Spring 2015

Teacher Knowledge and Perception of Students With an ADHD Label

Carrie Ballantine
Governors State University

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Teacher Knowledge and Perception of Students

With an ADHD Label

Carrie Ballantine

Prepared in Partial Fulfillment of the
Masters of Arts Degree in Multicategorical Special Education
Governors State University
Spring 2015
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Teacher Knowledge and Perception of Students

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Abstract

This descriptive, quantitative study utilized a cross-sectional survey to determine if there was a relationship between teacher knowledge of ADHD and their perception of students with the label, and it investigated the potential difference between general education and special education teachers. A three-part survey will be disseminated to participants. This includes demographic information, true-false questions about ADHD, and vignettes with a Likert scale measure of perception of the events described. A Pearson correlation may be used to analyze the degree of relationship between the level of teacher knowledge about ADHD and their perception of students with the label. T-tests were used to determine the significance in the vignette rating differences.

Keywords: ADHD, teacher perception, teacher knowledge
Chapter I

Introduction

According to the American Psychiatric Association (American Psychiatric Association [APA], 2013), five percent of American children are diagnosed with attention-deficit/hyperactivity disorder (ADHD). The Centers for Disease Control and Prevention (2013) indicates that approximately 11% of children ages 4-17 are diagnosed with ADHD, which has increased by 1.5% since 2007. This increase in diagnosed cases of ADHD elevates the probability of a classroom having at least one student who exhibits the behaviors of the disorder and necessitates appropriate interventions and accommodations. These statistics do not represent the undiagnosed student who exhibits similar behaviors and requires similar teacher attention and assistance. Ohan, Visser, Strain, and Allen (2011) state that the behaviors associated with ADHD can be very disruptive to the learning and social environment of the classroom. The behaviors are inclusive of, but not limited to: (a) off task behaviors, (b) poor peer interactions, (c) difficulty following directions, (d) climbing and running when inappropriate, and (e) inability to refrain from interrupting during conversations (Ohan, et al., 2011; Webber & Plotts, 2008).

Those that teach students with ADHD and their similarly behaving undiagnosed peers, may be impacted by the amount of perceived burden that comes with having these particular students in their classroom. Gargaro (2009) and Gehrman (2013) identified two major areas that impacted teacher negative perception of working with students labeled as ADHD or exhibiting similar behaviors. The two areas included classroom
encounters that created stress or frustration and a lack of peer or specialist support in working with students who exhibited ADHD behaviors regardless of label status (Gargaro, 2009; Gehrman, 2013). Teachers are involved in the processes of (a) documenting, (b) reporting, (c) assessing, and (d) implementing interventions and accommodations for students diagnosed with ADHD and those that exhibit similar behaviors (Arcia, Frank, Sanchez-LaCay, & Fernandez, 2000). The teacher’s perception of the students will impact the relationship between the two parties and the success of the student (Ohan et al., 2011).

Statement of the Problem

When children are labeled as ADHD there are potentially negative and positive outcomes that may result (Ohan et al., 2011). Teachers have specific expectations that come along with the label in terms of the child’s performance level and ability in academic areas, as well as, social. Negative perceptions of students with ADHD appear to stem from frustration that is the result of classroom interactions. Beliefs of inadequacy in maintaining behavior standards and meeting academic needs appropriately have caused increased stress upon teachers that have students with ADHD in their classrooms (Gehrman, 2013).

Can knowledge about ADHD alter teacher perception of students with the label? Graeper (2010) identified that “very little training about ADHD is part of teachers’ pre-service curriculum” (p. 69). Lack of knowledge can leave room for misconceptions that will effect the teachers’ perception of their ability to work with a child diagnosed with ADHD and their perception of the child’s ability to perform academically and
behaviorally. Zentall and Javorsky (2007) found “evidence-based in-service education can improve teachers’ attitudes and increase their understanding of or empathy for these children” (p. 91).

**Purpose of the Study**

The purpose of this study is to explore the relationship between the level of teacher knowledge about ADHD and their perception of students that have been diagnosed with the disorder. Also, provide awareness for the participating school district as to the types of professional development to assist teachers in gaining knowledge about the disorder. This will assist in correcting misconceptions about ADHD and offering behavior management solutions for successful classroom interactions.

**Questions of the Study**

There are two questions this study will attempt to answer. They are:

1. Does teacher knowledge of ADHD affect teacher perception of students with and without an ADHD label?

2. Will there be a difference between the knowledge level and perception of students with or without the label of ADHD in general education teachers when compared to special education teachers?

**Assumptions and Limitations**

The researcher assumes that the general and special education teachers, reading specialists, and speech and language pathologists will respond to survey questions honestly. It is also assumed that the participants will have had some experience working with at least one child with ADHD and had some type of training on the disorder. The
study may have several limitations. The first limitation may be the number of participants that respond to the survey when it was disseminated in spring of 2015. The second limitation may be minimal diversity among the participants in terms of gender, ethnicity, and experience. Additionally, the survey and vignettes utilized by Coronado (2012); Kos, Richdale, & Jackson (2004); and Ohan et al. (2011) leave no room for explanation of answers or understandings.

**Significance of the Study**

This study is significant because it may help teachers gage their understanding of ADHD in terms of etiology, characteristics, and treatments. It may also help teachers better understand how the label of ADHD effects the way in which they perceive a child’s ability to learn and behave. For the school district involved, the teacher knowledge of ADHD may lead to future professional development on the disorder. Appropriate topics may include interventions, accommodations, and behavior management strategies for working with students with and without the label of ADHD.
**Definition of Terms**

**Attention-Deficit/Hyperactivity Disorder.** ADHD is a pattern of behavior that interferes with development and functioning. It is marked by inattention and/or hyperactivity-impulsivity (APA, 2013). It is neurologically based and makes for difficulty in controlling behaviors in school and social settings (Lerner & Johns, 2012).

**Hyperactivity.** More than typically appropriate movement or talking for a given circumstance (APA, 2013). Students may appear as if they are driven by a motor and move from activity to activity after brief periods of time (Lerner & Johns, 2012). Behaviors include: a) Fidgeting or squirming, b) excessive climbing or running when not appropriate, c) difficulty playing or engaging in activities quietly, and d) excessively talks (Webber & Plotts, 2008).

**Impulsivity.** Defined in terms of ADHD as acting without thinking prior to initiation of action that may result in injury. It can reflect a desire for instant gratification or immediate responsiveness. The behaviors can be socially intrusive and decisions are made without consideration of future consequence (APA, 2013).

**Inattention.** Losing focus after a short period of time, a lack of attention to organization, and giving up when a task becomes challenging. These behaviors are not the result of defiance or an inability to understand what is required (APA, 2013). Marked by behaviors such as a) making careless mistakes, b) difficulty maintaining attention to tasks or play, c) appearance of not listening when being spoken to, d) forgetful, and e) difficulty organizing tasks or activities (Webber & Plotts, 2008).
Chapter Summary

ADHD is one of the most prevalent disorders that teachers will encounter in the classroom. The behaviors of ADHD can be stressful and frustrating for teachers, which is only compounded by a lack of knowledge about the disorder. This study may explore the impact of teacher knowledge about ADHD and their perception of a student with the label. A cross-sectional survey will be utilized to assess teacher knowledge and two vignettes to gauge teacher perception of students with and without a label of ADHD.
Chapter II

Review of the Literature

ADHD is one of the most prevalent disorders that teachers will encounter in the classroom (APA, 2013 & Center for Disease Control and Prevention, 2013). Behaviors typical of ADHD can be stressful and frustrating for teachers when encountered. The Individuals with Disabilities Education Act (IDEA) was purposefully created to ensure that students received the necessary services to be successful in the classroom, as well as, in life. In order for these services to be rendered, an appropriate diagnosis must be made. The Diagnostic and Statistical Manuel of Mental Disorder-Fifth Edition (DSM-5) (APA, 2013) explicitly outlines the observable behaviors that children with ADHD may exhibit. Clinicians use these guidelines to make a diagnosis and begin treatment of the disorder.

Special Education Law

Historically, special education legislation and litigation has been about the access to and quality of the instruction provided to students with disabilities. Brown v. Board of Education (1954) “maintained that state-required or state-sanctioned segregation solely on the basis of a person’s unalterable characteristics (e.g., race or disability) was unconstitutional” (Yell, 2012, p. 49). Thus, opening access to public education for all individuals regardless of race or disability. The decision for Mills v. Board of Education (1972) mandated that a “publicly supported education” be provided to all students with disabilities and procedural safe guards were put in place to ensure that requirements of the law are being upheld (Yell, 2012, p. 51). These two cases became the framework for
the Rehabilitation Act, in particular Section 504, and the Education for All Handicapped Children Act.

**Section 504 of the Rehabilitation Act.** Section 504 of the Rehabilitation Act of 1973 was set forth as a civil rights law to protect those with disabilities (Yell, 2012). The law formally identified individuals with handicaps as a person “who has a physical or mental impairment that substantially limits one or more of that person’s major life activities, or a person who has a record of such an impairment or who is regarded as having such an impairment” (Yell, 2012, p. 52). Any agency receiving federal funding is obligated to comply with the law and the necessary requirements. Creating opportunities equal to their nondisabled counterparts is the essential provision of this law, which can be accomplished through accommodation and modification of services or programming (Yell, 2012).

**Education for All Handicapped Children Act.** Education for All Handicapped Children Act of 1975 (EAHCA) established access to education for all students regardless of their disability (Yell, 2012). It “mandated that qualified students with disabilities had the right to (a) nondiscriminatory testing, evaluation, and placement procedures; (b) education in the least restrictive environment; (c) procedural due process, including parent involvement; (d) a free education; and (e) an appropriate education” (Yell, 2012, p. 53). However, the act failed to identify ADHD as an eligible disability for services. “This lead many public schools to deny access for children with ADD/ADHD to such services and to much parental and teacher exasperation in trying to get
educational recognition and assistance for this clearly academically handicapping disorder” (Barkley, 1998, p. 32)

**Individuals with Disability Education Act.** In 1990, the EAHCA was amended and brought forth as Individuals with Disabilities Education Act (IDEA). It was at this point, that the Department of Education reinterpreted the law to make it inclusive of ADHD under the eligibility category of Other Health Impaired (OHI) (Barkley, 1998). Reauthorization of IDEA occurred in 1997 and it reaffirmed that access to education must be granted, but also that the educational services rendered were of quality and established improvement in educational achievement (Yell, 2012).

**Receiving Services**

ADHD is not an identified disability under IDEA. However, this does not mean that students who are identified with the disorder are exempt from receiving special education services (Lerner & Johns, 2012). Parents and educators have two options for ensuring that their students receive the necessary assistance in education: Individualized educational programs (IEP) or a 504 plan. Both options provide the student with accommodations or modifications necessary to receive an educational experience similar to their non-disabled counterparts.

**Individualized Educational Programs.** An IEP can be developed for a student who has been identified as having an eligible disability under IDEA. ADHD is not an eligible disability, but a clarification paper released in 1991 entitled “Clarification of Policy to Address the Needs of Children with ADD within General and/or Special Education,” created a clearer definition of how a child with ADHD could become eligible
for special education services. The Notice of Proposed Rulemaking (NPRM) established a “two-pronged test of eligibility: (1) Have a condition that meets one of the disability categories listed under §300.7 (definition of “child with a disability”) and (2) need special education and related services because of that disability” (U.S. Department of Education, 1999, p. 1). An eligible disability, based off of IDEA's list of fourteen, must be the primary disability with ADHD as a comorbid condition. It also states that while an IEP may not be the best way of obtaining services based on the strict criteria, the opportunity to qualify under section 504 of the Rehabilitation Act may be a possibility (U.S. Department of Education, 1999).

A 1999 Topic Brief further strengthened the accessibility of services for children with ADHD by utilizing the label of Other Health Impairment (OHI) in eligibility determination (U.S. Department of Education, 1999). Clarification of the terms “limited strength, vitality, or alertness” in the OHI definition includes the behavioral characteristics of ADHD as follows: “A child’s heightened alertness to environmental stimuli that results in limited alertness with respect to the educational environment” (U.S. Department of Education, 1999, p. 1). If the clarification does not qualify the student for services, a 504 Plan is the next best option.

504 Plans. Section 504 of the Rehabilitation Act of 1973 requires any agency receiving federal funds to provide reasonable accommodations for people with disabilities (Lerner & Johns, 2012). When a child is determined to have an impairment that limits life activity with a physical or mental origination, the school must identify the student’s needs and make reasonable accommodations to provide the same educational
experience as those that are not impaired. Failure to comply or offer necessary accommodations may lead to the loss of federal funding (Lerner & Johns, 2012).

**Attention-Deficit/Hyperactivity Disorder Criteria**

The diagnostic criteria for ADHD, in the DSM-5 (APA, 2013), consist of a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by the criteria for inattention and/or hyperactivity-impulsivity. A diagnosis of ADHD the inattentive type is achieved through the identification of six or more of the following symptoms:

- Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities.
- Often has difficulty sustaining attention in tasks or play activities.
- Often does not seem to listen when spoken to directly.
- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace.
- Often has difficulty organizing task and activities.
- Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental efforts.
- Often loses things necessary for tasks or activities.
- Is often easily distracted by extraneous stimuli.
- Is often forgetful in daily activities (APA, 2013).

ADHD the hyperactive-impulsive type also must meet six or more of the following symptoms in order to make a diagnosis. The symptoms include:
a. Often fidgets with or taps hands or feet or squirms in seat.
b. Often leaves seat in situations when remaining seated is expected.
c. Often runs about or climbs in situations where it is inappropriate.
d. Often unable to play or engage in leisure activities quietly.
e. Is often “on the go,” acting as if “driven by a motor.”
f. Often talks excessively.
g. Often blurts out an answer before a question has been completed.
h. Often has difficulty waiting his or her turn.
i. Often interrupts or intrudes on others (APA, 2013).

Symptoms for both types must occur for at least a six-month period, be atypical for developmental stages, and have a negative impact on social interactions and academics (APA, 2013).

**Subtypes.** The DSM-5 (APA, 2013) identifies three subtypes: Combined, predominantly inattentive, and predominantly hyperactive/impulsive. The combined subtype is identified when criteria for both A1 and A2 are met over the last 6 months. Predominately inattentive is assigned when criteria for A1 are met for the past 6 months, but A2 are not. Predominately hyperactive/impulsive is assigned when criteria for A2 are met for the last 6 months, but A1 are not.

**Diagnosis.** In order for a diagnosis to be made, previously stated criteria must be met, as well as, the manifestation of some symptoms prior to the age of twelve. Symptoms must also be apparent in at least two settings such as home and school. Clear evidence showing a negative impact on the quality of social interactions and academics
must also be demonstrated (APA, 2013). The APA (2013) notes that the symptoms cannot be the result of defiance or a lack of comprehension of directives or tasks.

In order for a diagnosis of ADHD to be made, three types of procedures are used: (a) Developmental histories, (b) clinical procedures, and (c) observations and recordings (Webber & Plotts, 2008). Teacher input is utilized through the diagnostic process. Teacher observations can be considered more informative than parent observations due to the fact that the classroom environment is one that requires quite, sit-down activities, which cause hyperactivity to reach its limit of control. The behaviors associated with ADHD then become observable and measurable for those working with the child. Teacher observational data and completed checklists then assist the proper professionals in diagnosing a student (Webber & Plotts, 2008).

Etiology. There is not a single etiological explanation as to what causes ADHD to manifest. Heredity, brain development, and brain chemistry in combination cause the behavioral manifestations that we know as ADHD (Batshaw, Pellegrino, & Roizen, 2007). Heredity is the most common cause for the development of ADHD. Children with parents that have had a diagnosis or continue to be diagnosed with ADHD have a 25% chance of manifesting the disorder. If a sibling has been diagnosed, a child is five to seven times more likely to develop the disorder (Batshaw et al., 2007). The genes related to dopamine and norepinephrine are of highest interest in the development of ADHD, because dopamine controls behavioral and attention regulation in the frontal cortex of the brain while norepinephrine helps control alertness regulation and attention. These are the
two neurotransmitters that are targeted by stimulant medications that are often used as pharmacological treatments for the disorder (Batshaw et al., 2007).

Brain development plays a role in ADHD as well. Structural and functional differences have appeared in magnetic resonance imaging (MRI) scans. Five regions of the brain have been identified as differing for individuals identified with the disorder in comparison to unaffected peers: Frontal lobe, caudate nucleus, globus pallidus, corpus callosum, and posterior inferior cerebellar vermis (Batshaw et al., 2007). The frontal lobe, which regulates cognitive, emotional, and motor responses to stimuli, along with the cerebellum and basal ganglia, which are essential to motivation, behavioral control, and planning of movement, are five to nine percent smaller in individuals with ADHD (Batshaw et al., 2007). Functional MRI (fMRI) has further identified the prefrontal cortex as another area of difference for individuals with ADHD. During activities that required motor control during stimulus introduction, the fMRI revealed that the prefrontal cortex was under activated (Batshaw et al., 2007).

Brain development is also affected by other conditions that can contribute to ADHD behaviors. Prenatal exposure to alcohol, cigarette smoke, illegal drugs and lead; metabolic disorders; prematurity; and brain infections can contribute to the manifestation of ADHD, as well as, other disorders. Some genetic disorders (e.g. Turner syndrome, fragile X syndrome, Williams syndrome, Tourettes) are associated with the same inattentive and hyperactive-impulsive behaviors seen in ADHD (Batshaw et al., 2007).

Glass and Wigar (2001) raise the question of the true origination of the disorder: Classroom practices. They suggest that “teachers who find they believe a large
proportion of their students suffer from ADHD should evaluate their teaching methods and look for more flexible styles of instruction” (Glass & Wigar, 2001, p. 418). A lack of movement, hands-on activities, and small group instruction may be that actual driving force behind the inattentive, hyperactive, and impulsive behaviors society has come to associate with ADHD. Reduced class sizes and the appropriate number of instructional aides could potential reduce the number of incidences of the ADHD typical behaviors found in classrooms (Glass & Wigar, 2001). Classroom structure, instructional practices, and increased academic standards are cited by Glass and Wigar (2001) as the catalysts for normal childhood behaviors being diagnosed as ADHD.

Culture and Gender Issues

Culture and ethnicity appear to play a role in prevalence rates for diagnosis and treatment of ADHD (APA, 2013). Regional rate differences may be attributed to the culture and ethnicity of the child, as well as, the teacher or parent. Identification of children with ADHD is lower within the African American and Latino populations when compared to Caucasian counterparts. This seems to indicate that cultural behavior acceptability is relevant when assessing children from these cultures for a diagnosis of ADHD (APA, 2013).

Gender differences are also present in the prevalence of ADHD. The rate for children within the United States is 2:1 with more males being diagnosed. Girls are more likely to be identified as exhibiting the inattentive subtype of ADHD (APA, 2013). Boys are also more likely to experience ADHD in combination with a comorbid disorder.
These comorbid conditions may include oppositional-defiant disorder and conduct disorders (Webber & Plotts, 2008).

**Treatment**

Due to the prevalence and the disruptive nature of ADHD in the classroom, copious amounts of research have been completed to identify the most effective treatments. At this point, treatments can be categorized into three areas: (a) medication therapy; (b) behavior managements; and (c) cognitive-behavioral techniques (Webber & Plotts, 2008). Lerner and Johns (2012) assert that a “multimodal treatment plan” be used to effectively treat all aspects of the disorder. This is inclusive of: (a) Educational instruction, (b) behavior management strategies, (c) family and child counseling, (d) home management, and (e) medication. These treatment suggestions will also be explored based on their relevance and necessity in the classroom.

**Medications.** Stimulants are the primary pharmacological treatment for ADHD. Of those treated with stimulants, 70-90% respond with rapid improvement of on-task behavior and reductions in hyperactivity and impulsivity (Batshaw et al., 2007; Webber & Plotts, 2008). While medication appears to positively impact behavior, it does not have the same effect on academic challenges. Common stimulants used with children are (a) Ritalin, (b) Dexedrine, (c) Adderall, (d) Concerta, and (e) Yyvance (Lerner & Johns, 2012). These medications work by “increasing the arousal and alertness of the central nervous system” and “stimulating the production of the chemical neurotransmitters needed to send information from the brain stem to the parts of the brain that deal with attention” (Lerner & Johns, 2012, p. 212).
For the 10-30% of children that have negative results with the use of stimulant medications, there are other options for medication therapies. These include: Norepinephrine reuptake inhibitors, antidepressants, and alpha-2-adrenergic agonists (Batshaw et al., 2007). These three options have been tested and shown to have longer symptom improvement durations, low potential for abuse, and did not appear to affect tics and body functions. Although side effects include nausea, fatigue, and stomach problems, they seem to be outweighed by the positive results (Batshaw et al., 2007). Examples of non-stimulant medications include (a) Wellbutrin, (b) Catapres, (c) Tenex, and (d) Strattera.

**Classroom Implications.** ADHD can be disruptive to the classroom environment. Blurting out, fidgeting, walking around the room, and doodling instead of engaging in the lesson can disrupt a student’s ability to learn necessary academic skills that will lead to learning success. Teachers intervene in several different ways to help the student with ADHD achieve success. Interventions require teachers to have some understanding of behavioral psychology, invest class and personal time, and be willing to work with other professionals in order to ensure the efficacy of the plan (Arcia et al., 2000). Success tends to be seen after substantial periods of time and failure can leave teachers feeling frustrated, inadequate to teach these students, and create a negative impression of the students with the label ADHD. Arcia et al. (2000) reported that most teachers implement some form of a plan in attempts to manage behavior, in regards to children with ADHD, but lacked the necessary knowledge about the disorder to effectively change or prevent the undesirable behavior. The interventions and strategies
were reported to be more reactive instead of proactive to disruptive behaviors. These students require intensive and constant monitoring with changes to strategy plans as needed (Arcia et al., 2000). Common proactive interventions include behavioral, self-regulation, academic, and social learning plans (DuPaul, Weyandt, & Janusis, 2011).

**Behavioral Interventions.** Antecedent based interventions are a proactive means of preventing an undesirable behavior before it takes place. Teachers can accomplish this type of intervention through the establishment and review of classroom rules. Rules should be phrased positively and observable in the classroom. Children with ADHD should either be seated close to the posting or have an individual sized set at their desk. Frequent reviews act as a constant reminder to the student of the expected positive behaviors that are appropriate for the classroom. Praising frequently also promotes duration and continuation of desired behaviors (DuPaul et al., 2001).

Consequence-based behavioral interventions also prove successful. A token economy is a consequence-based intervention that gives rewards (e.g. tokens, stickers) after a desired behavior and punishments (e.g. taking away token, moving down a clip chart) when an undesirable behavior occurs. Reinforcement, either reward or punishment, must occur as close to the time of the behavior in order to make this intervention effective. Accumulation of tokens or stickers will then result in a larger reward at an established time. Consistency is crucial to the success of this intervention (DuPaul et al., 2001). Arcia et al. (2000) confirmed the success of token economies on the behavior of students with ADHD. The problem with a token economy largely stems from teacher inconsistency and a lack of awareness that this type of intervention can
directly change specified behaviors. Teachers reported using token economies, but not having specific standards for receiving rewards, not establishing time frames for rewards, and generally not understanding the behavior science behind its effectiveness (Arcia et al., 2000).

**Self-Regulation Interventions.** Self-regulation interventions call on the child to manage, evaluate, and reinforce their own behaviors with guidance and support from the teacher. The teacher and student evaluate daily behavior using a Likert scale like report card. When the child self-evaluates similar to the teacher evaluation and classroom behavior improves, rewards are dispersed and evaluation periods extend until they are no longer needed. This intervention is successful with students that have lesser degrees of ADHD (DuPaul et al, 2001). This intervention requires a great deal of initial teacher involvement and monitoring. The time commitment is great: Teacher and student must make time to confer and compare evaluation forms. It also requires consistency and creation of an evaluation tool (DuPaul et al, 2001).

**Academic Interventions.** Students with ADHD are more likely to have lower grades, more likely to be identified for special education, and an increased need for school based support or services despite adequate intellectual levels (DuPaul et al., 2011; Webber & Plotts, 2008). These facts immediately call for teachers to intervene and assist students with ADHD in areas of academics. There are many interventions that have proven to be successful with these types of students. Again, they require teacher preparation time prior to the lesson and an understanding of how these interventions will help the student be successful (DuPaul et al., 2011).
An antecedent-based academic intervention would be to minimize the amount of work required for the student with ADHD. The reduced quantity of in-class work and homework will help maintain the students focus and drive for completion. When assignments are completed, the teacher should praise the student to encourage continuation of the behavior and build the feeling of success. As the student is able to complete reduced assignments, the teacher may begin to lengthen the amount of required work over an extended period of time (DuPaul et al., 2011).

Interventions that have proven successful with students of all degrees of ADHD: Small-group skill remediation and utilization of technology based instruction. Skill remediation is targeted, explicit training of a deficit skill. The short period of instruction followed by instant feedback has made this skill successful during research studies. DuPaul et al. (2011) noted that instruction in reading and math that was presented through technology increased on-task behavior and academic performance in comparison to paper-pencil deskwork. The novelty of using technology maintains student attention and allows for successful completion.

Accommodations targeting an increase in attention, managing impulsivity, and reducing hyperactivity are necessary to make a student identified as having ADHD successful in the general education classroom. Increasing attention can be done by any of the following: (a) Preferential seating at the front of the room, (b) maintain direct, simple routines, (c) visual aides noting key points to instruction or procedure, and (d) increase the novelty appeal of the activity (Lerner & Johns, 2012). Impulsivity can be managed by teaching the student replacement behaviors. For example, students with ADHD must
be taught how to wait their turn. A teacher may work with a student to create an alternative physical behavior to alleviate the need to blurt out answers. The substitute behavior may include counting to five before raising their hand or writing the answer on a paper before signaling that they are ready to contribute (Lerner & Johns, 2012).

Hyperactivity can be managed, within the classroom, by combining some of the same techniques used with inattentiveness and impulsivity. Most of the techniques revolve around permitting the student to move. This can be as minor as placing completed assignments in a designated place within the room, writing tasks on a wall chart and allowing the student to get up and cross off completed items, or allowing the use of computers (Lerner & Johns, 2012).

**Social Interventions.** Behavioral and academic challenges are not the only difficulties students with ADHD face. Children with ADHD are often rejected by their peers due in large part to their overtly aggressive responses to stressful situations and their intrusive nature (Webber & Plotts, 2008). These responses to social situations cause children with ADHD to have difficulties in making and keeping friends, as well as, interpreting the intentions of others when encountered (DuPaul et al., 2011; Webber & Plotts, 2008). Group therapy is primarily used to help socially train students with ADHD. Students with and without ADHD work together to practice acceptable interactions in a variety of settings. While these training sessions appear to impact behavior in practice settings, they do not appear to translate to other real-world situations (DuPaul et al., 2011).
Dietary Modifications. Dietary modifications are a few of the numerous alternative and complementary therapies available to individuals with a diagnosis of ADHD. Dietary interventions work by adding foods that alleviate the symptoms or removing foods that contribute. Researchers have completed controlled dietary studies that eliminate allergens and additives from the diets of children that have been identified as having ADHD. Rating scale measures improved for 10-20% of the participants in area of hyperactivity, but not in inattentive behaviors (Batshaw et al., 2007). Mineral studies have indicated that children with ADHD have deficiencies in iron, zinc, and magnesium. An increase in zinc levels brought with it improvements in hyperactivity and impulsive behaviors. It was noted that no change in inattentive behaviors was noted (Batshaw et al., 2007).

Pediatric allergist Dr. Benjamin Franklin Feingold developed an elimination diet, which is a common practice when determining food allergens, to control many of the symptoms associated with ADHD (Biography, 2011). The diet addresses the sensitivity to additives and salicylates and the behavioral responses that this sensitivity creates. It is a two-stage process with the elimination of (a) artificial colors, (b) artificial flavor, (c) three petrochemical preservatives, (d) artificial sweeteners, and (e) salicylates occurring in state one. Stage two is marked by the systematic reintroduction of salicylates to determine which, if any, can be tolerated without reaction (Feingold Association of the United States [FAUS], 2012).

When Dr. Feingold first began to use the diet (then called the K-P diet) to treat children with ADHD (then called hyperkinesis), he said that 30% to 50% of them
got better. Later, after he also eliminated the petrochemical preservatives BHA and BHT (TBHQ didn't exist yet), he found that over 70% of the children got better. We still see that same - or better - result today. About 50% of children (or adults) don't need any other intervention. The others still need more help, which may be educational adjustments, tutoring, supplements, further restrictions due to identified allergies, behavior modification or counseling, or some sort of medication including stimulants. (Attention Deficit Disorder, 2013)

**Teacher Knowledge of ADHD**

Knowledge can come from experience working with a subject or topic, or it can come from training or education received (Knowledge, 2014). Teacher knowledge will be addressed as that gained through college education and the training received while working in a school. According to Gehrman (2013), Graeper (2010), and Jones and Chronis-Tuscano (2008), teachers involved in their study reported receiving little training related to ADHD during their pre-service curriculum with general education teachers receiving less than their special education counterpart. Teacher knowledge levels appear to greatly increase with their experience working with ADHD children in their classroom (Anderson, Watt, Noble, & Shanley, 2012; Kos, Richdale, & Hay, 2006; Kos, Richdale, & Jackson, 2004). Knowledge gained through experience was directly related to working with ADHD students, not simply the years working as a teacher. The areas of increased knowledge center on the characteristics of the disorder, however, the areas of etiology and treatments remained lower when studied by Anderson et al. (2012).
Kos et al. (2006) identified professional development and in-service training as a critical component in increasing teacher knowledge of ADHD and treatments. Unfortunately, that knowledge does not appear to translate into classroom behavioral management techniques for the general education teachers (Jones & Chronis-Tuscano, 2008). Opportunities for supervised training and practice of behavior management techniques could help bridge the gap between knowledge and use.

**Teacher Perceptions of ADHD**

The way in which a teacher perceives a student with ADHD will dictate the expectations and treatment of that student. Teacher perceptions of these students come from experiences in the confines of the classroom and from a lack of knowledge about the disorder. Gargaro (2009) and Graeper (2010) found that teachers often reported that working with students with ADHD was very stressful and resulted in a negative interaction. Gerhman (2013) found that regardless of the teachers perception of working with students diagnosed as ADHD they believed that could achieve academic success.

**Label Bias.** Ohan et al. (2011) describes label bias as the difference between the way an individual with a label is perceived versus the way in which an individual without a label is perceived. Label bias can produce both negative and positive responses from individuals. Cornett-Ruiz and Hendricks (1993) found that the label of ADHD had no effect on the first impression of peers and teachers. However, the hyperactive-impulsive behavior of students and peers immediate elicited a negative impression of the student being observed. This study demonstrated that the behavior, not the label, associated with ADHD created the negative impression. Novotny-Taylor (2001) found that parents and
teachers believed the label of ADHD was helpful. They believed that this meant the students were able to get the medication that they need to be successful. This is counter to what research has shown about the efficacy of medication in academic gains: Pharmacological treatments have minimal gains in the area of academics in contrast to the vast improvements shown in behavior (Novotny-Taylor, 2001).

**Internal and External Behavior Perception.** Acting-out behaviors are perceived by teachers to be more problematic than inattentive behaviors. These behaviors are more problematic because they require extra time and effort from the teacher (Gargaro, 2009; Kos et al., 2006). This perception changed if the teacher felt competent in the area of behavior management (Gargaro, 2009). Based on these findings by Kos et al. (2006), the teachers’ competency dictated the perception more so than the label or the behavior.

**Behavior Management Competency.** Feelings of competency increase with in-service training and ultimately the interactions between teachers and students with ADHD turn favorable (Anderson et al., 2012; Ohan et al., 2001; Zentall & Javorsky, 2007). Increase in knowledge had a converse effect on perception. As teachers learned more about ADHD as a disorder, which included treatments and interventions, the perception of having an ADHD student in the classroom became more negative. Anderson et al. (2012) attributed this shift towards negativity to the awareness of the disorders impact on the classroom and the time and effort needed from the teacher. The researcher hypothesizes that there will be no difference between the level of teacher knowledge about ADHD and their perception of students who are labeled ADHD.
Chapter Summary

The literature review revealed that ADHD is a complex disorder that requires a great deal of knowledge to identify the characteristics, etiology, and treatments. Successful treatments have been identified that can be used in the classroom, but these treatments assume that teachers understand the behavioral science supporting the strategy and the characteristics being targeted. The extra effort that these students need to be successful behaviorally and academically can be burdensome to teachers. This burden has the potential to negatively impact the teacher’s perception of students labeled as ADHD. However, the label also has the potential to have a positive impact. Teachers can perceive the label as the indication that students are receiving some type of therapy and the disruptive behaviors will be minimized or eliminated.
Chapter III

Methodology

The purpose of this descriptive quantitative study was to explore the relationship between the level of teacher knowledge about ADHD and their perception of students that have been diagnosed with the disorder, as well as, the differences between general education and special education teachers (Gay, Mills, & Airasian, 2012). A cross-sectional survey was used to collect data on (a) teacher knowledge of ADHD, (b) teacher perception of students with ADHD, and (c) demographic information.

Participants

The study focused on certified general education (GE) and special education teachers in grades K-5. It is noted that reading specialists and speech and language pathologists are included in the special educators category (SE). These specialists participate in collaborative teaching models that require them to take on the role of lead teacher within the classrooms with which they work. A convenience sampling of participants was drawn from a suburban school district in Illinois (Gay et al., 2012). According to the 2014 Illinois Report Card, the district employee demographic information is as follows: 98.9% of the employees were identified as being Caucasians and 1.1% as Hispanic. Gender distribution is 84% female to 16% male (Illinois State Board of Education, 2014).

Instrumentation

Google Forms (www.google.com) was utilized to (a) create, (b) distribute, (c) collect, and (d) organize responses for the three-part online survey instrument. The three
parts include an assessment of (a) actual knowledge, (b) vignettes, and (c) demographic information. The three parts were compiled and disseminated electronically.

**Part I: Actual Knowledge**

The first portion consists of 27-item questions that will be the same as those used by Kos, Richdale, and Jackson (2004). The questionnaire measured participant actual knowledge of ADHD. The areas of knowledge included: (a) prevalence, (b) etiology, (c) manifestation of behavior, and (d) interventions and treatments. The participant answered the True-False questions and earned one point for each correct answer and zero points for incorrect. Point totals were summed and a total correct was assigned. The following is a sample question from the first portion of the survey: “There are a greater number of boys than girls with ADHD” (Kos et al., 2004).

Kos, Richdale, and Jackson (2004) established content validity by having the questionnaire reviewed by two educational and developmental psychologists. Use of the instrument in additional studies (Jerome et al., 1994; Ohan et al., 2008; Sciutto et al., 2000) established content validity for the questionnaire.

**Part II: Vignettes**

The second portion of the questionnaire consisted of two vignettes and corresponding questions with a Likert scale response (Ohan et al., 2011). The vignettes determined teacher perception of students that exhibit criterion for a diagnosis of ADHD. Male and female vignettes will be used by randomly assigning participants to a gender group. Of the two vignettes that the participants receive, one will have an additional line that indicates that the student was diagnosed with ADHD (Ohan et al., 2011).
will have the female student with a diagnosis of ADHD and Survey B will have the male student with a diagnosis of ADHD. A Likert scale will then assess the participant’s response to questions pertaining to the vignette. The Likert scale ranged from a response of 1 (not at all or not a cause) to 9 (extremely or definite cause).

The vignette questions cover five major areas of interest in regard to perception: (a) Seriousness of behavior problems, (b) willingness to participate in intervention and accommodations, (c) emotional response to behavior depicted, (d) willingness to intervene with behavior problem, and (e) belief of etiology (Ohan et al., 2011). Ohan et al. (2009) established internal consistency for the aforementioned groupings as (a) severity ($\alpha = .79$), (b) treatment ($\alpha = .57$), (c) emotional reactions ($\alpha = .59$), and (d) anticipated behavioral reaction ($\alpha = .28$). Variance was also established that the vignette order was not significant after an ANOVA analysis ($p > .17$).

**Part III: Demographic Information**

The final part of the survey consisted of questions pertaining to demographic information. Participants were asked to provide general demographic information: (a) Gender, (b) type of certified teaching position, (c) years experience in a certified position. Participants were asked specific demographic questions targeting training or education on ADHD and years experience working with ADHD.

**Procedures**

Procedures were administered in the spring 2015. The topic was formulated through literature reviews about ADHD. The studies completed by Coronado (2012), Kos et al. (2004), and Ohan et al. (2011) have established the procedural protocols that
this study will follow. This includes the established survey and vignettes. Permission to utilize the districts email system to distribute the questionnaire to participants was granted in the spring of 2015.

**Data Collection**

Email addresses for general and special education teachers, reading specialists, and speech and language pathologists were acquired from the districts internal directory. Each email was assigned a number, which was entered into a random assignment site, GraphPad (www.graphpad.com). The numbers were entered and each email was randomly assigned to survey A or B. The email addresses were then sorted accordingly and survey share codes were distributed to the appropriate parties.

Two weeks after the initial survey invitation was disseminated, a reminder email was sent. After a period of four weeks, data was collected from the participant responses located within Google Sheets. From Google Sheets the data will be transferred to Microsoft Excel where the survey results will be quantified (Gay et al., 2012).

**Data Analysis**

**Part I: Actual Knowledge**

Data from part one of the survey were quantified by assigning point values to responses. One point was assigned for correct answers and a point value of zero was assigned to incorrect answers. A sum of the points is then calculated to create a total score. A mean and standard deviation of the total score was completed for each group (GE & SE).
Part II: Vignettes

Each participant received a mean score for each vignette. Pearson r correlation coefficient was used to determine if a relationship existed between the level of teacher knowledge and each perception vignette (Gay et al., 2012). Alpha level of $p \leq .05$ was established for determination significance of the correlation.

A simple analysis of variance (ANOVA) was used to analyze the results of the two vignette scenarios between general education and special education teachers. The vignette’s Likert scales were grouped into four question families: (a) Seriousness of behavior problems, (b) willingness to participate in intervention and accommodations, (c) emotional response to behavior depicted, and (d) willingness to intervene with behavior problem (Ohan et al., 2011). The families were then analyzed for significance between the two groups of educators (Gay et al., 2012). The significance level for the ANOVA was set at $p \leq .05$.

Chapter Summary

The purpose of this study is to investigate the relationship between teacher knowledge of ADHD and teacher perception of students with ADHD. The targeted groups were certified general and special education teachers, reading specialists, and speech and language pathologists in grades K-5 from a suburban school district in Illinois. A three-part survey was used to collect research data and will follow the studies of Coronado (2012), Kos et al. (2004), and Ohan et al. (2011). A t-test was performed to determine if the mean score difference on the actual knowledge portion of the survey was of significance. Pearson r correlation coefficient was used to determine in there was a
relationship between teacher knowledge and their perception of students with and without the label of ADHD. A simple one-way ANOVA was used to determine if the difference between the two groups was significant within each of the four question sets established within the vignette’s Likert scales.
Chapter IV

Results

A cross-sectional survey was utilized in this descriptive quantitative study in order to investigate the relationship between teacher knowledge of ADHD and the perception of students that have been diagnosed with the disorder. Additionally, it analyzed the potentially differences between general education and special education in regards to their actual knowledge and perception of ADHD. The survey was divided into three sections: (a) True-False assessment of actual knowledge, (b) two vignettes with corresponding Likert scales, and (c) demographics. Sixty surveys were distributed to general education and special education teachers in grades K-5 from a suburban school district in Illinois. Of the surveys distributed, 23 were returned for a rate of 38%.

Demographics

The participants were 14 general education and 9 special education teachers, reading specialists, and speech and language pathologists who work with students in kindergarten through fifth grade in a suburban school district in Illinois. Seventeen percent of the participants reported 1 to 10 years of teaching experience, 48% reported 11 to 20 years experience, and 30% reported 21 years or more experience. One participant did not identify their years of experience. The data indicates an experienced group of teachers participated in the survey.

Actual Knowledge

A 27-item dichotomous questionnaire was used to determine teacher actual knowledge of ADHD (Kos, Richdale, & Jackson, 2004). True-False answers were
quantified by assigning 1 point to correct answers and zero points for incorrect. Excel was utilized to perform the descriptive statistics, which assists in answer the question pertaining to teacher actual knowledge of ADHD. The following statistics were employed: mean, standard deviation, and standard variance. Table 1 displays the results of the descriptive statistics. The results indicate that the general education teachers earned the maximum score of 25 points. The special education teachers earned the highest mean score and also had the smallest sample variance. The small sample variance may be the result of the group only consisting of 9 participants.

Table 1

Descriptive Statistics—ADHD Actual Knowledge

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>Sample Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>23</td>
<td>17</td>
<td>24</td>
<td>21.35</td>
<td>1.67</td>
<td>2.66</td>
</tr>
<tr>
<td>General Education</td>
<td>14</td>
<td>17</td>
<td>25</td>
<td>20.00</td>
<td>2.29</td>
<td>4.86</td>
</tr>
<tr>
<td>Special Education</td>
<td>9</td>
<td>19</td>
<td>24</td>
<td>21.89</td>
<td>1.54</td>
<td>2.10</td>
</tr>
</tbody>
</table>

Note. n=participants, Minimum=lowest score, Maximum=greatest score, Mean score=average of scores, Standard deviation=variations in scores, and Sample variance=spread of scores

The 27 knowledge questions are broken into the following themes: (a) prevalence, (b) treatment, (c) etiology, (d) characteristics, and (e) diagnosis. Figures 1. illustrates the percentage correct for each theme and question number. The figures show treatment question number 12 received the lowest percentage correct with 17%. The responses indicate that teachers believe diets can be helpful in treating children with ADHD. Three themes indicated areas of strong knowledge: (a) prevalence, (b) etiology,
and (c) characteristics of the disorder. The questions that pertain to the theme are indicated in the following figures with a 100% correct response.

Figure 1. Correct responses for the 27-item questionnaire measuring teacher knowledge of ADHD. Question number in indicated along with the theme of the question. Refer to Appendix A for the complete list of questions referenced in Figure 1.
Differences Between General Education and Special Education

An independent t-test, calculated through Excel data analysis, was performed to determine whether the scores of the general education teachers and the special education teachers were significantly different. A t-score of 1.295 was established. When analyzing the t-score in comparison to the determined critical value of 2.093, the statistics indicate that there is no significant difference between the general education teachers and special education teachers in regard to their actual knowledge of ADHD.

Perception

Teacher perception of ADHD was measured using a Likert scale with two vignettes. One vignette was for a child identified with ADHD, and the second vignette was for a child with all the characteristics and behaviors but not diagnosed. The vignette questions cover five major areas of interest in regard to perception: (a) Seriousness of behavior problems, (b) willingness to participate in intervention and accommodations, (c) emotional response to behavior depicted, (d) willingness to intervene with behavior problem, and (e) belief of etiology (Ohan et al., 2011).

Correlation Between Knowledge and Perception

A Pearson correlation was used to determine if a relationship existed between the categories measured for the perception vignettes and actual knowledge total score. No statistical significance was found to determine a correlation between teacher knowledge of ADHD and their perception of a student with ADHD. Table 2 shows the results of the correlation.
Table 2

**Pearson Correlation—ADHD Actual Knowledge and Teacher Perception of Disorder**

<table>
<thead>
<tr>
<th></th>
<th>Identified</th>
<th>Unidentified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seriousness of Behavior</td>
<td>0.208</td>
<td>0.396</td>
</tr>
<tr>
<td>Participation in Interventions</td>
<td>0.204</td>
<td>0.188</td>
</tr>
<tr>
<td>Emotional Response to Behavior</td>
<td>0.174</td>
<td>0.191</td>
</tr>
<tr>
<td>Willingness to Intervene</td>
<td>0.162</td>
<td>0.077</td>
</tr>
<tr>
<td>Belief of Etiology</td>
<td>0.162</td>
<td>0.486</td>
</tr>
<tr>
<td>Total Score</td>
<td>0.222</td>
<td>0.074</td>
</tr>
</tbody>
</table>

Note. The correlation followed the following criteria: \( n=23, df=21, p=0.05 \), significance \( \geq 0.4122 \).

**Differences Between General Education And Special Education Perceptions**

An ANOVA was originally indicated as the means of determining a difference between GE and SE perceptions and actual knowledge. Due to the low return rate, 38%, a two-sample t-test was utilized with a Bonferroni adjusted p-value (P. Boudreau, personal communication, April 30, 2015). Based on the results, no significant difference was identified for any of the themes. Table 3 illustrates the results.
### Table 3

$t$-Tests (Pooled Variance)—Teacher Perception Differences Based on Role

<table>
<thead>
<tr>
<th>Perception Differences Based on Role</th>
<th>$t$</th>
<th>Mean Diff.</th>
<th>$P$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seriousness of Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identified</td>
<td>0.529</td>
<td>1.635</td>
<td>1.000</td>
</tr>
<tr>
<td>Unidentified</td>
<td>0.096</td>
<td>0.294</td>
<td>1.000</td>
</tr>
<tr>
<td>Participation in Interventions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identified</td>
<td>1.493</td>
<td>0.770</td>
<td>1.000</td>
</tr>
<tr>
<td>Unidentified</td>
<td>2.003</td>
<td>1.071</td>
<td>0.758</td>
</tr>
<tr>
<td>Emotional Response to Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identified</td>
<td>0.394</td>
<td>0.698</td>
<td>1.000</td>
</tr>
<tr>
<td>Unidentified</td>
<td>0.278</td>
<td>0.484</td>
<td>1.000</td>
</tr>
<tr>
<td>Willingness to Intervene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identified</td>
<td>1.128</td>
<td>2.246</td>
<td>1.000</td>
</tr>
<tr>
<td>Unidentified</td>
<td>2.853</td>
<td>4.468</td>
<td>0.124</td>
</tr>
<tr>
<td>Belief of Etiology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identified</td>
<td>1.445</td>
<td>2.389</td>
<td>1.000</td>
</tr>
<tr>
<td>Unidentified</td>
<td>1.228</td>
<td>2.722</td>
<td>1.000</td>
</tr>
<tr>
<td>Total Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identified</td>
<td>0.234</td>
<td>1.532</td>
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<tr>
<td>Unidentified</td>
<td>1.050</td>
<td>6.310</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Note. A Bonferroni adjusted $p$-value was used for each $t$-test, $df=21$, Mean difference calculated between general education and special education teachers.

### Chapter Summary

This descriptive quantitative study investigated the relationship between teacher knowledge of ADHD and the perception of students that have been diagnosed with the disorder. Additionally, it analyzed the potentially differences between general education and special education in regards to their actual knowledge and perception of ADHD.
Descriptive statistics were used to analyze the results of a 27-item knowledge questionnaire. A Pearson correlation determined that there was no significant relationship between teacher knowledge and their perception of students with ADHD. Additional t-tests were conducted to determine if a significant difference could be found between knowledge and each of the 5 subsections of the perception Likert scale; no significant difference was found.
Chapter V

Discussion and Conclusion

Teacher knowledge and perception were the topics of this cross-sectional survey. The study was investigating the relationship, through a Pearson correlation, between teacher knowledge of ADHD and their perception of students with the disability. Differences between general education and special education teachers’ knowledge and perception were also investigated by completing t-tests between each of the perception categories and knowledge scores.

Discussion

ADHD has become one of the most common disabilities within the general education classroom. The typical behaviors associated with the disorder can be disruptive the learning environment and frustrating for the teacher (Ohan et al., 2011). A cross-sectional survey investigated the role of teacher knowledge on the perception of the child identified as having ADHD, as well as, the impact of the behavior. While no statistical significance was determined to exist between knowledge and perception, or between general education and special education teachers; there were several themes identified has having misconceptions and strong understandings.

Misconceptions

Several knowledge questions were identified as areas of misconception. These areas included a) etiology, b) diagnosis, and c) behavioral characteristics of ADHD. Any question that was answered correctly by less than 70% of the participants was
identified as an area of possible misconception. These areas may also benefit from further training and education on the disorder.

**Etiology of ADHD.** Teacher answers indicated that they were unaware of the biological nature of ADHD, particularly the vulnerability towards inattention. Neural development and chemistry are large components in the manifestation of hyperactivity, impulsivity, and inattention (Batshaw et al., 2007). MRIs and fMRIs have highlighted the fact that children with ADHD have frontal lobes and prefrontal cortices that are under activated. These areas of the brain are responsible for regulation of stimuli and the body’s response or control to the stimuli (Batshaw et al., 2007).

Participants also indicated artificial food dyes and additives as being a cause of ADHD and the dietary controls of eliminating these substances could improve behaviors. 83% of the teachers believed that diets could be an effective means of controlling behaviors associated with ADHD. It has been reported that diets may help reduce the hyperactive and impulsive behaviors in young children, but was not an effective means of control for older children or with reducing the occurrence of inattentive behaviors (Batshaw et al., 2007). Feingold Association of The United States (2011) would argue that the removal of artificial dyes, flavors, and preservatives would allow the child, with sensitivity to the chemicals, to be freed of the symptoms that they cause. These symptoms mirror those of ADHD.

**Diagnosing ADHD.** A lack of understanding about the diagnostic process for ADHD was also highlighted. Teachers incorrectly answered the diagnostic question at a rate of 58% indicating the belief that ADHD can be diagnosed within the context of a
doctor’s office visit. The use of teacher and parent observation and rating scales are essential parts of the diagnosis of ADHD, and the behavior observations needed are generally unobtainable in a clinical setting (Webber & Plotts, 2008).

**Behavior Characteristics.** Teachers perpetuated common misconceptions about ADHD in their answers to questions pertaining to an inability to “sit still long enough to pay attention” and “an inflexible adherence to specific routines and rituals” (Kos et al., 2004). Thirty-nine percent of the teachers indicated that a child with ADHD could not pay attention long enough to learn, however, 100% of the participants determined that the same child could play video games for several hours without difficulty. The teachers understood the child’s ability to focus on high interest or novelty items, but could not apply it to novelty tasks in the classroom (DuPaul et al., 2011).

It was also falsely believed by 43% of the participants that children with ADHD did not follow specific routines strictly. Routines with explicit instructed steps assist the child with organization, time management, and planning. These routines can increase attention and curb impulsivity (Lerner & Johns, 2012).

**Strong Understandings**

The 27-item questionnaire highlighted areas of strong knowledge about ADHD. These areas were answered correctly by 100% of the participants. Participants understood that ADHD affects children from all walks of life and from either gender. Race or culture are not indicators of a child being more susceptible to ADHD, nor does socio-economic status (APA, 2013). While girls are just as likely to be diagnosed with ADHD the APA (2013) found that boys were more likely to be identified at a ratio of 2:1.
The participants also identified that poor parenting practices and overconsumption of sugary products do not cause ADHD. This seems to indicate that they understand a biological component plays a role in the presentation of ADHD symptoms even though they were unable to identify it specifically.

Conclusion

While no statistical significance was found in terms of a relationship between the level of teacher knowledge and their perception of students with ADHD or differences between general education and special education teacher’s knowledge or perception of ADHD, several areas of teacher knowledge stood out as supporting misconceptions. These misconceptions centered on themes of (a) the cause of the disorder, (b) the diagnostic process, and (c) behavioral characteristics of ADHD.

Educational Implications

Based on the conclusions of the study, all teachers may benefit from professional development that highlights the causes of ADHD, as well as, the role they play in the diagnostic process. The behavioral characteristics that are associated with each cause of the disorder should also be discussed. This will allow teachers to use their knowledge of interventions, accommodations, and modifications with the appropriate behaviors in order to help the student reach success.

Recommendations for Further Research

Future research may choose to include a sample that has greater diversity among teacher experience and ethnicity or culture of teachers and students. Additional research is recommended to analyze the knowledge and perception differences between pre-
service and in-service teachers with a wide range of experience. Samples from multiple
districts with varying populations based on ethnicity is recommended to produce a greater
collection of data, as well as, reflecting the cultural differences towards ADHD.

Summary

This descriptive, quantitative utilizes a cross-sectional survey to investigate the
relationship between teacher knowledge and their perception of students with ADHD.
The difference among general education and special education teachers was also
investigated. The data collected from a Pearson correlation and two-sample t-tests
yielded no significant relationships or differences. However, misconceptions on the
actual knowledge questionnaire highlighted themes that warrant further investigation.
These themes included: (a) etiology, (b) diagnostic process, and (c) behavioral
characteristics. Further research is also recommended to investigate a more diverse
population of teachers in terms of culture and years of experience.
References


Appendices

Appendix A: Actual knowledge 27-item questionnaire
Appendix B: Teacher perception vignette
Appendix C: Collaborative Institutional Training Initiative Report
Appendix A

SURVEY INSTRUMENT

27- Item Questionnaire  True or False

1. There are a greater number of boys than girls with ADHD.

2. There is approximately 1 child in every classroom with a diagnosis of ADHD.

3. If medication is prescribed, educational interventions are often unnecessary.

4. ADHD children are born with biological vulnerabilities toward inattention and poor self-esteem.

5. If a child responds to stimulant medication (e.g., Ritalin) then he/she probably has ADHD.

6. A child who is not overactive, but fails to pay attention, may have ADHD.

7. ADHD is often caused by food additives.

8. ADHD can be diagnosed by the doctor’s office most of the time.

9. Children with ADHD always need a quiet environment to concentrate.

10. Approximately 5% of American school-aged children have ADHD.

11. ADHD children usually come from single parent families.

12. Diets are usually not helpful in treating children with ADHD.

13. ADHD can be inherited.

14. Medication is a cure for ADHD.

15. All children with ADHD are overactive.

16. There are subtypes of ADHD.

17. ADHD affects male children only.

18. The cause of ADHD is unknown.
19. ADHD is the result of poor parenting practices.

20. If a child can play X-Box (electronic game system) for several hours, then he/she probably doesn't have ADHD.


22. ADHD is caused by too much sugar in the diet.

23. Family dysfunction will increase the likelihood that a child will be diagnosed with ADHD.

24. Children from any walk of life can have ADHD.

25. Children with ADHD usually have good peer relations because of their outgoing nature.

26. Research has shown that prolonged use of medication leads to increased addiction (i.e., drug alcohol) in adulthood.

27. Children with ADHD generally display an inflexible adherence to specific routines and rituals.

(Kos, Richdale, & Jackson, 2004).
INSTRUCTIONS:

On the following pages, there are descriptions of children who have inattentive, hyperactive, and/or defiant behaviors. When you read each description, please imagine that you are that child’s teacher. After each description, there are questions for you to complete based on your experience and opinions as a school teacher. If you are unsure how to respond, please go with your first impression or reaction (Ohan et al., 2008).

It should be noted this study is focused on behaviors characteristic of a child with Attention-Deficit/Hyperactivity Disorder (ADHD) and not behaviors characteristic of a child with Attention-Deficit Disorder (ADD).
Alexandra is a 9 year old girl. Alexandra’s parents say that getting her to do homework or chores is tough because she constantly becomes sidetracked and jumps around from one thing to the next. Her teacher says that Alexandra’s schoolwork is poor because she either rushes to complete it or doesn’t follow instructions. Her teacher also says Alexandra is constantly talking and doesn’t seem to listen to what is being said. When Alexandra does listen, she often answers before thinking. Alexandra consistently loses her workbooks and other belongings. Alexandra is hardly ever still. If she is not banging on the desk with her pencils, she is wandering around the room talking to students who are working. Other students avoid Alexandra because she pesters them to hurry or tries to take their turn.

1. How serious are Alexandra’s behavior problems?
   1---------2---------3---------4---------5---------6---------7---------8---------9
   not at all    moderately    extremely

2. How much impairment do Alexandra’s behavior problems cause in her daily life?
   1---------2---------3---------4---------5---------6---------7---------8---------9
   none        moderate     extreme

3. How disruptive are Alexandra’s behavior problems to those around her?
   1---------2---------3---------4---------5---------6---------7---------8---------9
   not at all    moderately    extremely

4. How much would Alexandra’s behavior problems interfere with the following:
   a) her family?
      1---------2---------3---------4---------5---------6---------7---------8---------9
      not at all    moderate     extreme

   b) her ability to make friends and get along socially with other children?
      1---------2---------3---------4---------5---------6---------7---------8---------9
      not at all    somewhat    extreme

   c) her academic progress?
      1---------2---------3---------4---------5---------6---------7---------8---------9
      not at all    somewhat    extreme
d) her classroom?

1-2-3-4-5-6-7-8-9
not at all somewhat extremely

8. How confident are you that you could implement effective class interventions for Alexandra?

1-2-3-4-5-6-7-8-9
not at all moderate extreme

9. How frustrated would you be with Alexandra’s behavior during your instructional time?

1-2-3-4-5-6-7-8-9
not at all moderately extremely

10. How stressful would it be to have Alexandra as a student?

1-2-3-4-5-6-7-8-9
not at all moderately extreme

11. In your opinion, how much would the following types of treatments benefit Alexandra:

   a) Learning Assistance program

1-2-3-4-5-6-7-8-9
not at all moderately extreme

   b) Medication

1-2-3-4-5-6-7-8-9
not at all moderately extreme

   c) Behavioral modification at school and home (e.g., rewards)

1-2-3-4-5-6-7-8-9
not at all moderately extreme

   d) Changes to her diet (e.g., lower sugar and processed foods?)

1-2-3-4-5-6-7-8-9
not at all moderately extreme

12. In your opinion, what are the likely causes of Alexandra’s behavior problems?

   a) Poor diet and nutrition

1-2-3-4-5-6-7-8-9
not a cause moderate cause definite cause

   b) Unrecognized learning problems

1-2-3-4-5-6-7-8-9
not a cause moderate cause definite cause

   c) Neurobiological problems
d) Family problems

1---2---3---4---5---6---7---8---9
not a cause moderate cause definite cause
Alexander is a 9 year old boy. Alexander's parents say that getting him to do homework or chores is tough because he constantly becomes sidetracked and jumps around from one thing to the next. His teacher says that Alexander's schoolwork is poor because he either rushes to complete it or doesn't follow instructions. His teacher also says Alexander is constantly talking and doesn't seem to listen to what is being said. When Alexander does listen, he often answers before thinking. Alexander consistently loses his workbooks and other belongings. Alexander is hardly ever still. If he is not banging on the desk with his pencils, he is wandering around the room talking to students who are working. Other students avoid Alexander because he pesters them to hurry or tries to take their turn.

1. How serious are Alexander's behavior problems?

   1---------2---------3---------4---------5---------6---------7---------8---------9
   not at all  moderately extremely

2. How much impairment do Alexander's behavior problems cause in his daily life?

   1---------2---------3---------4---------5---------6---------7---------8---------9
   none moderate extreme

3. How disruptive are Alexander's behavior problems to those around him?

   1---------2---------3---------4---------5---------6---------7---------8---------9
   not at all moderately extreme

4. How much would Alexander's behavior problems interfere with the following:
   a) his family?

   1---------2---------3---------4---------5---------6---------7---------8---------9
   not at all moderate extreme

   b) his ability to make friends and get along socially with other children?

   1---------2---------3---------4---------5---------6---------7---------8---------9
   not at all somewhat extreme

   c) his academic progress?

   1---------2---------3---------4---------5---------6---------7---------8---------9
   not at all somewhat extreme

   d) his classroom?
1. How confident are you that you could implement effective class interventions for Alexander?

1. not at all
2. somewhat
3. moderately
4. extreme

2. How frustrated would you be with Alexander’s behavior during your instructional time?

1. not at all
2. moderately
3. extreme

3. In your opinion, how much would the following types of treatments benefit Alexander:
   b) Learning Assistance program

1. not at all
2. moderately
3. extreme

4. Medication

1. not at all
2. moderately
3. extreme

5. Behavioral modification at school and home (e.g., rewards)

1. not at all
2. moderately
3. extreme

6. Changes to his diet (e.g., lower sugar and processed foods?)

1. not at all
2. moderately
3. extreme

4. In your opinion, what are the likely causes of Alexander’s behavior problems?
   a) Poor diet and nutrition

1. not a cause
2. moderate cause
3. definite cause

b) Unrecognized learning problems

1. not a cause
2. moderate cause
3. definite cause

c) Neurobiological problems

1. not a cause
2. moderate cause
3. definite cause
d) Family problems

1---------2---------3---------4---------5---------6---------7---------8---------9
not a cause moderate cause definite cause