.150</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Type</td>
<td>1</td>
<td>183.498</td>
<td>3.572</td>
<td>.060</td>
</tr>
</tbody>
</table>
Results of the analysis revealed that no significant difference existed between general and special educators with respect to attitudes about persons with epilepsy, as reflected by Attitude Scale Scores on the ATPE. Additionally, no significant difference was found between general and special education teachers with respect to general knowledge about epilepsy, as reflected by scores on the Knowledge Scale of the ATPE. These findings suggest that special educators and general educators have similar attitudes and knowledge levels about epilepsy.

**Linear Regression Analysis**

Based on previous literature and results of the bivariate correlations, a linear regression analysis was completed to examine which teacher-related variables best predicted teachers’ attitudes and knowledge about epilepsy. As the assumptions of independence, linearity, conditional normality, and equal variance were met for all

Table 3-6. Summary of Regression Analysis for Variables Predicting Teachers’ Attitude Scale Scores on ATPE

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTrat</td>
<td>.563</td>
<td>.540</td>
<td>.089</td>
<td>1.042</td>
<td>.298</td>
</tr>
<tr>
<td>KNOWrat</td>
<td>.154</td>
<td>.548</td>
<td>.017</td>
<td>.281</td>
<td>.779</td>
</tr>
<tr>
<td>FREQrat</td>
<td>-.812</td>
<td>.437</td>
<td>-.142</td>
<td>-1.857</td>
<td>.064</td>
</tr>
<tr>
<td>YrsTeach</td>
<td>.024</td>
<td>.301</td>
<td>.003</td>
<td>.079</td>
<td>.937</td>
</tr>
<tr>
<td>ATPEKnow</td>
<td>.967</td>
<td>.070</td>
<td>.643</td>
<td>13.898</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note. R² = .413; Adjusted R² = .403

Table 3-7. Summary of Regression Analysis for Variables Predicting Teachers’ Knowledge Scale Scores on ATPE

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
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Note. R² = .452; Adjusted R² = .443
independent variables, linear regression was determined to be an appropriate test of predictors of teachers’ attitudes and knowledge about epilepsy.

Results of the first linear regression analysis indicated that the only independent variable that significantly predicted teachers’ attitudes about epilepsy was their level of knowledge about epilepsy, as reflected in their score on the Knowledge Scale of the ATPE. This variable accounted for approximately 41% of the variance in scores on the Knowledge Scale of the ATPE (R² = .413). The other variables included in the analysis, including years of teaching experience, self-reported knowledge about epilepsy, and frequency and intensity of contact with persons with epilepsy did not predict teachers’ attitudes about persons with epilepsy. These results suggest that teachers who are more knowledgeable about epilepsy also have more positive attitudes about persons with epilepsy.

Results of the second linear regression analysis indicated that two independent variables significantly predicted teachers’ knowledge about epilepsy: self-reported knowledge about epilepsy and Attitude Scale scores on the ATPE. These variables accounted for approximately 45% of variance in Attitude Scale scores on the ATPE (R² = .452). The other variables included in the analysis (years of teaching experience, frequency and intensity of contact with persons with epilepsy) were not significant predictors of teachers’ knowledge about epilepsy. These results suggest that teachers with more positive attitudes about persons with epilepsy know more about epilepsy, and that most teachers can accurately predict their own level of knowledge about epilepsy.

**Responses to Open-Ended Questions: Descriptive Analysis**

A descriptive analysis was completed on written responses from 309 subjects to the open-ended questions of the Knowledge Questionnaire Addendum. Eight subjects
completed the ATPE, but did not complete the Knowledge Questionnaire Addendum. Initially, 20% of subjects’ written responses on the Knowledge Questionnaire addendum (N= 63) were selected and read by the researcher. Responses from this sub-group were then divided up by question (1-7) and subjects’ responses were categorized into groups, based on the type of response given. After this initial categorization, the researcher re-read the responses and developed categories of responses for each question, giving each category a number. At the end of this phase of the analysis, each question was assigned between 5 and 14 categories into which responses could be classified (see Appendix E). If individual responses contained ideas representing more than one theme, the response was assigned multiple theme categories, as appropriate. If responses could not be categorized into one of the established theme categories, then it was categorized as “Other/Unclassifiable”. Only a small percentage of responses fell into this category.

After development of the coding system was finished, a reliability check of the coding system was completed. The researcher read through the written responses of 20% of the sample and coded subjects’ responses by category. Another researcher independently read the same 20% of responses and independently coded them into categories using the same coding system developed for the study. Inter-rater reliability was calculated for each question and resulted in the following: Question 1, 93% agreement, Question 2, 93% agreement, Question 3, 91% agreement, Question 4, 93% agreement, Question 5, 93% agreement, Question 6, 91% agreement, Question 7, 90% agreement. Adequate inter-rater reliability was obtained for all seven questions.

For Question 1, “What should you do if a child has a seizure in your class?”, responses were categorized into 11 separate theme categories. The majority of teachers’
responses fell into 2 categories: “Get help” (30.7% of General Education responses and 29.4% of Special Education responses) and “Avoid Injury” (41.5% of General Education responses and 31.6% of Special Education Responses). Results for Question 1 are summarized in Figure 3-3. For Question 2, “How might epilepsy affect a child’s school performance?”, responses were also categorized into 11 separate theme categories. For general education teachers, the majority of responses were categorized into the following two categories: “Psychological Adjustment Issues” (17.7%) and “Lost Time During Seizure” (13%).

![Figure 3-3. Theme Categorizations for Teachers’ Responses to Question 1: “What should you do if a child has a seizure in your class?”](image)

For special education teachers, the majority of responses were categorized into the following two categories: “Excessive Absences” (21.2%) and “Lost Time During Seizures” (15%). Results for Question 2 are summarized in Figure 3-4.
For Question 3, “What kinds of things might you observe if a child has a seizure?”, responses were categorized into 5 separate theme categories. For both special and general educators, the majority of responses fell into two theme categories: “Only Tonic-clonic” (43.8% of general educators and 34.6% of special educators) and “Both Seizure Types” (43.8% of general educators and 50.4% of special educators). That is, when asked to describe symptoms of a seizure, teachers in both fields were most likely to describe either symptoms of only “grand mal” seizures (i.e., losing muscle tone and consciousness and having convulsions), or to recognize symptoms of both types of seizures (“grand mal” and “petit mal”). Special educators were slightly more likely to describe symptoms of both major types of seizures than general educators. The remainder of teachers’ responses

Figure 3-4. Theme Categorizations for Teachers’ Responses to Question 2: “How might epilepsy affect a child’s school performance?”
fell into the following categories: “Don’t Know/Unsure” (6.3% of general educators, 4.7% of special educators), “Only Non-Tonic-Clonic” (3.1% of general educators, 5.1% of special educators), and “Other” (3.1% of general educators, 5.1% of special educators). Results for Question 3 are summarized in Figure 3-5.

For Question 4, “How does a child with epilepsy qualify for special education services?”, responses were categorized into 8 separate theme categories. For general educators, the response category with the highest percentage of responses was “Don’t Know/Unsure” (35%), followed by “Other” (15%). The response category with the highest number of responses for special educators, alternatively, fell into the category “OHI” (40.7%), indicating that a relatively large number of special education teachers correctly recognized that students with epilepsy were specifically eligible for
special education services under the designation of “Other Health Impaired”. Results for Question 4 are summarized in Figure 3-6.

For Question 5, “How might epilepsy affect a child’s ability to learn?”, responses were categorized into 11 separate theme categories. Responses for general educators were most likely to fall into two categories: “Don’t Know/Unsure” (21.8%) and “No Effect” (16.1%). For special educators, the single category with the most responses was “Cognitive Problems” (23.4%). Results for Question 5 are summarized in Figure 3-7.

For Question 6, “How might epilepsy affect a child’s behavior?”, responses were categorized into 14 separate theme categories. For this question, teachers’ responses were more evenly spread across categories. For general education teachers, the categories with the greatest number of responses were “Self Esteem” (20.2%) and “Don’t Know/Unsure”

![Figure 3-6. Theme Categorizations for Teachers’ Responses to Question 4: “How does a child with epilepsy qualify for special education services?”](image-url)
(17.4%). For special educators, the categories with the greatest number of responses were “Self Esteem” (15.5%) and “Acting Out/Aggressive” (13%). Results for Question 6 are summarized in Figure 3-8.

For Question 7, “Can a child with epilepsy participate in sports or physical education?”, teachers’ responses were categorized in 11 theme categories. Most general educators’ responses were categorized into two categories: “Yes, Why Not?” (21%) and “If Controlled” (21%). For special educators, the categories with the greatest number of responses were “With Medical Clearance” (35%) and “If Controlled” (25.8%). Results for Question 7 are summarized in Figure 3-9.

Figure 3-7. Theme Categorizations for Teachers’ Responses to Question 5: “How might epilepsy affect a child’s ability to learn?”
Figure 3-8. Theme Categorizations for Teachers’ Responses to Question 6: “How might epilepsy affect a child’s behavior?”
Figure 3-9. Theme Categorizations for Teachers’ Responses to Question 7: “Can a child with epilepsy participate in sports or physical education?
CHAPTER 4
DISCUSSION

Findings

Although a review of the literature suggests that epilepsy has the potential to profoundly affect a child’s school adjustment, very little information exists about teachers’ knowledge and attitudes about students with epilepsy. When reviewing the findings of the few studies that have addressed these issues, it is clear that, although studies consistently point to the existence of inaccuracies in teachers’ knowledge and attitudes about students with epilepsy, very few studies have drawn these conclusions using a psychometrically sound survey instrument with teachers in the United States (Bishop & Slevin, 2004, Bishop & Boag, 2006). Additionally, although children with epilepsy are placed in special education more frequently than their peers (Bailet & Turk, 2000, Williams, 2004), no study has determined if knowledge and attitudes about epilepsy differ when special education teachers are compared to general education teachers. Further, previous studies have failed to address many of the most important issues relevant specifically to education for children with epilepsy. Thus, the purpose of the present study was to address 3 main goals: The first goal of this study was to address the role of teacher-related variables in predicting teachers’ knowledge and attitudes about epilepsy. The second research question addressed by this study examined whether or not attitudes and knowledge about epilepsy differed between teachers who teach special education and those who teach general education. Finally, the last goal of this study was to explore the following question: What is the nature of the knowledge held by teachers in specific areas relevant to the school adjustment of children with epilepsy? This question was investigated by completing a descriptive analysis of teachers’ written
Predictors of Teacher Knowledge and Attitudes About Epilepsy

A number of authors have suggested in the previous literature that teacher knowledge and attitudes about students with epilepsy may have an important impact on teacher’s interactions with and ability to effectively educate these students (Anotnak & Livneh, 1997, Bishop & Slevin, 2004). It follows, then, that a thorough understanding of teachers’ current attitudes and knowledge about students with epilepsy is necessary to guide the development of teacher education programs about students with epilepsy. Yet, very few studies have examined teacher attitudes and knowledge about epilepsy using a psychometrically sound survey instrument (Bishop & Slevin, 2004, Bishop & Boag, 2006). Only one of these studies has examined questions about which teacher-related variables predict teacher knowledge and attitudes about epilepsy (Bishop & Boag, 2006). In order to guide teacher education efforts, it is imperative to better understand which variables influence teachers’ attitudes and knowledge about persons with epilepsy. Thus, one goal of the current study was to examine which teacher-related variables predicted teachers’ attitudes and knowledge about epilepsy. Results of the current study found only a few significant predictors of teachers’ knowledge and attitudes about epilepsy. First, with respect to attitudes about epilepsy, only knowledge about epilepsy (as measured by the Knowledge Scale score on the ATPE) predicted teachers’ attitudes about epilepsy. These results suggest that the more accurate teachers’ general knowledge is about epilepsy, the more positive their attitudes about persons with epilepsy were. Results from the current study are consistent with previous research that suggested that an increase in
knowledge about persons with disabilities leads to improved attitudes about persons with disabilities (Hsieh & Chiou, 2001, Bishop & Boag, 2006).

Other teacher-related variables examined in this study, familiarity with epilepsy (as measured by teachers’ ratings of their own knowledge about epilepsy, and frequency and intensity of contact with persons with epilepsy) and teaching experience (as measured by years teaching) did not significantly predict teachers’ attitudes about persons with epilepsy. Although not expected, this finding makes sense, in light of the literature on teacher attitudes and beliefs, which suggests that teachers’ beliefs are formed early in their educational careers and are highly impervious to change (Nespor, 1987; Pajares, 1992). Teachers’ personal experiences with epilepsy can be both positive and negative; thus, experience, in itself, does not seem to be enough to create more positive attitudes.

With respect to teachers’ general knowledge about epilepsy, two variables were found to be significant predictors: self-rated knowledge about epilepsy and attitudes towards persons with epilepsy (as measured by the Attitude Scale score on the ATPE). These results suggest that teachers are accurate reporters of their own knowledge about epilepsy. That is, teachers who feel like they know a great deal about epilepsy usually do, in fact, know a lot, and vice-versa. These results also suggest that teachers with more positive attitudes about persons with epilepsy also have more accurate knowledge about epilepsy. This finding is in line with the previously discussed inverse finding that teachers’ knowledge levels also predicted their attitudes.

Comparison of Special Education Teachers and General Education Teachers

This study’s quantitative comparison of general educators and special educators, with respect to general knowledge and attitudes about epilepsy revealed that there were
no significant differences between the two groups. This finding was contrary to the investigator’s expectation that special educators would be more knowledgeable about epilepsy and have more favorable attitudes towards persons with epilepsy than their general education counterparts. This difference was expected in light of the fact that, since children with epilepsy are placed in special education classes more often than their peers, special education teachers are more likely to have a greater amount of experience with children with epilepsy. Indeed, with regard to the sample from the current study, special education teachers did report having significantly more frequent and intense experience with persons with epilepsy. This differential in experience was expected to translate into a significant difference in knowledge and attitudes. With respect to quantitative data, however, that notion was not supported. This finding may be a result of the unspecific nature of the instrument used to assess attitudes and knowledge, the ATPE. The ATPE was designed to assess the *general public’s* knowledge and attitudes regarding epilepsy, not designed specifically to assess *teachers*. Therefore, the ATPE did not assess teachers’ knowledge or attitudes about issues specific to education or children with epilepsy. At the present time, a psychometrically sound instrument designed specifically for teachers, aimed at addressing educational issues, does not exist. It is possible that differences between the knowledge and attitudes of special and general educators would be more significant if they were assessed using an instrument designed to address these specific issues.

However, results of this study’s regression analyses indicated that familiarity with epilepsy and years of teaching experience were not significant predictors of teachers’ general knowledge or attitudes about persons with epilepsy. It is, therefore, possible that
special educators’ increased level of experience with children with epilepsy does not translate into more accurate general knowledge or more positive attitudes about persons with epilepsy, as prior experiences can be both positive and negative.

**Teacher Knowledge About School-Related Issues for Children with Epilepsy**

As previously mentioned, while teachers’ responses on the ATPE provided an indicator of their general attitudes and knowledge about epilepsy, the ATPE was not designed to assess knowledge about specific issues related to education for children with epilepsy. Thus, while teachers’ scores on the ATPE revealed generally positive attitudes towards persons with epilepsy and relatively accurate general knowledge about epilepsy, these results were not a valid indicator of teachers’ specific knowledge about educational issues for children with epilepsy. To further explore the nature of teachers’ knowledge about these issues, a descriptive analysis was completed on teachers’ written responses to the Knowledge Questionnaire Addendum, which was designed specifically to address these educational issues. These results provided more relevant insight into teachers’ knowledge with respect to educational issues, and highlighted differences between general educators and special educators in some key areas. These findings are discussed below.

**Knowledge about seizure first aid**

Knowledge about what to do when a child has a seizure is of utmost importance, as the consequences of not knowing what to do, or doing the wrong thing, could be harmful to the child having the seizure. When a child has a generalized tonic-clonic seizure (the type of seizure most frequently requiring any kind of first-aid attention), the Epilepsy Foundation of America (2009) recommends that teachers should do the following:
1. Keep calm. Reassure other children that the child will be fine in a minute.

2. Ease the child gently to the floor and clear the area around him of anything that could hurt him.

3. Put something flat and soft (like a folded jacket) under his head so it will not bang against the floor as his body jerks.

4. Turn him gently onto his side. This keeps his airway clear and allows any fluid in his mouth to drain harmlessly away. DON’T try to force his mouth open. DON’T try to hold on to his tongue. DON’T put anything in his mouth. DON’T restrain his movements.

5. When the jerking movements stop, let the child rest until full consciousness returns.

6. Breathing may have been shallow during the seizure, and may even have stopped briefly. This can give the child’s lips or skin a bluish tinge, which corrects naturally as the seizure ends. In the unlikely event that breathing does not begin again, check the child’s airway for any obstruction. It is rarely necessary to give artificial respiration.

When teachers were asked, “What should you do if a student has a seizure?”, both general and special education teachers were likely to mention either calling for help (“Call 911”, “Call the school nurse”) or clearing the area to avoid injury to the child. While clearing the area around the seizing child was identified as an important first-aid measure by the Epilepsy Foundation, the percentage of teachers that mentioned any of the other first aid procedures outlined by the Epilepsy Foundation was relatively quite small. Protecting the child’s head was only mentioned by 2.3% of general educators and 4% of special educators. Turning the child onto his side was only mentioned by 6.5% of general educators and 10% of special educators. Checking the child’s airway was only mentioned by 3.4% of general educators and 4.2% of special educators. Other precautions outlined by the Epilepsy Foundation, such as keeping calm, reassuring other children, and letting the child rest until full consciousness returns were not mentioned by either group of teachers frequently enough to warrant a separate theme category. These findings seem to
indicate that knowledge of seizure first-aid is lacking amongst both special and general education teachers. This finding is understandable, given that training in seizure first aid is not likely a standard subject covered by most teacher education programs. However, this finding underscores the importance of providing teachers with educational materials and inservice training which covers seizure first aid whenever a child with epilepsy is a member of their class.

Knowledge about effects of epilepsy on school performance

The current literature identifies numerous ways that epilepsy may affect a child’s school performance. Results of the descriptive analysis of teachers’ responses to this question indicated that both general and special educators were aware of some of the ways that epilepsy could effect a child’s school performance and unaware of others. Both subgroups of teachers tended to believe that children with epilepsy would be most affected by issues that are common to all children with chronic illnesses. For example, special education teachers were most likely to indicate that epilepsy would affect a child’s school performance by causing excessive absences from school (21.2% of responses). General educators were most likely to suggest that psychological adjustment issues, such as anxiety, would have the most affect on a child’s school performance (17.7%). The literature does suggest that these are both significant school adjustment issues for children with chronic illnesses. However, other, more epilepsy-specific factors were not mentioned as frequently.

It is interesting to note, for example, that less than 10% of both special education and general education teachers’ responses indicated that epilepsy’s effects on cognition (e.g., memory, attention, general IQ) could affect a child’s school performance. The literature in this area, however, suggests that some areas of cognition, especially memory
and attention, are commonly affected in children with epilepsy (Bailet & Turk, 2000, Williams, 2004). Slightly more teachers in both subgroups did indicate an awareness of the possibility of lost instructional time during a seizure (13% of general educators and 15% of special educators). However, this is still a relatively small percentage of the total number of responses. Special educators were more aware of the possibility of a child being fatigued or disoriented after a seizure than general educators were (12.7% special ed., 7.7% general ed.), and general educators were more likely than special educators to indicate that they didn’t know how epilepsy could affect school performance (9.2%) or that it would have no effect on school performance (8.5).

**Knowledge about symptoms of seizures**

Interestingly, both general and special educators were able to describe symptoms of a seizure with relative accuracy. When asked, “What kinds of things might you observe if a student has a seizure?”, almost half of responses from general educators and just over half of responses from special educators recognized that seizure symptoms may be either convulsive or non-convulsive. Thus, a relatively large number of teachers recognize that some students’ seizures may involve subtle symptoms (such as staring into space or appearing to ignore them). However, it is also important to note that over half of general educators did not recognize symptoms of non-grand-mal seizures. That is, 53.2% of responses from general education teachers fell into three categories that did not mention any symptoms of non-convulsive seizures (“Don’t Know/Unsure”, “Only Tonic-clonic”, and “Other”). This result is significant in that it suggests that a substantial percentage of teachers may not recognize more subtle symptoms of a seizure. For example, a teacher who is unaware of the symptoms of absence seizures may incorrectly characterize a child as inattentive or forgetful when the child is, in fact, missing
instructional material *during* seizures. This finding highlights the need for providing teachers with educational materials and inservice training that covers a child’s specific seizure symptoms whenever a child with epilepsy is a member of their class.

**Knowledge about epilepsy and special education**

Given the significant effects that epilepsy can potentially have on a child’s school functioning, it follows that students with epilepsy may need to utilize special education services more frequently than their peers. Indeed, the current literature supports the notion that this is the case (Bailet & Turk, 2000; Wodrich, Kaplan, & Deering, 2006). Federal legislation describes the criteria for qualifying for special education services under the “Other Health Impaired” category as having a chronic or acute health problem that limits strength, vitality, and alertness and adversely affects educational performance (Turnbull, Turnbull, Shank, & Leal, 1999). Under this umbrella, if a student with epilepsy’s school performance is adversely impacted, then they qualify for special education services because of their epilepsy. However, barriers to receiving appropriate services can potentially arise if a child with epilepsy is in need of accommodations in his educational setting. If educators do not recognize that having epilepsy can qualify a child for special education services, securing these accommodations may become an unnecessarily laborious and sometimes contentious process.

Results of this study seem to indicate that general education teachers are largely unaware that students with epilepsy qualify for special education. A substantial majority of responses (over 68%) from general education teachers did not recognize a way that students with epilepsy could qualify for special education services or educational accommodations. By contrast, special educators were more likely to recognize that students with epilepsy could qualify for special education services under the “Other
Health Impaired” designation (40.7% of responses). Only 7.5% of responses from general educators mentioned the “Other Health Impaired” category. While it seems quite understandable that special educators would be more familiar with the various ways in which students can qualify for special education, these findings do suggest the need for education in this area whenever teachers have a student with epilepsy in their class.

Knowledge about effects of epilepsy on learning ability

As previously discussed, epilepsy has the potential to significantly impact a child’s learning ability. Results of this study suggest that a significant percentage of general education teachers are unaware of the potential effects that epilepsy can have on a child’s ability to learn. Of general educator’s responses, 42.7% indicated that they were unsure of the answer, or that epilepsy should have no effect on a child’s ability to learn. It is interesting to note that almost a quarter of special education teachers’ responses also fell into these categories. Special education teachers, however, were also likely to indicate that cognitive problems, such as those associated with memory, would affect a child’s ability to learn (23.4%). Interestingly, when asked a more general question previously (i.e., “How might epilepsy affect a child’s school performance?”), special education teachers did not frequently mention cognitive problems (9.5%).

Teachers in both sub-groups were aware of other ways that epilepsy could potentially affect a child’s ability to learn, but much less frequently. For example, less than 15% of teachers’ responses in both subgroups reflected knowledge of the possibility of anti-epileptic medications causing side-effects that might affect a child’s learning ability. Likewise, less than 15% of teachers’ responses in both groups indicated that loss of instructional time due to seizure activity could affect a child’s ability to learn. These results suggest that educational materials and inservice presentations for teachers who
have students with epilepsy in their classes should include information on specific ways that epilepsy can affect a child’s learning ability, as this is an area where there seems to be a gap in knowledge.

Knowledge about effects of epilepsy on behavior

Similar to teachers’ knowledge about the effects of epilepsy on learning ability, teachers also appeared to have consistent gaps in knowledge about epilepsy’s effects on behavior. Over a quarter of general educators in the current study indicated that they did not know how epilepsy could affect a child’s behavior or that it should have no effect on behavior, as did just under 20% of special education teachers. Some teachers were aware that epilepsy, like other chronic illnesses, could potentially affect a child’s psychological health. Both special education teachers and general education teachers recognized that epilepsy could have effects on a child’s self-esteem with relative frequency (15.5% and 20.2%, respectively), though general educators were more likely to provide responses in this area. Other responses related to self-esteem, such as “feeling embarrassment” about having seizures were mentioned by general educators with relative frequency (12.3%).

Although the literature indicates that children with epilepsy are at increased risk for symptoms of depression and anxiety (Caplan et al., 2005), only 8.7% of general educators’ responses and 4.8% of special educators’ responses indicated that epilepsy could affect a child’s behavior by making them more susceptible to mood disorders. Similarly, although the literature cites attention problems as being widely prevalent among children with epilepsy, occurring in an estimated 37% of the population (Bailet & Turk, 2000; Williams, 2004), in this study, only 2% of general education teachers and 6% of special education teachers indicated that epilepsy could affect a child’s behavior by making the child inattentive. Additionally, although the literature also suggests that anti-
epileptic drugs can have significant effects on behavior (Loring & Meador, 2004), only 2.2% of general education teachers and 5% of special education teachers mentioned medication side-effects in their response. Again, these results suggest that while some teachers have some knowledge about how epilepsy can affect a child’s behavior, most seem to have incomplete knowledge, or lack knowledge about the most salient ways that behavior can be affected (such as attention problems). Thus, information on how epilepsy can affect a child’s behavior should be included when developing instructional materials for teachers regarding epilepsy. These results also underscore the importance of providing teachers with the opportunities to learn more about epilepsy (such as in-service presentations or reading materials) when they have a student with epilepsy in their class.

**Knowledge about participation in physical education and sports**

Findings of this study suggest that teachers are overwhelmingly supportive of students with epilepsy participating in sports and physical education. The majority of responses from both subgroups of teachers indicated that students with epilepsy should be able to participate in physical activities, albeit with some caveats. Special educators, for example, more commonly suggested that students with epilepsy could participate in sports or physical education as long as the student had medical clearance to do so (35% vs. 13% of general educators) Both subgroups suggested about equally that students could participate in physical activity as long as the student’s epilepsy was controlled by medication (25.8% vs. 21% of general educators). Interestingly, general educators were more likely than special educators to suggest that there was no reason for children with epilepsy not to participate in any physical activity, frequently stating that children with epilepsy are, “Just like everyone else”. While this attitude is positive, it also suggests that perhaps some teachers may potentially be unaware of the risks associated with some
physical activities for some children with epilepsy, as well as the need for extra vigilance, supervision, and training in seizure first aid for P.E. teachers and coaches.

On a similar note, while both subgroups of teachers supported the participation of students with epilepsy in physical activities, relatively few teachers (13% of general educators and 16% of special educators) mentioned that it may be necessary for P.E. teachers and coaches to have specific training in order to be prepared to properly supervise the student with epilepsy during physical activities.

**Limitations of the Current Study**

While this study presents some significant findings, several factors limit these results and must be addressed. These limitations can be discussed in terms of threats to both external and internal validity. External validity is the extent to which the findings of the study are applicable to the broader population beyond the scope of the study itself (Shaughnessy & Zechmeister, 1994). The first limitation of this study that threatens external validity lies in the low response rate by teachers whose participation was requested. When the response rate of a survey is low, the chances increase that the sample being studied is somehow different from the population at large, and thus that results of the study are not generalizable to the larger population. While the overall sample size for the study was relatively large and sufficient for the statistical analyses that were completed, many teachers who were invited to participate elected not to. The overall response rate for teachers in the study was only 14%. Efforts were made to achieve a higher response rate whenever possible (e.g., reminder e-mails were sent to participants in Hillsborough County). However, the researcher encountered a number of barriers to increasing the response rate. First, in one local county, many principals disallowed the use of reminders of any sort, as they felt this would unnecessarily bother
the teachers at their school. As the researcher tried to make every effort to conduct this study in a manner that was as undisruptive to teachers and principals as possible, reminders were not sent to teachers in Alachua county, nor were teachers contacted multiple times to complete the survey. Both of these procedures may have increased the response rate. Additionally, due to lack of research funding, teachers were not offered any compensation for completing the study. Compensating teachers for completing the study may have increased the response rate, as the literature suggests that compensating survey participants increases responses (Czaja & Blair, 2005). Another factor that may have contributed to the low response rate for the study was the time of year when the study was conducted. Data was collected from teachers at the beginning of the school year (in Alachua and Gilchrist counties) and the end of the school year (in Hillsborough county), and these are, traditionally, very busy times of the year for teachers. It may be that teachers were simply felt too busy at these times to complete the survey, resulting in a low return rate.

Unfortunately, data could not be collected on teachers who elected not to participate; thus, it is impossible to determine if teachers who did elect to participate were systematically different from teachers who did not in any significant way. In order to address this issue, however, demographic characteristics of the study sample were compared to demographic characteristics of the entire population of teachers from the counties from which the study sample came (available from the Florida Department of Education). The study sample was compared to the Florida Department of Education demographic statistics to look for large differences between the study sample and the larger population of teachers in the district. Differences were noted between the study
sample and the general teacher population in Florida, with respect to education level and gender. Teachers in the study sample had slightly higher levels of education and were more likely to be female than in the general population of teachers in Florida. However, correlation results indicated that gender and teaching experience were not significantly related to knowledge or attitudes about epilepsy. Thus, the noted differences in the study sample could be expected to have a minimal effect on the study’s results.

Another threat to external validity lies in the narrow geographic region from which study participants were recruited. Subjects for this study only came from the state of Florida, so the results of this study may not be generalizable to the population of teachers outside the state of Florida.

Other limitations to this study can be discussed in terms of threats to internal validity. Internal validity refers to the extent to which the study’s findings are a result of the manipulations of the study itself or a result of some other possible causes for the outcome (Shaughnessy & Zechmeister, 1994). Thus, another limitation for this study is the fact that, because they came from different geographic regions, systematic differences may exist between the subgroup of special education teachers and the subgroup of general education teachers. It is possible that the results of this study (relating to differences between special educators and general educators) are a result of differences between teachers from different Florida counties, rather than differences resulting from teaching special education or general education. That is, because adequate numbers of special education teachers could not be recruited in Alachua and Gilchrist counties, it became necessary to recruit teachers from an additional district. Thus, only special education teachers were recruited in Hillsborough county. This design resulted in the
majority of the special education sample coming from Hillsborough County and the
majority of the general education sample coming from Alachua and Gilchrist counties. In
order to further examine this limitation, the general education sample and special
education sample were compared on relevant demographic variables to see if significant
differences existed between groups. In fact, the two groups did differ with respect to
education level and familiarity with epilepsy. The difference between groups with respect
to familiarity with epilepsy was expected, due to the fact that children with epilepsy are
placed in special education classes more often than their peers. With respect to education
level, however, the difference between groups was not expected. General educators, who
came mostly from Alachua and Gilchrist counties, had a significantly higher level of
education than special education teachers. This is possibly due to the fact that both
counties are located within very close distance to the University of Florida, making
higher degree attainment more convenient and, thus, more likely. Results of this study
indicated that significant differences did not exist between special and general educators
with respect to knowledge and attitudes about persons with epilepsy. It is possible that a
difference would have been found if special and general educators had all come from the
same county, or if subjects from both groups had come from all three counties in
relatively equal numbers.

A final limitation to this study that must be addressed in terms of internal validity
is the nature of the survey instrument used to assess teachers’ attitudes and knowledge
about persons with epilepsy, the ATPE. As mentioned previously, the ATPE was
designed as a measure to be used with the general public to assess general knowledge and
attitudes about persons with epilepsy. It was not designed specifically for teachers, nor
was it designed specifically with educational issues in mind. A psychometrically sound
survey instrument designed specifically for teachers, for the purpose of addressing
educationally relevant knowledge and attitudes, does not yet exist. Therefore, its use in
the context of this study is not ideal, especially when comparing special educators and
general educators. It is possible that special educators do have more accurate knowledge
about educational issues faced by children with epilepsy, and this suggestion is
supported, at least in part, by findings from the descriptive analysis in this study. As the
ATPE does not ask about these issues, it may not detect important differences.

**Conclusions**

Results of this study suggest that teachers’ attitudes about persons with epilepsy
are predicted by their knowledge about epilepsy. That is, teachers who have more
accurate knowledge about epilepsy have more positive attitudes about persons with
epilepsy. Likewise, teacher attitudes about epilepsy are also a significant predictor of
teacher knowledge about epilepsy. Additionally, teachers’ self-ratings of their knowledge
about epilepsy also predict their knowledge about epilepsy. In other words, teachers are
accurate at predicting their own level of knowledge about epilepsy. Interestingly, other
aspects of teachers’ familiarity with epilepsy (frequency and intensity of contact with
persons with epilepsy) were not predictors of knowledge or attitudes about epilepsy.
Thus, it seems that more prior experience with persons with epilepsy does not predict
more accurate knowledge or positive attitudes about persons with epilepsy. These
findings suggest that increasing teachers’ knowledge about epilepsy could lead to more
positive attitudes towards students with epilepsy, and that beginning and veteran teachers
alike could benefit from being provided with the opportunity to learn more about the
needs of students with epilepsy.
When special education teachers were quantitatively compared to general education teachers, no significant differences were found between the two groups with respect to knowledge or attitudes about persons with epilepsy. However, when a descriptive analysis was completed examining teacher’s responses to open-ended questions about educational issues for children with epilepsy, some differences between special educators and general educators emerged. Across all areas, general education teachers were more likely to report that they did not know about the effects of epilepsy on education, or that epilepsy had no effect on education. Special educators were more likely than general educators to be aware of the specific effects of epilepsy on cognition and behavior. They were also more likely to be aware of how children with epilepsy qualify for special education services.

Some important gaps in teachers’ knowledge about educational issues for children with epilepsy were identified for both special educators and general educators through the descriptive analysis. The most salient of these findings was that teachers seem to know relatively little about what to do if a child has a seizure in their classroom. This lack of knowledge could have serious consequences to the well-being of the student with epilepsy, should a seizure occur in the classroom. Additionally, teachers seem to be often unaware of the more subtle, non-convulsive symptoms of some seizure types, and may not recognize them if a child were to exhibit these symptoms in the classroom. Failure to recognize these symptoms could result in incorrect characterization of the student with epilepsy and misguided educational planning. Teachers often seem to be unaware of many of ways that epilepsy can affect a child’s learning ability and behavior. The idea that epilepsy should not affect a child’s learning or behavior seems prevalent. It seems
possible that while many teachers have positive attitudes about children with epilepsy, they may be unaware of the potential hurdles these students may face.

Taken together, these findings have important implications for teacher education. The results of this study underscore the vital importance of providing teachers with the opportunity to learn about how epilepsy can affect a student’s school performance when a child with epilepsy enters their class. Parents surveyed in the pilot portion of this study endorsed concern about teachers and other school personnel having accurate knowledge about epilepsy as one of their top concerns. Results of this study support the contention that their concerns are not unfounded. Inservice training and reading materials would be invaluable to teachers when a student with epilepsy begins attending their school. Inservice training should include information about seizure first aid, how to recognize seizures, as well as a discussion of how epilepsy can affect a child’s performance in school, both academically and behaviorally. An increase in teachers’ knowledge about educational issues for children with epilepsy would likely lead to a better understanding of the educational needs of children with epilepsy, which could contribute to better educational outcomes for children with epilepsy. Additionally, more accurate knowledge about students with epilepsy could also lead to more positive attitudes about students with epilepsy.

**Directions for Future Research**

The findings presented in this study pave the way for a great deal of relevant future research. It is clear from these findings that there is still much to be learned about teacher attitudes and knowledge about students with epilepsy and their educational needs, and that learning more about those needs could result in better educational outcomes.
Future research would benefit from studies taking both quantitative and qualitative approaches.

Development of a psychometrically sound survey instrument designed specifically to address knowledge and attitudes about educational issues for children with epilepsy would contribute greatly to understanding these constructs. Such an instrument would have great utility, both for research purposes, and instructional purposes. For example, such an instrument could be used for a broader, larger-scale survey of teachers in the United States. A better, more complete snapshot of teachers’ understanding of the educational needs of children with epilepsy could be gained in this way. This information would guide the development of teacher education programs about pediatric epilepsy.

Educational programs aimed at providing teachers with information about pediatric epilepsy and its effects on school adjustment have not been evaluated from an empirical standpoint. An important direction for future research involves the evaluation of educational programs about pediatric epilepsy and measurements of their impact on teacher knowledge and attitudes about epilepsy.

Additionally, it has not yet been empirically determined whether or not teacher attitudes and knowledge have a measurable effect on student educational outcomes. Although the literature seems to suggest that teacher attitudes and beliefs influence student outcomes in academic areas, the effect of teacher attitudes and beliefs on the educational outcomes of students with chronic illnesses is yet undetermined. Although a quantitative approach may provide insight into this question, it may be best answered, at least initially, by an in-depth, qualitative case-study of children with epilepsy and their teachers. Collection of rich, contextually-relevant data about how teachers of students
with epilepsy view teaching of their student, what types of problems they encounter, why they think these problems have occurred, and how they solve them could contribute greatly to our understanding of educational issues for children with epilepsy and their teachers. Complementary information from the student with epilepsy and his parents would also contribute to this understanding.
APPENDIX A
ATPE FORMS

ATPE • Form 6−A
Personal Information Form

(1) → Today’s date: ___/___/___ → (2) Age last birthday: ___ → (3) Sex: ___ M ___ F
(4) → Marital status: ___ Single ___ Married ___ Separated ___ Divorced ___ Widowed
(5) → Heritage: ___ White ___ Black ___ Hispanic ___ Oriental ___ Other: _______________________
(6) → Highest educational level attained (Check only one):
___ Some High School → ___ High School Graduate →
___ College Freshman → ___ College Sophomore → ___ College Junior → ___ College Senior →
___ Bachelor’s Degree → ___ Bachelor’s Degree +15 credits →
___ Master’s Degree → ___ Specialist Degree → ___ Doctorate
(7) → If you attended college, what was your:
Undergraduate Major: ___________________________ →
Graduate Major: ___________________________ →
(8) → Recent occupations (most recent first) → Years
_________________________________________ → ___________ →
_________________________________________ → ___________ →
_________________________________________ → ___________ →
_________________________________________ → ___________ →
(9) → Do you know a person or persons with epilepsy? ___ Yes ___ If “Yes,” in what ways do you know this person or persons (Check all that apply):
___ Spouse ___ Child ___ Sibling ___ Relative (explain): ___________________________ →
___ Client, patient, or student ___ Co-worker ___ Employee ___
___ Neighbor ___ Acquaintance (explain): ___________________________ →
___ Other (explain): ___________________________ →

Please rate your general knowledge of the conditions and life circumstances of persons with epilepsy:
→ No Knowledge → Extensive Knowledge
→ 1 → 2 → 3 → 4 → 5 → 6

Please rate the frequency of your contact with persons with epilepsy:
→ Very Infrequent → Very Frequent
→ 1 → 2 → 3 → 4 → 5 → 6

Please rate the intensity of your contact with persons with epilepsy, regardless of the frequency of that contact:
→ Not At All Intense → Very Intense
→ 1 → 2 → 3 → 4 → 5 → 6
ATPE - Form S

Directions: Listed below are a number of statements expressing opinions or ideas about persons with epilepsy. There are many differences of opinion; many persons agree and many persons disagree with each statement. We would like to know your opinion about them. Read each statement carefully and then circle the appropriate number, from -3 to +3, that best corresponds with how you feel about the statement. There is no time limit for the completion of this questionnaire, but you should work as rapidly as you can.

KEY
-3: I disagree very much
-2: I disagree pretty much
-1: I disagree a little
+1: I agree a little
+2: I agree pretty much
+3: I agree very much

Please Respond To Every Statement

1. Schools should not place children with epilepsy into regular classrooms. -3 -2 -1 +1 +2 +3
2. Persons with epilepsy have the same rights as all people. -3 -2 -1 +1 +2 +3
3. Persons with epilepsy can safely operate machinery. -3 -2 -1 +1 +2 +3
4. The individual with epilepsy does not possess a normal life expectancy. -3 -2 -1 +1 +2 +3
5. Insurance companies should not deny insurance to an individual with epilepsy. -3 -2 -1 +1 +2 +3
6. The individual with epilepsy should not be prevented from having children. -3 -2 -1 +1 +2 +3
7. Persons with epilepsy should be prohibited from driving. -3 -2 -1 +1 +2 +3
8. Children with epilepsy should attend regular public schools. -3 -2 -1 +1 +2 +3
9. The onset of epileptic seizures in a spouse is sufficient reason for divorce. -3 -2 -1 +1 +2 +3
10. Individuals with epilepsy are also mentally retarded. -3 -2 -1 +1 +2 +3
11. Persons with epilepsy are a danger to the public. -3 -2 -1 +1 +2 +3
12. The responsibility for educating children with epilepsy rests with the community. -3 -2 -1 +1 +2 +3
13. Individuals with epilepsy are accident-prone. -3 -2 -1 +1 +2 +3

> Over Please >
Please Respond To Every Statement

<table>
<thead>
<tr>
<th>KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3: I disagree very much</td>
</tr>
<tr>
<td>-2: I disagree pretty much</td>
</tr>
<tr>
<td>-1: I disagree a little</td>
</tr>
<tr>
<td>+1: I agree a little</td>
</tr>
<tr>
<td>+2: I agree pretty much</td>
</tr>
<tr>
<td>+3: I agree very much</td>
</tr>
</tbody>
</table>

14. Children need to be protected from classmates who have epilepsy. | -3  -2  -1  +1  +2  +3 |
15. Parents should expect of their child who has epilepsy what they expect of other children. | -3  -2  -1  +1  +2  +3 |
16. Persons with epilepsy can safely participate in strenuous activity. | -3  -2  -1  +1  +2  +3 |
17. Persons with epilepsy are more likely to develop and express criminal tendencies than are other people. | -3  -2  -1  +1  +2  +3 |
18. Persons with epilepsy should not be prohibited from marrying. | -3  -2  -1  +1  +2  +3 |
19. Laws citing epilepsy as the basis for the annulment of adoption should be repealed. | -3  -2  -1  +1  +2  +3 |
20. Persons with epilepsy prefer to live with others of similar characteristics. | -3  -2  -1  +1  +2  +3 |
21. Equal employment opportunities should be available to individuals with epilepsy. | -3  -2  -1  +1  +2  +3 |
22. You can expect the condition of a person with epilepsy to deteriorate. | -3  -2  -1  +1  +2  +3 |
23. The offspring of parents with epilepsy will also have epilepsy. | -3  -2  -1  +1  +2  +3 |
24. When their seizures are controlled by medication, persons with epilepsy are just like anyone else. | -3  -2  -1  +1  +2  +3 |
25. Families of children with epilepsy should not be provided supportive social services. | -3  -2  -1  +1  +2  +3 |
26. Epilepsy is not a contagious disease. | -3  -2  -1  +1  +2  +3 |
27. Children with epilepsy in regular classes have an adverse effect on the other children. | -3  -2  -1  +1  +2  +3 |
28. Individuals with epilepsy can cope with a 40-hour work week. | -3  -2  -1  +1  +2  +3 |

Thank You For Your Assistance In Completing This Questionnaire
Epilepsy Questionnaire Addendum

1. What should you do if a student has a seizure?

______________________________________________________________________________
______________________________________________________________________________

2. How might epilepsy affect a child’s school performance?

______________________________________________________________________________
______________________________________________________________________________

3. What kinds of things might you observe if a child has a seizure?

______________________________________________________________________________
______________________________________________________________________________

4. How does a child with epilepsy qualify for special education services?

______________________________________________________________________________
______________________________________________________________________________

5. How might epilepsy affect a child’s ability to learn?

______________________________________________________________________________
______________________________________________________________________________

6. How might epilepsy affect a child’s behavior?

______________________________________________________________________________
______________________________________________________________________________

7. Can a child with epilepsy participate in sports or physical education? Why or why not?

______________________________________________________________________________
School Concerns Questionnaire for Parents of Children with Epilepsy

Please indicate whether or not these statements are true for you and your child (please think about the most recent school year):

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>I am confident that my child’s medications can be managed at school</em> (e.g., given at the right time of day, given every day, etc.).</td>
<td></td>
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<tr>
<td><em>I feel like my child’s teacher(s) knows enough about epilepsy.</em></td>
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<td><em>My child has difficulty with peers at school.</em></td>
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<tr>
<td><em>My child has difficulty making up school work when he or she is absent.</em></td>
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<tr>
<td><em>Having epilepsy makes school more difficult for my child.</em></td>
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<tr>
<td><em>If my child has trouble learning, his school will know how to help him.</em></td>
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<tr>
<td><em>I am confident that someone at my child’s school can handle things if my child has a seizure at school.</em></td>
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<tr>
<td><em>I worry that if my child has a seizure at school, no one will know what to do.</em></td>
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<tr>
<td><em>Teachers feel like having my child in their classroom is a burden.</em></td>
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<td><strong>School personnel (teachers, guidance counselors, etc.) have made an effort to learn more about epilepsy because my child is at the school.</strong></td>
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<tr>
<td><strong>I feel like it is easy to communicate with the school about my child.</strong></td>
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<tr>
<td><strong>I feel like my child’s academic needs are being met at his school.</strong></td>
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<tr>
<td><strong>My child is included in all activities at school.</strong></td>
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<tr>
<td><strong>The school is willing to make changes to meet my child’s needs.</strong></td>
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<td><strong>I feel like my child’s school listens to my concerns.</strong></td>
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<tr>
<td><strong>My child’s school has attempted to educate my child’s peers about epilepsy.</strong></td>
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<tr>
<td><strong>I feel comfortable telling my child’s teachers that my child has epilepsy.</strong></td>
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<tr>
<td><strong>I feel like my child’s teacher treats him differently because he has epilepsy.</strong></td>
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<tr>
<td><strong>I believe other children at school treat my child differently because he has epilepsy.</strong></td>
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<tr>
<td><strong>I believe my child gets bullied (at school or on the bus) more often than other kids.</strong></td>
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<tr>
<td>I feel like my child’s teacher(s) are uncomfortable with him/her having a seizure in the classroom.</td>
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</tbody>
</table>
Epilepsy Knowledge Questionnaire for Educators

The following questions are designed to find out how accurate your knowledge about pediatric epilepsy is. It’s OK if you don’t know all of the answers. Please be honest and answer the questions using only the knowledge you currently have about epilepsy (don’t look anything up!). Please circle the letter for the best answer for each question.

1. To what extent can children with epilepsy usually participate in school sports or regular physical education?
   a. They cannot participate in school sports or physical education because it is not safe for them
   b. They cannot participate because they pose a risk to other students
   c. They can participate to the extent that their physical abilities allow
   d. They should be limited to participation only in activities that require minimal exertion

2. A child can be diagnosed with epilepsy if:
   a. He or she has one seizure
   b. At least one of the child’s parents has epilepsy
   c. He or she has multiple seizures and abnormalities on an electroencephalogram (EEG) test
   d. All of the above

3. When a child has a seizure, he or she may exhibit any of the following symptoms:
   a. Staring into space, as if daydreaming
   b. Losing consciousness and making jerking movements
   c. Making laughing sounds
   d. All of the above

4. A seizure is best defined as an event:
   a. Where an individual loses consciousness and shakes
   b. That is time-limited and results from abnormal activity in the brain
   c. Where an individual has a staring spell
   d. Where blood flow to the brain temporarily stops

5. Children with epilepsy may qualify for special education services:
   a. Only if they have a significant discrepancy between their IQ score and academic achievement
   b. Only if they have significant behavior problems
   c. If their epilepsy is affecting their school performance
   d. Only if their epilepsy is not controlled by medication

6. In general, behavior problems in children with epilepsy are:
   a. Just as common as in the general population
   b. More common than in the general population
   c. Less common than in the general population
d. unrelated to the child’s epilepsy

7. Epilepsy, as a medical condition:
   a. Can be “outgrown”
   b. Can always be completely controlled with medication, if taken properly
   c. Will always get worse as a child gets older
   d. Is always a lifelong condition, once diagnosed

8. Treatment for epilepsy may include which of the following:
   a. Medication
   b. Surgery
   c. Special diet
   d. All of the above

9. Some common side effects of epilepsy medications include:
   a. Impaired attention
   b. “Slowing” of motor movements
   c. Lack of motivation
   d. All of the above

10. Effects on a child in the hours following a seizure may include which of the following:
    I. The need to sleep for hours
    II. The desire to eat large amounts of food
    III. Forgetting everything that happened on the day before the seizure
    IV. Extreme hyperactivity
    
    a. I & IV
    b. II & III
    c. I & III
    d. III & IV

11. Which of the following learning abilities are most likely to be affected by epilepsy:
    a. Memory and attention
    b. Visual-spatial ability
    c. Speed for processing information
    d. Verbal reasoning

12. Learning disabilities are:
    a. More common in children with epilepsy than in the general population
    b. Less common in children with epilepsy than in the general population
    c. Unrelated to epilepsy
    d. Only present when a child’s epilepsy is not controlled by medication
13. First aid for a child having a convulsive seizure includes the following:
   I. Putting something firm in the child’s mouth so that he/she doesn’t swallow his/her tongue
   II. Clearing the area around the child so that he/she doesn’t hit anything
   III. Holding his/her arms and legs still
   IV. Put something soft, like a folded jacket, under the head

   a. I & II
   b. II & IV
   c. I, II, & III
   d. I, II, III, & IV

14. Epilepsy can be caused by which of the following:
   I. Infectious disease
   II. Genetic disorders
   III. Head Injury
   IV. Poor nutrition

   a. I & II only
   b. II, III, and IV
   c. III & IV only
   d. I, II, & III

15. In general, children with epilepsy achieve in school:
   a. As well as children without epilepsy
   b. Better than children without epilepsy
   c. Worse than children without epilepsy, even in the absence of learning disability or cognitive impairment
   d. Worse than children without epilepsy, ONLY when there is a diagnosed learning disability or cognitive impairment

THANK YOU FOR YOUR PARTICIPATION!
Table E-1. Core concepts underlying each theme for Question 1.

<table>
<thead>
<tr>
<th>Theme Category</th>
<th>Criteria</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t Know/Unsure</td>
<td>Indicates that respondent does not know the answer</td>
<td>“Don’t Know”, “Not sure”, “No training”, etc., or is left blank</td>
</tr>
<tr>
<td>Get Help</td>
<td>Reflects a response which involves calling someone else who knows what to do for a seizing student.</td>
<td>“Call 911.”, “Call school nurse.” “Call office.”</td>
</tr>
<tr>
<td>Avoid Injury</td>
<td>Reflects a response which involves making sure the seizing student doesn’t get injured.</td>
<td>“Clear area around student”, “Get things away from them.”, “Move them away from desks and chairs.”</td>
</tr>
<tr>
<td>Protect Head</td>
<td>Reflects a response which involves making sure the student’s head is protected.</td>
<td>“Put pillow under their head.”, “Pad head (put something soft under).”, “Protect head.”</td>
</tr>
<tr>
<td>Check Airway</td>
<td>Reflects a response which involves checking the student’s airway.</td>
<td>“Ensure they’re breathing.”, “Make sure airways are clear and they don’t begin to choke.”, “Watch tongue/airway.”</td>
</tr>
<tr>
<td>Roll to Side</td>
<td>Reflects a response which involves turning the student onto his/her side.</td>
<td>“Roll person onto side to prevent swallowing tongue or saliva”, “Roll them if possible to left side”, ‘Turn them on their side”</td>
</tr>
<tr>
<td>Time Seizure</td>
<td>Reflects a response which involves timing of the seizure.</td>
<td>“Time it”, “Time the seizure”</td>
</tr>
<tr>
<td>Document Seizure</td>
<td>Reflects a response which involves documenting the seizures occurrence somehow.</td>
<td>“Contact parents”, “Record that the seizure happened”</td>
</tr>
<tr>
<td>Incorrect/Harmful</td>
<td>Reflects a response which is either incorrect or could potentially be harmful to the student.</td>
<td>“Place cloth on tongue”, “Put something in their mouth to bite down on”, “Do not touch the student”</td>
</tr>
<tr>
<td>Follow Procedures</td>
<td>Reflects a response which involves following procedures were provided to them regarding the student.</td>
<td>“Follow established procedures”, “Follow pediatrician’s orders”.</td>
</tr>
<tr>
<td>Other</td>
<td>Response could not be classified into above categories.</td>
<td></td>
</tr>
</tbody>
</table>
Table E-2. Core concepts underlying each theme for Question 2.

<table>
<thead>
<tr>
<th>Question: How might epilepsy affect a child’s school performance?</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Theme Category</strong></td>
<td><strong>Criteria</strong></td>
<td><strong>Examples</strong></td>
</tr>
<tr>
<td>Don’t Know/Unsure</td>
<td>Indicates that respondent does not know the answer</td>
<td>“Don’t Know”, “Not sure”, “No training”, etc. , or is left blank</td>
</tr>
<tr>
<td>No Effect</td>
<td>Indicates that epilepsy has no effect on school performance.</td>
<td>“It shouldn’t”, “They are usually fine”, “It should have no effect”</td>
</tr>
<tr>
<td>If Controlled, No Effect</td>
<td>Indicates that as long as medication is taken and seizures are controlled properly, there should be no effect on school performance.</td>
<td>“If seizures are controlled with meds, the child should be like any other student”, “I wouldn’t think that it would if seizures were controlled by medications”</td>
</tr>
<tr>
<td>Depends on Severity</td>
<td>Indicates that school effects would depend on the severity of the child’s condition.</td>
<td>“Depends on how many seizures they have each week”, “Depends on the severity of the epilepsy”, “If it’s severe, they could have memory problems.”</td>
</tr>
<tr>
<td>Lost Time During Seizure</td>
<td>Indicates that a student may miss instructional time while having a seizure at school.</td>
<td>“Might miss information (especially during seizure)”, “If petit mal seizures, the child may not hear directions, etc.”</td>
</tr>
<tr>
<td>Excessive Absences</td>
<td>Indicates that a student with epilepsy may have excessive absences.</td>
<td>“Only if they’ve missed a lot of school due to frequent seizures”, “A child’s performance can be affected when a student has to miss school due to an epileptic episode”</td>
</tr>
<tr>
<td>Medication Side-Effects</td>
<td>Indicates that a student may have medication side-effects that affect school performance.</td>
<td>“Medications might affect alertness, appetite, attention”, “Meds may have side-effects”, “The medications for epilepsy may effect concentration, energy level, etc.”</td>
</tr>
<tr>
<td>Cognitive Problems</td>
<td>Indicates that a student may be affected by cognitive difficulties related to his/her epilepsy.</td>
<td>“Petit mal seizures may affect memory”, “Could cause impaired brain function”, “Loss of memory”</td>
</tr>
<tr>
<td>Tired/Disoriented</td>
<td>Indicates that a student may be tired or disoriented after a seizure.</td>
<td>“After a seizure, they might be ‘out of it’”, “May need to sleep after seizure”, “It can zap their energy”</td>
</tr>
<tr>
<td>Psych Adjustment Issues</td>
<td>Indicates that students with epilepsy might have psychological adjustment issues that affect their school performance.</td>
<td>“ Might cause stress”, “Anxiety about having an attack at school may affect performance”</td>
</tr>
<tr>
<td>Other</td>
<td>Response could not be classified into above categories.</td>
<td></td>
</tr>
</tbody>
</table>
Table E-3. Core concepts underlying each theme for Question 3.

<table>
<thead>
<tr>
<th>Theme Category</th>
<th>Criteria</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t Know/Unsure</td>
<td>Indicates that respondent does not know the answer</td>
<td>“Don’t Know”, “Not sure”, “No training”, etc., or is left blank</td>
</tr>
<tr>
<td>Only Tonic-Clonic</td>
<td>Reflects a response that demonstrates knowledge of</td>
<td>“A child on the floor, shaking and maybe drooling”, “Writhing around on the floor”, “Shaking/falling”, “Twitching, jerking”</td>
</tr>
<tr>
<td></td>
<td>only tonic-clonic (grand-mal) seizures.</td>
<td></td>
</tr>
<tr>
<td>Only Non-Tonic-Clonic</td>
<td>Reflects a response that demonstrates knowledge of</td>
<td>“Zoning out”, “Staring into space”</td>
</tr>
<tr>
<td></td>
<td>only non tonic-clonic seizures.</td>
<td></td>
</tr>
<tr>
<td>Both Seizure Types</td>
<td>Reflects a response that demonstrates knowledge of</td>
<td>“Sweating, shaking, or just staring off into space are things I might expect to see during a seizure”, “Uncontrolled shaking, loss of bladder control, petit mal seizures – ‘zoning out’”, “Muscle spasms, eyes/eyelids flickering; lapse in attention”</td>
</tr>
<tr>
<td></td>
<td>both major types of seizures.</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Response could not be classified into above</td>
<td>categories.</td>
</tr>
<tr>
<td></td>
<td>categories.</td>
<td></td>
</tr>
</tbody>
</table>
Table E-4. Core concepts underlying each theme for Question 4.

<table>
<thead>
<tr>
<th>Theme Category</th>
<th>Criteria</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t Know/Unsure</td>
<td>Indicates that respondent does not know the answer</td>
<td>“Don’t Know”, “Not sure”, “No training”, etc., or is left blank</td>
</tr>
<tr>
<td>Doesn’t Qualify</td>
<td>Indicates that epilepsy is not a condition which qualifies a child for special education services.</td>
<td>“If the child is of normal intelligence, I see no need for special education”, “Epilepsy does not qualify a student for special education”, “The same way any other child would”</td>
</tr>
<tr>
<td>Describes Accommodations</td>
<td>Indicates examples of accommodations that a student with epilepsy might benefit from.</td>
<td>“Accommodations might include extended time for testing, reteaching, etc.”, “The child needs a teacher that is trained to respond to seizures”, “May require additional time, peer note taker, teacher training and awareness”</td>
</tr>
<tr>
<td>Describes Process</td>
<td>Indicates the process by which a child with epilepsy would qualify for special education.</td>
<td>“Through a doctor’s diagnosis and ESE/504 paperwork”, “psychological evaluation, intervention packet, teacher checklist”</td>
</tr>
<tr>
<td>504 Plan</td>
<td>Response mentions a 504 Plan by name.</td>
<td>“May get accommodations through a 504 Plan”, “Under a 504 Plan”</td>
</tr>
<tr>
<td>OHI</td>
<td>Response mentions qualifying for special education services under the “Other Health Impaired” category by name.</td>
<td>“Other Health Impaired”, “Other Health Impaired (OHI)”, “They qualify under OHI”</td>
</tr>
<tr>
<td>Describes OHI</td>
<td>Response describes the “OHI” category, but it is not mentioned by name.</td>
<td>“Medical documentation of their condition and testing”, “If the handicapping condition affects the student’s ability to receive instruction, then the child should be found eligible for services”</td>
</tr>
<tr>
<td>Other</td>
<td>Response could not be classified into above categories.</td>
<td></td>
</tr>
</tbody>
</table>
Table E-5. Core concepts underlying each theme for Question 5.

<table>
<thead>
<tr>
<th>Theme Category</th>
<th>Criteria</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t Know/Unsure</td>
<td>Indicates that respondent does not know the answer</td>
<td>“Don’t Know”, “Not sure”, “No training”, etc., or is left blank</td>
</tr>
<tr>
<td>No Effect</td>
<td>Indicates that epilepsy has no effect on a child’s ability to learn.</td>
<td>“I wouldn’t think there would be an effect”, “It should not affect a child’s ability”, “No know link to intelligence or learning disabilities”</td>
</tr>
<tr>
<td>If Controlled, No Effect</td>
<td>Indicates that as long as medication is taken and seizures are controlled properly, there should be no effect on school performance.</td>
<td>“If they can be controlled, I think the child would be no different in his ability to learn”, “If properly diagnosed and medicated, I don’t believe it does.”</td>
</tr>
<tr>
<td>Depends on Severity</td>
<td>Indicates that school effects would depend on the severity of the child’s condition.</td>
<td>“If seizures are severe, there could be affect on IQ”</td>
</tr>
<tr>
<td>Lost Time During Seizure</td>
<td>Indicates that a student may miss instructional time while having a seizure at school.</td>
<td>“If they have continued zone outs, they might miss portions of lessons”, “Loss of instructional time due to seizures”, “May miss instruction while the seizure is actually occurring”</td>
</tr>
<tr>
<td>Excessive Absences</td>
<td>Indicates that a student with epilepsy may have excessive absences.</td>
<td>“Time out of school for medical problems and appointments”, “Increased number of absences”</td>
</tr>
<tr>
<td>Medication Side-Effects</td>
<td>Indicates that a student may have medication side-effects that affect learning ability.</td>
<td>“Adverse effects of medications”, “Side effects from meds may inhibit learning somewhat”, “Medication may have an effect on a child’s alertness”</td>
</tr>
<tr>
<td>Cognitive Problems</td>
<td>Indicates that a student may be affected by cognitive difficulties related to his/her epilepsy.</td>
<td>“Memory”, “Attention and memory may be affected”, “Loss of memory”, “It could affect processing”</td>
</tr>
<tr>
<td>Tired/Disoriented</td>
<td>Indicates that a student may be tired or disoriented after a seizure.</td>
<td>“Sleepiness, disorientation due to seizures”, “Loss of sleep”, “Tired a lot”</td>
</tr>
<tr>
<td>Psych Adjustment Issues</td>
<td>Indicates that students with epilepsy might have psychological adjustment issues that affect their school performance.</td>
<td>“Any difference affects social acceptance, and that affects learning environment”, “Social anxiety”, “May affect self-esteem and confidence in the classroom”</td>
</tr>
<tr>
<td>Other</td>
<td>Response could not be classified into above categories.</td>
<td></td>
</tr>
</tbody>
</table>
Table E-6. Core concepts underlying each theme for Question 6.

<table>
<thead>
<tr>
<th>Theme Category</th>
<th>Criteria</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t Know/Unsure</td>
<td>Indicates that respondent does not know the answer</td>
<td>“Don’t Know”, “Not sure”, “No training”, etc., or is left blank</td>
</tr>
<tr>
<td>No Effect</td>
<td>Indicates that epilepsy has no effect on a child’s behavior.</td>
<td>“It shouldn’t”, “It really shouldn’t affect behavior”, “Not at all”</td>
</tr>
<tr>
<td>Peer Difficulties</td>
<td>Indicates that student may have difficulty with peers.</td>
<td>“May cause social isolation resulting in poor peer/social relations”, “Not given opportunities to interact with peers”, “The child may feel alone or socially isolated if class is not educated...”</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>Indicates that student may have lowered self-esteem.</td>
<td>“Lack of confidence”, “May be withdrawn and quiet”, “Self esteem may be affected”</td>
</tr>
<tr>
<td>Anxious/Overwhelmed</td>
<td>Indicates that student may be anxious about their condition or overwhelmed by it.</td>
<td>“Social anxiety of it happening around others”, “Afraid of having seizures at school”, “They can be nervous and overwhelmed with life and school”</td>
</tr>
<tr>
<td>Depressed</td>
<td>Indicates that student may be depressed.</td>
<td>“May be depressed about condition”</td>
</tr>
<tr>
<td>Coddled</td>
<td>Indicates that student may be “coddled” by parents and not held to the same standards as others.</td>
<td>“He or she could be coddled by parents or teachers and may not think he or she has to work like everyone else”</td>
</tr>
<tr>
<td>Embarrassed</td>
<td>Indicates that student may be embarrassed about his/her condition.</td>
<td>“May be embarrassed – some lose bladder control”, “Child may be embarrassed by seizures, “Embarassment”</td>
</tr>
<tr>
<td>Acting Out/Aggressive</td>
<td>Indicates that student may “act out” or be aggressive.</td>
<td>“Medications and frustration with condition may cause acting out”, “Could become aggressive”</td>
</tr>
<tr>
<td>Tired/Disoriented</td>
<td>Indicates that student may be frequently tired or disoriented.</td>
<td>“Might fatigue child after a seizure”, “They could be really tired and lethargic”</td>
</tr>
<tr>
<td>Inattentive</td>
<td>Indicates that student may be inattentive or “zoned out”.</td>
<td>“May seem unresponsive and like they’re ignoring you, but may be that they’re actually seizing”</td>
</tr>
<tr>
<td>Medication Side-Effects</td>
<td>Indicates that a student may have medication side-effects that affect student’s behavior.</td>
<td>“A child may appear apathetic or lethargic (reactions to meds)”, “Medicine effects”</td>
</tr>
<tr>
<td>Excessive Absences</td>
<td>Indicates that a student with epilepsy may have excessive absences.</td>
<td>“Absenteeism”</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>Response could not be classified into above categories.</td>
</tr>
</tbody>
</table>
### Table E-7. Core concepts underlying each theme for Question 7.

<table>
<thead>
<tr>
<th>Theme Category</th>
<th>Criteria</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t Know/Unsure</td>
<td>Indicates that respondent does not know the answer</td>
<td>“Don’t Know”, “Not sure”, “No training”, etc., or is left blank</td>
</tr>
<tr>
<td>Yes, why not?</td>
<td>Indicates that children with epilepsy should be able to participate in all sports and physical activities and that there is no reason not to.</td>
<td>“Absolutely! No reason not to!”, “Yes, they should be like anyone else”, “As far as I’m aware, yes. No physical restrictions”</td>
</tr>
<tr>
<td>With Medical Clearance</td>
<td>Indicates that children with epilepsy can participate in sports and physical education as long as they have clearance from a medical professional.</td>
<td>“I think they should (with doctor approval)”, “Unless instructed by Dr. not to”, “The child may participate in sports as long as it is cleared by a doctor”</td>
</tr>
<tr>
<td>With Extra Precautions</td>
<td>Indicates that children with epilepsy can participate as long as extra precautions are taken.</td>
<td>“Yes, if child gets plenty of fluids and does not get overheated”, “Yes, but monitored”, “Yes, but may need to limit activities so they don’t get overheated”</td>
</tr>
<tr>
<td>If Controlled</td>
<td>Indicates that children with epilepsy can participate as long as their epilepsy is well-controlled.</td>
<td>“With proper meds, I think they can do what everyone else does”, “Yes. Seizures can be prevented with medication”, “As long as their seizures are controlled, why not?”</td>
</tr>
<tr>
<td>Depends on Severity</td>
<td>Indicates that whether or children with epilepsy can participate in sports or physical education depends on the severity of their condition.</td>
<td>“Depends on the severity of the case”, “I would imagine there are different levels of severity…judgments should be made on an individual basis”</td>
</tr>
<tr>
<td>Depends on Activity</td>
<td>Indicates that whether or not children with epilepsy can participate in sports or physical education depends on the type of activity presented.</td>
<td>“Yes, if the activity does not offer a physical danger”, “I think it would depend on the activity of the sports (like no full-contact football)”, “Certain sports should not be allowed or curtailed, ie swimming diving (seizure in water alone could be fatal)”</td>
</tr>
<tr>
<td>If Student is Aware</td>
<td>Indicates that children with epilepsy can participate as long as they are aware of when a seizure is about to come on.</td>
<td>“I guess they could if they knew when a seizure was coming”, “Yes, they can learn to tell when adverse symptoms can occur and they can take time out to rest”</td>
</tr>
<tr>
<td>Activity Not a Trigger</td>
<td>Indicates that children with epilepsy can participate as long as the activity is not a trigger for their seizures.</td>
<td>“Depends on the trigger for the seizure”, “Yes, as long as the activity doesn’t bring a seizure on”</td>
</tr>
<tr>
<td>With Proper Supervision</td>
<td>Indicates that children with epilepsy can participate as long as adults are supervising and are properly trained in how to respond to a seizure.</td>
<td>“Yes, with Dr.’s permission. School personnel should all be told of the condition and what to do in the event of a seizure”</td>
</tr>
<tr>
<td>Other</td>
<td>Response could not be classified into above categories.</td>
<td></td>
</tr>
</tbody>
</table>
LIST OF REFERENCES


BIографиЧESKИЙ СKЕTCH

Amy Loomis Roux was born and raised in Port Richey, Florida, by her parents, Jeffrey and Joyce Loomis, with her sister, Amanda Loomis. She moved to Atlanta, Georgia, in 1994, where she completed her undergraduate degree in psychology at Emory University. During her four years at Emory, Amy developed an interest in children with chronic illnesses and their adjustment to school, in particular, through her work as a research assistant. Amy began her graduate studies in school psychology at the University of Florida in 1999. During her time in graduate school, she has further developed her research interests in school adjustment for children with chronic illness, especially children with neurological conditions. She will graduate in August 2009 with a doctorate in school psychology. She hopes to continue to pursue her research interests upon graduation, as well as to be engaged in clinical work with children.