5-2008

Attention-Deficit/Hyperactivity Disorder Knowledge and Practices: A Survey of Pediatricians and Family Practice Physicians

Kara L. Spielmans
Utah State University

ATTENTION-DEFICIT/HYPERACTIVITY DISORDER KNOWLEDGE AND PRACTICES: A SURVEY OF PEDIATRICIANS AND FAMILY PRACTICE PHYSICIANS

by

Kara L. Spielmans

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Psychology

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

2008

ABSTRACT

Attention-Deficit/Hyperactivity Disorder Knowledge and Practices:

A Survey of Pediatricians and Family Practice Physicians

by

Kara L. Spielmans, Master of Science

Utah State University, 2008

Major Professor: Dr. Gretchen Gimpel Peacock
Department: Psychology

Attention-deficit/hyperactivity disorder (ADHD) is a common childhood disorder often treated by pediatricians or family practice physicians. ADHD knowledge held by treating physicians may be an important predictor in patient outcomes. This study examined ADHD knowledge and common assessment and treatment practices of pediatricians and family practice physicians via a national survey sent to members of the American Academy of Pediatrics and the American Academy of Family Physicians. Mailings included the Knowledge of Attention Deficit Disorders Scale--Revised (KADDS-R) and a demographic/practice questionnaire. Although both physician types reported utilizing assessment and treatment methods consistent with current ADHD practice guidelines, findings suggested that pediatricians had greater ADHD knowledge than did family physicians. Physicians who had completed a behavioral pediatric rotation or training specific to ADHD had greater knowledge than physicians who had not done so. The number of new ADHD evaluations conducted monthly was also related

to ADHD knowledge. Implications for future research examining ADHD knowledge, training, and outcomes are discussed.

(80 pages)

ACKNOWLEDGMENTS

I would like to thank my major professor, Gretchen Gimpel Peacock, Ph.D., for her encouragement, support, guidance, and patience throughout the process of completing this thesis. I would also like to thank my other committee members, Melanie Domenech-Rodriguez, Ph.D., and Dennis Odell, M.D., for their valuable input and support of the project.

I am also very grateful for the dedication and support I received from a variety of family members as I worked on this study, particularly my husband, Glen Spielmans, Ph.D., for his assistance on statistical details as well as his patience and input throughout the project. My mother, Darlene Mickelson, and my sister, Karla Mickelson, were instrumental in assisting with the survey mailing preparations. Finally, I would like to thank my father, Keith Mickelson, for his support and belief in my achievements throughout my graduate school years and beyond.

Kara L. Spielmans

CONTENTS

LIST OF TABLES

CHAPTER I

PROBLEM STATEMENT

Attention-deficit/hyperactivity disorder (ADHD) is a common problem among school-age children. The disorder is characterized by symptoms of inattentiveness, impulsiveness, difficulties concentrating, and/or hyperactivity with an onset typically in the late preschool or early elementary school years (Robison, Sclar, Skaer, & Galin, 1999). Research studies estimating prevalence of ADHD in the general population report rates ranging from 1.7-16% (Robinson et al., 1999) with a rate of approximately 2.0-6.4% in school-age children (American Psychiatric Association, 1994; Arnold, 1996; DuPaul, 1991; Gingerich, Turnock, Litfin, & Rosen, 1998; Lambert, Sandoval, & Sassone, 1978; Pelham, Gnagy, Greenslade, & Milich, 1992; Szatmari, 1992). Children with Attention-Deficit/Hyperactivity Disorder (ADHD) experience many negative consequences. The distractible, impulsive, and hyperactive behaviors associated with the disorder often lead to difficulties in school and in social activities. School difficulties include poor academic performance, problems organizing belongings, and difficulties staying on task. These problems often lead to frustration in teachers and parents (Searight, Nahlik, & Campbell, 1995). Furthermore, children with ADHD often are reprimanded for failure to stay on task and/or complete work, and may get in trouble for misbehaving and/or acting aggressively toward their peers. These negative consequences associated with ADHD can also lead to peer rejection and social isolation in the classroom (Frederick & Olmi, 1994; Stormont, 2001). Long-term outcomes for individuals with ADHD also tend to be poor; many adolescents and adults continue to

have problems such as continuation of core ADHD symptoms, oppositional or antisocial behavior, and substance abuse, as well as emotional and interpersonal problems (Hechtman, 1991; Klein & Mannuzza, 1991; Mannuza, Klein, Bessler, Malloy, & LaPadula, 1998; Young, 2000).

In order to minimize the negative outcomes for children with ADHD, it is important that they receive proper diagnosis and treatment of their symptoms. Because there is no way to objectively assess for ADHD (such as using a medical diagnostic test), the diagnosis must depend heavily on reports from parents, teachers, and other caregivers. However, information obtained from such reporters via interviews and rating scales often include a variety of symptoms that are not always consistent. In addition, data from these sources are often used in conjunction with data from direct observations and information from these different methods may vary. The clinician is then left with a mix of information and must determine how to synthesize this often inconsistent data.

Another challenge is differential diagnosis of ADHD, a complicated task due to the nature of the symptoms, their similarity to symptoms of other behavior disorders, as well as the likelihood of comorbidity with other psychiatric disorders (Sciutto, Terjesen, & Frank, 2000). For example, children who are depressed often have symptoms similar to those of children with ADHD including: problems staying on task, difficulty remembering information, and problems concentrating during academic instruction. A child with depression who is having problems concentrating and focusing may have some difficulty remembering details of an academic lesson or points of a conversation. In addition, a child with depression may lack motivation to succeed in school, but the teacher may perceive it as primarily an attention problem and refer the child for an

ADHD assessment. The irritability that can occur with childhood depression is another symptom that can be mistaken for ADHD.

Behaviors that are oppositional in nature such as refusing to do an assignment or failure to follow an adult's instructions also necessitate the need for differential diagnosis. In these cases it can be difficult to determine whether the behavior is a product of hyperactivity and/or inability to pay attention or if it is purely oppositional behavior that would warrant a diagnosis of oppositional defiant disorder (ODD), a behavior disorder characterized by defiance or refusal to comply with adults' requests or rules (APA, 1994).

Other difficulties with the assessment of ADHD include identifying cases that are of the primarily inattentive subtype because symptoms may not be readily observable to others. In this type of case, rather than seeing an obvious display of hyperactive and/or impulsive behavior, the child primarily experiences the consequences associated with a short attention span and difficulty concentrating, such as having difficulty following conversations, directions, or remembering details. A final challenge worth noting is the assessment of older children or teenagers. In these cases the diagnosis must rely on the parents' retrospective reports of behavior and symptoms before age 7 to determine whether or not the symptoms were present during early childhood, a criterion that is necessary for a diagnosis of ADHD (APA, 1994).

Different types of professionals often have varying approaches to assessment and treatment of ADHD. However, all professionals who diagnosis and treat children suspected of having ADHD should be knowledgeable about the disorder, its symptoms, and appropriate assessment methods. Because families with school-age children tend to

seek help from primary care physicians for attention and behavior problems rather than from mental health professionals (Bussing, Zima, & Belin, 1998; Zarin, Tanielian, Suarez, & Marcus, 1998), it is essential that primary care physicians are knowledgeable about the symptoms of ADHD and their assessment in addition to the treatment options available.

Primary care physicians who treat children are typically either family practice physicians or pediatricians (Hoagwood, Kelleher, Feil, & Comer, 2000). Because much of the knowledge acquired by primary care physicians is obtained through clinical rotations during residency, continuing education, and experience, family practice physicians, and pediatricians may vary in their level of knowledge and expertise regarding ADHD. Although both types of physicians receive the same core medical school training, pediatricians complete a 3-year residency focused specifically on children, whereas family practice physicians complete a 3-year residency in which they focus on treating patients of all ages. Furthermore, pediatricians are more likely to complete a rotation in behavioral pediatrics during their residency program that suggests that they will be more knowledgeable about all childhood behavioral/mental health problems, including ADHD, than family practice physicians.

Given that physicians are the professionals most likely to first see children with behavioral problems, it is important to know how much knowledge they possess regarding ADHD and how that may impact their assessment and management of the disorder. Past research has suggested that physicians' practices often are not consistent with standards of care (Ward, Fidler, Lockyer, & Toews, 1999). Having more knowledge about ADHD will likely lead to improved care because physicians will be

prepared to recognize the symptoms of ADHD, be aware of the treatment strategies that have empirical support, and will probably be more likely to employ a multimethod assessment approach. Although medical training programs are now requiring more exposure to behavioral medicine than in the past, it is uncertain how much education medical students and residents are receiving that is specifically related to the assessment and management of ADHD. Limited research has been conducted in this area, and it has been focused mainly on assessment of physicians' attitudes about the management of ADHD (Kwasman, Tinsley, & Lepper, 1995).

To understand physicians' knowledge more thoroughly, it would be helpful to gain more in-depth information on what they know about the symptoms and treatments for ADHD as well as gather data on physicians' ADHD management practices. Because most children are likely to be seen by pediatricians or family practice physicians when ADHD is suspected, an investigation of physician knowledge of ADHD is necessary to ensure that physicians who are regularly working with children are prepared to handle these cases. Due to the differences in training and experiences between family practice physicians and pediatricians, it is also important to compare knowledge across physician type. This information can then be utilized to create strategies for disseminating knowledge to each type of medical professional if it appears that there is a significant knowledge deficiency in one or more areas. Furthermore, asking physicians about their practices for assessment and management of ADHD will address how their level of knowledge may impact their care of children presenting with symptoms or concerns related to the disorder.

The purpose of this study was to examine pediatricians' and family practice physicians' knowledge about ADHD and gather some basic information on their ADHD assessment practices. Attitudes towards various types of treatment were also measured, such as the use of stimulant medication, recommendations for parent training/behavior modification, and the application of other less common (and less supported) treatments such as dietary changes, and alternative or experimental treatments.

CHAPTER II

REVIEW OF LITERATURE

Background on ADHD

Attention-deficit/hyperactivity disorder (ADHD) is one of the most common childhood disorders. The *Diagnostic and Statistical Manual of Mental Disorders (4th ed.)* (*DSM-IV*; APA, 1994) reports that ADHD occurs in 3-5% of school-age children (APA). Empirical studies estimate that prevalence rates in the general United States population range from 1.7-16% (Bird et al., 1988; Costello et al., 1988; Robison et al., 1999; Szatmari, Boyle, & Offord, 1989). However, studies in other countries have reported figures outside of these ranges; an example being a reported rate of 29% of adolescents in India (Barkley, 1998). Although ADHD is most commonly conceptualized as a childhood disorder, it can certainly continue into adulthood as well. The reports on adulthood prevalence are mixed, but studies report 8-65% of children with ADHD continue to have symptoms of ADHD as adults (Mannuzza, Gittelman-Klein, Bessler, Malloy, & LaPadula, 1993; Weiss & Hechtman, 1993).

According to the *DSM-IV* (APA, 1994), ADHD is classified according to three different subtypes, the "combined type," the "predominantly inattentive type," and the "predominantly hyperactive-impulsive type" (APA). The diagnosis of "combined type" is applied when the disorder is characterized by multiple symptoms of inattention as well as hyperactivity-impulsivity. The inattentive subtype is characterized by distractibility, failure to pay attention to details, difficulty sustaining attention, and problems with organization (Barkley, 1998). A child with primarily inattentive symptoms may have

trouble completing academic or complex tasks due to the problems with concentration and distractibility. Tasks that are repetitive or boring to the child such as homework, academic lessons, or chores may bring out the most prominent display of the child's ADHD symptoms (Barkley, DuPaul, & McMurray, 1990; Luk, 1985). Researchers attribute children's difficulties with these tasks more to diminished effort and low motivation than to problems with distractibility (Barkley). One theory behind this idea of low motivation is that there is no immediate gratification in such tasks (Barkley). Therefore, when a more appealing alternative is available (e.g., playing with toys), a child with ADHD will engage in that more rewarding activity as opposed to concentrating on a difficult or boring academic lesson. Supporting such a theory, research has consistently found that children with ADHD tend to prefer a small, immediate reward over larger, delayed rewards (Luman, Oosterlaan, & Sergeant, 2005).

The hyperactive/impulsive symptoms of ADHD are manifested in problems with awaiting one's turn or playing quietly, excessive talking and physical behaviors or feelings of restlessness, and appearing unable to slow down or relax most of the time. Children exhibiting the primarily hyperactive-impulsive subtype often take "shortcuts" in their work performance at school and home in order to avoid doing things that require attention to detail and self-control (Barkley, 1998). Similarly, social situations that call for sharing and cooperation may lend themselves to interruptions, rudeness, and insensitive comments from children with ADHD. Adults with ADHD tend to have fewer symptoms of hyperactivity per se and instead experience feelings of restlessness, fidgeting, and excessive speech (Barkley).

In order to meet the criteria for ADHD, an individual must exhibit six or more symptoms of the inattention or six or more symptoms of hyperactivity/impulsivity or both for a "combined type" diagnosis. The *DSM-IV* criteria are as follows (APA, 1994, pp. 83-85):

Inattention

a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities.

b) often has difficulty sustaining attention in tasks or play activities

c) often does not seem to listen when spoken to directly

d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand directions)

e) often has difficulty organizing tasks and activities

f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)

g) often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)

h) is often easily distracted by extraneous stimuli

i) is often forgetful in daily activities

Hyperactivity

a) often fidgets with hands or feet or squirms in seat

b) often leaves seat in classroom or in other situations in which remaining seated is expected

c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)

d) often has difficulty playing or engaging in leisure activities quietly

e) is often "on the go" or often acts as if "driven by a motor"

f) often talks excessively

Impulsivity

a) often blurts out answers before questions have been completed.

b) often has difficulty awaiting turn

c) often interrupts or intrudes on others (e.g., butts into conversations or games)

Other diagnostic requirements include a presence of some of the symptoms before the age of 7, impaired daily functioning in two or more settings, and "evidence of clinically significant impairment in social, academic, or occupational functioning" (APA, 1994, p. 84). Finally, the symptoms cannot be better accounted for by another disorder such as a mood disorder or a personality disorder.

Because ADHD is characterized by a wide variety of behaviors that overlap with other psychological disorders, differential diagnosis is a challenge. In addition, children with ADHD often have comorbid disorders that further compromise their social and/or occupational functioning. ODD and conduct disorder (CD) are frequently comorbid with ADHD. ODD is a behavior disorder that is characterized by repeated disobedience, defiance, and hostility toward caretakers and other authority figures (McMahon & Wells, 1998). Diagnostic criteria include symptoms such as "often argues with adults," "often deliberately annoys people," "often actively defies or refuses to comply with adults' requests or rules," and "is angry and resentful" (APA, 1994, pp. 93-94). The symptoms of ADHD and ODD can look somewhat similar, particularly ones that involve issues of failure to comply, avoidance of difficult tasks, annoying other people, intruding on others, and being touchy or easily annoyed. Furthermore, it is not uncommon for a child

to meet criteria for both disorders; comorbid ODD was estimated to occur in 64-67% of children with ADHD according to one review (Barkley, 1998). However, one study found a lower, though still substantial comorbidity rate (Szatmari, Offord, & Boyle, 1989), estimating that up to 44% of children with ADHD have at least one other disorder. Differences in estimated rates of comorbidity across studies could relate to varying samples or differences in measurement techniques.

CD is considered to be a more serious disorder than ODD, although many children who are diagnosed with ODD later qualify for a diagnosis of CD (APA, 1994). Barkley's (1998) summary of research studies reported that 20-50% of children and 44-50% of adolescents with ADHD also meet criteria for CD. A diagnosis of CD requires that a child or adolescent exhibit 3 or more of 15 behaviors grouped in the following categories: aggression to people and animals, destruction of property, deceitfulness or theft, and serious violations of rules (APA). Children diagnosed with CD are at higher risk than those without CD for social and occupational maladjustment as adults including problems with mood and anxiety disorders, somatoform disorders, and substance related disorders (APA).

Comorbid conditions are not limited to externalizing behaviors. Children with ADHD are also more likely to suffer from anxiety, depression, substance abuse, learning disabilities, and tics than children without ADHD (Spencer, Biederman, & Mick, 2007). For example, in a clinical sample of children with ADHD, nearly 49% of the children also had an anxiety disorder or depression (Jensen, Shervette, Xenakis, & Richters, 1993). Somatic complaints also tend to be more common in children with ADHD than children without ADHD (Barkley et al., 1990). These complaints include general

headaches and stomachaches as well as symptoms of specific health ailments such as colds, ear infections, allergies, and so forth. The additional burden from affective disorders and/or physical discomfort can further complicate social and academic functioning in children who have ADHD.

ADHD symptoms must also be distinguished from those of the less common yet serious bipolar disorder. Both ADHD and bipolar can be characterized by distractibility and increased motor activity (APA, 1994). Frequently children with bipolar disorder may exhibit rapid cycling of bipolar episodes that may resemble the symptoms of ADHD (Kim & Miklowitz). Characteristics of bipolar episodes such as racing thoughts, impulsivity, rapid speech, and irritability might look similar to a case of ADHD with significant impairment. Although not all of those symptoms are criteria of both disorders, those features are generally associated with both ADHD and bipolar disorder (Kim & Miklowitz, 2002). Similarly, a child with ADHD who frequently exhibits emotional lability may be misdiagnosed as having bipolar disorder due to the presence of mood swings. The onset of ADHD, however, is typically in the preschool years and its course is considered to be more chronic than bipolar disorder in children (Weller, Weller, & Fristad, 1995). The age of onset and analysis of nonoverlapping symptoms (e.g., goal directed activity, grandiosity) are crucial to differential diagnosis (Kim & Miklowitz, 2002; Weller et al., 1995).

Children with ADHD tend to have difficulties with peer acceptance and social interactions (Cunningham & Siegel, 1987; Erhardt & Hinshaw, 1994; Hubbard & Newcomb, 1991), and often suffer from developmental, adaptive, and academic difficulties (Barkley, 1998; Massetti et al., 2007, in press). According to parent reports,

children with ADHD typically show poorer sleep than controls (Owens, 2005), but a recent meta-analysis found that objective polysomnographic measures of sleep reveal very few differences between children with ADHD and controls (Sadeh, Pergamin, & Bar-Haim, 2006).

The vast array of problems children with ADHD can have complicates diagnosis and treatment of this disorder. As already illustrated, symptom overlap among disorders is common; therefore, practitioners must take care to conduct a thorough evaluation using multiple sources of information to aid in differential diagnosis. Parents and teachers should both report on the child's behavior and symptoms, and practitioners should always collect data using various methods such as rating scales, direct observations, and interviews to accurately identify the disorder(s) present.

History of the Disorder

Conceptualizations of ADHD have changed since its original identification by George Still in 1902 (Barkley, 1998). Still described children who were aggressive, emotional, poorly inhibited, and resistant to discipline (Barkley). Still believed that the severe cases of this nature were not a result of poor parenting or upbringing, but rather a product of a biological disorder that disrupted children's ability to control their behavior. This initial conceptualization of the disorder was presented at a few lectures and then gradually made its way into papers over the next 35 years (Barkley). Scholars began to believe that problems of this nature were a result of brain damage, and so the term "minimal brain damage" was used to describe the disorder (Strauss & Lehtinen, 1947). The hypothesis regarding neurological impairment was softened from "minimal brain

damage" to "minimal brain dysfunction (MBD)" in the early 1960s (Clements & Peters, 1962). Gradually the beliefs about the etiology shifted from a heavy focus on neurological damage to merely an association with abnormal brain functioning and the names for the disorder reflected descriptions of behavior instead. "Hyperactive child syndrome" and "hyperkinetic reaction of childhood" were the diagnostic terminology used in the late 1960s and 1970s (Barkley). The disorder was starting to be conceptualized as an attention disorder, with two distinct models hypothesized, in the 1970s and early 1980s (Barkley). The first model, Wender's (1971) theory of MBD, asserted that children with MBD had 6 clusters of symptoms: motor behavior, attentional-perceptual cognitive function, learning difficulties, impulse control, interpersonal relations, and emotion. Wender hypothesized that children with these symptoms had an underlying biochemical imbalance that resulted in a lack of reinforcement in the brain, thus causing the behavioral deviations/problems (Levy, 1991; Wender, 1972). The second theory was Douglass's Model of Attention Deficits, which outlined 4 symptom subtypes for ADHD: the investment, organization, and maintenance of attention and effort; the inhibition of impulsive responding; the modulation of arousal levels to meet situational demands; and an unusually strong inclination to seek immediate reinforcement (Douglass & Peters, 1979). Douglass's research team demonstrated that hyperactive children were very distractible, particularly on Continuous Performance Tests (CPTs) that require children to respond to visual and auditory signals that are embedded in a series of irrelevant stimuli (Barkley). Douglass's work became widely publicized and influential, leading to a renaming of the disorder to attention-deficit disorder (ADD) in 1980 with the publication of the third edition of the *Diagnostic and*

Statistical Manual for Mental Disorders (3rd ed.) (DSM-III, American Psychiatric Association, 1980).

The *DSM-III* (APA, 1980) reflected a radical change in the conceptualization of the disorder. The new diagnostic criteria placed greater emphasis on inattention and impulsivity. The *DSM-III* also outlined a specific symptom list, cutoff scores, other disorders to rule out, and guidelines for age and duration of symptoms (Barkley, 1998). Subtypes of the disorder were created, reflecting the presence or absence of hyperactivity (+H/-H). Preliminary research supported that distinction and found that children with ADD-H tended to struggle with daydreaming, lethargy, and learning disabilities whereas those with ADD+H had similar problems plus aggression and peer rejection (Barkley).

In 1987 the DSM was revised again (*Diagnostic and Statistical Manual of Mental Disorders (3rd ed.-Revised; DSM-III-R;* American Psychiatric Association, 1987), and the name of the disorder was changed to ADHD. The criteria consisted of a single list of symptoms and a single cutoff score (APA). The *DSM-III-R* no longer recognized the ADD-H subtype, and cases of the ADD-H nature would be classified as undifferentiated ADD (APA). The elimination of the ADD-H subtype in the *DSM-III-R* was the result of a controversy as to whether or not that symptom profile was a separate disorder deserving its own criteria. At that time, there was not enough research data available on the disorder to justify the subtyping approach (Barkley, 1998). An emphasis on empirical support was stressed in the construction of the *DSM-III-R* criteria, as the single list of symptoms was based on data from behavior rating scales that were tested in a large field trial to examine their sensitivity and specificity (Barkley).

The development of the *DSM-IV* criteria for ADHD (*Diagnostic and Statistical Manual of Mental Disorders*, American Psychiatric Association, 1994) continued to utilize empirical data and employed a much more rigorous approach as compared to previous versions (Barkley, 1998). The improvements in the criteria were based on input from an expert committee, a literature review of ADHD, an informal committee survey of rating scales assessing ADHD, and statistical analyses of a field trial that tested the items (Barkley). The most distinctive change to the criteria in the *DSM-IV* was a reinstatement of the inattentive form of the disorder that was similar to the ADD-H version in the *DSM-III* (Barkley). The result was a coding scheme characterized by 3 different subtypes of ADHD: predominantly inattentive, predominantly hyperactive-impulsive, and combined type (APA). The new empirically based criteria as well as the redefined subtypes were the result of factor analyses of parent and teacher rating scales collected in the field study. The cutoff points for the number of symptoms necessary for diagnosis of ADHD were also based on research (Lahey et al., 1994). These diagnostic criteria and guidelines are those utilized in the assessment of ADHD today.

Development of ADHD Assessment and Treatment Guidelines

Because there has been such a transformation in conceptualizations of ADHD, the assessment and management practices of this disorder have changed over time as well. Once the literature began promoting the use of the *DSM-IV* (APA, 1994) criteria and its recognition of symptoms related to impulse control and sustained attention, best practices dictated that diagnoses be based more on data from multiple sources and less on the

evaluator's subjective opinions than in the past. In turn, assessment and management practices for ADHD have adapted to current conceptualizations of ADHD and many practitioners have adopted a multimethod and/or multidisciplinary approach to assessment and, in some cases, treatment of disorder. Today the disorder is still conceptualized as a behavior disorder with inattentive and hyperactive components as indicated in the *DSM-IV* criteria previously outlined.

This modern conceptualization of ADHD as a behavior disorder has led to the development of professional guidelines for diagnosis and evaluation as well as treatment of the school-aged child with ADHD. The American Academy of Pediatrics (AAP) has developed "evidenced-based" recommendations for the diagnosis and treatment of children with ADHD in primary care settings (AAP, 2000, 2001). The first set of guidelines introduced in May of 2000 focused on the evaluation of ADHD and was created by a committee of medical professionals that met over a 2-year period and reviewed and analyzed the ADHD literature (AAP, 2000). The outcome of the committee's investigation was a document outlining guidelines for the evaluation of ADHD based on the following 6 recommendations (AAP, 2000, pp. 1160-1167):

1) In a child 6 to 12 years old who presents with inattention, hyperactivity, impulsivity, academic underachievement, or behavior problems, primary care clinicians should initiate an evaluation for ADHD.

2) The diagnosis of ADHD requires that a child meet DSM-IV criteria.

3) The assessment of ADHD requires evidence directly obtained from parents or caregivers regarding the core symptoms of ADHD in various settings, the age of onset, duration of symptoms, and degree of functional impairment.

4) The assessment of ADHD requires evidence directly obtained from the classroom teacher regarding the core symptoms of ADHD, the duration of symptoms, the degree of functional impairment, and coexisting conditions.

A physician should review any reports from a school-based multidisciplinary evaluation where they exist, which will include assessments from the teacher or other school-based professional.

5) Evaluation of the child with ADHD should include assessment for coexisting conditions.

6) Other diagnostic tests are not routinely indicated to establish the diagnosis of ADHD. Examples include blood tests, hormone tests, electroencephalogram, CPTs.

These recommendations provide physicians with a framework for assessment of pediatric ADHD that emphasize research-based practices and discourage subjective or uniformed diagnosis. More specifically, the AAP guidelines advocate for adherence to *DSM-IV* criteria, data collection from multiple informants and environmental settings, and consideration of coexisting conditions. Although it may seem apparent that these components should be included in assessment procedures, previous research indicated that physicians tended to rely on general clinical impressions and brief observations from the office visit (e.g., hyperactivity) rather than attending to specific diagnostic criteria (Copeland, Wolraich, Lindgren, Milich, & Woolson, 1987; Moser & Kallail, 1995). The consideration of functional impairment in various settings of a child's life reduces the chances that an ADHD diagnosis will be made based on a single situation/setting where the child displays ADHD-like behaviors due to a lack of structure or limits on that child's behavior. It also does not allow for diagnosis based on parental report alone, a practice that can be flawed because some parents may tend to exaggerate a child's symptoms, be intolerant of developmentally appropriate behaviors, or fail to understand how their own parenting practices can lead to ADHD related behaviors at home. If a child displays symptoms such as distractibility, impulsivity, and hyperactivity at home but is unaffected

by these symptoms at school, one can conclude that under the "right" environmental conditions (e.g., school setting) the child can function effectively and therefore is not functionally impaired across settings. The conceptualization of ADHD as a disorder implies that it is not a set of characteristics that can be controlled by the child, suggesting that proper assessment should include a functional approach (evaluation of environmental conditions/antecedents and/or consequences of the child's behavior). The functional approach can also encourage communication between home and school that will hopefully foster collaboration when a treatment plan is devised.

In addition to recommending what type of ADHD-specific evidence should be collected, the AAP guidelines stress the importance of differential diagnosis and assessment of potential comorbid conditions. This practice is critical because, as discussed earlier, ADHD-related characteristics can be similar to other disorders such as ODD, learning disabilities, and so forth (Searight et al., 1995). If a practitioner fails to consider other causes of impairment, the treatment proposed by the practitioner may be inappropriate, ineffective, or both. Consideration of coexisting conditions will allow for improved understanding and treatment of presenting problems.

Finally, the AAP does not validate the use of medical/diagnostic tests to confirm the presence of ADHD. Because previous research has not provided adequate support for these other diagnostic procedures, physicians should avoid them and rely instead on evaluation of the diagnostic criteria using ratings scales, direct observations, and patient history/parent report of behavior in various settings. These practices will improve the reliability and validity of ADHD diagnoses.

The second set of clinical practice guidelines on the treatment of ADHD in school-aged children was released in October of 2001. The development of these new guidelines was similar to that of the evaluation guidelines. The AAP collaborated with several organizations of medical professionals (both primary care and subspecialty) and met over a period of 3 years, during which it reviewed and analyzed the literature on the treatment for ADHD (AAP, 2001). The final product includes 5 recommendations that are expanded in detail in the guideline publication, but are outlined as follows (AAP, pp. 1033-1044):

1) Primary care clinicians should establish a management program that recognizes ADHD as a chronic condition.

2) The treating clinician, parents, and child, in collaboration with school personnel, should specify appropriate target outcomes to guide management.

3) The clinician should recommend stimulant medication and/or behavior therapy as appropriate to improve target outcomes in children with ADHD.

4) When the selected management for a child with ADHD has not met target outcomes, clinicians should evaluate the original diagnosis, use of all appropriate treatments, adherence to the treatment plan, and presence of coexisting conditions.

5) The clinician should periodically provide a systematic follow-up for the child with ADHD. Monitoring should be directed to target outcomes and adverse effects, with information gathered from parents, teachers, and the child.

Similar to the evaluation guidelines, the treatment guidelines recommend strategies for the practitioner to use that utilize the highest standard of care. These strategies include being prepared to treat ADHD cases, collaboration with other individuals involved in the child's care, acquiring knowledge of empirically supported treatment options, and monitoring treatment outcomes. Adhering to these guidelines will

maximize treatment effects and decrease the likelihood of situations/factors that can complicate a case.

The recommendations strongly advocate that the primary care clinician establish a protocol when treating pediatric ADHD. As the first recommendation indicates, the clinician must recognize that ADHD is a chronic condition. This understanding coupled with a research-based protocol for treatment will hopefully lead to strategies that directly target not only the child's behavior, but also the parenting practices and environmental conditions that maintain the behavior. This may mean prescribing a combination of treatment approaches. Clinicians who are knowledgeable about ADHD and its treatment options will understand that although there is substantial empirical support for stimulant medication treatment, medication therapy alone produces temporary alleviation of some of the symptoms and therefore does not provide a "cure" for the problem. In addition, stimulant medication may present some adverse side effects such as anxiety, tics, and eating and/or sleeping disturbances (Jeffries, 1995).

Behavior therapy, although traditionally less popular among physicians, also has significant empirical support (Anastopolous, Shelton, DuPaul, & Guevremont, 1993; Fehlings, Roberts, Humphries, & Dawe, 1991) though its effects also tend to decrease greatly after treatment is stopped (Strayhorn & Weidman, 1991). One large multicenter controlled-trail comparing stimulant medication to behavior therapy found that stimulants yielded greater improvements than behavior therapy, while behavior therapy showed improvements that were comparable to the control group, which consisted of treatment as usual in the community (MTA Cooperative Group, 1999). However, it has been noted that of the six treatment sites, three found highly positive treatment effects for behavior

therapy, while three sites found negative effects for behavior therapy (Swanson, Kraemer, & Hinshaw, 2001). This suggested that therapist training or skill level likely varied significantly across sites and that skilled behavior therapists are often successful in bringing about significant change for their ADHD clientele. Another important finding in the MTA study was that the combination of behavioral therapy and medication produced higher parent and teacher satisfaction ratings than medication alone, and achieved similar results in reducing ADHD symptoms as compared to medication alone, while requiring a significantly lower average dose of medication, thus minimizing risk of side effects (MTA Cooperative Group). Behavior therapy is often an effective treatment for ADHD, alone or in combination with stimulant medication, and physicians should be aware of this useful treatment option.

Finally, primary care clinicians should be prepared to provide accurate information about the disorder, coordinate efforts with other professionals as well as parents, and help the family target specific treatment outcomes. The goals of treatment should aim to maximize the student's academic, interpersonal, and overall adaptive functioning at home and in school. Because there is not one specific treatment plan that will work for all children with ADHD, the clinician must design a plan to meet the needs of each child/family along with a plan to monitor progress. Failure to improve outcomes with a specified treatment plan may reflect a lack of understanding of the child's needs or problems, inappropriate selection or application of treatment strategies, or both. In these cases, the clinician should reevaluate the case to determine what went wrong (or may have been missed) and then adjust the program based on the reconsideration. If a clinician stresses that he/she is committed to helping the family achieve specific

outcomes and is willing to adjust treatment if necessary, the family will be more likely to adhere to the treatment plan and consult with the clinician when concerns arise. This type of collaborative relationship should be pursued in the school setting as well to maintain treatment integrity and foster generalization to all settings.

In summary, the AAP practice guidelines were designed to clarify and promote "best practices" in conducting ADHD evaluations using the latest (DSM-IV) empirically supported criteria as well as the utilization of efficacious treatments for ADHD. The recommendations for both sets of guidelines were based on empirical findings and analyses by extensive peer review committees within the AAP as well as outside organizations (AAP, 2000, 2001). Although they are useful in promoting knowledge and defining the primary care physicians' roles in ADHD management, the guidelines do not really provide new information about ADHD; they simply summarize protocols for implementing "best practices" in evaluating and treating children with ADHD.

Physicians Who Evaluate and Treat ADHD

The AAP (2000, 2001) practice guidelines are certainly a step in the right direction to facilitate the development of in-depth knowledge about ADHD among pediatricians. Although published by the AAP, these guidelines will hopefully reach all types of primary care physicians that work with children. Studies have indicated that children with attention and behavior problems are more likely to be treated by a primary care provider than by a mental health professional (Bussing et al., 1998; Zarin et al., 1998). Therefore, knowledge about ADHD among all primary care physicians who treat the pediatric population is essential to the successful management of attention and

behavior problems that frequently arise in practice. As mentioned previously, accurate knowledge will also aid in differential diagnosis and evaluation of comorbid conditions in children who present with a variety of psychological and/or behavioral concerns.

Studies cited by Garralda, Bowman, and Mandalia (1999) indicated that nearly one in four children who visit a primary care physician have a psychiatric disorder. Regarding ADHD specifically, Brown and colleagues (2001) indicated that prevalence rates of ADHD among children coming to primary care providers were similar to prevalence rates of ADHD found in epidemiological studies of the general population (between 2-8%). Unless a psychologist happens to be working in or affiliated with a primary care setting, children with ADHD-related concerns will likely be evaluated and treated by a medical professional rather than a mental health practitioner (Wolraich et al., 1990). Among children who are seen by a medical professional for ADHD-related concerns, primary care providers (pediatricians, general/family practice, adolescent medicine, etc.) will treat the majority (approximately 75%) of them (Zarin et al., 1998). Similarly, Bussing and colleagues (1998) reported that 75% of special education students receiving treatment for ADHD were treated by a primary care provider.

Based on results from the aforementioned studies, one can conclude that primary care providers are the most likely candidates for managing ADHD in the pediatric population. What about the children who are not treated by a primary care provider? It is estimated that only 12% of children with ADHD who seek help from a medical professional are treated by psychiatrists (Zarin et al., 1998). Children treated by psychiatrists tend to be those who are the most severely impaired, suggesting that most "run of the mill" ADHD cases are treated by primary care providers (Stein & Orlando,

2001). A study analyzing behavioral health care claim data indicated that approximately 64% of patients receiving "mental health" care for ADHD were treated by a therapist alone or a therapist in conjunction with a psychiatrist (Stein & Orlando). However, because this study was specifically looking at treatment claims within a behavioral health/mental health care plan and other studies have indicated that approximately 75% of pediatric ADHD cases are managed by primary care physicians (Zarin et al.) one can infer that the percentage of patients receiving some type of treatment from nonmedical providers (e.g., therapists or psychologists) in the general population is much lower than figures reported by Stein and Orlando. As a result, it is likely that most of the children receiving treatment for ADHD have never had a complete psychological or psychiatric evaluation (Wolraich et al., 1990).

The lack of use of formal, objective assessment procedures is common among physicians. Historically, these practices/assessment procedures have not been a part of their medical or residency training. A national survey revealed that physicians typically rely on their impressions of a child based on parent report in conjunction with observations regarding the child's behavior during the office visit (Copeland et al., 1987). They often compare those impressions to general descriptions of hyperactivity and attention deficits from the pediatric literature and then draw conclusions (Copeland et al.). This process is quite different than attempting to objectively evaluate whether a child meets *DSM-IV* criteria for the disorder and may result in different diagnoses and treatment strategies than those produced by clinicians who utilize the DSM diagnostic approach. A more recent study also found that primary care physicians frequently fail to

systematically adhere to *DSM-IV* criteria when assessing ADHD (Chan, Hopkins, Perrin, Herrerias, & Homer, 2005).

Not surprisingly, results from Copeland and colleagues' (1987) study also revealed that physicians trained prior to 1970 reported practices that were significantly different from those trained after 1970. The less recently trained physicians were found to rely more frequently on the child's behavior in the office when making diagnoses, using response to medication as part of the assessment, and more likely to use medication therapy for the treatment of ADHD (Copeland et al.). The physicians trained after 1970 reported being more reluctant to prescribe medications for preschoolers, rely more heavily on psychoeducational reports in diagnostic decisions, and were more likely to recommend behavioral treatments than physicians trained prior to 1970 (Bennett & Sherman, 1983; Copeland et al.). However, because these studies were published prior to the publication of the DSM-IV and the dissemination of AAP's practice guidelines, it is difficult to infer what physicians are currently doing with regard to ADHD practices.

An earlier survey of clinical practices regarding the treatment of pediatric ADHD symptoms reported that 94% of all primary care pediatricians versus 75% of all family practice physicians performed a neurological examination for "soft" neurological signs and 86% of pediatricians versus 74% of family practice physicians referred to a psychologist for psychometric testing (Bennett & Sherman, 1983). Although family practice physicians utilized these procedures less often than pediatricians, they were more likely to refer the child to a neurologist and utilize electroencephalograms (EEGs) than pediatricians (Bennett & Sherman). According to that study, incorporating an assessment of "soft" neurologic signs when evaluating ADHD was found to be more

likely among the younger physicians than those trained prior to 1960 (Bennett & Sherman).

Regarding other practice differences between pediatricians and family practice physicians, Wolraich and colleagues (1990) found that, in general, family practitioners take less time in their evaluations than do pediatricians and are less likely to incorporate data from observations in home and school environments than pediatricians. A study of family practitioners in Missouri indicated that information from teachers was becoming a key component of the initial and ongoing assessment process for ADHD (Eppright, Bradley, Vogel, & Williamson, 1998). Results from more recent studies indicated that obtaining input from teachers and using rating scales are typical evaluation practices and now physicians do not typically advocate for analysis of "soft" neurological signs or EEGs (Eppright et al., 1998; Moser & Kallail, 1995). However, given the lack of studies conducted after the publication of the *DSM-IV* and the AAP guidelines, further research is needed to determine national trends in pediatricians' and family practice physicians' modern assessment practices.

Knowledge About ADHD

Although the diagnostic criteria for ADHD are clearly laid out in the *DSM-IV* and the aforementioned clinical practice guidelines have been published, it is uncertain how well practitioners who assess and treat children with ADHD abide by these criteria/ guidelines. It seems that first and foremost, to be proficient in assessing for the disorder and distinguishing it from comorbid disorders, a strong working knowledge of the diagnostic criteria should be in place. This knowledge, combined with other information

about the prevalence, common behavioral manifestations of ADHD, situations that worsen symptoms, and so forth, should facilitate better assessment and management of the disorder than if knowledge about ADHD is minimal.

A few studies have been conducted regarding knowledge of ADHD. These studies conducted with teachers, parents, and physicians have attempted to identify various trends related to ADHD knowledge. Among teachers, knowledge of ADHD was found to be weak regarding treatment strategies, the history, myths, and general facts about ADHD, while maintaining accuracy regarding its symptoms (Barbaresi & Olsen, 1998; Bekle, 2004; Brook, Watemburg, & Geva, 2000; Jerome, Washington, Laine, & Segal, 1999; Scuitto et al., 2000). Parental ADHD knowledge has been documented in numerous studies, although the focus is typically on knowledge of stimulant medication or how knowledge levels relate to treatment acceptance/adherence or other variables rather than describing trends in the knowledge itself (Corkum, Rimer, & Schachar, 1999; dosReis et al., 2003; Harrison & Sofronoff, 2002; McNeal, Roberts, & Barone, 2000; Weinberg, 1999).

Although the existing data regarding ADHD knowledge in teachers and parents is somewhat limited, a report on the empirical examination of physicians' knowledge of the disorder itself is virtually nonexistent. Only two studies related to physician's ADHD knowledge could be found. The first was a national survey conducted by Kwasman and colleagues (1995) that claimed to study pediatricians' knowledge and attitudes regarding diagnosis and treatment of ADHD. A sample of pediatricians from the AAP were asked to report on their attitudes toward treating patients with ADHD, their treatment practices, their knowledge of how medication works, and the challenges they face when treating

patients with ADHD. Results reported by Kwasman and colleagues included the following statistics: 18.7% of respondents were likely to refer children with ADHD to a psychiatrist, psychologist, educational therapist or related discipline; 77.2% attempted to obtain a psychoeducational report from the school; and 30% obtained psychoeducational testing results prior to starting medication. In addition, data were reported related to the type of medication prescribed, enjoyment of treating patients with ADHD, and various other questions regarding attitudes, patient interaction styles, and so forth. The "knowledge" portion of the survey was very limited; the authors only reported collecting data on knowledge related to methylphenidate as well as "knowledge" of common child and parental misperceptions about ADHD. This study did not examine knowledge of diagnostic criteria, disorder subtypes, typical manifestations of symptoms, treatment efficacies, outcomes of having ADHD, or prevalence rates--all of which are important elements in understanding the disorder.

The other study found that attempted to measure physicians' knowledge of ADHD was conducted by a research group in Canada. Ward and colleagues (1999) designed a workshop intended to educate family practice physicians about ADHD and how it should be managed. Upon registering for the course, family practice physicians were given a knowledge survey that covered diagnosis, prevalence, and prognosis. The purpose of the study was to measure how much knowledge improved and ADHD management practices changed 6 months after participating in the workshop. On their survey, higher scores were indicative of greater ADHD knowledge. The survey consisted of 42 items, with the total score indicating the number of items that were answered correctly. Although Ward and colleagues reported that the mean posttest knowledge

score of 32.6 (77.62%) was significantly higher than the mean pretest knowledge score of 27.1 (64.52%), no details were provided by the authors about the trends in physicians' pretest or posttest knowledge. However, Ward and colleagues did indicate that physicians' ADHD management practices (as measured by self-report questionnaires asking about their practices and levels of involvement with patients) improved after receiving the workshop training.

Despite the fact that the studies described previously have some limitations in terms of instrumentation and the types of knowledge assessed, there is evidence that having knowledge about ADHD is related to attitudes toward issues surrounding ADHD as well as practices for assessment and management of the disorder. Copeland and colleagues (1987) studied pediatricians' reported practices in the assessment and treatment of ADHD and concluded that when treating patients presenting with ADHD-related concerns, physicians rely heavily on information available in the pediatric literature in conjunction with parent and teacher reports about the symptoms. Physicians who utilize empirically supported pediatric literature such as the AAP practice guidelines will hopefully have better knowledge than those who do not keep up with such literature. In turn, a greater understanding/knowledge level of the disorder should lead to better utilization of empirically supported assessment and treatment practices. Employing these practices translates into offering the best available care for the patients and will hopefully result in improved outcomes as a result of the care they receive. Therefore, a concerted effort should be made to ensure a high level of ADHD knowledge among physicians. This effort will be most efficient and effective if information is explicitly presented to medical students, residents, or physicians in a manner that targets empirically based

"knowledge deficiencies" among certain types of physicians and for certain areas of knowledge. Furthermore, physicians may improve their ADHD knowledge more if the material provided is more accessible, succinct, and relevant to their practice than a mere recommendation to review lengthy practice guidelines or relying on physicians themselves to look up empirical information on the topic.

Summary

Given that children with behavioral problems are most likely to be seen initially by their pediatrician or family practice physician, it is important to know how much knowledge these medical professionals have about ADHD. As previously outlined, research on physicians' knowledge of ADHD is very limited. Once an exploration of their existing knowledge level has been conducted, conclusions can be drawn about knowledge and its relationship to ADHD management practices. Recommendations for improvements in medical training or continuing education can also be made based on the findings. This study was designed to examine and compare pediatricians' and family practice physicians' knowledge about ADHD.

The following questions were addressed in this study: (a) Is there a difference in knowledge of ADHD between pediatricians and family practice physicians? (b) What demographic/background variables are related to level of knowledge? (c) Which treatments for ADHD do physicians believe are acceptable? (d) Which treatments do physicians report most frequently using/recommending? and (e) What assessment practices do physicians report utilizing/recommending?

It was hypothesized that pediatricians would have more accurate and complete knowledge about ADHD than family practice physicians. It was also predicted that physicians with the most knowledge would be physicians who regularly see the most clients with ADHD-related concerns.

CHAPTER III

METHOD

Participants

Participants were recruited through two professional practice organizations: The American Academy of Pediatrics (AAP) and the American Academy of Family Physicians (AAFP). These organizations were selected because they were thought to best represent each type of physician of interest (i.e., pediatricians and family physicians) and provide an accessible means to collect a nationwide sample. There were a total of 269 participants, 136 of whom were members of the AAFP and 133 of whom were members of the AAP. The sample was predominantly Caucasian and most respondents were practicing in urban areas. However, there were proportionately more AAFP members practicing in rural settings compared to AAP members. The number of male and female respondents were approximately equivalent. A more complete description of demographic characteristics of the participants is presented in Tables 1 and 2. Pediatricians reported evaluating significantly more clients with ADHD on a monthly basis than did family physicians and also reported having a higher ADHD caseload, on average, in comparison with family physicians.

There were three physicians, all AAP members, who reported having greater than 1000 ADHD cases in their current practice. These three data points upwardly skewed the mean for the AAP group significantly. Prior to trimming the three outliers, the AAP mean for ADHD cases in current practice was 232.02 with a standard deviation of 1083.75 cases. The data as reported in Table 2 after the trimming of outliers represents

Table 1

Sample Demographic Characteristics: Frequencies

Demographic variable	AAFP (n = *136)* *N* (%)	AAP (*n* = 133) *N* (%)	Total (*n* = 269) *N* (%)
Sex			
Male	75 (56.4)	63 (47.4)	138 (51.3)
Female	58 (43.6)	70 (52.6)	128 (47.6)
Type of practice			
Group practice	71 (53.0)	66 (49.6)	137 (51.3)
Medical school	7 (5.2)	17 (12.8)	24 (9.0)
Multi-specialty	8 (6.0)	8 (6.0)	16 (6.0)
Other	23 (17.2)	18 (13.5)	41 (15.4)
Private practice	24 (17.9)	21 (15.8)	45 (16.9)
Retired	1 (0.7)	3 (2.3)	4 (1.5)
Location of practice			
Urban	70 (53.4)	97 (74.6)	167 (64.0)
Rural	61 (46.6)	32 (24.6)	93 (35.6)
Urban and rural	0 (0.0)	1 (0.8)	1 (0.4)
Race			
Caucasian	123 (91.8)	113 (85.0)	236 (88.4)
Asian	3 (2.2)	12 (9.0)	15 (5.6)
Latino/a	4 (3.0)	3 (2.3)	7 (2.6)
African-American	1 (0.7)	4 (3.0)	5 (1.9)
Native American	0 (0.0)	1 (0.8)	1 (0.4)
Other	3 (2.2)	0 (0.0)	3 (1.1)

the overall AAP dataset much more closely than the original dataset which included outliers.

Table 2

Sample Demographic Characteristics: Means

Variable	*N*	Mean (*SD*)	*t*	*p*	*d*
Years in practice					
AAP	131	16.24 (11.44)	1.39	.17	.17
AAFP	134	18.04 (9.52)			
Total	265	17.15 (10.53)			
Age					
AAP	130	46.98 (11.70)	1.26	.21	.16
AAFP	134	48.62 (9.33)			
Total	264	47.58 (10.61)			
New ADHD evaluations per month					
AAP	132	3.86 (6.38)	4.41	<.001	.63
AAFP	134	1.33 (1.70)			
Total	266	2.58 (4.81)			
ADHD cases in current practice					
AAP	114	80.25 (126.53)	4.44	<.001	.66
AAFP	133	24.56 (47.39)			
Total	247	50.26 (96.61)			

Measures

The primary measure used was the Knowledge of Attention Deficit Disorders Scale--Revised (KADDS-R), an instrument that was designed to measure specific areas of knowledge about ADHD (Sciutto et al., 2000; Sciutto, Nolfi, & Blulm, 2004). This measure has been used previously to measure teachers' knowledge of ADHD and has some preliminary psychometric data to support its use (Sciutto et al., 2000, 2004). Few ADHD knowledge measures have been utilized in prior research, and most of them have

been used in only one study. In addition, some ADHD knowledge measures are quite brief (e.g., Brook et al., 2000; Lian, Ho, Yeo, & Ho, 2003; Walter, Gouze, & Lim, 2006), have no psychometric data (e.g., Kwasman, Tinsley, & Thompson, 2004), or have only been used on samples that are likely quite different than Americans (Ghanizadeh, in press; Ghanizadeh, Bahredar, & Moeini, 2006) The KADDS-R was selected due to its relatively broad ADHD content coverage, its specificity to ADHD, its acceptable psychometric properties, and its use in multiple prior investigations.

The KADDS-R is a 29-item rating scale and uses a true (T), false (F), or don't know (DK) response format. The KADDS-R was designed to measure knowledge in 4 areas/subscales: (a) associated features of ADHD, (b) *DSM-IV* diagnosis, (c) negative indicators, and (d) treatment of ADHD (Sciutto et al., 2004). The KADDS-R total score is generated by summing the number of correct responses. This instrument was tested on 200 elementary school teachers from northeastern Ohio. Internal consistency of the KADDS-R was found to be .80. The KADDS-R total score was found to significantly correlate with the number of ADHD-related articles read by teachers ($r = .369$; $p < .001$) and the number of ADHD children taught ($r = .305$; $p < .001$). Sciutto and colleagues reported evidence for discriminant validity based on the participants' years of teaching experience ($r = .120$; $p = .089$) and the teacher's age ($r = .114$; $p = .107$). However, this reported evidence may be irrelevant because it is unclear as to whether knowledge of ADHD should correlate with years of teaching experience or age. Therefore, discriminant validity for the KADDS-R has not been clearly established. No psychometric information was provided about the subscales; therefore, the subscales were not utilized in the present analysis.

Although the technical adequacy of the KADDS was originally evaluated with teachers, its use with physicians was considered to be appropriate because it is a simple instrument with true/false questions that covers a variety of facts regarding ADHD and its impact on school-aged children. The questions on the KADDS-R are not specific to teachers' knowledge or experiences; the items cover symptoms and associated features of ADHD, some medical and medication information, as well as the impact of ADHD on children in the classroom. Therefore, the questions are likely appropriate for use with any professional that regularly encounters children with ADHD. The internal consistency of the KADDS-R for the present study with physicians was less than optimal; Cronbach's alpha was .636. However, the internal consistency of the subscales was extremely low; they measured as follows: negative indicators (.599), associated features (.399), *DSM-IV* (.188), and treatment (.345). As such, only the total KADDS-R score was deemed appropriate for use when analyzing the results.

Additional demographic and practice questions (Appendix B) were attached to the KADDS-R that was sent to the physicians. The questionnaire included items regarding the acceptability of various treatments for ADHD, evaluation practices, sources of training/information on ADHD, and prescribing trends. It also included questions that asked basic demographic information such as gender, age, practice location, number of ongoing ADHD cases, and so forth. This information was important to collect in conjunction with the KADDS-R responses to allow for further analyses of trends in physicians' practices and how various professional experiences relate to knowledge of the disorder.

Procedure

A randomized set of 1,000 mailing labels were obtained from both the AAP and AAFP. The samples were requested according to the following criteria: must be currently practicing in the U.S., no residents, no students, and individuals must be engaged in direct practice rather than in academic or administrative positions. The desired final sample size was approximately 200 (100 of each physician type). Cohen (1992) has suggested that experiments should strive to obtain a power of .80. Using Cohen's power table, a two-tailed test with the alpha set at .05 would require between 64 and 99 participants per group for an effect size in the .4-.5 range. Cohen also noted that the researcher should obtain enough participants per group to detect a medium effect size (approximately .5) if the effect size is unknown.

Mailings were sent to 1,000 members from the AAFP and 982 members from the AAP. Eighteen participant labels from the AAP were excluded due to their titles being something other than M.D. or D.O. (e.g., CNP or DDS). Nine surveys mailed to AAP members were returned due to incorrect address. Thus, the total number of surveys received by AAP members appears to be 973. Each mailing included a cover letter (Appendix A), the KADDS-R with the demographic/practice survey (Appendix B), and a postage-paid return envelope. The research materials were mailed to the AAFP members first and were sent to the AAP members approximately 1 month later. All recipients were asked to fill out the survey and return the forms in the postage-paid envelope. The cover letter informed recipients that their participation was entirely

voluntary, and included contact information for the researchers. The data were collected for approximately 3 months following the initial mailing.

The total number of surveys that were returned from the AAFP was 136 and all were useable for a return rate of 13.6%. The total number of surveys returned from the AAP was 139 with 6 of them returned blank, for a total return rate 14.26%, and a usable return rate 13.64%.

CHAPTER IV

RESULTS

The first research question examined whether pediatricians and family physicians differed in their knowledge of ADHD. An independent samples *t* test was utilized to answer this question, and Cohen's *d* was used to examine the magnitude of difference between physician types. Pediatricians scored significantly higher than family physicians on the KADDS-R indicating they were more knowledgeable about ADHD. The effect size for this comparison was moderate (see Table 3). AAP members correctly answered 81.6% of questions, while AAFP members answered 74.6% of KADDS-R items accurately.

The second research question examined which demographic/background variables were related to ADHD knowledge. For categorical demographic variables, *t* tests were utilized to examine differences in ADHD knowledge based on these variables. To examine the magnitude of difference between groups, Cohen's *d* was used. As can be seen in Table 3, physicians who had received specific ADHD training as well as those who completed a behavioral pediatric rotation scored significantly higher on the KADDS-R, indicating greater knowledge regarding ADHD, compared to physicians who had not completed specific training and had not had a behavioral pediatric rotation. The effect sizes for both of these comparisons were moderate. The location of practice (urban or rural) showed no association with KADDS-R total score. Correlations were used to analyze the relationship between continuous demographic variables and ADHD knowledge. The correlation between years in practice and KADDS-R total score was not

Table 3

Training/Background Variables and Total KADDS-R Scores

Background variable	*N*	Mean (*SD*)	*t*	*p*	*d*
Professional affiliation					
AAP	132	23.65 (2.72)	5.87	< .001	.72
AAFP	132	21.62 (2.90)			
Received ADHD training					
Yes	138	23.52 (2.48)	5.20	< .001	.66
No	124	21.68 (3.17)			
Completed behavioral pediatric rotation					
Yes	81	23.72 (2.56)	4.00	< .001	.54
No	181	22.17 (3.02)			
Practice location			0.16		
Urban	165	22.50 (3.12)		.88	.02
Rural	92	22.57 (2.94)			

significant, nor was the correlation between number of ADHD cases currently seen in the physician's practice and KADDS-R score. There was a small but statistically significant correlation between the number of new ADHD evaluations per month conducted by a physician and total KADDS-R score, with those who conduct more evaluations having greater knowledge of ADHD. Results from the correlational analyses are summarized in Table 4.

The third research question addressed which treatments for ADHD were endorsed as acceptable by physicians. Additionally, differences between pediatricians and family physicians were evaluated. Only physicians who indicated they saw patients with ADHD

Table 4

Correlation Between Demographic Variables and Total KADDS-R Scores

Variables	1	2	3	4
1. Years in practice	1.00			
2. New ADHD Evaluations per month	.-.03	1.00		
3. Number of ADHD cases in practice	-.06	.10	1.00	
4. KADDS-R Total	-.05	.24*	.03	1.00

* indicates $p < .05$.

responded to these questions. As can be seen in Table 5, stimulant medication, parent training, and atomoxetine were most frequently endorsed as acceptable, with school accommodations and individual counseling endorsed somewhat less frequently, and biofeedback, dietary changes, and homeopathic remedies endorsed infrequently. Chi-square analyses were used to examine differences between physician types regarding the acceptability of various treatments. Pediatricians endorsed school accommodations as acceptable significantly more frequently than family physicians, while family physicians endorsed dietary changes as acceptable significantly more often than did pediatricians. No other significant differences were noted.

The fourth research question examined which interventions are frequently utilized in treating ADHD. Physicians were asked to indicate the percentage of their patients who receive stimulant medication and the percentage of their patients to whom they recommend behavioral treatments. Independent samples *t* tests were utilized to examine

Table 5

Endorsement of Various Treatment Types as Acceptable[a]

Treatment type	AAFP $n = 113$ N (%)	AAP $n = 110$ N (%)	χ^2	p
Stimulant medication				
Yes	110 (97.3)	110 (100.0)	2.96	.09
No	3 (2.7)	0 (0.0)		
Parent training				
Yes	104 (92.0)	101 (91.8)	.00	.95
No	9 (8.0)	9 (8.2)		
Atomoxetine				
Yes	98 (86.7)	93 (84.5)	.22	.64
No	15 (13.3)	17 (15.5)		
Individual counseling				
Yes	82 (72.6)	83 (75.5)	.24	.62
No	31 (27.4)	27 (24.5)		
Biofeedback				
Yes	12 (10.6)	15 (13.6)	.48	.49
No	101 (89.4)	95 (86.4)		
School accommodations				
Yes	83 (73.5)	100 (90.9)	11.54	.001
No	30 (26.5)	10 (9.1)		
Dietary changes				
Yes	23 (20.4)	8 (7.3)	7.97	.005
No	90 (79.6)	102 (92.7)		
Homoepathic remedies				
Yes	9 (8.0)	8 (7.3)	.04	.85
No	104 (92.0)	102 (92.7)		

[a]Refers to number and percentage of physicians endorsing a particular treatment as acceptable for ADHD.

potential differences between physician types regarding these treatments. Pediatricians indicated that a greater percentage of their child/adolescent ADHD patients were prescribed stimulant medication compared to patients of family physicians (see Table 6). There was no statistically significant difference between physician types regarding the percentage of ADHD patients who were advised to receive behavioral treatments.

To provide more specific information regarding which medications were most frequently utilized (subsumed under the fourth research question), physicians were asked to write in responses to the question, "Which medication(s) do you most commonly prescribe for ADHD?" Responses were grouped into three categories: dextroamphetamine (Adderall, dextroamphetamine); methylphenidate (Concerta, Daytrana, Focalin, Metadate, methylphenidate, and Ritalin); or atmoxetine (Strattera). Chi-square analyses revealed several differences between physician types regarding commonly prescribed ADHD medications. Pediatricians were significantly more likely

Table 6

Percentage of Patients Receiving or Recommended to Receive Various Treatments

Background variable	*N*	Mean (*SD*)	*t*	*p*	*d*
% receiving stimulants					
AAP	107	86.69 (14.55)	3.26	.001	.45
AAFP	111	78.33 (22.64)			
% recommended behavioral treatments					
AAP	107	76.01 (35.62)	1.46	.145	.20
AAFP	112	82.73 (32.29)			

to commonly prescribe dextroamphetamine for ADHD, and were significantly less likely to prescribe atomoxetine compared to family physicians (see Table 7). There was no difference between physician types regarding the frequency of prescribing methylphenidate.

The final research question related to assessment practices of physicians. Physicians were asked to indicate their usual course of action when assessing children with ADHD-related concerns. As displayed in Table 8, results indicate that while both types of physicians frequently evaluated children themselves, pediatricians were significantly more likely to do so than were family practice physicians. Family physicians were significantly more likely to refer cases to a psychologist/counselor and to refer cases to an ADHD specialty clinic than were pediatricians. There were no significant differences between physician types regarding the likelihood of referring cases to a specialty physician or in the rate of referring ADHD cases to another primary care physician.

Table 7

Commonly Prescribed Medications for ADHD

Treatment	AAFP $n = 108$ N (%)	AAP $n = 107$ N (%)	χ^2	p
Methylphenidate	93 (85.8)	97 (90.7)	1.08	.299
Dextroamphetamine	59 (54.6)	83 (77.6)	12.61	< .001
Atomoxetine	58 (53.7)	24 (22.4)	22.28	< .001

Note. Numbers in table reflect number and percentages of respondents who reported this was one of the three most common medications they prescribe for ADHD. Medications were grouped by class.

Table 8

Usual Course of Action When Evaluating ADHD Cases[a]

Assessment type	AAFP $n = 113$ N (%)	AAP $n = 110$ N (%)	χ^2	p
Assess by self				
Yes	82 (72.6)	100 (90.9)	12.49	<.001
No	31 (27.4)	10 (9.1)		
Refer to psychologist or counselor				
Yes	66 (58.4)	43 (39.1)	8.32	.004
No	47 (41.6)	67 (60.9)		
Refer to specialty physician				
Yes	35 (31.0)	34 (30.9)	.00	.99
No	78 (69.0)	76 (69.1)		
Refer to ADHD specialty clinic				
Yes	22 (19.5)	11 (10.0)	3.96	.05
No	91 (80.5)	99 (90.0)		
Refer to primary care physician				
Yes	4 (3.5)	1 (0.9)	1.76	.19
No	109 (96.5)	109 (99.1)		

Physicians were asked about the methods they typically utilize when assessing for ADHD. As shown in Table 9, both family physicians and pediatricians indicated that they frequently utilized parent and teacher rating scales in their assessments. Medical/family history, and psychoeducational testing were also endorsed frequently, and school input/records were also commonly endorsed. Medication response was used less frequently, while continuous performance tests and quantitative electroencephalographs were very infrequently used as ADHD assessment tools.

Table 9

Methods Typically Utilized When Assessing for ADHD

Assessment type	AAFP $n = 113$ N (%)	AAP $n = 110$ N (%)	χ^2	p
Teacher rating scales				
Yes	102 (90.3)	105 (95.5)	2.25	0.13
No	11 (9.7)	5 (4.5)		
Parent rating scales				
Yes	100 (88.5)	105 (95.5)	3.64	.06
No	13 (11.5)	5 (4.5)		
Medical/family history				
Yes	85 (75.2)	88 (88.0)	.732	.39
No	28 (24.8)	22 (22.0)		
Other school input/records				
Yes	59 (52.2)	75 (68.2)	5.93	.02
No	54 (47.8)	35 (31.8)		
Psychoeducational testing				
Yes	67 (59.3)	66 (60.0)	.12	.91
No	46 (40.7)	44 (40.0)		
Physical exam/lab tests				
Yes	58 (51.3)	53 (48.2)	.22	.64
No	55 (48.7)	57 (51.8)		
Medication response				
Yes	44 (38.9)	42 (13.6)	.13	.91
No	69 (61.1)	68 (86.4)		
Continuous performance tasks				
Yes				
No	4 (3.5)	6 (5.5)	.48	.49
	109 (96.5)	104 (94.5)		
Quantitative EEG				
Yes	0 (0.0)	1 (0.9)	1.03	.31
No	113 (100.0)	109 (99.1)		

Pediatricians were significantly more likely to report using information from school input and records than were family physicians. There were no other significant differences between physician types regarding methods commonly used to assess for ADHD.

CHAPTER V

DISCUSSION

Background

The current study was conducted to examine trends in physician knowledge regarding ADHD. Because primary care physicians often diagnose and treat ADHD in children, it is important that they have up-to-date knowledge of effective assessment and treatment practices. To date, studies on knowledge of ADHD have been limited to teachers and parents. This study of ADHD knowledge among pediatricians and family practice physicians was an attempt to quantify and compare the knowledge of professionals in this field and make future suggestions for training.

Summary of Results

ADHD is frequently treated in primary care settings yet there is little information available regarding the degree of ADHD knowledge possessed by primary care physicians. Thus, the primary focus of this study was to evaluate ADHD knowledge and practices in a sample of pediatricians and family practice physicians. This is an important topic to study because if there is a difference in ADHD knowledge and practices between pediatricians and family practice physicians, there may also be a difference in the quality of care received by patients with ADHD who are being treated by each type of physician. The present findings suggest that pediatricians' level of knowledge regarding ADHD is greater than family practice physicians' knowledge. The difference was of a moderate effect size. It is not surprising that pediatricians exhibited greater knowledge, as they

work nearly exclusively with children, and their residency experiences were focused on children, while family physicians' practices and training experiences exposed them to a more heterogeneous population in terms of age. If greater ADHD knowledge is related to improved patient outcomes, it is possible that patients with ADHD who are under the care of pediatricians may have better outcomes in comparison with patients who see family physicians.

Demographic variables of the responding physicians were also examined as potential predictors of ADHD knowledge. Physicians who had received specific ADHD training were more knowledgeable than those who had not received such training. The same trend was found with physicians who had completed a behavioral pediatric rotation during their residency. The only other variable that was found to have a small, but statistically significant correlation with overall ADHD knowledge was the number of new ADHD evaluations per month. The number of years in practice as well as the total number of ADHD cases in physicians' practices were not significantly correlated with KADDS-R total scores. Therefore, training specific to ADHD appears related to higher levels of knowledge, which may positively impact the patient care delivered by physicians who receive such training. This finding is particularly relevant to medical training programs, suggesting that requiring students and interns to be involved in seminars, workshops and/or practical experiences that are specifically related to patients with ADHD will allow them to be more knowledgeable about ADHD.

Acceptability of treatments as well as the frequency of use of certain treatments were also evaluated. In general, physicians who treated patients with ADHD believed stimulant medications, parent training, atomoxetine, individual counseling, and school

accommodations were acceptable forms of treatment, with stimulant medications and parent training being endorsed by more than 90% of the respondents. Results from this survey suggest that the most commonly endorsed treatments (stimulant medications and parent training) are also the treatments that have the most empirical support (Fehlings et al., 1991; MTA Cooperative Group, 1999), which is an encouraging finding. In addition, physicians very commonly (over 90% of the time) reported using teacher and parent rating scales as part of their ADHD assessments, which is consistent with best practices for assessing for ADHD (American Association of Pediatrics, 2000). When physicians were specifically asked which medications they typically prescribed, the three types of medications most commonly identified were: dextroamphetamine, methylphenidate, and atomoxetine. Given that empirically supported therapies were endorsed as commonly used by both pediatricians and family practice physicians, this indicates that findings from clinical trials have been disseminated at least somewhat effectively into routine practice. This survey, however, did not examine dosage or length of treatment, so it is possible that ADHD patients are commonly receiving doses of behavioral treatment and/or pharmacotherapy that lack empirical support or that treatment is of an insufficient length to reduce ADHD symptoms effectively. Also, while the survey examined what physicians stated they did when assessing and treating ADHD cases, it did not examine the actual practice of physicians. Thus, there may be a social desirability bias, in that physicians may be aware that practice guidelines dictate the use of parent and teacher rating scales when assessing for ADHD, but they may not take the time to collect and interpret such rating scales in their actual clinical practice.

The final research question addressed assessment practices of physicians. It was found that physicians frequently assessed cases themselves, and reported the use of teacher and parent rating scales. Use of medical and family history was also frequently endorsed as part of the ADHD assessment process. Pediatricians were more significantly likely to assess cases themselves (i.e., to not refer cases for assessment) in comparison to family practice physicians. The survey did not assess which rating scales were utilized in ADHD assessment, so it is unclear if reliable and valid instruments are being utilized commonly or if lesser quality rating scales are used frequently.

It is also important to consider that the family practice physicians and pediatricians in this sample were significantly different in terms of some relevant background variables. On average, pediatricians performed significantly more ADHD assessments and had a higher number of ADHD cases in their practice compared to family physicians. It is unlikely that having a higher ADHD caseload was related to the higher level of ADHD knowledge demonstrated by AAP members, as ADHD knowledge was not significantly related to the number of ADHD cases seen in a physician's practice. However, there was a small, but significant correlation between the number of new ADHD evaluations performed monthly and ADHD knowledge, suggesting that some of the difference in knowledge between pediatricians and family physicians may be due to the number of ADHD evaluations performed rather than physician type per se. However, given the small correlation between the number of ADHD evaluations performed per month and ADHD knowledge, it appears that the number of ADHD evaluations does not account for all of the difference between physician types in terms of ADHD knowledge. Also, it is unclear if performing more ADHD assessments would lead to greater ADHD

knowledge, or if more knowledge would lead to a greater frequency of ADHD evaluations. Assessing the causality of such relationships was beyond the scope of the present study.

Although no previous studies have used the KADDS to evaluate physicians' knowledge of ADHD, a small number of prior studies have used the KADDS to examine ADHD knowledge of teachers and other educational professionals. One study, using a prior version of the KADDS, found that teachers answered 48% of questions correctly (Scuitto, Terjesen, & Frank, 2000). Another inquiry found that teachers answered the KADDS questions correctly 47% of the time, compared with 64% for school counselors and 81% for school psychologists (Herbert, Crittenden, & Dalrymple, 2004). AAP members in the present study answered 82% of the questions correctly and AAFP members answered 75% of questions accurately. Thus, physicians in the current investigation appeared to have significantly higher ADHD knowledge than teachers and school counselors. However, it is important to note that the because the KADDS-R is a revision of the KADDS, the relationship between the two measures is unknown, so scores from the present study cannot be directly compared to older studies.

Limitations

Survey research in and of itself always has limitations due to the nature of the sample collection. Because the mailing list was generated based on membership in a professional organization, individuals who belong to those organizations may systematically differ from practicing physicians who do not belong to such professional organizations. Perhaps members of the AAP and AAFP are more likely to be informed

by keeping up with current literature and attending workshops/conferences than practicing physicians who are not currently members of these professional organizations. Furthermore, because the targeted participants elected to participate by completing and returning the survey and the response rate was approximately 14%, the generalizability of these results is somewhat limited. Physicians who returned the survey may have been more interested in and knowledgeable about ADHD than those who chose not to respond. In addition, it is important to note that the KADDS-R was not specifically designed to assess the knowledge of physicians, so it is possible that this measure does not accurately tap the ADHD knowledge of such a population.

The psychometric properties of the KADDS-R utilized in the present study are somewhat weak. Although original studies using the KADDS found overall internal consistencies of .86 (Sciutto et al., 2000) and .81 (Bender, 1996, as cited in Sciutto et al., 2000) and a later study by Sciutto and colleagues in 2004 using the KADDS-R obtained an internal consistency of .80, the present study using the KADDS-R with physicians resulted in an internal consistency of .64. Such a low internal consistency indicates that the various KADDS-R items did not correlate highly with one another and thus may not all be measuring the same construct. This limitation raises concerns about the extent to which ADHD knowledge was measured by the instrument and indicates that the results should be interpreted with caution.

In addition, there is very little evidence of convergent validity with the KADDS-R. Because there is no "cutoff" score that relates to a qualitative description of total knowledge on the KADDS-R, it is unclear what scores would be considered a "strong" versus "poor" knowledge level of ADHD. While it is makes sense that physicians with

greater ADHD knowledge should help their patients with ADHD achieve more positive outcomes compared to patients of physicians with lesser knowledge, there is little data investigating the link between physician ADHD knowledge and patient outcomes. Thus, although several variables in the present study were related to greater physician ADHD knowledge, it is unclear if any of these variables are actually linked to improved patient outcomes.

Future Directions

The present study suggests that physicians who completed a behavioral pediatric residency rotation were more knowledgeable about ADHD than physicians who did not complete this type of rotation. Similarly, physicians who had received training specifically on ADHD, in the form of workshops, courses, and/or seminars were more knowledgeable than those who had not received such training.

If knowledge is linked to outcomes, what is the best way to disseminate information about ADHD and how do physicians best learn and apply this information? There are certainly numerous ways in which ADHD knowledge can be disseminated, as it is unclear what type of ADHD education leads to the greatest increase in knowledge. All practicing physicians need to complete continuing medical education (CME) regularly, and it appears that ADHD-focused CME may be helpful in advancing physician knowledge. There are many methods to deliver CME, including web-based education, journal supplements, grand rounds, speakers, and others. Research should investigate which of these methods is most effective at enhancing physician knowledge of ADHD.

In a similar vein, the present results suggest that completing a behavioral pediatric rotation during residency is effective at enhancing ADHD knowledge. In such rotations, residents likely receive didactic training regarding ADHD and are likely exposed to ADHD cases. The relative importance of exposure to didactics versus clinical experience in behavioral pediatric rotations is unexplored. Research may help to explain which components of such rotations are related to enhancing ADHD knowledge among residents.

It is important to note that the link between physician knowledge and patient outcomes remains unexplored. For example, pediatricians demonstrated significantly greater ADHD knowledge than family physicians, yet it is unknown if patients of pediatricians show greater benefit from treatment in comparison to patients of family physicians. Further study is needed to determine if greater knowledge is related to better outcomes for children with ADHD. Such a study is certainly practical. Physicians could complete baseline measures of ADHD knowledge, and their patients (and the patients' parents and teachers) could complete baseline measures of ADHD symptoms as well as follow-up measures at various times. The relationship between baseline ADHD knowledge and patient outcomes could then be examined, controlling for any number of confounding variables, such as baseline symptom severity, treatment setting, receipt of behavioral treatment, and so forth. Such a study could utilize a variety of practitioners, including psychiatrists, family care physicians, and pediatricians.

Assuming that physicians with greater ADHD knowledge deliver higher quality care to their patients with ADHD, it is unclear which elements of knowledge are most tightly linked to outcome. For example, is having the diagnostic criteria for ADHD

firmly committed to memory more important than being closely familiar with current treatment guidelines? Is a solid understanding of interpreting rating scales more strongly linked with patient outcome than understanding the latest ADHD clinical trial results for atomoxetine? There are many aspects of ADHD knowledge, and researchers have yet to determine which, if any, of these aspects are related to enhancing patient outcomes.

The present study found that a handful of background variables related to increased knowledge of ADHD. Education is a complex and multifaceted process, leaving much room for researchers to creatively examine which types of education are helpful in enhancing ADHD knowledge most efficiently. Future research may examine ADHD knowledge, but it seems of greater importance that research should investigate the potential link between ADHD knowledge and treatment outcomes, as research on knowledge is of relatively minor importance until the benefits of knowledge are more clearly determined.

REFERENCES

American Academy of Pediatrics. (2000). Clinical practice guideline: Diagnosis and evaluation of the child with Attention-Deficit/Hyperactivity Disorder. *Pediatrics, 105(5),* 1158-1170.

American Academy of Pediatrics. (2001). Clinical practice guideline: Treatment of the school-aged child with Attention-Deficit/Hyperactivity Disorder. *Pediatrics, 108(4)*, 1033-1044.

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., revised). Washington, DC: Author.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Anastopoulos, A. D., Shelton, T. L., DuPaul, G. J., & Guevremont, D. C. (1993). Parent training for attention-deficit hyperactivity disorder: Its impact on parent functioning. *Journal of Abnormal Child Psychology, 21*(5), 581-596.

Arnold, L. E. (1996). Sex differences in ADHD: Conference summary. *Journal of Abnormal Child Psychology, 24*(5), 555-569.

Barbaresi, W. J., & Olsen, R. D. (1998). An ADHD educational intervention for elementary schoolteachers: A pilot study. *Journal of Developmental & Behavioral Pediatrics, 19*(2), 94-100.

Barkley, R. A. (1998). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment* (2nd ed.). New York: Guilford Press.

Barkley, R. A., DuPaul, G. J., & McMurray, M. B. (1990). A comprehensive evaluation of attention deficit disorder with and without hyperactivity. *Journal of Consulting and Clinical Psychology, 58*, 775-789.

Bekle, B. (2004). Knowledge and attitudes about Attention-Deficit Hyperactivity Disorder (ADHD): A comparison between practicing teachers and undergraduate education students. *Journal of Attention Disorders, 7*, 151-161.

Bender, A. S. (1996). *Effects of active learning on student teachers' identifications and referrals of attention deficit hyperactivity disorder.* Unpublished doctoral dissertation. Hofstra University, Hempstead, NY.

Bennett, F. C., & Sherman, R. (1983). Management of childhood "hyperactivity" by primary care physicians. *Developmental and Behavioral Pediatrics, 4*(2), 88-93.

Bird, H. R., Canino, G., Rubio-Stipec, M., Gould, M. S., Ribera, J., Sesman, M., et al. (1988). Estimates of the prevalence of childhood maladjustment in a community survey in Puerto Rico. *Archives of General Psychiatry, 45,* 1120-1126.

Brook, U., Watemburg, N., & Geva, D. (2000). Attitude and knowledge of attention deficit hyperactivity disorder and learning disability among high school teachers. *Patient Education and Counseling, 40*, 247-252.

Brown, R. T., Freeman, W. S., Perrin, J. M., Stein, M. T., Amler, R. W., Feldman, H. M., et al., (2001). Prevalence and assessment of attention-deficit/hyperactivity disorder in primary care settings. *Pediatrics, 107*(3), 1-11.

Bussing, R., Zima, B. T., & Belin, T. R. (1998). Variations in ADHD treatment among special education students. *Journal of the American Academy of Child & Adolescent Psychiatry, 37*(9), 968-976.

Chan, E., Hopkins, M. R., Perrin, J. M., Herrerias, C., & Homer, C. J. (2005). Diagnostic practices for attention deficit hyperactivity disorder: A national survey of primary care physicians. *Ambulatory Pediatrics 5*(4), 201-208.

Clements, S. D., & Peters, J. E. (1962). Minimal brain dysfunction in the school-age child: Diagnosis and treatment. *Archives of General Psychiatry, 6(3)*, 185-197.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159.

Copeland, L., Wolraich, M., Lindgren, S., Milich, R., & Woolson, R. (1987). Pediatricians' reported practices in the assessment and treatment of attention deficit disorders. *Developmental and Behavioral Pediatrics, 8*(4), 191-197.

Corkum, P., Rimer, P., & Schachar, R. (1999). Parental knowledge of attention-deficit hyperactivity disorder and opinions of treatment options: Impact on enrollment and adherence to a 12-month treatment trial. *Canadian Journal of Psychiatry, 44*(10), 1043-1048.

Costello, E. J., Costello, A. J., Edelbrock, C., Burns, B.J., Dulcan, M. K., Brent, D., et al. (1988). Psychiatric disorders in pediatric primary care. *Archives of General Psychiatry, 45,* 1107-1118.

Cunningham, C. E., & Siegel, L. S. (1987). Peer interactions of normal and attention-deficit disordered boys during free play, cooperative task, and simulated classroom situations. *Journal of Abnormal Child Psychology, 15*, 247-268.

dosReis, S., Zito, J. M., Safer, D. J., Soeken, K. L., Mitchell, J. W., & Ellwood, L. C. (2003). Parental perceptions and satisfaction with stimulant medication for Attention-Deficit Hyperactivity Disorder. *Journal of Developmental & Behavioral Pediatrics, 24*(3), 155-162.

Douglass, V. I., & Peters, K. G. (1979). Toward a clearer definition of the deficit in attentional deficit of hyperactive children. In G. A. Hale & M. Lewis (Eds.), *Attention and the developments of cognitive skills* (pp. 173-248). New York: Plenum.

DuPaul, G. R. (1991). Parent and teacher ratings of ADHD symptoms: Psychometric properties in a community-based sample. *Journal of Clinical Child Psychology, 20*, 2425-2453.

Eppright, T. D., Bradley, S., Vogel, S. J., & Williamson, H. A. (1998). The management of patients with Attention-Deficit Hyperactivity Disorder by family practitioners. *Missouri Medicine, 95*(3), 118-279.

Erhardt, P., & Hinshaw, S. P. (1994). Initial sociometric impressions of Attention-Deficit Hyperactivity Disorder and comparison boys: Predictions from social behaviors and from nonbehavioral variables. *Journal of Consulting and Clinical Psychology, 62*, 833-842.

Fehlings, D. L., Roberts, W., Humphries, T., & Dawe, G. (1991). Attention deficit hyperactivity disorder: Does cognitive behavior therapy improve home behavior? *Journal of Developmental Behavioral Pediatrics, 12*, 223-228.

Frederick, B. P., & Olmi, D. J. (1994). Children with attention-deficit/hyperactivity disorder: A review of the literature on social skills deficits. *Psychology in the Schools, 31*(4), 288-296.

Garralda, M. E., Bowman, F. M., & Mandalia, S. (1999). Children with psychiatric disorders who are frequent attenders to primary care. *European Child & Adolescent Psychiatry, 8,* 34-44.

Ghanizadeh, A. (in press). Educating and counseling of parents of children with attention-deficit hyperactivity disorder. *Patient Education and Counseling.*

Ghanizadeh, A., Bahredar, M. J., & Moeini, S. R. (2006). Knowledge and attitudes toward attention deficit hyperactivity disorder among elementary school teachers. *Patient Education and Counseling, 63*, 84-88.

Gingerich, K. J., Turnock, P., Litfin, J. K., & Rosen, L. A. (1998). Diversity and attention deficit hyperactivity disorder. *Journal of Clinical Psychology, 54*(4), 415-426.

Harrison, C., & Sofronoff, K. (2002). ADHD and parental psychological distress: Role of demographics, child behavioral characteristics, and parental cognitions. *Journal of the American Academy of Child & Adolescent Psychiatry, 41*(6), 703-711.

Hechtman, L. (1991). Resilience and vulnerability in long term outcome of attention deficit hyperactivity disorder. *Canadian Journal of Psychiatry, 36*(6), 415-421.

Herbert, J. D., Crittenden, K., & Dalyrmple, K. L. (2004). Knowledge of social anxiety disorder relative to Attention Defict Hyperactivity Disorder among educational professionals. *Journal of Clinical Child and Adolescent Psychology, 33*, 366-372.

Hoagwood, K., Kelleher, K. J., Feil, M., & Comer, D. M. (2000). Treatment services for children with ADHD: A national perspective. *Journal of the American Academy of Child & Adolescent Psychiatry, 39*(2), 198-206.

Hubbard, J. A., & Newcomb, A. F. (1991). Initial dyadic peer interaction of Attention Deficit-Hyperactivity Disorder and normal boys. *Journal of Abnormal Child Psychology, 19,* 179-195.

Jeffries, B. (1995). The treatment of ADHD: Psychological and/or medication based interventions? *Journal of Psychological Practice, 1*(4), 195-201.

Jensen, P. S., Shervette, R. E., III, Xenakis, S. N., & Richters, J. (1993). Anxiety and depressive disorders in attention deficit disorders with hyperactivity: New findings. *American Journal of Psychiatry, 150,* 1203-1209.

Jerome, L., Washington, P., Laine, C. J., & Segal, A. (1999). Graduating teachers' knowledge and attitudes about attention-deficit hyperactivity disorder: A comparison with practicing teachers. *Canadian Journal of Psychiatry, 44(2),* 192.

Kim, E. Y., & Miklowitz, D. J. (2002). Childhood mania, attention deficit hyperactivity disorder and conduct disorder: A critical review of diagnostic dilemmas. *Bipolar Disorders, 4,* 215-225.

Klein, R. G., & Mannuzza, S. (1991). Long-term outcome of hyperactive children: A review. *Journal of the American Academy of Child & Adolescent Psychiatry, 30*(3), 383-387.

Kwasman, A., Tinsley, B. J., & Lepper, H. S. (1995). Pediatricians' knowledge and attitudes concerning diagnosis and treatment of attention deficit and hyperactivity disorders. *Archives of Pediatric Adolescent Medicine, 149*, 1211-1216.

Kwasman, A., Tinsley, B., & Thompson, S. (2004). School nurses' knowledge and beliefs about the management of children with ADD. *Journal of School Nursing, 20*, 22-28.

Lahey, B. B., Applegate, B., McBurnett, K., Biederman, J., Greenhill, L., Hynd, G. W., et al. (1994). DSM-IV field trials for attention deficit/hyperactivity disorder in children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 151*, 1673-1685.

Lambert, N. M., Sandoval, J., & Sassone, D. (1978). Prevalence of hyperactivity in elementary school children as a function of social system definers. *American Journal of Orthopsychiatry, 48*, 446-463.

Levy, F. (1991). The dopamine theory of attention deficit hyperactivity disorder (ADHD). *Australian & New Zealand Journal of Psychiatry, 25*(2), 277-283.

Lian, W. B., Ho, S. K. Y., Yeo, C. L., & Ho, L. Y. (2003). General practitioners' knowledge on childhood developmental and behavioural disorders. *Singapore Medical Journal, 44*, 397-403.

Luk, S. (1985). Direct observations studies of hyperactive behaviors. *Journal of the American Academy of Child and Adolescent Psychiatry, 29,* 611-619.

Luman, M., Oosterlaan, J., & Sergeant, J. A. (2005). The impact of reinforcement contingencies on AD/HD: A review and theoretical appraisal. *Clinical Psychology Review, 25*, 183-213.

Mannuzza, S., Gittelman-Klien, R., Bessler, A., Malloy, P., & LaPadula, M. (1993). Adult outcome of hyperactive boys: Educational achievement, occupational rank, and psychiatric status. *Archives of General Psychiatry, 50*, 565-576.

Mannuzza, S., Klein, R., Bessler, A., Malloy, P., & LaPadula, M. (1998). Adult psychiatric status of hyperactive boys grown up. *American Journal of Psychiatry, 155*, 493-498.

Massetti, G. M., Lahey, B. B., Pelham, W. E., Loney, J., Ehrhardt, A., Lee, S. S., et al. (In press). Academic achievement over 8 years among children who met modified criteria for attention-deficit/hyperactivity disorder at 4-6 years of age. *Journal of Abnormal Child Psychology.*

McMahon, R. J., & Wells, K. C. (1998). Conduct problems. In E. J. Mash & R. A. Barkley (Eds.), *Treatment of childhood disorders, second edition* (pp. 137-270). New York: Guilford Press.

McNeal, R. E., Roberts, M. C., & Barone, V. J. (2000). Mothers' and children's' perceptions of medication for children with Attention Deficit Hyperactivity Disorder. *Child Psychiatry & Human Development, 30*(3), 173-187.

Moser, S. E., & Kallail, K. J. (1995). Attention-Deficit Hyperactivity Disorder: Management by family physicians. *Archives of Family Medicine, 4,* 241-244.

MTA Cooperative Group. (1999). A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry, 56,* 1073-1086.

Owens, J. A. (2005). The ADHD and sleep conundrum: A review. *Journal of Developmental and Behavioral Pediatrics, 26*(4), 312-322.

Pelham, W.E, Gnagy, E. M., Greenslade, K. E., & Milich, R. (1992). Teacher ratings of DSM-III-R symptoms for the disruptive behavior disorders. *Journal of the American Academy of Child and Adolescent Psychiatry, 31*, 210-218.

Robison, L. M., Sclar, D. A., Skaer, T. L., & Galin, R. S. (1999). National trends in the prevalence of Attention-Deficit/Hyperactivity Disorder and the prescribing of methylphenidate among school-age children: 1990-1995. *Clinical Pediatrics, 38*, 209-217.

Sadeh, A., Pergamin, L., & Bar-Haim, Y. (2006). Sleep in children with attention-deficit hyperactivity disorder: A meta-analysis of polysomnographic studies. *Sleep Medicine Reviews, 10,* 381-398.

Sciutto, M. J., Terjesen, M. D., & Frank, A. S. B. (2000). Teachers' knowledge and misperceptions of attention-deficit/hyperactivity disorder. *Psychology in the schools, 37*(2), 115-122.

Sciutto, M. J., Nolfi, C. J., & Bluhm, C. A. (2002). Effects of child gender and symptom type on elementary school teachers' referrals for ADHD. *Journal of Emotional and Beahvioral Disorders, 12,* 247-253.

Searight, H. R., Nahlik, J. E., & Campbell, D. C. (1995). Attention-Deficit/Hyperactivity Disorder: Assessment, diagnosis, and management. *Journal of Family Practice, 40*(3), 270-279.

Spencer, T. J., Biederman, J., & Mick, E. (2007). Attention-deficit/hyperactivity disorder: diagnosis, lifespan, comorbidities, and neurobiology. *Journal of Pediatric Psychology, 32*, 631-642.

Stein, B., & Orlando, M. (2001). ADHD treatment in a behavioral health care carve-out: Medications, providers and service utilization. *The Journal of Behavioral Health Services & Research, 28*(1), 30-41.

Stormont, M. (2001). Social outcomes of children with AD/HD: Contributing factors and implications for practice. *Psychology in the Schools, 38*(6), 521-531.

Strauss, A. A., & Lehtinen, J. E. (1947). *Psychopathology and education of the brain-injured child.* New York: Grune & Stratton.

Strayhorn, J. M., & Weidman, C. S. (1991). Follow-up one year after parent-child interaction training: Effects on behavior of preschool children. *Journal of the American Academy of Child and Adolescent Psychiatry, 30*(1), 138-143.

Swanson, J. M., Kraemer, H. C., & Hinshaw, S. P. (2001). Clinical relevance of the primary findings of the MTA: Success rates based on severity of ADHD and ODD symptoms at the end of treatment. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*, 168-179.

Szatmari, P. (1992). The epidemiology of Attention-Deficit Hyperactivity Disorder. *Child and Adolescent Psychiatric Clinics of North America, 1*(2), 361-372.

Szatmari, P., Boyle, M., & Offord, D. R. (1989). ADHD and conduct disorder: Degree of diagnostic overlap and differences among correlates. *Journal of the American Academy of Child and Adolescent Psychiatry, 24*, 153-189.

Szatmari, P., Offord, D. R., & Boyle, M. H. (1989). Ontario Child Health Study: Prevalence of attention deficit disorder with hyperactivity. *Journal of Child Psychology and Psychiatry, 30*, 219-230.

Walter, H. J., Gouze, K., & Lim, K. G. (2006). Teachers' beliefs about mental health needs in inner city elementary schools. *Journal of the American Academy of Child and Adolescent Psychiatry, 45*, 61-68.

Ward, R. W., Fidler, H., Lockyer, J., & Toews, J. (1999). Learning, change, and practicing physicians. *Academic Medicine, 74*(10), s31-s33.

Weinberg, H. A. (1999). Parent training for attention-deficit hyperactivity disorder: Parental and child outcome. *Journal of Clinical Psychology, 55*(7), 907-913.

Weiss, G., & Hechtman, L. (1993). *Hyperactive children grown up* (2nd ed.). New York: Guilford Press.

Weller, E. B., Weller, R. A., & Fristad, M. A. (1995). Bipolar disorder in children: Misdiagnosis, underdiagnosis and future directions. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*(6), 709-714.

Wender, P. (1971). *Minimal brain dysfunction.* New York: Wiley.

Wender, P. (1972). The minimal brain dysfunction syndrome in children: I. The syndrome and its relevance for psychiatry: II. A psychological and biochemical model for the syndrome. *Journal of Nervous & Mental Disease 155*(1), 55-71.

Wolraich, M. L., Lindgren, S., Stromquist, A., Milich, R., Davis, C., & Watson, D. (1990). Stimulant medication use by primary care physicians in the treatment of attention deficit hyperactivity disorder. *Pediatrics, 86*(1), 95-101.

Young, S. (2000). ADHD children grown up: An empirical review. *Counselling Psychology Quarterly, 13*(2), 191-200

Zarin, D. A., Tanielian, T. L., Suarez, A. P., & Marcus, S. C. (1998). Datapoints: Treatment of attention-deficit hyperactivity disorder by different physician specialties. *Psychiatric Services, 49*, 171.

APPENDIXES

Appendix A:

Cover Letter

Approval terminates 05/30/2007
Protocol Number: 1550; (R2 approved 12/11/06)
IRB Password Protected per True M. Rubal-Fox, IRB Administrator

UtahState UNIVERSITY

November 7, 2006

Dear Physician:

We are conducting a research study regarding physicians' experiences and practices with Attention-Deficit/Hyperactivity Disorder (ADHD) and are asking for input from approximately 500 physicians across the country. This research is NOT sponsored by a drug company or any other organization.

If you are interested in participating, please complete the enclosed questionnaire and return it in the postage-paid envelope that has been provided. The average time to complete this survey is approximately 5-10 minutes. Completing and returning the survey indicates your consent to participate in our study.

Your participation in this study is voluntary and there are no identified risks associated with this study. Although participating in this study will not directly benefit you, you will be making a valuable contribution to our understanding of physicians' practices with youth with ADHD. All results obtained from your survey will be anonymous. The Institutional Review Board (IRB) for the protection of human participants at USU (phone: 435-797-1821) has approved this research study. If you have any questions regarding this study, please contact Kara Spielmans or Gretchen Gimpel Peacock.

If you would like a copy of the results of this study, please enclose a separate note with your name and address. Results will be available once the study is complete, which should be in approximately six months. Results may also be published in a research journal.

Thank you for participating in this important research study.

Sincerely,

Gretchen Gimpel Peacock, Ph.D.
Associate Professor
Department of Psychology
(435) 797-0721

Kara L. Spielmans
Graduate Student
Department of Psychology
(716) 922-2645

Dennis Odell, M.D.
Pediatrician & Medical Director
Center for Persons with Disabilities

Appendix B:

Materials Included in Mailings to

AAFP and AAP Members

KADDS-R

Please answer the following questions regarding Attention-Deficit/Hyperactivity Disorders (ADHD). True (T), False (F), or Don't Know (DK) (circle one):

If you are unsure of an answer, please respond "Don't Know" (DK), DO NOT GUESS.

1.	T	F	DK	Children with ADHD are frequently distracted by extraneous stimuli.
2.	T	F	DK	Children with ADHD are typically more compliant with their fathers than with their mothers.
3.	T	F	DK	In order to be diagnosed with ADHD, the child's symptoms must have been present before age 7.
4.	T	F	DK	ADHD is more common in the 1st degree biological relatives (i.e. mother, father) of children with ADHD than in the general population.
5.	T	F	DK	One symptom of ADHD is physical cruelty to other people.
6.	T	F	DK	Children with ADHD often fidget or squirm in their seats.
7.	T	F	DK	Parent and teacher training in managing a child with ADHD are generally effective when combined with medication treatment.
8.	T	F	DK	It is common for children with ADHD to have an inflated sense of self-esteem or grandiosity.
9.	T	F	DK	It is possible for an adult to be diagnosed with ADHD.
10.	T	F	DK	Children with ADHD often have a history of stealing or destroying other people's things.
11.	T	F	DK	Side effects of stimulant medications used for treatment of ADHD may include mild insomnia and appetite reduction.
12.	T	F	DK	Current wisdom about ADHD suggests two clusters of symptoms: One of inattention and another consisting of hyperactivity/impulsivity.
13.	T	F	DK	Most children with ADHD "outgrow" their symptoms by the onset of puberty and subsequently function normally in adulthood.
14.	T	F	DK	In order to be diagnosed with ADHD, a child must exhibit relevant symptoms in two or more settings (e.g., home, school).
15.	T	F	DK	Reducing dietary intake of sugar or food additives is generally effective in reducing the symptoms of ADHD.
16.	T	F	DK	A diagnosis of ADHD by itself makes a child eligible for placement in special education.

17. T F DK Stimulant medications are the most common type of medication used to treat children with ADHD

18. T F DK Children with ADHD often have difficulties organizing tasks and activities.

19. T F DK Children with ADHD generally experience more problems in novel situations than in familiar situations.

20. T F DK There are specific physical features which can be identified by medical professionals in making a definitive diagnosis of ADHD.

21. T F DK In school age children, the prevalence of ADHD in males and females is equivalent.

True (T), False (F), or Don't Know (DK) (circle one):

22. T F DK In very young children (less than 4 years old), the problem behaviors of children with ADHD are distinctly different from age-appropriate behaviors of children without ADHD.

23. T F DK Children with ADHD are more distinguishable from normal children in a classroom setting than in a free play situation.

24. T F DK The majority of children with ADHD evidence some degree of poor school performance in the elementary school years.

25. T F DK Behaviors associated with ADHD can also bee seen in some children without ADHD.

26. T F DK Interventions that utilize reinforcement principles alone have been found to be the most effective type of behavioral treatment in reducing severe symptoms of ADHD.

27. T F DK Research has shown that prolonged use of stimulant medications leads to increased risk of addiction (i.e., drug, alcohol) in adulthood.

28. T F DK If a child responds to stimulant medications (e.g., Ritalin), then he/she probably has ADHD.

29. T F DK Children with ADHD generally display an inflexible adherence to specific routines or rituals.

30. T F DK One symptom of ADHD involves stealing and destroying things.

31. T F DK A good way to find out if a child has ADHD is to put him/her on stimulant medications.

PHYSICIAN DEMOGRAPHICS *(Please check one or fill in the blank)*

1. **Gender**: ____ Male ____ Female

2. **Number of years in practice since completion of residency**: _____

3. **Age**: _____

4. **State in which you currently reside**: _____

5. **Type of Current Practice**:
____ Solo/Private Practice ____ Group Practice ____ Multi-Specialty Clinic
____ Medical School ____ Retired ____
Other (*please describe*)_____

6. **Current Practice Setting (if retired, please indicate most recent)**:
____ Urban/Metro Area ___ Rural/Small Town

7. **Race/Ethnicity**:
____ Caucasian ____ African-American ____ Asian
____ Latino/a ____ Native American ____ Other _____

ADHD MANAGEMENT & TRAINING *(Please check one or fill in as directed)*

8. **Did you complete a specific rotation during your residency program that focused on behavioral pediatrics?**
____ No ____ Yes - *If so, how long was this rotation?*_____

9. **Have you ever received specific training on ADHD such as seminars, workshops, courses, etc?**
____ No ____ Yes - If so, what type of training? _____

10. **Please check any source(s) of information that have significantly contributed to your knowledge about ADHD.** *(Check all that apply)*

____ Professional Newsletters ____ Colleagues
____ Drug Representatives ____ Workshops/Conferences
____ Text/reference books ____ College or medical school courses
____ Internet resources ____ Experience with patients and/or parents
____ Journal Articles
____ Other(s) (please specifiy)_____
_____

11. **On average, how many children / adolescents do you see for *new* ADHD evaluations per *month*?** _____

12. **Approximately how many total children / adolescents with ADHD do you currently have in your practice?** _____

If you answered zero to question #11 *AND* #12, Please stop here and return the survey.

13. **Of your child/adolescent patients with ADHD, what percentage are prescribed stimulant medication by either yourself or another physician?** _____

14. **To what *percentage* of your child/adolescent patients with ADHD do you recommend behavioral treatments (parent training, reinforcement systems, self-monitoring, etc.)?** _____

15. **Which of the following do you endorse as acceptable treatments for ADHD?** (*Check all that apply*)

____Stimulant Medications
____Other medications (*please list*) _____
____Strattera
____School Accommodations/Modifications
____Dietary Changes/Restrictions
____Homeopathic Remedies
____Parent Training
____Individual Counseling
____Biofeedback (EEG or other)
____Other(s) (*please specify*)_____

16. **When initially evaluating/diagnosing children with ADHD-related concerns, what is your usual course of action?** *(Check all that apply)*

_____ Evaluate the child yourself
_____ Refer to another primary care physician (pediatrician, family practice, etc.)
_____ Refer to a specialty physician (psychiatrist, neurologist, etc.)
_____ Refer to a psychologist/counselor
_____ Refer to an ADHD specialty clinic

17. **Which methods do you <u>typically</u> utilize when assessing for ADHD?** (*Check all that apply*)

____ Medication Response
____ Physical Exam/Medical Lab Tests
____ Medical/Family History
____ Quantitative Electroencephalograph (QEEG)
____ Continuous Performance Test (CPT)
____ Psychoeducational Testing
(completed by psychologist, school, etc.)
____ Parent Rating Scales
____ Teacher Rating Scales
____ Other School Input/Records
____ Other(s) (*please specify*)
_____
_____

18. **Which medication(s) do you most commonly prescribe for ADHD?**

_____
_____
_____

END OF SURVEY, Thank you for your time & input!