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Increasing Inclusion Opportunities for Children with
Autism Spectrum Disorder and Epilepsy
in the School and Community

by
Laura Kuelbs

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Project Abstract

Participation in school settings and in community organizations is an important part of childhood. For children with autism spectrum disorder (ASD) and epilepsy, opportunities to participate with their peers who do not have disabilities are uncommon due to a lack of accurate information and confidence in education professionals and community leaders. The purpose of this project is to create two handbooks, one for education professionals and one for community organizations, that explain the diagnoses of ASD and epilepsy and provide ways to meet the needs of children with the comorbid diagnosis within general education classrooms and inclusive community organizations. This will increase awareness, knowledge, and confidence of education professionals and community leaders in order to increase inclusion.

*Keywords:* Autism Spectrum Disorder, epilepsy, inclusion in school, inclusion in the community
INCLUSION OF CHILDREN WITH ASD AND EPILEPSY

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Chapter One: Definition of Problem

Growing up, children have opportunities to connect with others of their same age and with similar interests through school and community organizations. For children with disabilities the availability of such opportunities varies widely, and many places that have programs for children with disabilities have limited access to children without disabilities.

As the percentage of children with Autism Spectrum Disorder (ASD) increases so does the need for appropriate supports in all areas of life. A diagnosis of ASD requires deficits in social communication and interaction and restricted, repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 2013). Deficits in social communication and interaction require specific instruction in these areas, which is often most effective in natural environments (Kane, Connell, & Pellecchia, 2010). The second part of the diagnosis, patterns of behavior, interests, or activities, also requires awareness and support within all settings. Providing children with ASD with an education alongside same-age peers without disabilities is becoming more frequent. Also, inclusion in formal community organizations with same age peers without disabilities is infrequent (Potvin, Snider, Prelock, Kehayia, & Wood-Dauphinee, 2013). Within schools and community organizations individuals are typically familiar with the terms ASD or autism but their specific knowledge about how to support individuals with ASD is generally low.

Children with ASD are more likely to have a comorbid diagnosis of epilepsy (Jokiranta et al., 2014; Viscidi et al., 2014; Hughes & Melyn, 2005). A comorbid diagnosis means that both diagnoses are present in the same individual at the same
time. Similar to ASD the epilepsy diagnosis has large variety in severity and lasting impact. Children with epilepsy typically undergo pharmacological treatment to prevent the recurrence of seizures (Engel, 2001). There are negative stigma and multiple misconceptions associated with the diagnosis of epilepsy. Children with epilepsy and ASD are typically more affected by ASD and also have an intellectual disability (Berg, Plioplys, & Tuchman, 2011; Jokiranta et al., 2014).

The unfamiliarity with the individual diagnoses, negative stigma, and limited availability of accessible research for education professionals and community organizations do not allow inclusion to be as successful as possible. Often the organizations or schools rely on incomplete or inaccurate information to support children with epilepsy within their programs (Bishop & Boag, 2006). Education professionals and community leaders need access to information about the diagnoses and resources to facilitate inclusion of children with this comorbid diagnosis.

**Purpose of Project**

In order to facilitate inclusion of children with ASD and epilepsy education professionals and community organizations need accurate, relevant information about epilepsy and ASD. This project aims to provide that information through a handbook that includes information about the individual diagnoses and the comorbid diagnosis and resources specific to education and to community organizations. The project and literature review will be guided by three research questions. First, what are the specific diagnostic criteria for ASD and epilepsy and what is the relationship between the two diagnoses? Second, what do children with epilepsy and with ASD need in order to be included; specifically what evidence-based practices are necessary? Third, what
INCLUSION OF CHILDREN WITH ASD AND EPILEPSY

information is available to education professionals and community leaders regarding inclusion of children with either diagnosis individually?

**Preview Literature**

Based on the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association, 2013), Autism Spectrum Disorder (ASD) is diagnosed when individuals have deficits in social communication and social interaction and have restricted, repetitive patterns of behavior, interests, or activities. To address the spectrum nature of the disorder each area is given a severity rating. The current prevalence of ASD is one in 68 children with males approximately four times more likely to be diagnosed with ASD (Baio, 2014). Students with ASD receive many interventions and treatments in and out of school. These interventions and treatments range from being scientifically based with a large body of research support to being not recommended based on current research. Many that are commonly used in schools are promising practices, which means that the limited research that has been completed shows positive results, or they are research based. Some of these methods are Applied Behavior Analysis, structured teaching (TEACCH), Picture Exchange Communication Systems, assistive technology, and social stories (Simpson et al., 2005). Teaching materials include visually labeled centers, sensory materials, and visual schedules (Deris & DiCarlo, 2013). School inclusion experiences of children with ASD vary drastically but are generally positive. Inclusion in community organizations is less well studied and occurs less frequently. Specifically, children with ASD are less likely to participate in formal activities and activities with other people than their peers (Potvin et al., 2013).
Epilepsy is a neurological disease that is diagnosed after at least one unprovoked seizure with a high risk of recurrence. The frequency, duration, severity, and cognitive impact of epileptic seizures are highly variable (Fisher et al., 2014). Primary management of epilepsy is medication (Engel, 2001). Epilepsy can begin at any stage of life with some forms that are specific to childhood can be outgrown and some that are lifelong. Lifetime prevalence of epilepsy in children is around 1% (Russ, Larson, & Halfton, 2012). In schools approximately half of children with epilepsy receive special education services and many such children are placed in a self-contained classroom (Berg et al., 2005). Teachers often have positive attitudes about children with epilepsy but have limited knowledge and training (Bishop & Boag, 2006). For children and adults with epilepsy community inclusion is connected to the social stigma of epilepsy including negative feelings and misconceptions about epilepsy (Paschal et al. 2007).

For children with ASD there is an increased risk of epilepsy. The prevalence of epilepsy in children with ASD is in the range of 5-46%, which is significantly higher than the current reported prevalence of epilepsy (Jokiranta et al., 2014; Viscidi et al., 2014; Hughes & Melyn, 2005). The increased prevalence is believed to be connected to similar underlying biological factors (Barnes, Sidhu, & Tuchman, 2013). Children with ASD and epilepsy are more likely than children with ASD alone to have motor difficulties, impaired daily living skills, challenging behaviors, and intellectual disabilities (Berg, Plioplys, & Tuchman, 2011; Jokiranta et al., 2014; Turk et al., 2009).

**Preview Methodology**

To create this project, the first step was to research the individual diagnoses of ASD and epilepsy and the comorbid diagnosis to identify what children with the dual
diagnosis need and what an inclusive setting would look like. This research looks at current inclusion of children with ASD and epilepsy to determine the information that education professionals and community leaders need before inclusion can increase for children with ASD and epilepsy in schools and the community.

Once the necessary information is identified then the handbooks are created that target education professionals and community leaders. The handbooks provide the much same overview information set up so that it is accessible.

**Significance of Project**

Growing up, memories are made through participation in activities and organizations. Children with ASD and epilepsy often do not have access to the same opportunities as children without disabilities because there is a lack of accurate knowledge and understanding about the diagnosis and what children would need in order to be included. This project is designed to convey accurate information and increase the confidence of education professionals and community leaders in their ability to meet the needs of children with ASD and epilepsy. By providing this information children with ASD and epilepsy will have access to more opportunities to interact with same age peers without disabilities who have similar interests in school and in the community. It will improve the quality of children’s lives by decreasing the negative stigma and misconceptions by providing accurate information to education professionals and community leaders who can disseminate the information.

**Summary of Chapter**

Inclusion has been shown to benefit children with disabilities but is often hindered by lack of specific, accurate knowledge on the part of the adults organizing and guiding
the activities. Opportunities for inclusion occur in school and the community so adults in both areas need to be familiar with disability specific knowledge and strategies. The disability focus for this project is comorbid ASD and epilepsy. By creating packets for education professionals and community leaders with information and resources, it is hoped that they will be more confident in their ability to support children with ASD and epilepsy and thus more willing to include a child with this diagnosis.

**Definitions**

**Autism Spectrum Disorder** – A developmental disorder characterized by deficits in communication and interaction and restricted, repetitive behaviors, interests, or activities.

**Comorbid** – Two or more disorders, conditions, or diseases present in the same individual at the same time.

**Community Groups** – Any organization that members of the community voluntarily participate in including sports leagues, scouts, and after school programs.

**Community Leaders** – Individuals in charge of scheduling, organizing, planning for a community group.

**Dual Diagnosis** – When two disorders, conditions, or diseases are present in the same individual at the same time. For this project the dual diagnosis is ASD and epilepsy.

**Epilepsy** – A disease characterized by recurrent or potentially recurrent seizures.

**Inclusion** – A practice where children with disabilities participate in social, academic, or leisure activities with same age peers without disabilities.

**Prevalence** – The rate at which a disease or disorder is present in a given population.
Chapter Two: Literature Review

Autism Spectrum Disorder (ASD) is a developmental disorder beginning in childhood, and epilepsy is a relatively common neurological disorder characterized by recurrent seizures. The prevalence of ASD in children is increasing, and studies have shown that individuals with ASD are more likely to have epilepsy than individuals without ASD (Jokiranta et al., 2014). Children with ASD and epilepsy require support in school and in the community for successful inclusion.

This literature review informs the project by answering multiple research questions. First, what are the diagnostic criteria and the relationship between ASD and epilepsy? Second, what does inclusion of children with ASD and children with epilepsy require and what evidence-based practices are being used? Finally, what information is available to educational professionals and community leaders regarding facilitating inclusion of children with ASD and epilepsy? The purpose of this project is to facilitate inclusion of students with ASD and epilepsy by providing training for education professionals and community group members regarding the diagnoses and necessary supports for children with ASD and epilepsy.

Autism Spectrum Disorder

Diagnostic Criteria and Prevalence

Current diagnostic criteria for autism spectrum disorder, found in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013), are deficits in social communication and social interaction and restricted, repetitive patterns of behavior, interests, or activities, both of which are given a rating of current severity (Level 1, 2, or 3). Deficits in social communication and social
interaction must include deficits in social-emotional reciprocity, deficits in nonverbal communicative behaviors, and deficits in developing, maintaining, and understanding relationships as seen across multiple contexts. Restricted, repetitive patterns of behavior, interests, or activities include at least two of the following: stereotyped or repetitive motor movements, insistence on sameness, highly restricted, fixated interests, and hyper- or hyporeactivity to sensory input (American Psychiatric Association, 2013).

These symptoms must be present early in life, must cause clinically significant impairment in important areas of functioning, and must not be better explained by intellectual disability. A final aspect of the diagnosis involves specification as to whether ASD occurs with or without intellectual impairment or language impairment, or whether it is associated with another known medical, genetic, neurodevelopmental, mental, or behavioral disorder or catatonia (American Psychiatric Association, 2013).

This new diagnostic criteria simplifies the previous version in which there were more diagnostic categories, and it provides more information regarding severity of the individual symptoms. Asperger’s Disorder and Pervasive Developmental Disorder – Not Otherwise Specified and no longer included. Children and adults with a well-established diagnosis of these disorders should be given the diagnosis of Autism Spectrum Disorder. Those who show deficits in social communication but no other criteria for Autism Spectrum Disorder should be evaluated for the diagnosis of social (pragmatic) communication disorder (American Psychiatric Association, 2013).

Studies on the prevalence of ASD have been primarily based on the diagnosis from the previous version of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2000). Current research on the prevalence places it
at one in 68 children with a gender difference of one in 42 boys and one in 189 girls diagnosed with ASD. A further gender difference is connected to intellectual disability. Although girls are less likely to be diagnosed with ASD, the percentage of girls diagnosed with ASD with an intellectual disability is greater than the percentage of boys diagnosed with ASD with an intellectual disability in most geographical areas. The prevalence of ASD among white children has also been found to be higher than among black or Hispanic children (Baio, 2014).

Inclusion of Children with ASD in School

School inclusion is increasing in prevalence and has academic, social, and behavioral benefits. Simpson et al. (2005) reviewed 37 interventions and treatments commonly used with individuals with ASD including twelve skill-based, seven interpersonal, and eight cognitive interventions and treatments. Many of the interventions were found to be promising practices, which indicated that there is some research base suggesting favorable outcomes and that the interventions have been widely used for several years. These include many treatments and interventions that are common in schools such as assistive technology, augmentative alternative communication, structured teaching (TEACCH), Picture Exchange Communication System (PECS), and social stories. Only a few were found to be scientifically based practices including Applied Behavior Analysis (ABA), Discrete Trial Teaching (DTT), and Pivotal Response Training (PRT). These interventions have undergone substantial, rigorous research and have been shown to increase skill acquisition significantly and are used in many schools to help children with ASD. Specific materials for teaching students with ASD include visually labeled centers and areas, quiet areas and sensory
Inclusion of Children with ASD and Epilepsy

There is some evidence that suggests that placements in inclusive settings could increase the risk for social isolation and rejection (Ochs, Kremer-Sadlik, Solomon, & Sirota, 2001). However, research also suggests that although children with ASD tend to have fewer reciprocal friendships than their typically developing peers they report similar levels of closeness, security, and conflict as peers with no greater experiences of loneliness. In fact, when matched with peers who have similar social circles and friendships, children with ASD tended to report less loneliness than their peers (Chamberlain, Kasari, & Rotheram-Fuller, 2007). The positive inclusion experiences of children with ASD may vary based on the disclosure practices of their parents. Children whose families fully disclosed their child’s condition to the school and the child’s classmates experience more positive inclusion possibly related to conversations about the conversations that were facilitated regarding ASD and the likes, dislikes, strengths, and weaknesses of the child. Within classrooms that do not have disclosure the tendency for negative inclusion experiences such as neglect, rejection, and scorn was greatly increased (Ochs et al., 2001).

Inclusion of Children with ASD in the Community

Growing up children often participate in community organizations that correspond to their personal interests. The range of community organizations for children includes many forms of recreation and leisure activities where children interact socially with peers who have similar interests. For children with ASD these interactions are more challenging, as social communication and interaction are one aspect of the diagnosis of
ASD (American Psychiatric Association, 2013). Similar to inclusion in school, children with ASD require additional supports to make such inclusion in community organizations successful. A survey of personnel from community organizations by McConkey, Mullan, and Addis (2012) in Northern Ireland shows that many are willing to include children with autism but they have unmet needs with regard to making that successful for the child and for the organization. During, a pilot of a specially designed two-hour autism training for community group leaders they found that training could change the attitudes and perceptions of community group leaders about children with autism.

Children with ASD are less likely than their peers to participate in recreational activities that involve other people and formal recreational activities such as team sports, community organizations, and taking art or music lessons (Potvin, Snider, Prelock, Kehayia, Wood-Dauphinee, 2013). To support the inclusion of children with ASD in community activities and organizations such as summer camps and organized sports, parents and professionals need to collaborate so that the students can meaningfully participate. This collaboration can take the form of step-based processes such as Making Action Plans System (MAPS), Choosing Outcomes and Accommodations for Children (COACH), and Planning Alternative Tomorrows with Hope (PATH) (Potvin, Prelock, & Snider, 2008). These processes look at present levels of performance and goals for the child. The team collaboratively develops a plan for the achievement of the goals with regard for the child’s strengths, weaknesses, likes, and dislikes (Falvey, Forest, Pearpoint, & Rosenberg, 1994; Giangreco, Cloninger, & Iverson, 1998). Brookman et al. (2003) describe a program for including children with ASD in a community summer camp and developing social skills through the inclusion.
The program includes trained paraprofessionals supporting the campers, individualized social and behavioral goals, and the interventions of priming, self-management, and peer involvement. Through this program eight children with ASD were able to participate successfully in camp activities and the model was efficient and easy to implement. Through collaboration and training, children with ASD can be successful when included in community settings.

**Epilepsy**

**Diagnosis and Prevalence**

Epilepsy is a common neurological disease characterized by recurrent unprovoked seizures. Current diagnosis of epilepsy occurs after at least one unprovoked seizure with either a second unprovoked seizure or a high risk of recurrence. Traditionally epilepsy has been referred to as a disorder; however, it is now considered a disease due to its lasting nature (Fisher et al., 2014). Epilepsy is a broad term that encompasses multiple syndromes with varied seizure types and long-term outcomes for the individuals with the diagnoses (Engel, 2001). For some individuals, epilepsy can be resolved over time (Fisher et al., 2014).

Since epilepsy can vary in severity, frequency and duration of seizures, timing of seizures, and cognitive impact of seizures, the treatment needs of children with epilepsy vary greatly. For approximately 70% of children epilepsy is managed with medication and different medicines are used to treat different types of epilepsy and different types of seizures. The medicines do not fix what is causing the seizures. Instead, they prevent seizures from reoccurring (Schachter, Shafer, & Sirven, 2013). In children with epilepsy there is an increased risk for mental health disorders and physical disabilities (Russ
Larson, & Halfton, 2012). Children with epilepsy also performed lower on tests of memory, academic achievement, and behavioral and emotional functioning than similar age peers without epilepsy (Bailet & Turk, 2000). Freiliner et al. (2006) found that 22.2% of children with epilepsy had behavioral scores that fell into the moderately or severely disturbed range on the Child Behavior Checklist.

Lifetime prevalence of epilepsy in children from birth to 17 years is around 1% with a current reported prevalence of 6.3 out of 1000. The prevalence is higher in lower-income families and in older children. Males were more likely to be diagnosed than females (Russ et al., 2012).

Inclusion of Children with Epilepsy in School

Approximately one half of children with epilepsy receive special education services (Berg et al., 2005; Wodrich, Kaplan, & Deering, 2006). Although some students receive services under other health impairment (OHI), most receive services under more traditional diagnostic categories with many under intellectual disability (ID), and the students are often placed in self-contained classrooms (Berg et al., 2005). The rate of receipt of special education services is high for children with epilepsy who are neurologically normal. Children who are school-aged at the onset of seizures and subsequent diagnosis of epilepsy are more likely to have received special education before the onset of epilepsy (Wodrich et al., 2006). Based on reports from parents and teachers children with epilepsy show high rates of behavioral concerns including attention problems and internalizing psychopathology (Titus, Kanive, Sanders, & Blackburn, 2008). Given the variety of needs of children with epilepsy teachers should have knowledge and training regarding epilepsy and its effects on children. Based on
survey results, teachers generally have positive attitudes about children with epilepsy. However, their knowledge of epilepsy is low and many report a lack of adequate training. Compared to other illnesses and disabilities, including asthma, diabetes, and HIV/AIDS, teachers are least familiar with epilepsy (Bishop & Boag, 2006; Nabors, Little, Akin-Little, & Iobst, 2008).

Inclusion of Children with Epilepsy in the Community

Children with epilepsy experience adverse outcomes more frequently than their typically developing peers as they mature into adulthood including criminal convictions, unplanned pregnancies, social isolation, and heavy alcohol consumption (Camfield & Camfield, 2007). Community inclusion for individuals with epilepsy is connected to the social stigma associated with epilepsy. Individuals with epilepsy indicate that they believe the general public has negative feelings toward them and held many misconceptions about individuals with epilepsy. These misconceptions include believing that all epilepsy patients have severe seizures, epilepsy is a mental illness, epilepsy is contagious, epilepsy is passed from parent to child, and individuals with epilepsy should be socially avoided. These individuals also believe an awareness program would help to educate the general public (Paschal et al., 2007). The stigma associated with epilepsy is negatively correlated with the quality of life of individuals with epilepsy. Community awareness is needed to address the stigma associated with epilepsy in order to improve the quality of life for individuals with epilepsy (Kumari, Ram, Nizamie, & Goyal, 2009). This need translates to a need for community members to be informed about epilepsy before full inclusion with appropriate supports can occur for children with epilepsy in community settings.
Relationship between ASD and Epilepsy

Prevalence and Differences in Diagnosis

Among children with ASD there is an increased risk for a diagnosis of epilepsy. Studies place the prevalence of epilepsy in children with ASD in the range of 6.6%-46%, which is significantly higher than among children without ASD (Jokiranta et al., 2014; Viscidi et al., 2014; Hughes & Melyn, 2005). There are multiple seizure types but there is not one that is specifically associated with ASD including partial, generalized, and mixed (Steffenburg, Steffenburg, & Gillberg, 2003). Shubrats et al. (2015) found that children with epilepsy are more severely affected by ASD. The association between ASD and epilepsy is increased when accompanied by intellectual disability (Berg, Plioplys, & Tuchman, 2011; Jokiranta et al., 2014). Children with ASD and epilepsy are more likely to have motor difficulties, impaired daily living skills, and challenging behaviors than children with ASD alone. However, they were no more likely to be aloof and passive and instead were more likely to be described as active and odd when interacting with others (Turk et al., 2009).

The increased prevalence of epilepsy among children with ASD may be due to underlying neurological mechanisms. A standard biological explanation is that the balance of one biological mechanism is altered in both ASD and epilepsy. Many studies have targeted the neurotransmitter GABA, which has a role in brain development, to identify its connection with ASD and epilepsy (Barnes, Sidhu, & Tuchman, 2013). Both ASD and epilepsy have been associated with a mutation in the receptor for GABAₐ, and the deficits in signaling that are caused by the mutation could be a risk factor for the comorbid diagnosis (Kang & Barnes, 2013).
**Needs of Children with Dual Diagnosis**

Currently treatment of children with ASD and epilepsy is limited to treating the diagnoses separately, and due to the heterogeneity of both diagnoses there is no one treatment that will work for all children with ASD and epilepsy (Tuchman, Alessandri, & Cuccaro, 2010). Often the treatment approach that targets each individual diagnosis is appropriate. However, there are additional considerations when children have the comorbid diagnosis. Since many of the treatments for epilepsy are pharmacological when the child also has ASD factors including formulations, dosing schedules, need for blood monitoring, and behavioral side effects of the medications must be carefully considered. Potential side effects must be monitored closely because some may be incorrectly attributed to the diagnosis of ASD rather than correctly to the medication (Spence & Schneider, 2009). Anti-epileptic drugs are also prescribed to children with ASD without epilepsy to treat behavioral symptoms and mood disorders (Tuchman et al., 2010). Since children with ASD and epilepsy have symptoms of both that need to be addressed a comprehensive treatment that targets the behavioral and medical needs is emerging and should include pharmacological interventions as well as behavioral and psychosocial interventions (Tuchman et al., 2010).

**Summary of Chapter**

Autism spectrum disorder is a developmental disability characterized by impairments in social communication and interactions and restricted, repeated patterns of behavior. Epilepsy is a disease, which involves at least one unprovoked seizure followed either by additional seizures or the high risk of another seizure. Individuals with ASD have a significantly increased risk for having epilepsy than the general population.
INCLUSION OF CHILDREN WITH ASD AND EPILEPSY

Research has shown that inclusion is important for children with disabilities. However, that research has focused primarily on schools with a few exceptions. It has shown that there are training needs for educational professionals and for community groups that specifically addresses the needs of children with ASD and the needs of children with epilepsy. Since a large percentage of those populations overlap the same professionals need to be able to support children with both diagnoses.
Chapter Three: Methodology

Children with ASD and epilepsy need supports to be included in school and in the community. Currently information for community leaders and most educational professionals is limited. Inclusion is a team effort that should not rely solely on information provided by one individual. In a school setting only education specialists and school psychologists show high levels of knowledge about the diagnoses of ASD and epilepsy. Within the community the majority of opportunities for children with disabilities are not inclusive. Instead they are within programs that are specifically designed for children with disabilities, and there are limited opportunities for inclusion. To provide children with ASD and epilepsy with opportunities for inclusion, educational professionals and community leaders need information about the diagnoses and specific training regarding how to meet the needs of these children within such settings. This project is designed to meet the needs of educational professionals and community leaders and to increase inclusion opportunities for children with ASD and epilepsy by creating an information packet for each group of individuals that explains the diagnoses and provides resources such as lesson plans and social activities to meet the needs of children with ASD and epilepsy.

**Design**

This project consists of a handbook for community members and a handbook for education professionals. The handbook consists of information about the individual diagnoses and about trends seen in children with both diagnoses. Information is included about the social deficits of children with ASD and epilepsy and how community members and education professionals can meet those needs in the different settings
including setting up a Circle of Friends, using games, and using Social Stories. Much of the information is included in both handbooks because there are many aspects of the diagnoses that will need to be supported across all environments. There is also a brief overview of alternative communication, which many children with ASD and epilepsy use. Also included for both education professionals and community members is information about schedules and sensory needs, which meet the behavioral needs of children with ASD and epilepsy. For education professionals there is a list of children's books that can be used in a classroom to teach students without disabilities about disabilities, ASD, and epilepsy and a list of common acronyms that are used in special education. The end of the handbook has a list of resources for education professionals and community members about social skills, general ideas, and other readings. In the handbook for education professionals there are more categories in the list and includes information about lessons, inclusive schools, and publishing companies.

The handbook meets the needs that community organizations and education professionals have for including children with ASD and epilepsy because it offers accurate information about the diagnoses and how to meet the needs of children with the comorbid diagnosis in an easy-to-use document. The information is presented so that each page could stand-alone and addresses one specific area, need, or strategy during inclusion. This handbook is designed as an introduction to the diagnoses of ASD and epilepsy and the needs of children with the comorbid diagnosis.

**Audience and Setting**

This project was designed for general education teachers, paraprofessionals, administrators, and leaders in community organizations such as scouts, sports teams,
and after school programs, who are or could be working with school age children with ASD and epilepsy. It is designed for individuals with minimal background in special education and working with children with ASD or with epilepsy. The target audience is the general community and public school system with an emphasis on general education and community organizations that serve school age children with and without disabilities. It is designed to support education professionals and community leaders and provide them with the tools and information that they need in order to meet the needs of school age children with a diagnosis of ASD and epilepsy across the spectrum of an ASD diagnosis because the population of children with ASD and epilepsy is increasing.

**Procedures**

Multiple steps went into creating this project. First, the diagnoses of ASD and epilepsy were researched in order to identify the official diagnostic criteria for each diagnosis. Once this was known time was devoted to researching knowledge of children with each individual diagnosis among education professionals and community organization members, and it became apparent that, although education professionals and community organization members have positive attitudes and are willing to include children with either ASD or epilepsy, there is a general lack of accurate knowledge about each diagnosis. This provided the direction for topics that the project would address in order to increase inclusion opportunities for children with ASD and epilepsy.

Information about the comorbid diagnosis of ASD and epilepsy was researched to identify any commonalities among individuals diagnosed with both. Through the research it became clear that there is a need for comprehensive treatment options for
children with ASD and epilepsy but that information is more relevant to parents, therapists, and medical professionals who are making the treatment decisions for the children. Within the school and community settings, children with ASD and epilepsy need many of the same supports and accommodations as children with a diagnosis of either ASD or epilepsy, and these supports and accommodations were identified for inclusion into the handbook.

Using the research gathered about the diagnoses and necessary supports, the document was created using publishing software that can export files into Portable Document Format (PDF). By having it in PDF format, the handbooks can be opened on most computers giving as much accessibility as possible. First the cover page and table of contents were created to serve as an outline during the creation of the project. Throughout the creation of the two handbooks, it became clear that much of the information would be important for both education professionals and community members to have access to, and thus much of the information was shared between the two handbooks. There were a few topics specific to education professionals that were determined to be unnecessary for community members, specifically children’s books about disability and acronyms found in special education. Once all necessary content was written into each handbook, a list of additional resources was created to give users a list of books and agencies that they could use to do their own research for more information.

**Summary of Chapter**

The number of children with ASD and epilepsy is increasing thus driving the need for inclusion opportunities in school and community settings. An obstacle for inclusive
settings has been the lack of accurate knowledge and understanding of what children with ASD and epilepsy need on the part of community leaders and education professionals. Based on this information two handbooks were created, one for education professionals and one for community leaders, that provide accurate information about the diagnoses, areas of weakness for children with the diagnosis, and accommodations that can be incorporated into an inclusive setting to address social and behavioral needs.
Chapter Four: Project

Children with disabilities are being included in educational settings with increasing frequency, but their participation in formal recreational activities and community organizations is still limited. Educational professionals and community leaders generally have positive attitudes toward children with ASD and children with epilepsy but do not have adequate, accurate knowledge regarding the diagnoses in order to best support children with the comorbid diagnosis who are included in general education classrooms and community organizations. In order to increase the inclusion opportunities and the success of those opportunities this project consists of two similar handbooks, one for educators and one for community group members, that provide information about the diagnoses and the needs of children with the comorbid diagnosis. Information is included regarding the primary areas of need in ASD including social skills, communication, schedules, and sensory differences. Within each area there are ideas for supports to ensure the success of the inclusive placement. In social skills there is information about using a Circle of Friends to include peers without disabilities in supporting the child with ASD and epilepsy. Resources are provided for further reading and to address the need to individualize the supports for each child who is included in a general education classroom or community organization. The handbook incorporates the benefits of inclusion for children with ASD and epilepsy as well as their peers without disabilities. The handbooks are arranged so that most topics are given one page with multiple smaller sections, a setup which allows for quick reference of a certain topic or area of need. Since half of the diagnosis of ASD is a deficit in social communication and interaction, social skills are given more space and more interventions.
Handbook of Autism Spectrum Disorder and Epilepsy

For Administrators, Teachers, and Paraprofessionals
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</tbody>
</table>
What Is Inclusion?

Inclusion is the practice of welcoming and educating all children regardless of disability within the general education classroom with the appropriate supports (Hammeken, 2007). In 2013, the percentage of children with disabilities in a general education classroom over 80% of their school day was 61.1%, which is an increase of 12.9% from 2002 (United States Department of Education, 2013). Inclusion is not limited to children with disabilities. It also applies to children who are gifted and children with any perceived differences (Wade & Zone, 2000).

Why Inclusion?

Children with and without disabilities benefit from inclusion. Children with disabilities have models of age-appropriate behavior. Students learn to accept each other and recognize everyone's contributions to the classroom. Inclusion emphasizes bringing the accommodations into the regular classroom giving all students a chance to benefit from these strategies as necessary. Many of the techniques used during inclusion are considered best practices in teaching (Hammeken, 2007).

Legal Information

The terms inclusion and inclusive education are not found in the Individuals with Disabilities Education Act. However, the term "Least Restrictive Environment" is found in the law. This means that students with disabilities have the right to be educated in general education as much as possible. Students with disabilities should only be educated in separate classes or schools when education in a regular classroom will not be possible even with aids and supports (Falvey & Givner, 2005).

What It Looks Like

Since inclusion is not specifically written into the law there is not a one size fits all way to organize an inclusive education program (Hammeken, 2007). In inclusion children of all levels, including children who are gifted and children with disabilities, learn in the same classroom, participating together, and accessing curriculum that is differentiated to meet their needs (Wade & Zone, 2000). Inclusion fosters a collaborative working environment because general education teachers and special education teachers work together to provide all students with the necessary supports to make them successful (Hammeken, 2007).
Autism Spectrum Disorder

Based on the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed; American Psychiatric Association (APA), 2013) Autism Spectrum Disorder (ASD) is a developmental disability, in which individuals have deficits in social communication and interaction and show restricted, repetitive patterns of behavior, interests, and activities. One in 68 children is diagnosed with ASD with boys four times more likely to have ASD than girls (Baio, 2014). Children with ASD often have gastrointestinal problems and sleep problems (APA, 2013).

**Social Deficits**

Some examples of deficits in social communication and interaction are deficits in social-emotional reciprocity, deficits in nonverbal communicative behaviors, and deficits in making, maintaining, and understanding relationships. These could include a lack of back and forth conversations, abnormal social initiations, abnormal use of eye contact and body language, lack of facial expressions, absence of interest in peers and difficulties in imaginative play (APA, 2013).

**Repetitive Patterns**

This category of the diagnosis includes stereotyped and repetitive motor movements and speech such as hand flapping and echolalia and insistence on sameness, routines, and ritualized behavior patterns such as taking the same route every day. It also covers restricted interests that are abnormal in the intensity or focus and under- or over- reactions to sensory input such as apparent indifference to pain or having an adverse reaction to certain sounds or textures (APA, 2013).

**Other Information**

Autism Spectrum Disorder is no longer divided into different diagnoses, meaning Asperger Syndrome and Pervasive Developmental Disorder - Not OtherwiseSpecified are not diagnoses anymore (APA, 2013; APA, 2000). Each aspect of the diagnosis is also given a rating of severity, Level 1, 2, or 3, to indicate the level of support needed. The symptoms must be present during early development but may not be fully noticed until social demands increase. Other specifiers used on the diagnosis are with or without intellectual impairment or language impairment and associated with another disorder (APA, 2013).
Epilepsy

Epilepsy is a neurological disease that affects individuals of all ages, with a prevalence of approximately 1% in children. It is characterized by recurrent unprovoked seizures, a high risk of recurrent unprovoked seizures, or an epilepsy syndrome (Fisher et al., 2014). Seizures can vary in type, frequency, duration, and severity. Within the epilepsy syndromes there are different prognoses based on the type, with some epilepsies limited to childhood with minor lifelong impacts and some with more severe effects (Engel, 2001).

Types of Seizures

<table>
<thead>
<tr>
<th>Types of Seizures</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generalized and partial, based on how much of the brain is affected.</td>
<td>For 70% of individuals with epilepsy, the seizures are controllable with medication. The type of medication used is dependent on the type of epilepsy and type of seizure. The medication does not fix the underlying cause of epilepsy. Instead, it works to prevent seizures from reoccurring (Schachter, Shafer, &amp; Sirven, 2013). For individuals whose epilepsy is not controllable with medication, there are surgical options to remove the focus of seizures in the brain.</td>
</tr>
<tr>
<td>Two common types of seizures in children are grand-mal and absence. Grand-mal involve loss of consciousness, body stiffening, and body jerking. Absence seizures involve brief loss of consciousness with few or no symptoms. These are generalized seizures and involve the entire brain. Partial seizures are limited to one portion of the brain (Fisher et al., 2014)</td>
<td></td>
</tr>
</tbody>
</table>

Seizure First Aid

To care for a person having a seizure, ease the person to the floor, turn the person onto his or her side, cushion his or her head, move anything sharp or hard from the area, and remove or loosen neckwear and glasses. Do not hold the person down or place anything in his or her mouth. Call 911 if the seizure is longer than 5 minutes, if the person is hurt, if the person has another seizure soon after, or if you are unsure of the cause (American Red Cross, 2011).

For children with epilepsy their neurologist needs to have a description of the seizures, so give parents as much information as possible afterward.
# Dual Diagnosis

Children with ASD have a greater risk of having epilepsy than their peers without ASD. Between 5% and 46% of children with ASD also have epilepsy (Spence & Schneider, 2009). There is no one form of epilepsy or type of seizure that is associated with ASD (Steffenburg, Steffenburg, & Gillberg, 2003). Children with both ASD and epilepsy often also have intellectual disabilities and are more likely to have challenging behaviors, impaired daily living skills, and motor difficulties (Jokiranta et al., 2014; Turk et al., 2009). Since epilepsy is commonly associated with ASD and the prevalence of ASD is increasing, so too is the number of children with both diagnoses.

## Possible Reasons

Since there is a substantial minority of children with ASD who also have epilepsy, many studies have attempted to answer the question of why. The prevailing explanation is that common neurological mechanisms underlie both. Studies have focused on a few specific chemicals to identify whether there is a chemical imbalance or whether a chemical produces an unanticipated response in the brain in individuals with ASD and epilepsy (Barnes, Sidhu, & Tuchman, 2013). So far a mutation in the receptor of one chemical, GABA, has been identified as being associated with ASD and with epilepsy. Since this is an identified risk factor for each diagnosis individually, it is being studied as a risk factor for the comorbid diagnosis as well (Kang & Barnes, 2013).

## Treatment

Children with ASD and epilepsy require many of the same treatments and supports as children with either diagnosis individually and thus can receive many treatments that target one diagnosis or the other. However, children with both diagnoses need to have access to coordinated, comprehensive treatments that include pharmacological and behavioral interventions (Tuchman, Alessandri, & Cuccaro, 2010). There are additional considerations when using medication to treat epilepsy in a child with ASD, including possible behavioral side effects, how and when the medication is taken, and additional monitoring needs. Also, interactions with other drugs must be considered because many children with ASD take medication to address other emotional and behavioral needs (Spence & Schneider, 2009).
Children's Books About Disability

Picture books can provide children with information that would otherwise be inaccessible to them. The books listed here provide children with information about disabilities, ASD, and epilepsy and could be positive additions to any elementary classroom library. Some books specifically deal with inclusion and others focus on the disabilities themselves.

<table>
<thead>
<tr>
<th>General</th>
<th>ASD</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Don't Call Me Special</em> by Pat Thomas</td>
<td><em>A is for Autism, F is for Friend</em> by</td>
</tr>
<tr>
<td><em>Don't Call Me Names</em> by C.W. Graham</td>
<td>Joanna Keating-Velasco</td>
</tr>
<tr>
<td><em>Keith Edward's Different Days</em> by Karen Melberg Schwier</td>
<td><em>Russell's World</em> by Charles A. Amenta,</td>
</tr>
<tr>
<td><em>What It's Like to Be Me</em> by Helen Exley</td>
<td>Monika Pollak</td>
</tr>
<tr>
<td><em>There's A Blue Square on My Brother's School Bus</em> by Sally Craymer</td>
<td><em>The Autism Acceptance Book</em> by Ellen</td>
</tr>
<tr>
<td></td>
<td>Sabin</td>
</tr>
<tr>
<td></td>
<td><em>Andy and his Yellow Frisbee</em> by Mary</td>
</tr>
<tr>
<td></td>
<td>Thompson</td>
</tr>
<tr>
<td></td>
<td><em>Since We're Friends</em> by Celeste Shally,</td>
</tr>
<tr>
<td></td>
<td>David Harrington</td>
</tr>
<tr>
<td></td>
<td><em>A Friend Like John</em> by Suzanne B.</td>
</tr>
<tr>
<td></td>
<td>Bartlett, MD</td>
</tr>
<tr>
<td></td>
<td><em>Jackie's Journal</em> by Jackie Christiansen,</td>
</tr>
<tr>
<td></td>
<td>Diane Mayer Christiansen</td>
</tr>
<tr>
<td></td>
<td><em>Lucy's Amazing Friend</em> by Stephanie</td>
</tr>
<tr>
<td></td>
<td>Workman, Tim Raynes</td>
</tr>
<tr>
<td></td>
<td><em>Little Rainman</em> by Karen Simmons</td>
</tr>
<tr>
<td></td>
<td><em>Nathan's Journey</em> by Helen Barclay</td>
</tr>
<tr>
<td></td>
<td><em>Please Don't Say Hello</em> by Phyllis-</td>
</tr>
<tr>
<td></td>
<td>Terri Gold</td>
</tr>
<tr>
<td></td>
<td><em>Inside Out</em> by Ann M. Martin</td>
</tr>
<tr>
<td></td>
<td><em>A Friend Like Simon</em> by Kate Gaynot</td>
</tr>
</tbody>
</table>
Teaching Play and Social Skills

Children with ASD and epilepsy often lack varied, spontaneous pretend or social play and need to be taught how to play (Kalyva, 2011). For any game it is crucial to ensure that all participants know the rules. The games included here have modifications that can be used to develop children’s play and social skills. Any game that requires taking turns, having a conversation, or sharing can be used to help children practice social skills with their peers (Notbohm & Zysk, 2010).

**Charades**

Children get up and choose a card that they act out so that their peers can guess their card. To use this with children with ASD and epilepsy, make sure the cards are familiar to them. Some children will need their own set of cards to hold up to make their guesses. Charades has the added benefit of incorporating pretending in the form of acting out a word or phrase.

**People BINGO**

Best played with a group of 8 or more, each child receives a game card with descriptions of people in each box. Children have to find someone who fits each criteria and have that person initial the box. Children with ASD and epilepsy could have a peer buddy or use alternative communication. An additional modification would be to decrease the number of boxes in their grid.

**I Spy**

For I Spy the initial clue is given with only one adjective or descriptor. For example "I spy something yellow." Every other child should be given a chance to guess. If no one gets the clue, then the person who created it adds another descriptor such as "I spy something yellow and skinny." It continues until someone guesses correctly. "Is it a pencil?" Then that person gets to make the clue.

**Go Fish**

When playing Go Fish, especially with more than two people, have children ask each other for cards by name. Emphasize looking at the person they are asking and asking the whole question using appropriate communication means. Cards can also be created using familiar topics, such as cars or characters from favorite TV shows, instead of numbers.
People BINGO Card

Find someone who....

<table>
<thead>
<tr>
<th>Has blue eyes</th>
<th>Likes ice cream</th>
<th>Has a brother</th>
<th>Likes to read</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plays soccer</th>
<th>Has been on vacation</th>
<th>Owns a dog</th>
<th>Plays baseball</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Likes board games</th>
<th>Has brown hair</th>
<th>Likes pizza</th>
<th>Has been to a waterpark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goes to the pool</th>
<th>Has a sister</th>
<th>Plays video games</th>
<th>Owns a cat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Circle of Friends

Circle of Friends is a group of peers specifically chosen to interact with a student with social challenges. The peers serve as social role models and provide the student with social challenges with a support network. Since children with ASD and epilepsy have social deficits, they are candidates for a Circle of Friends. The peers in turn learn that the social impairments are part of the disability and can decrease bullying (Schneider, 2007; Kalyva, 2011).

Setting It Up

Schneider (2007) explains setting up a Circle of Friends with 6-10 children and the target child. Peers in the Circle of Friends should be students who are well liked, are not afraid to reach out to others, and whom the target comes into regular contact with. Parents should be notified and have Circle of Friends explained to them so they can give permission for their children to participate.

Circle of Friends meetings can be weekly or biweekly. The target child comes to meetings once a month while the other children attend all of the meetings. At the meetings where the target child does not attend, the peer mentors learn about the target child's condition and behavior. They also practice ways to help the target child develop social skills and learn when to communicate with adults.

The meetings which the target child attends involve fun social activities so the children feel comfortable with each other and practice social skills.

Games and Activities

Circle of Friends games and activities should be noncompetitive and avoid areas of difficulty for the child. These could include "Who Am I" where every child has a person on their back and everyone has to identify their card using "yes" or "no" questions and "Describe Me" where children introduce themselves with adjectives starting with the first letter of their names (Schneider, 2007).

Chats

Both the target child and peers will need to be taught how to have a chat. Teaching concrete steps helps students who struggle with conversations. Children can learn that there are topics that you can talk about with anyone, how to start and end conversations, and how to ask the same questions back. Some children need to plan their chats ahead of time (Schneider, 2007).
Social Stories

The Social Stories approach was developed by Carol Gray. They are brief stories designed to familiarize children with disabilities with social interactions or public events. An event or interaction is broken down into short steps, which are described with written language and visuals as appropriate. Social Stories can be used to describe a situation, teach social skills, teach routines, teach appropriate behaviors, and help a child with problematic behaviors (Kalyva, 2011).

Creating a Social Story

Social Stories usually have 2-5 sentences and may be a book with a cover. Kalyva (2011) explained guidelines for designing and implementing successful Social Stories.

1. Identify the behavior or situation that the Social Story will target.
2. Collect information on the behavior that needs to change.
3. Write a Social Story using descriptive and directive sentences. The aim is to describe the social situation not to direct the action.
4. Check the content with the parents or teachers of the child and then read the story to the child or let him or her read it independently.
5. Observe the child's behavior and record the child's reactions, rereading the story daily. As appropriate modify or withdraw the Social Story.

Sample

Waiting for a Swing

At school I get to go to recess with my class.
There are other kids out playing.
I like to go on the swings. It is fun to swing high.
Sometimes the swings are full and I have to wait my turn.
I stand on the line in front of the swing and count to 20.
When I get to 20 the other student gets off.
Then I can get on the swing!

Sample

For more information about Social Stories visit: www.carolgraysocialstories.com.
Carol Gray has also published books including My Social Stories Book and The New Social Story Book.
Alternative Communication

Approximately 25% of children with ASD do not develop functional speech (Tiegerman-Farber, 2009). To give children with ASD and epilepsy a means of communication there are numerous alternative forms of communication including aided and unaided. Aided communication requires means outside of the user such as electronic devices or pictures and unaided communication does not require anything outside the user (Mirenda, 2003).

**Sign Language**

Sign language is a system of unaided communication that uses hand and facial expressions to represent specific words and phrases. Children with ASD including children with low functioning ASD are able to learn and produce a variety of signs to communicate their basic needs and wants. Studies have focused on single signs instead of principles of communication (Kalyva, 2011).

**Picture Exchange**

PECS, Picture Exchange Communication System, is an aided communication system designed to teach basic communication skills to address self-help needs. The user chooses a picture icon or phrase and gives it to another person in order to access needs and wants, answer questions, or make comments. The emphasis is on spontaneous communication (Kalyva, 2011).

**Static Display**

A static display is a type of voice output communication device on which the word or phrase choices do not change automatically. This does not mean that the communication choices are finite because there is the possibility to have grids of different options and this also includes devices with a computer style keyboard giving the user flexibility (Mirenda, 2015).

**Dynamic Display**

Dynamic displays are voice output communication devices where the user can access different levels of vocabulary based on their selections. For example a child could push the "food" button and go to a different screen with multiple foods that the child could choose. These are becoming very popular and even utilize applications for tablets (Mirenda, 2015).
Children with ASD and epilepsy benefit in many ways from visual schedules, which are the most common visual tools and can be used in any environment. When they know what is happening next, they have less anxiety and display fewer challenging behaviors. A schedule can be created that breaks down an individual activity into manageable steps, or one can be created that shows the entire day (Notbohm & Zysk, 2010).

Creating a Schedule

Notbohm and Zysk (2010) explain the steps for creating a schedule as:

1. Decide who will be using the schedule. It could be just the child with ASD and epilepsy or a general schedule for the whole class.

2. Divide the day or activity into understandable and manageable segments and name each part.

3. Choose the visual system, objects, photos, drawings, words, or a combination.

4. Select a format for the schedule, desk sized, in a notebook, or posted on the wall.

5. Select visuals that are appropriate for each segment.

6. Go through the schedule to ensure that it is clear and sequential.

7. Teach the child how to use the schedule.

8. Refer to the schedule for information about what is happening or changing.
Children with ASD and epilepsy are very likely to have differences in the way they process and react to sensory stimuli. Some children appear to over- or under-react to sensory input and may have trouble perceiving environmental stimuli and responding appropriately (Kalyva, 2011). There are seven sensory systems, and children with ASD and epilepsy can be hypo- or hyper-sensitive to stimuli in any or all of them (National Autistic Society (NAS), 2014).

### Sensory Needs

#### Sensory Systems

The seven sensory systems are:

1. Vision
2. Hearing
3. Taste
4. Touch
5. Smell
6. Vestibular
7. Proprioception

#### Hearing

For hypo-sensitivity, use visuals that support verbal information and use means of gaining attention other than calling by name (NAS, 2014).

For hyper-sensitivity, use ear plugs, shut doors and windows to decrease additional sounds, listen to quiet music (NAS, 2014).

#### Vision

For hypo-sensitivity, use additional visual supports such as color coding, drawings, colored pictures, and practice eye coordination (NAS, 2014).

For hyper-sensitivity, wear sunglasses, cover fluorescent lighting, create a space without visual distractions, and use blackout curtains (NAS, 2014).

#### Taste

For hypo-sensitivity, provide foods with strong flavors and spices and teach what is food and what is not food (NAS, 2014).

For hyper-sensitivity, use bland foods and pureed foods. Introduce new foods slowly using rewards frequently (NAS, 2014).
Sensory Needs Continued

Since children with ASD and epilepsy may have needs in any or all of the sensory systems certain strategies can help with hypo- or hyper-sensitivity of any system. In rare cases an individual with ASD may experience synaesthesia in which sensory input in one system is processed and comes out of a different system. An example would be an individual who hears a color or sees music (NAS, 2014).

<table>
<thead>
<tr>
<th>Smell</th>
<th>Vestibular</th>
</tr>
</thead>
<tbody>
<tr>
<td>For hypo-sensitivity, use</td>
<td>Vestibular is balance.</td>
</tr>
<tr>
<td>unscented detergents,</td>
<td>For hypo-sensitivity, use</td>
</tr>
<tr>
<td>shampoos, and soaps and</td>
<td>activities to develop the</td>
</tr>
<tr>
<td>make the environment as</td>
<td>system such as rocking</td>
</tr>
<tr>
<td>fragrance free as possible</td>
<td>horses, swings, seesaws,</td>
</tr>
<tr>
<td>(NAS, 2014).</td>
<td>and throwing and</td>
</tr>
<tr>
<td>For hyper-sensitivity, use</td>
<td>catching games (NAS,</td>
</tr>
<tr>
<td>strong-smelling products</td>
<td>2014).</td>
</tr>
<tr>
<td>as needed to distract from</td>
<td>For hyper-sensitivity, use</td>
</tr>
<tr>
<td>inappropriate strong-</td>
<td>visual cues like a finish</td>
</tr>
<tr>
<td>smelling stimuli (NAS,</td>
<td>line and break down</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Touch</th>
<th>Proprioception</th>
</tr>
</thead>
<tbody>
<tr>
<td>For hypo-sensitivity, use</td>
<td>Proprioception is body</td>
</tr>
<tr>
<td>weighted blankets and</td>
<td>awareness.</td>
</tr>
<tr>
<td>vests or have the child</td>
<td>For hypo-sensitivity, use</td>
</tr>
<tr>
<td>carry a weighted backpack</td>
<td>furniture around the</td>
</tr>
<tr>
<td>(NAS, 2014).</td>
<td>edge of the room and</td>
</tr>
<tr>
<td>For hyper-sensitivity,</td>
<td>use colored tape to</td>
</tr>
<tr>
<td>warn the child before</td>
<td>indicate boundaries</td>
</tr>
<tr>
<td>touching them, introduce</td>
<td>(NAS, 2014).</td>
</tr>
<tr>
<td>different textures</td>
<td>For hyper-sensitivity, use</td>
</tr>
<tr>
<td>gradually, use sand, rice,</td>
<td>fine motor activities</td>
</tr>
<tr>
<td>or water tables (NAS,</td>
<td>such as lacing boards</td>
</tr>
</tbody>
</table>
Special Education Acronyms

Special education is full of the use of acronyms that are used in writing and in speaking. A list is included here of many of the common acronyms and what they stand for. These are many of the ones that could be encountered during inclusion of children with ASD and epilepsy. However, this list is not comprehensive and it is always better to ask the author or speaker for their meaning than to not know.

AAC - Augmentative Alternative Communication
ABA - Applied Behavior Analysis
APE - Adaptive Physical Education
ASD - Autism Spectrum Disorder
AT - Assistive Technology
BIP - Behavior Intervention Plan
DSM - Diagnostic and Statistical Manual of Mental Disorders
ESY - Extended School Year
FAPE - Free Appropriate Public Education
FBA - Functional Behavior Assessment
IA - Instructional Assistant
IDEA - Individuals with Disabilities Education Act
IEP - Individualized Education Plan
ITP - Individualized Transition Plan
LEA - Local Education Agency
LRE - Least Restrictive Environment
OHI - Other Health Impairment
OT - Occupational Therapy
PT - Physical Therapy
RTI - Response to Intervention
SLP - Speech Language Pathologist
SST - Student Study Team
Resources

General

1001 Great Ideas for Teaching and Raising Children with Autism or Asperger’s by Ellen Notbohm and Veronica Zysk

Autism: Educational and Therapeutic Approaches by Efrosini Kalyva

Instruction of Students with Severe Disabilities by Martha E. Snell and Fredda Brown

Human Exceptionality: School, Community, and Family by Michael L. Hardman, Clifford J. Drew, and M. Winston Egan

Inclusion

Creating an Inclusive School (2nd ed.) edited by Richard A. Villa and Jacqueline S. Thousand

The Teacher’s Guide to Inclusive Education: 750 Strategies for Success by Peggy A. Haammeken

Inclusive Education edited by Suzanne E. Wade

Behavior Solutions for the Inclusive Classroom by Beth Aune, Beth Burt, and Peter Gennaro

Social Skills

Playing it Right: Social Skills Activities for Parents and Teachers of Young Children with Autism Spectrum Disorders, Including Asperger Syndrome and Autism by Rachael Bareket

With Open Arms: Creating School Communities of Support for Kids with Social Challenges Using Circle of Friends, Extracurricular Activities, and Learning Teams by Mary Schlieder

The New Social Stories Book by Carol Gray
Resources Continued

Agencies and Organizations

Epilepsy Foundation - www.epilepsy.com
International League Against Epilepsy - www.ilae.org
Autism Society of America - www.autism-society.org
National Autistic Society - www.autism.org.uk
Autism Speaks - www.autismspeaks.org
Include Autism - www.includeautism.org

Publishing Companies

These companies publish many books about disabilities as resources for parents, teachers, community members, and other professionals.

Autism Asperger Publishing Company
Inclusion Press
Future Horizons Inc.
Brooks Publishing Co

Other Reading

*Life, Animated* by Ron Suskind
*Autism: Sensory-Movement Differences and Diversity* by Martha R. Leary and Anne M. Donnellan
*Carly's Voice* by Arthur Fleischmann and Carly Fleischmann
*Emergence: Labeled Autistic* by Temple Grandin
*Epilepsy in our World* by Lisa Andermann
References


References Continued


Handbook of Autism Spectrum Disorder and Epilepsy

For Community Organizations
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What Is Inclusion?

Inclusion is the practice of welcoming all individuals regardless of perceived differences with any necessary, appropriate supports (Falvey & Givner, 2005). Children with disabilities, specifically autism spectrum disorder, are less likely than their same age peers to participate in recreational activities like team sports, art lessons, and school clubs (Potvin, Snider, Prelock, Kehayia, & Wood-Dauphinee, 2013). Recreation includes formal and informal activities and is crucial to children's development and health (World Health Organization, 2001).

Why Inclusion?

Children with and without disabilities benefit from inclusion. Children with disabilities have models of age-appropriate behavior. Students learn to accept each other's differences and how to support each other (Hammeken, 2007). For children with disabilities to have access to the most broad range of recreational and community activities inclusion is necessary because there are not organizations that target individuals with disabilities for every type of recreational activity.

How to Start

To support children with disabilities organizations need to collaborate with parents and professionals because each child with a disability will need individualized supports to fully participate. This collaboration could be embedded into a step-based process that identifies the wishes of the child and takes into account his or her specific limitations to ensure that the child will be participating fully in activities of their own choosing (Potvin, Prelock, & Snider, 2008).

What It Looks Like

Children with disabilities have the opportunity to participate with peers without disability in activities of their choosing with necessary supports, which could include a peer buddy, visual schedule, or adapted materials or equipment. All children are given the opportunities to participate as they would like, which could be trying a different position in baseball or earning a specific badge in scouts. They are able to participate both in informal recreational activities such as fishing or going on a hike and formal recreational activities such as participating in team sports and school clubs (Wilson, Arnold, Rowland, & Burnham, 1997).
Autism Spectrum Disorder

Based on the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed; American Psychiatric Association (APA), 2013) Autism Spectrum Disorder (ASD) is a developmental disability, in which individuals have deficits in social communication and interaction and show restricted, repetitive patterns of behavior, interests, and activities. One in 68 children is diagnosed with ASD with boys four times more likely to have ASD than girls (Baio, 2014). Children with ASD often have gastrointestinal problems and sleep problems (APA, 2013).

### Social Deficits

Some examples of deficits in social communication and interaction are deficits in social-emotional reciprocity, deficits in nonverbal communicative behaviors, and deficits in making, maintaining, and understanding relationships. These could include a lack of back and forth conversations, abnormal social initiations, abnormal use of eye contact and body language, lack of facial expressions, absence of interest in peers and difficulties in imaginative play (APA, 2013).

### Repetitive Patterns

This category of the diagnosis includes stereotyped and repetitive motor movements and speech such as hand flapping and echolalia and insistence on sameness, routines, and ritualized behavior patterns such as taking the same route every day. It also covers restricted interests that are abnormal in the intensity or focus and under- or over- reactions to sensory input such as apparent indifference to pain or having an adverse reaction to certain sounds or textures (APA, 2013).

### Other Information

Autism Spectrum Disorder is no longer divided into different diagnoses, meaning Asperger Syndrome and Pervasive Developmental Disorder - Not Otherwise Specified are not diagnoses anymore (APA, 2013; APA, 2000). Each aspect of the diagnosis is also given a rating of severity, Level 1, 2, or 3, to indicate the level of support needed. The symptoms must be present during early development but may not be fully noticed until social demands increase. Other specifiers used on the diagnosis are with or without intellectual impairment or language impairment and associated with another disorder (APA, 2013).
Epilepsy

Epilepsy is a neurological disease that affects individuals of all ages, with a prevalence of approximately 1% in children. It is characterized by recurrent unprovoked seizures, a high risk of recurrent unprovoked seizures, or an epilepsy syndrome (Fisher et al., 2014). Seizures can vary in type, frequency, duration, and severity. Within the epilepsy syndromes there are different prognoses based on the type, with some epilepsies limited to childhood with minor lifelong impacts and some with more severe effects (Engel, 2001).

Types of Seizures

There are two categories of seizures, generalized and partial, based on how much of the brain is affected. Two common types of seizures in children are grand-mal and absence. Grand-mal involve loss of consciousness, body stiffening, and body jerking. Absence seizures involve brief loss of consciousness with few or no symptoms. These are generalized seizures and involve the entire brain. Partial seizures are limited to one portion of the brain (Fisher et al., 2014)

Treatment

For 70% of individuals with epilepsy, the seizures are controllable with medication. The type of medication used is dependent on the type of epilepsy and type of seizure. The medication does not fix the underlying cause of epilepsy. Instead, it works to prevent seizures from reoccurring (Schachter, Shafer, & Sirven, 2013). For individuals whose epilepsy is not controllable with medication, there are surgical options to remove the focus of seizures in the brain.

Seizure First Aid

To care for a person having a seizure, ease the person to the floor, turn the person onto his or her side, cushion his or her head, move anything sharp or hard from the area, and remove or loosen neckwear and glasses. Do not hold the person down or place anything in his or her mouth. Call 911 if the seizure is longer than 5 minutes, if the person is hurt, if the person has another seizure soon after, or if you are unsure of the cause (American Red Cross, 2011).

For children with epilepsy their neurologist needs to have a description of the seizures, so give parents as much information as possible afterward.
Dual Diagnosis

Children with ASD have a greater risk of having epilepsy than their peers without ASD. Between 5% and 46% of children with ASD also have epilepsy (Spence & Schneider, 2009). There is no one form of epilepsy or type of seizure that is associated with ASD (Steffenburg, Steffenburg, & Gillberg, 2003). Children with both ASD and epilepsy often also have intellectual disabilities and are more likely to have challenging behaviors, impaired daily living skills, and motor difficulties (Jokiranta et al., 2014; Turk et al., 2009). Since epilepsy is commonly associated with ASD and the prevalence of ASD is increasing, so too is the number of children with both diagnoses.

Possible Reasons

Since there is a substantial minority of children with ASD who also have epilepsy, many studies have attempted to answer the question of why. The prevailing explanation is that common neurological mechanisms underlie both. Studies have focused on a few specific chemicals to identify whether there is a chemical imbalance or whether a chemical produces an unanticipated response in the brain in individuals with ASD and epilepsy (Barnes, Sidhu, & Tuchman, 2013). So far a mutation in the receptor of one chemical, GABA\textsubscript{A}, has been identified as being associated with ASD and with epilepsy. Since this is an identified risk factor for each diagnosis individually, it is being studied as a risk factor for the comorbid diagnosis as well (Kang & Barnes, 2013).

Treatment

Children with ASD and epilepsy require many of the same treatments and supports as children with either diagnosis individually and thus can receive many treatments that target one diagnosis or the other. However, children with both diagnoses need to have access to coordinated, comprehensive treatments that include pharmacological and behavioral interventions (Tuchman, Alessandri, & Cuccaro 2010). There are additional considerations when using medication to treat epilepsy in a child with ASD, including possible behavioral side effects, how and when the medication is taken, and additional monitoring needs. Also, interactions with other drugs must be considered because many children with ASD take medication to address other emotional and behavioral needs (Spence & Schneider, 2009).
Teaching Play and Social Skills

Children with ASD and epilepsy often lack varied, spontaneous pretend or social play and need to be taught how to play (Kalyva, 2011). For any game it is crucial to ensure that all participants know the rules. The games included here have modifications that can be used to develop children’s play and social skills. Any game that requires taking turns, having a conversation, or sharing can be used to help children practice social skills with their peers (Notbohm & Zysk, 2010).

**Charades**

Children get up and choose a card that they act out so that their peers can guess their card. To use this with children with ASD and epilepsy, make sure the cards are familiar to them. Some children will need their own set of cards to hold up to make their guesses. Charades has the added benefit of incorporating pretending in the form of acting out a word or phrase.

**People BINGO**

Best played with a group of 8 or more, each child receives a game card with descriptions of people in each box. Children have to find someone who fits each criteria and have that person initial the box. Children with ASD and epilepsy could have a peer buddy or use alternative communication. An additional modification would be to decrease the number of boxes in their grid.

**I Spy**

For I Spy the initial clue is given with only one adjective or descriptor. For example "I spy something yellow." Every other child should be given a chance to guess. If no one gets the clue, then the person who created it adds another descriptor such as "I spy something yellow and skinny. It continues until someone guesses correctly. "Is it a pencil?" Then that person gets to make the clue.

**Go Fish**

When playing Go Fish, especially with more than two people, have children ask each other for cards by name. Emphasize looking at the person they are asking and asking the whole question using appropriate communication means. Cards can also be created using familiar topics, such as cars or characters from favorite TV shows, instead of numbers.
# People BINGO Card

Find someone who....

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Has blue eyes</td>
<td>Likes ice cream</td>
<td>Has a brother</td>
<td>Likes to read</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plays soccer</td>
<td>Has been on vacation</td>
<td>Owns a dog</td>
<td>Plays baseball</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likes board games</td>
<td>Has brown hair</td>
<td>Likes pizza</td>
<td>Has been to a waterpark</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goes to the pool</td>
<td>Has a sister</td>
<td>Plays video games</td>
<td>Owns a cat</td>
</tr>
</tbody>
</table>
Circle of Friends

Circle of Friends is a group of peers specifically chosen to interact with a student with social challenges. The peers serve as social role models and provide the student with social challenges with a support network. Since children with ASD and epilepsy have social deficits, they are candidates for a Circle of Friends. The peers in turn learn that the social impairments are part of the disability and can decrease bullying (Schneider, 2007; Kalyva, 2011).

Setting It Up

Schneider (2007) explains setting up a Circle of Friends with 6-10 children and the target child. Peers in the Circle of Friends should be students who are well liked, are not afraid to reach out to others, and whom the target comes into regular contact with. Parents should be notified and have Circle of Friends explained to them so they can give permission for their children to participate.

Circle of Friends meetings can be weekly or biweekly. The target child comes to meetings once a month while the other children attend all of the meetings. At the meetings where the target child does not attend, the peer mentors learn about the target child’s condition and behavior. They also practice ways to help the target child develop social skills and learn when to communicate with adults.

The meetings which the target child attends involve fun social activities so the children feel comfortable with each other and practice social skills.

Games and Activities

Circle of Friends games and activities should be noncompetitive and avoid areas of difficulty for the child. These could include "Who Am I" where every child has a person on their back and everyone has to identify their card using "yes" or "no" questions and "Describe Me" where children introduce themselves with adjectives starting with the first letter of their names (Schneider, 2007).

Chats

Both the target child and peers will need to be taught how to have a chat. Teaching concrete steps helps students who struggle with conversations. Children can learn that there are topics that you can talk about with anyone, how to start and end conversations, and how to ask the same questions back. Some children need to plan their chats ahead of time (Schneider, 2007).
Social Stories

The Social Stories approach was developed by Carol Gray (1994). They are brief stories designed to familiarize children with disabilities with social interactions or public events. An event or interaction is broken down into short steps, which are described with written language and visuals as appropriate. Social Stories can be used to describe a situation, teach social skills, teach routines, teach appropriate behaviors, and help a child with problematic behaviors (Kalyva, 2011).

Creating a Social Story

1. Identify the behavior or situation that the Social Story will target.
2. Collect information on the behavior that needs to change.
3. Write a Social Story using descriptive and directive sentences. The aim is to describe the social situation not to direct the action.
4. Check the content with the parents or teachers of the child and then read the story to the child or let him or her read it independently.
5. Observe the child's behavior and record the child's reactions, rereading the story daily. As appropriate modify or withdraw the Social Story.

Sample

Waiting for a Swing
When I go to the after school program we get to play games inside and outside.
The games are very exciting.
Sometimes I want to run.
I can run during the outside games.
When I walk inside everyone stays safe.
Since everyone is safe we get to keep playing!

Sample

For more information about Social Stories visit: www.carolgraysocialstories.com.
Carol Gray has also published books including My Social Stories Book and The New Social Story Book.
## Alternative Communication

Approximately 25% of children with ASD are do not develop functional speech (Tiegerman-Farber, 2009). To give children with ASD and epilepsy a means of communication there are numerous alternative forms of communication including aided and unaided. Aided communication requires means outside of the user such as electronic devices or pictures and unaided communication does not require anything outside the user (Mirenda, 2003).

### Sign Language

Sign language is a system of unaided communication that uses hand and facial expressions to represent specific words and phrases. Children with ASD including children with low functioning ASD are able to learn and produce a variety of signs to communicate their basic needs and wants. Studies have focused on single signs instead of principles of communication (Kalyva, 2011).

### Picture Exchange

PECS, Picture Exchange Communication System, is an aided communication system designed to teach basic communication skills to address self-help needs. The user chooses a picture icon or phrase and gives it to another person in order to access needs and wants, answer questions, or make comments. The emphasis is on spontaneous communication (Kalyva, 2011).

### Static Display

A static display is a type of voice output communication device on which the word or phrase choices do not change automatically. This does not mean that the communication choices are finite because there is the possibility to have grids of different options and this also includes devices with a computer style keyboard giving the user flexibility (Mirenda, 2015).

### Dynamic Display

Dynamic displays are voice output communication devices where the user can access different levels of vocabulary based on their selections. For example a child could push the "food" button and go to a different screen with multiple foods that the child could choose. These are becoming very popular and even utilize applications for tablets (Mirenda, 2015).
Schedule

Children with ASD and epilepsy benefit in many ways from visual schedules, which are the most common visual tools and can be used in any environment. When they know what is happening next, they have less anxiety and display fewer challenging behaviors. A schedule can be created that breaks down an individual activity into manageable steps, or one can be created that shows the entire day (Notbohm & Zysk, 2010).

Creating a Schedule

Notbohm and Zysk (2010) explain the steps for creating a schedule as:

1. Decide who will be using the schedule. It could be just the child with ASD and epilepsy or a general schedule for the whole class.
2. Divide the day or activity into understandable and manageable segments and name each part.
3. Choose the visual system, objects, photos, drawings, words, or a combination.
4. Select a format for the schedule, desk sized, in a notebook, or posted on the wall.
5. Select visuals that are appropriate for each segment.
6. Go through the schedule to ensure that it is clear and sequential.
7. Teach the child how to use the schedule.
8. Refer to the schedule for information about what is happening or changing.

Sample

<table>
<thead>
<tr>
<th>snack</th>
<th>special activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>art</td>
<td>free choice</td>
</tr>
<tr>
<td>home</td>
<td></td>
</tr>
</tbody>
</table>
Sensory Needs

Children with ASD and epilepsy are very likely to have differences in the way they process and react to sensory stimuli. Some children appear to over- or under-react to sensory input and may have trouble perceiving environmental stimuli and responding appropriately (Kalyva, 2011). There are seven sensory systems, and children with ASD and epilepsy can be hypo- or hyper-sensitive to stimuli in any or all of them (National Autistic Society (NAS), 2014).

Sensory Systems

The seven sensory systems are:
1. Vision
2. Hearing
3. Taste
4. Touch
5. Smell
6. Vestibular
7. Proprioception

Hearing

For hypo-sensitivity, use visuals that support verbal information and use means of gaining attention other than calling by name (NAS, 2014).

For hyper-sensitivity, use ear plugs, shut doors and windows to decrease additional sounds, listen to quiet music (NAS, 2014).

Vision

For hypo-sensitivity, use additional visual supports such as color coding, drawings, colored pictures, and practice eye coordination (NAS, 2014).

For hyper-sensitivity, wear sunglasses, cover fluorescent lighting, create a space without visual distractions, and use blackout curtains (NAS, 2014).

Taste

For hypo-sensitivity, provide foods with strong flavors and spices and teach what is food and what is not food (NAS, 2014).

For hyper-sensitivity, use bland foods and pureed foods. Introduce new foods that slowly using rewards frequently (NAS, 2014).
Sensory Needs Continued

Since children with ASD and epilepsy may have needs in any or all of the sensory systems certain strategies can help with hypo- or hyper-sensitivity of any system. In rare cases an individual with ASD may experience synesthesia in which sensory input in one system is processed and comes out of a different system. An example would be an individual who hears a color or sees music (NAS, 2014).

**Smell**

For hypo-sensitivity, use unscented detergents, shampoos, and soaps and make the environment as fragrance free as possible (NAS, 2014).

For hyper-sensitivity, use strong-smelling products as needed to distract from inappropriate strong-smelling stimuli (NAS, 2014).

**Vestibular**

Vestibular is balance.

For hypo-sensitivity, use activities to develop the system such as rocking horses, swings, seesaws, and throwing and catching games (NAS, 2014).

For hyper-sensitivity, use visual cues like a finish line and break down activities (NAS, 2014).

**Touch**

For hypo-sensitivity, use weighted blankets and vests or have the child carry a weighted backpack (NAS, 2014).

For hyper-sensitivity, warn the child before touching them, introduce different textures gradually, use sand, rice, or water tables (NAS, 2014; Notbohm & Zysk, 2010).

**Proprioception**

Proprioception is body awareness.

For hypo-sensitivity, put furniture around the edge of the room and use colored tape to indicate boundaries (NAS, 2014).

For hyper-sensitivity, use fine motor activities such as lacing boards (NAS, 2014).
Resources

Social Skills

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Autism Society of America - www.autism-society.org
National Autistic Society - www.autism.org.uk
Autism Speaks - www.autismspeaks.org
Include Autism - www.includeautism.org

Other Reading

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Carly’s Voice by Arthur Fleischmann and Carly Fleischmann

Emergence: Labeled Autistic by Temple Grandin

Epilepsy in our World by Lisa Andermann
References


References Continued


Chapter Five: Project Recommendations

Children with autism spectrum disorder (ASD) have an increased risk of developing epilepsy (Jokiranta et al., 2014; Viscidi et al., 2014; Hughes & Melyn, 2005). During the school years children with ASD and epilepsy should have access to the same opportunities as their peers without disabilities, but they often do not because there is a lack of confidence and accurate knowledge among community members and general education teachers about how to best meet the needs of children with ASD and epilepsy. This project aimed to provide education professionals and community organizations with the information that they need to include children with ASD and epilepsy in their classrooms and activities. Through the process of creating this project, I learned many facts about the characteristics and needs of children with ASD and epilepsy and about the needs of community members and education professionals who are working to include children in activities with peers without disabilities. I intend for this project to provide education professionals and community leaders with an overview of some information that they need in order to include children with ASD and epilepsy in the classroom or organization. In order to encourage inclusion and disseminate the knowledge in this handbook, I plan to provide it to several community organizations and schools. With unlimited resources, I would expand the handbook for education professionals to include lessons about ASD and epilepsy to use with students without disabilities. I would also expand and split the handbook for community organizations to target the different types of community organizations. This project provides opportunities for future empirical research on the best practices for education of children with ASD and epilepsy and how it figures into a comprehensive treatment plan. It also
could be used during a training program for education professionals and community members about children with ASD and epilepsy. Since the number of children with ASD and epilepsy is increasing, it is important the research and information available to education professionals and community members be accurate and up to date.

**Lessons Learned**

During this project and the research leading up to it, I learned a lot of new information about comorbid ASD and epilepsy and the needs of children with both. This information can be grouped into two areas. First, although I knew that epilepsy was common among children with ASD, I learned about common traits seen in children with ASD and epilepsy and their medical, behavioral, academic, and social needs. Finally, I learned about many of the current hurdles to inclusion of children with ASD and epilepsy in order to determine what to address in the project to increase inclusive opportunities.

Going into this project, I had limited background knowledge and knew that children with ASD were more likely to have epilepsy. I learned that the research provides a wide range of percentages of children with ASD who have epilepsy ranging from 5% to 46%. However, all possible percentages are significantly higher than for children without ASD, which is around 1%. Another fact that I learned is that children with epilepsy and ASD are generally more affected by their ASD and have more challenging behaviors, impaired daily living skills, and motor difficulties. They are also more likely to have an intellectual disability. The research showed that, although there is a need for comprehensive treatment of ASD and epilepsy, many children also need treatments and interventions that target each individual diagnosis. In schools the
treatments and interventions used for ASD are just as important and beneficial for children with ASD and epilepsy. I learned that there is most likely a common neurological cause for ASD and epilepsy that leads to the common comorbid diagnosis. However, research is still narrowing down the exact neurological mechanism, but one that has been recognized as likely is the neurotransmitter, GABA$_A$.

The second group of lessons came in the needs of community members and education professionals when including children with ASD and epilepsy. The research showed that many said that they were willing to include children with ASD and children with epilepsy but that they did not feel that they understood the diagnoses or knew how to support children with the diagnoses. They frequently reported that they needed more training and information in order to include children with ASD and epilepsy successfully. As I was creating the two handbooks, I was surprised by how much of the information I needed to include in each handbook. I went into the project expecting to create two handbooks that were very different but ended up making two that were very similar in order to include adequate information about the diagnoses and needs without overwhelming the readers by including information that was not applicable to them.

Although this project does meet the basic needs of education professionals and community leaders there is a need for more detailed and targeted information. Going into the project, I thought that I would be able to meet the needs of all types of community organizations in one handbook but that turned out to be too vast of a project, so I decided to create a project that would meet the needs of community organizations when initially considering including a child with ASD and epilepsy. These needs in the
beginning include a basic understanding of the diagnoses and the how to address some of the common deficits and behaviors.

**Project Implementation Plans**

I plan to provide this project to administrators and community organizations for them to distribute to teachers and community leaders who will be able to include children with ASD and epilepsy. I will provide it in an electronic format and hard copy version so that they can disseminate the information in the easiest way for them. By providing this to schools and community organizations, I hope that it will be used to increase awareness and understanding of children with ASD and epilepsy and the needs of this specific population in order to increase the inclusive opportunities that children have. I will also provide it to any teachers that I come into direct contact with when working on inclusion opportunities for my students.

**Educational Implications**

Based on what I have learned, it is important to be aware of all diagnoses a child has because the diagnoses could change the treatments he or she is receiving at home. However, many of the needs of a child with ASD and epilepsy in a classroom will be similar to a child with ASD. Given the nature of the epilepsy, the child could be more impacted during the school day depending on the type, duration, and timing of the seizures. Also, when including a child with ASD and epilepsy into a general education classroom or community setting with peers without disabilities it is important to make sure the peers are aware of the needs of the child with ASD and epilepsy and how they can help support the child; this could include participating in a Circle of Friends or working with the child during an activity. In order to prevent the cycle of negative stigma
from continuing, children without disabilities should be educated about ASD and epilepsy and other disabilities. Many of the strategies included in this handbook, such as the Social Stories and schedules, can and should be used with the support of peers without disabilities.

**Limitations of Project**

This project is designed to meet the general needs of community organizations and education professionals by providing accurate information regarding the diagnoses of ASD and epilepsy and the deficits of children with the comorbid diagnosis. However, the information presented for community organizations is intentionally broad and does not have individualized supports for the different types of community organizations. With endless resources and support I would have liked to create a handbook for each type of community organization such as team sports, individual sports, and scouts with more individual supports that would benefit those groups. Some examples would be how to adapt the drills done in sports and the badges earned in scouts to the needs and abilities of the child with ASD and epilepsy. Concerning education, I would have liked to include a detailed set of lesson plans that would teach children without disabilities about ASD and epilepsy. There are many negative stereotypes about both ASD and epilepsy that could be addressed with education about both especially targeting the fact it is not a disease that can be caught by coming in contact with an individual with ASD or epilepsy.

**Future Research or Project Suggestions**

This project can lead to future research because I found that there is a recommendation that ASD and epilepsy be treated using a comprehensive method that
has yet to be fully developed. Future educational research should get empirical data about best practices in teaching children with ASD and epilepsy, keeping in mind findings from medical research regarding the medical and psychological treatment some of which will be applicable to education. In the future this project could also be expanded to include a training that would be available during professional growth days for teachers and provided in community settings and open to the public. This project leads to effective instruction of children with ASD and epilepsy because it gives them the opportunity to be in inclusive settings where the educational professionals are familiar with their comorbid diagnosis and thus their needs.

**Summary/Conclusion**

Inclusion in school and community settings is a right that all children should have, and children with disabilities are often excluded for a variety of reasons. One of the reasons is that the adults do not have an adequate, accurate knowledge of the disability; thus they do not feel that they can meet the needs of the child. This project aims to address that reason for a specific group of children. Children with ASD and epilepsy have a range of social and behavioral needs that impact their functioning in all settings, including school and the community. In order to give education professionals and community organizations the confidence and knowledge to meet those needs and be willing to include a child with ASD and epilepsy, this project consists of two handbooks that provide information and interventions that can be used in school and a community organization.

A large collection of research exists that explains the commonalities seen in children with ASD and epilepsy and the possible reasons the two are frequently
comorbid. There is also research that addresses the need for comprehensive treatment of ASD and epilepsy. However, there is minimal research that discusses what children with ASD and epilepsy need in the classroom and in the community. The trend appears to be that they need similar interventions as children with ASD alone although attention does need to be paid to the fact that they also have epilepsy and may have medical needs. The interventions and supports included in the handbook address needs that arise from the ASD diagnosis.
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