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Suburban and Rural Elementary Teachers' Knowledge of the Role of Ritalin in the Treatment of Elementary Students with Attention Deficit Hyperactivity Disorder

Vicki R. Barrett

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**SUBURBAN AND RURAL ELEMENTARY TEACHERS' KNOWLEDGE OF
THE ROLE OF RITALIN IN THE TREATMENT OF ELEMENTARY STUDENTS
WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER**

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ABSTRACT

SUBURBAN AND RURAL ELEMENTARY TEACHERS' KNOWLEDGE OF THE ROLE OF RITALIN IN THE TREATMENT OF ELEMENTARY STUDENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

Vicki R. Barrett

The present study examined teachers' knowledge concerning the effects of Ritalin of children with Attention Deficit Hyperactivity Disorder. Two school districts were studied with the premise that a school district's wealth had an effect on the level of teachers' knowledge of students with ADHD. The Maryland Avenue Elementary School, which is part of the Bexley School District, located in a suburban area in Franklin County Ohio, was selected as the wealthy school district in this study. The Eastern Elementary School, which is part of the Meigs Local School District, located in rural southeastern Ohio in Meigs County was selected as the poor school district in this study.

Surveys examining the teachers' knowledge of students with ADHD were sent to both school districts. Twenty of twenty-one teachers responded on the surveys sent to the Maryland Avenue Elementary School. Twenty-six of forty teachers responded on the surveys sent to the Eastern Elementary School. The results of these surveys are examined and summarized in the present study.

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CHAPTER ONE

Introduction

The twentieth century was an era with many educational changes. During these one hundred years, education in the United States became more readily available to a larger population. Within the last fifty years stimulant therapy became available for hyperactive children who did not fit within the factory system of education in the United States.

As the nation's economy continued to shift from an agrarian to an industrial society and eventually to a service and technical society, America's one-room school began to disappear with the creation of school buildings which possessed a factory-like appearance. Pressure from the business community forced school administrators to adopt business terminology and practices (Callahan, 1962). This pressure was exemplified in 1903, when the Atlantic Monthly recommended that school administrators should be economical, and peoples' money should not be wasted (Callahan, 1962). Ellwood P. Cubberly, dean of the School of Education at Stanford described the emergence of educational efficiency experts as one of the most significant movements in all of our educational history. Our schools are in a sense, factories in which the raw material (student) is to be shaped and fashioned into products to meet the various demands of life (Callahan, 1962).

The impact of the business world upon the educational community continued through the twentieth century. Schools were viewed not as centers of learning, but as enterprises which were functioning efficiently if the students went through without failing and received their diplomas on schedule and if the operations were handled economically. The emphasis on the business and mechanical aspects of education and the neglect of the instructional side, so strong in the 1920's was still strong in the 1960's (Callahan, 1962).

Within this factory-like system of education in the U.S. the question arises of what to do with students who do not fit within the factory mold of a student assembly line educational system? Leonard Ayres, one of the first educators to view the school as a factory and to apply business and industrial values in a systematic way, claimed that U.S. public schools were fitted not to the slow child or the average child, but to the unusually bright one. He suggested that in order to balance the books the number of double promotions given should equal the number of years lost by slow students (Callahan, 1962).

In the later half of the twentieth century students who did not fit the mold because of over activity, inattention, distractibility, impulsivity, excitability or a lack of organization skills have often been treated with stimulant therapy. The goal of stimulant therapy was to create a student who would be productive, thus fitting into the industrial model of American education. As a result of the evolution of stimulant therapy, Methylphenidate (MPH or Ritalin) has become the drug of choice for these children. The current term of diagnosis for these children is attention-deficit/hyperactivity disorder. This study examines urban and rural elementary teachers' knowledge of the characteristics of ADHD, the methods used to determine treatment, the characteristics, the controversy concerning the use of Ritalin, and the effects of the usage of Ritalin.

Statement of Problem

Stimulant therapy is often a key factor in treating students with ADHD. Methylphenidate commonly known, as MPH, or Ritalin, is the number one stimulant prescribed to children with attention-deficit/hyperactivity disorder. This study examines teachers from a wealthy suburban Central Ohio school district and from a poor rural school district from Southeastern Ohio in terms of their knowledge of ADHD, the methods used to determine the treatment of ADHD, the controversy over the use of Ritalin, and the effects of Ritalin on the child with ADHD.

Research Questions

This study is guided by the following research questions:

- 1) What is the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio and a poor rural school district in Southeastern Ohio concerning the effects of the use of Ritalin on children with ADHD?
- 2) What is the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio and a poor rural school district in Southeastern Ohio concerning the characteristics of the child diagnosed with ADHD?
- 3) What is the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio and a poor rural school district in Southeastern Ohio concerning the methods used to determine the treatment of ADHD?

- 4) What is the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio and a poor school district in Southeastern Ohio concerning the controversies surrounding the use of Ritalin with children with ADHD?
- 5) What is the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio and a poor rural school district in Southeastern Ohio concerning the role of the teacher in the education of the ADHD child?

Research Hypotheses

The research hypotheses for this study are:

- 1) The level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio will not be similar to the knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the effects of the use of Ritalin on children with ADHD.
- 2) The level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio will not be similar to the knowledge possessed by elementary teachers of a poor rural school district in Southeastern Ohio concerning the characteristics of the child diagnosed with ADHD.
- 3) The level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio will not be similar to the knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the methods used to determine the treatment of ADHD.
- 4) The level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio will not be similar to the knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the controversies surrounding the use of Ritalin with children with ADHD.
- 5) The level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio will not be similar to the knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the role of the teacher in the education of the ADHD child.

Significance of the Study

The purpose of this study is to examine the knowledge level of elementary teachers from a wealthy suburban school district in Central Ohio and a poor rural district of Southeastern Ohio regarding the effects of Ritalin on children with ADHD, characteristics of attention-deficit/hyperactivity disorder, the methods for determining the treatment of children with ADHD, the controversy that surrounds the use of Ritalin, and the role of the teacher in the education of the ADHD child. The study will be beneficial to administrators, teachers, parents, and researchers who are interested in elementary teachers knowledge of attention-deficit hyperactivity disorder, its treatment, and the use of Ritalin.

Delimitations

The delimitations for this study include:

- 1) Teachers from a wealthy suburban school district in Central Ohio and a poor rural school district in Southeastern Ohio are the foci of this study.
- 2) Administrators and high school teachers are excluded from this study.
- 3) Inner-city schools are excluded from this study.

Limitations

The limitations for this study include:

- 1) The number of surveys received by the researcher.
- 2) The honesty of respondents to the survey questions.
- 3) The time frame in which teacher surveys are received by the researcher.

Definition of Terms

Attention-deficit/hyperactivity disorder: A condition in which a child exhibits a consistent pattern of inattention and/or hyperactivity-impulsivity that is more extreme than would be expected for a child of a comparable developmental level.

ADHD: An acronym for attention-deficit/hyperactivity disorder.

Elementary Teacher: A teacher who works in grades Kindergarten through sixth grade.

Knowledge: Familiarity, awareness, or understanding gained through experience or study.

Methylphenidate (Ritalin): A stimulant drug that exerts most of its effects on the central nervous system. Under the Comprehensive Drug Abuse Prevention and Control Act of

1970 it is classified as a Schedule II controlled substance with tight prescription regulations and imposed quotas on production.

Poor school district: A school district that has an average teacher salary at or below \$30,000 per year.

Ritalin: The brand name for Methylphenidate.

Rural: An area with a population under 2,500.

Suburban: A built up area outside the inner city.

Titration: The determination of the reactive capacity of a solution.

Wealthy school district: A school district that has an average teacher salary at or above \$50,000 per year.

Organization of the Study

Chapter One provides an Introduction to the development of education in the United States during the twentieth century, supplying historical and sociological context for the rise of stimulant medication to treat children diagnosed with ADHD. Chapter One also contains the Statement of Problem, Research Questions, Significance of the Study, Delimitation's, Limitations, Definition of Terms, and Organization of the Study. Chapter Two reviews the literature concerning the characteristics of attention-deficit/hyperactivity disorder, the methods for determining the treatment of children with ADHD, the controversy that surrounds the use of Ritalin, the effects of Ritalin on children with ADHD, and the role of the teacher and ADHD.. The methodology within the framework of the research design, population, instrumentation, data collection, and analysis are described in Chapter Three. Findings of this study along with a discussion after analyzing the data are reported in Chapter Four, which also includes recommendations for research and practice based on the findings of the study. A list of references is found at the conclusion of this work.

CHAPTER TWO

Review of the Literature

Introduction

During an era in which emphasis is placed upon outcome-based educational practices, a problem arises concerning students who do not fit within the factory model of education. For over fifty years many students who were excitable and easily distracted have been treated with stimulant therapy. Ritalin (Methylphenidate) has become an extremely popular drug to help the student who has been classified as ADHD to fit into the normal educational environment. Describing the traits of the ADHD child, the methods used to determine treatment, and the effects of Ritalin and the controversy of its use are the foci of this study.

Characteristics of the child diagnosed with Attention Deficit Hyperactivity Disorder

Professional journal articles describing the hyperactive child and the methods of treating these children have been published for many years. The hyperactive child syndrome is not a new disorder (Frankenberger and Cannon, 1999). Over the years the hyperactive child's ability to be selectively inattentive has been noted and has evolved into a classification of Attention Deficit Hyperactivity Disorder (ADHD). Barkley (1976) suggested that the selective inattention of the ADHD child was the result of the child ignoring tasks he or she found to be not interesting. He based this idea on the fact that ADHD children could concentrate on video games for a long period of time.

The child with ADHD exhibits many modes of behavior. The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* describes Attention Deficit Hyperactivity Disorder as a persistent pattern of inattention and/or hyperactivity-impulsivity that is more extreme than would be expected for an individual of a comparable developmental level. Symptoms of the disorder must have been evident before age seven and the symptoms must be exhibited in two or more of the individual's social settings such as school or home (Frankenberger and Cannon, 1999). Children with ADHD often experience difficulties in the classroom. These difficulties include following teacher directions, completing assignments, and mastering basic literary skills. Standard achievement test scores are up to one standard deviation below that of their peers (Stoner, 1994). Noncompliance and sleep disorders are also problems

experienced by children with ADHD (Kayser, 1997). In 1994, 40% of the students diagnosed with ADHD received special education services.

The American Psychiatric Association has defined three subtypes of attention deficit hyperactivity disorder. The three subtypes are ADHD, Predominantly Inattentive Type; ADHD, Predominantly Hyperactive-Impulsive Type, and ADHD, Combined Type. The ADHD, Predominantly Inattentive Type child is easily distracted and poorly organized, not overtly hyperactive. According to McCluskey (1999), these children also experience poor concentration, mental under focusing, and attentional problems when the child is relatively still. The ADHD, Predominantly Hyperactive-Impulsive Type child fidgets and moves around excessively often blurting out answers. He or she also has difficulty taking turns. McCluskey (1999) reports that the ADHD, predominantly hyperactive impulsive child also climbs, runs, is restless during sleep, and has an inability to stay seated. The ADHD, Combined Type child is both inattentive and hyperactive (Runnheim, 1996).

Many factors are involved in the development of ADHD in children. No one knows the exact cause of ADHD. Environmental factors such as lead and sugar have been blamed for the syndrome, but there is no clear evidence to support the claims (Livingston, 1997). Substantial evidence indicates that heredity and genetic influences play a major role in the development of ADHD (McCluskey, 1999). A gene that is linked to the regulation of dopamine may be a possible cause. Dopamine is a neurotransmitter, that when lacking in the frontal lobe of the brain, is a cause of ADHD in many children. The attention system also seems to be affected by noradrenaline and serotonin neurons (McCluskey, 1999).

ADHD researchers have discovered that among identical twins, when one twin experiences ADHD, 51 percent of the time the second twin experiences ADHD. Among non-identical twins, 31% of the second twins experience ADHD. Most researchers are convinced that there is no single explanation for the development of ADHD.

The catecholamine hypothesis has been used to explain the activity within the brain of the ADHD child. Catecholamines are chemicals within the human brain. Catecholamines along with other chemicals in the brain are known as neurotransmitters and allow cells to communicate. When a nerve cell “fires” it releases a tiny amount of these chemicals into the small gaps between nerve cells called synapses. Neurotransmitters attach themselves to receptors on the receiving cell and make the cell more or less likely to fire. This process occurs

in the brain in quadrillions of similar activities each second. The amount of the neurotransmitters released into the synapses may influence brain function. ADHD has been described as a neurotransmitter dysfunction (Livingston, 1997). Other possible causes for attention deficit hyperactivity disorder include neurotransmitter deficiencies, abnormalities in the frontal lobes, and an under-arousal of the central nervous system.

While children who experience ADHD exhibit certain primary behaviors, secondary behaviors also play a major part in their lives. Primary characteristics of ADHD include over activity, inattention, distractibility, impulsivity, excitability, and disorganization. Secondary behaviors are direct results of primary behaviors. As a result of an inability to control impulses, ADHD children often appear to be socially awkward. Lack of judgment and a tendency to be impulsive often makes the ADHD child unpopular with his or her peers. These children also have trouble with interpersonal relationships. They have trouble making and keeping friends. Since ADHD children have a tendency to blurt out statements, they are prone to tell lies. Unfortunately these children often are made scapegoats by their peers (McCluskey, 1999).

Self-esteem is a major problem the child with attention deficit hyperactivity disorder experiences. As a result of their inability to stay on task and their behaving in an unpredictable manner, ADHD children often are sources of frustrations for teachers, parents, and other caregivers. These frustrations can result in blame being directed toward the child. The ADHD child's inability to understand and control his or her own behaviors, along with pressures from peers and adults results in the creation of a negative view of one's self. Many children with ADHD get a continuous dose of criticism from all sides to the point where they begin to take a totally negative view of themselves and their actions (McCluskey, 1999).

What is Ritalin and its Effects on ADHD Children?

Methylphenidate (Ritalin) was developed in the 1940's and was reformulated in the 1950's. During the 1970's, methylphenidate (Ritalin), a refined version of an amphetamine compound, became the primary stimulant for the treatment of children diagnosed with an attention deficit hyperactivity disorder. Ritalin is classified as a CNS stimulant because it exerts most of its effects on the central nervous system. Ritalin has been linked to altering catecholamines. Catecholamines are a class of neurotransmitters, which include dopamine, norepinephrine, and epinephrine (Swanson, 1995). Ritalin stimulates these neurotransmitters by inducing their release from the presynaptic neuron, blocking their reuptake, and/or inhibiting the

actions of monoamine oxidase (Anastopulos, 1991). Ritalin stimulates the reticular activating system and the limbic and striatum and other parts of the brain that control attention, arousal and inhibitory processes. Behavioral effects of Ritalin may be caused by its lowering of the central nervous system's threshold for prolonging sensitivity to reinforcement beyond when satiation or habituation would typically occur (Anastopulos, 1991).

Ritalin is similar in chemical structure to amphetamines. Hubbard, Srinivas, Quinn & Mihda reported that only the d-isomer (d-threo-methylphenidate) portion of Ritalin had significant results when used on children with ADHD. Ritalin, like amphetamines, is a fast acting drug. It is rapidly absorbed and reaches a maximum level of intensity within one to three hours after being taken orally. A slow release form of Ritalin has been developed, but it is not used in clinical practices. A ten mg dose of Ritalin has the same effect as a 20 mg does of the slow release Ritalin SR (Swanson, 1995).

When using Ritalin with ADHD children it is important for the doctor to prescribe the proper dosage and to monitor the effects of the drug on the children over an extended period of time. Titration is an experimental process the doctors use to determine the proper dosage of Ritalin. Three methods of titrations procedures exist. The first method involves using a double-blind experiment. Since individual patients with ADHD often vary greatly, the initial dose of Ritalin may range from 5 to 20 milligrams. Although doctors, parents, and child are aware of the amount of dosage, a double blind experiment is used to administer the Ritalin and a placebo. Favorable responses attributed to the placebo may occur in up to 30% of the cases. While the Ritalin and placebo are disguised by a double blind procedure, in some cases the amount of Ritalin is administered in on a step-basis. A second titration method deals with scaling dose values. In other words, dosage is determined by the weight of the ADHD child. Dosage scales would be based upon the number of milligrams of Ritalin per kilogram of body weight. With this method the scale must be adjusted as the amount of weight increases. Frequency of dosing is the third method of titration. Studies have been conducted to determine whether Ritalin should be given on a per day or per hour basis, or at specific times during the day (Swanson, 1995).

The Effects of Ritalin on the ADHD Child

Time is a variable that must be considered when studying the effects of Ritalin on the ADHD child. The amount of time Ritalin influences the ADHD child varies with each individual child. Peak blood levels of Ritalin occur between 1 and 3 hours after it is introduced

into the system. Ritalin influences the ADHD child's actions the most between two to four hours after taking the drug. (Anastopoulos, 1991). The limited duration of action is related to the drug's rapid absorption and elimination from the brain and blood stream. If medication is given at too long an interval the Ritalin level in the blood will become very low and when the next dose is given a "roller coaster" effect with episodes of active and inactive periods occurring (Schulz, 1997). Ritalin may affect the ADHD child's behavior for up to seven hours.

Many studies support Ritalin's ability to improve the ADHD child's ability to function in the classroom. The use of Ritalin has enhanced behavior in the areas of sustained attention, impulsive-reflective responding, associative learning, and on-task and academic accuracy rates. The amount of commands, criticism, and punishment directed at the ADHD child has also been reduced (Anastopoulos, 1991).

Improving achievement in the classroom is a major goal for the ADHD child. While the debate continues, many studies indicate that Ritalin is not overly effective in improving classroom achievement. Barkley and Cunningham's (1978) review of the literature provided little support for the idea that Ritalin had consistent positive effects on academic achievement test scores. Ritalin may bring about short-term improvements in academic achievement, but researchers did not find long-term positive effects of Ritalin on academic performance. While Satterfield, Satterfield, and Cantwell (1980) reported a smaller gap in the deficit between ADHD and non ADHD children with the use of Ritalin, Alto and Frankenberger found that deficits in word analysis, reading, basic and complete composition on the Iowa Test of Basic Skills were not reduced after four to six months of Ritalin treatment (Frankenberger, 1999). Aman and Werry in 1982 found nothing to support the short or long term influences on Ritalin on reading skills, but in 1983 Gittleman, Klein, and Feingold reported that Ritalin had occasional effects on reading performance (Frankenberger, 1999). A study conducted by Webber in 1992 indicates that Ritalin did not appear to improve academic achievement even after one or two years of use.

Researchers have indicated that a drop in ability levels occurs among ADHD children between the first and second grades. When children were matched on verbal cognitive scores, the Ritalin group experienced lower achievement scores in reading, word analysis, basic composite, and complete composite, both before and after being placed on Ritalin. Although the use of Ritalin did not bring large increases academically, the drug did lessen the amount of decrease in ability levels that occurs between the first and second grades.

Kavale (1982) conducted an analysis of 135 studies researching the effects of Ritalin on academic achievement, and reported that Ritalin had a positive influence on academic achievement. The medicated group experienced a fifteen percentile increase in test scores. A 10% gain on the Wide Range Achievement Test (WRAT) along with a 24% increase on the Iowa Test of Basic Skills were also reported. In the reading and writing subtests of the WRAT, children taking Ritalin scored moderate positive gains (Frankenberger, 1999). While Kavale reported that academic learning and performance were improved by stimulant therapy, Ottenbacher and Cooper claimed that stimulant therapy had little direct effect on improving overall academic performance (Swanson, 1995).

Frankenberger and Cannon studied the effects of Ritalin on ADHD children from grades one through five. They studied achievement differences between a group of Ritalin medicated ADHD children and a Contrast group of non-ADHD children. They reported the effects of Ritalin on both cognitive abilities and achievement skills. On the first grade level, the Ritalin and the contrast groups' scores were similar on the Cognitive Abilities Test of the Iowa Test of Basic Skills (ITBS). The interactive plot for the Cognitive Verbal scores revealed a small difference in the first grade and almost no difference in the second grade. It appeared the Ritalin group was catching up with the contrast group. By the fifth grade, the Ritalin group's verbal scores were much lower than those of the contrast group. No significant differences between the two groups were reported in nonverbal abilities in the first and second grades. By the time the groups had reached the fifth grade the contrast group's scores improved, while the Ritalin group's scores declined. The combination of these two events created a significant gap between the two groups (Frankenberger and Cannon, 1999).

During the first and second grades, the Ritalin group scored much lower on the quantitative section of the Cognitive Abilities Test than did the contrast group. At the fifth grade level the differences between the two groups were not significant. It appeared that while the Ritalin group's ability declined from the first through fifth grade in the verbal and nonverbal sections of the Cognitive Abilities Test, the group was able to overcome a significant deficit on the quantitative section of the test.

The results of the Ritalin and contrast groups in the area of achievement skills were similar to those reported in the study of cognitive abilities. The gap between the two groups widen over time. The children in the Ritalin group fell further and further behind. On the Math

Total section of the Iowa Test of Basic Skills the Ritalin group performed at a much lower achievement level through grades one through five. These findings are in direct contrast to Kavale's (1982) report of children demonstrating a 24% achievement gain on the ITBS (Frankenberger, 1999). In the area of reading the Ritalin group fell behind the contrast group throughout the study. These results are similar to the results of similar reading studies. Cannon (1995) reported similar responses of children who had been on Ritalin for two years on the Wisconsin Third Grade Reading Test.

After analyzing their results, Frankenberger and Cannon came to several conclusions. If Ritalin is a major factor in enhancing academic achievement, the Ritalin group should have performed much better than study results show. If Ritalin was beneficial in achievement, the study showed that between the first and second grades to be the best time to enhance learning by using Ritalin. The positive effects of the first year usage of Ritalin are similar to the results reported by Weber (1992). In summary, there does appear to be evidence of some short-term treatment benefits for children who receive Ritalin, but long-term benefits are not apparent (Frankenberger, 1999).

Ritalin has positive effects on the ADHD child's behavior in the classroom. In 1976, Barkley reported that 75% of hyperactive children benefit from psychostimulant drugs such as Ritalin. In a 1993 study, Pelham discovered that when the use of Ritalin in the classroom is compared with the use of behavior modification in the classroom, the positive effects were twice that of behavior modification. Swanson (1995) reported that 97% of relevant reviews favored the use of stimulant therapy, which includes the use of Ritalin, on behavioral excesses. He also claimed in his review of the reviews on stimulant therapy that parents, teachers, and physicians in most cases clearly perceived the short term benefits of drugs such as Ritalin. Chase and Clement (1985) study reported that self-reinforcement was better than Ritalin.

As with any drug, Ritalin has side effects. Typical side effects include insomnia, decreased appetite, increased tension, increases in heart rate and blood pressure. In a few cases headaches or stomachaches may occur. Cowart (1998) reports anorexia and suppression of growth as rare side effects of Ritalin. In very rare cases symptoms of Tourette's Disorder may appear. Deterioration of behavior may also be a side effect. A rebound effect may occur during the late afternoon or early evening after a morning application of Ritalin. This rebound effect

may include behaviors worse than behaviors experienced when the child is not taking Ritalin, such as weepiness, and irritability (Anastopoulos, 1991).

Methods used to determine the treatment of ADHD

Attention Deficit Hyperactivity Disorder is not a newly discovered condition, yet cost-effective assessment protocol for use in clinical practice has remained elusive (Barkley, 1988). Due to the many dimensions of ADHD, it is extremely difficult to uniformly diagnose and treat ADHD. Because no performance measure uniformly differentiates a child with ADHD, the diagnosis remains largely a behavioral one (Hale, 1998). Many ADHD children are given stimulant therapies based solely upon a doctor's interview with a parent and a physical exam. Physicians often will prescribe a small dose of stimulant medication and within a fourteen-day period contact the child's parents to determine if the amount of dosage is adequate. While it may appear that physicians play a key role in the diagnosis of the ADHD child, this is not always the case. Alto (1995) reported that only 24 percent of the children studied had physicians involved with their diagnosis.

Rating scales can provide more reliable and objective data than those provided by an interview (Brown, 2000). Several teacher and parent rating scales are available in both broadband and narrow-band scales. Broadband scales measures several different behaviors. Narrow-band scales are used to measure a single item such as hyperactivity (Brown, 2000).

Standardized behavior rating scales devised to measure the presence and severity of ADHD symptoms have become popular as additional sources of data during initial diagnosis and treatment of ADHD (Wodrich and Kush 1998). Doctors use of behavior rating sheets to determine a stimulant dosage for the ADHD child, parents or teachers complete these rating sheets. It is estimated that slightly more than one half of the prescribing physicians use rating sheets (Stoner, 1994). The use of behavior rating sheets by physicians in determining the treatment of the ADHD child has many problems. Validity is a major problem with rating sheets. Most behavior rating scales are incapable of accurately measuring improvement of behavior solely in terms of reduction in ratings of problem behaviors (Stoner, 1994). Wodrich and Kush (1998) claim that, due to a lack of contextual references, rating scales lack the ability to accurately describe the subjects' characteristics. While a scale may report progress, it does not report the conditions upon which the progress occurred (Wodrich and Kush 1998).

The School Situations Questionnaire (SSQ) provides the opportunity for teachers to provide a more detailed rating of the student. The Schools Situations Questionnaire contains twelve situations that the teacher may rate as being either present or absent. The teacher may also rate each situation on a severity scale of 1(mild) to 9 (severe) (Wodrich and Kush, 1998). The SSQ can be used to determine whether the child is ADHD, and monitor the effects of Ritalin on the ADHD child. In a study by Wodrich and Kush (1998), the SSQ was found to be effective in monitoring the effects of Ritalin by studying the behavior scale rating changes. The SSQ can also be used as one source of data in a multimethod approach that includes behavioral observation, parent and teacher rating forms, and possible measures of task performance when medication is adjusted for the individual student (Wodrich and Kush, 1998).

Evaluating the ADHD child's performance in the classroom is a way to measure the success of a method of treatment. Stoner (1994) reports that by measuring daily performance in the classroom and observing the number of educational outcomes successfully completed, the physician can make adjustments in the treatment plan. Curriculum Based Measurement (CBM) has been developed to provide a means for evaluating educational behavior and outcomes. CBM data are collected during brief one to three minute fluency measures of student performance in reading, math, spelling, and written expression (Stoner, 1994). Curriculum Based Measurement provides a broad overview of the ADHD child's behavior. This broad overview is exemplified by having the child read an unfamiliar passage as opposed to the child repeating a word list that he or she had prior knowledge to and an opportunity to practice. The goal of CBM is to provide the teacher with a basis from which an educational plan may be created. An extensive body of research has accumulated to support the reliability and validity of CBM for educational decision-making. Curriculum Based Measurement is a potentially useful technology for assessing the effects of medication on the academic performance of children with ADHD (Stoner, 1994).

Restricted Academic Task is a technique used to determine the method of treatment of the ADHD child. Restricted Academic Task is an analogue academic situation that was designed to evaluate those disruptive behaviors most frequently seen in ADHD children during situations in which they are required to accomplish assigned tasks independent of an adult's supervision (Fischer and Newby, 1998). It is very difficult for the ADHD child to work independently. The assigned task gives the physician the opportunity to attain data, which demonstrates behavior changes of the ADHD children using stimulant therapy. The Restricted Academic Task

technique measures modes of behavior that cannot be directly assessed by subjective teacher and parent statements or by standardized rating scales.

Fischer and Newby used the Restricted Academic Task to study the responses of ADHD children using stimulant therapy. One hundred and forty-nine children between five and seventeen years of age diagnosed with ADHD participated in the study. Before being considered for the study, the subjects were required to have experienced teacher or parental complaints concerning inattention, impulsivity, and restlessness. They experienced behavior problems prior to age six, and demonstrated behavior problems for at least twelve months. The children in the study were also required to be over 1.5 SD's from the mean of nondisabled children on standardized teacher and parent behavior rating scales.

The procedure consisted of three weekly assessment periods. Parents were given a week's supply of either Ritalin or the placebo at the clinic visit preceding that week. A double blind procedure was used to conduct the study. The children were given two doses of Ritalin and a placebo. Subjects were randomly given the placebo and Ritalin in one of six sequences of dosage levels. Evaluations of the children were held on the last day of study week. During the weeks the study participants received a dose of Ritalin, the medication was administered one hour before they were evaluated.

During the Restricted Academic Task, the ADHD children's behaviors were recorded. The weekly testing sessions were held in a room with a one-way mirror and an intercom system. The room also contained student worktables and a table with toys. Subjects were given no information or directions concerning the toys on the table. After completing a pretest, each child was instructed to work on a math assignment that was aligned with the student's grade level and ability. Fisher and Newby used a ten-minute observation period. Observers behind the one-way mirror recorded each subject's behavior into five different categories every thirty seconds. The five categories were; off-task, fidgeting, vocalizing, playing with objects, and out of seat. A score was given in each category. Each behavior category could then be reported as a percentage of the total behavior during the ten-minute period of observation.

According to the results of the Fischer and Newby study, Restricted Academic Task is a successful method for determining the treatment of the ADHD child. The studies indicate that while in a restricted task situation, students are sensitive to stimulant therapy. By comparing the results from the various dosage levels of Ritalin and the placebo, physicians or researchers can

successfully prescribe the necessary amount of Ritalin for the child. They also came to the conclusion that the Restricted Academic Task could be easily adapted for classroom use. While cost and time efficient, the use of this method to determine the type of treatment for the ADHD child can increase the level of validity and rigor of information that can be gained (Fischer and Newby, 1998).

Many instruments are used today to diagnose the children with attention deficit hyperactivity disorder. In choosing a method to treat the ADHD child, the use of medication (Ritalin) should be considered as part of an overall treatment plan (Schulz, 1997). Both direct assessment (cognitive) and questionnaires and direct observations (behavioral) may be used to determine the amount of Ritalin to be used in the treatment of the ADHD child.

Cognitive instruments are direct assessments of a child's activities and are used to determine the dosage of a stimulant drug (Ritalin). The Cancellation of Rapidly Recurring Target Figures (CT) requires children to identify certain shapes among a group of other geometric shapes. The Children's Selective Reminding Test (SRT) measures verbal learning and memory. Children are asked to read a list of words, and then to recall the same words in any order. Once the list can be recited twice without making a mistake, the words were considered to be in the long-term memory. The Go-No Go Test requires children to perform a motor activity when told to "Go" and cease the activity on the command "No". The activity is performed in three-second intervals. The score is obtained by subtracting the number of incorrect responses from the number of total responses. The Gordon Diagnostic System (GDS) is a visual performance test that evaluates sustained attention. The subject views flashing numbers on a computer screen. The subject is to press a button whenever the number one is followed by the number nine. Evaluators record the number of correct and incorrect responses (Hale, 1998).

Behavioral assessments of the ADHD child are completed by the use of questionnaires and rating scales. The Conners Parent Rating Scale (CPRS-48) evaluates behavior on five levels. The caregiver completes a graphic rating scale that rates behavior from zero (behavior is not a problem) to three (behavior is very much a problem). The Conners Teacher Rating Scale (CTRS-39) is a thirty-nine question survey that is similar to the CPRS-48. The Side Effects Rating Scale (SERS) reports the side effects of stimulant medication. The graphic rating scale ranges from zero (absent) to nine (serious). Areas that are rated include loss of sleep, loss of appetite, irritability, drowsiness, and frequency of stomachaches (Hale, 1998). The School

Situations Rating Scale measures conduct in school while the School Situations Rating Scale Revised documents the number of attention-related difficulties present in the school (Brown, 2000).

Two popular rating scales used to assess ADHD children are the Behavior Assessment System for Children (BASC) and the Child Behavior Checklist system. The BASC may be used for subjects with ages from 4 to 18. The program contains parent, teacher, and self-completed rating scales. The teacher and parent rating scales measure leadership and social skills as well as hyperactivity, depression and anxiety. The self-completed rating scale measures the subject's attitudes, self esteem, personal and school adjustment. The Child Behavior Checklist also measures subjects between the ages of 4 to 18 years of age. Like the BASC the Child Behavior Checklist also contains rating scales for parents, teachers, and a youth self report. These scales measure behavioral problems such as aggressive behavior, attention, anxiety, and depression (Brown, 2000).

The controversies surrounding the use of Ritalin with children with ADHD

While the use of Ritalin is an integral part of the treatment of the ADHD child, many have protested its use for numerous reasons. In 1971, Ritalin (methylphenidate) and amphetamines were reclassified and placed on Schedule II of the Comprehensive Drug Abuse Prevention and Control Act of 1970. Schedule II drugs required tight prescription regulations and imposed quotas on productions (Swanson, 1995). The United Nations International Narcotics Control Board issued a "red flag" regarding the use of stimulant medication, including Ritalin in the United States (Schulz, 1997). The group reported a three hundred percent increase in the prescription of Ritalin worldwide between 1990 and 1994. Gibbs reported that the production of Ritalin increased 700% between 1990 and 1997 (Frankenberger, 1999). Ninety percent of Ritalin production and sales occurred in the United States. The defense attorney for a 15 year old who was convicted of killing his classmate with a baseball bat claimed that his client's behavior was the result of the use of Ritalin. In Georgia a suit was filed against a public school district and the American Psychiatric Association. Five medical malpractice suits concerning the use of Ritalin were filed in the state of Massachusetts (Coward, 1988).

A recent controversy over the use of Ritalin involved the use of the drug and the potential for future drug addictions. Ritalin may be taken in its regular pill form or may be crushed and snorted, or dissolved and injected into a vein, producing both euphoria and addiction (Blanchard,

2001). James Manlandro, the medical director of Seabrook House, a drug rehab center in South Jersey claimed that one-third of his adolescent clients have abused Ritalin. In November 1999, a University of California Berkley education professor reported the results of a twenty-six year study that tracked children into adulthood. The professor reported an increase in drug abuse among children treated with stimulants such as Ritalin. A study that followed 212 boys for four years suggested that stimulant medication protects ADHD children from a further risk of substance abuse by helping them function better at school and home (Roan, 1999). Stephanie Ives, who monitors substance abuse at the University of Pennsylvania reported that Ritalin abuse was very far down our list of substances of concern (Blanchard, 2001).

Breaking and entering in an attempt to steal Ritalin may be an indicator of possible Ritalin abuse. Since Ritalin is classified as a Schedule II, it possesses a high potential for abuse. Between January 1996, and December 1997, 700,000 doses of Ritalin were reported stolen and in 1998, there were 378 reported thefts from pharmacies. Students have used small squares of wood to open the nurse's office door to steal Ritalin. DEA officials reported between January 1990, and May 1995, methylphenidate, the chemical name for Ritalin, "ranked in the top ten most frequently reported controlled drugs stolen from registrants." (Blanchard, 2001).

While the use of Ritalin has been proven to be effective and safe, criticism of its use increased in the waning years of the twentieth century. Carl L. Kline of the University of British Columbia reported that Ritalin is nothing more than a street drug being administered to cover the fact that we don't know what's going on with these children (Livingston, 1997). In the late 1980's the Church of Scientology published a pamphlet entitled "Ritalin: A Warning for Parents". The church leaders also gave assistance to parents of ADHD children in preparing law suits against doctors who prescribed Ritalin (Swanson, 1995).

The number of children receiving Ritalin is constantly increasing. It is estimated that between 3 to 5 percent of the school age children in the United States are ADHD. The medication rate is approaching five percent. Between 1988 and 1999 the use of Ritalin has increased 330%. It seems that what was once a rare disability has become the latest educational fad. In some schools, half the male students are labeled ADHD. Schools are turning into pharmacies as students line up to get their next Ritalin pill (Runnheim, 1996).

The Role of Teachers in the Treatment of the ADHD child

While classroom teachers are a valuable source of information with regard to diagnosis of ADHD, many teachers are not equipped to deal with ADHD. Lack of teacher knowledge about ADHD has been identified as one of the greatest obstacles in attending the needs of children with ADHD (Sciutto, 2000). Barkley suggests that teachers have a poor grasp of the nature, course, causes, and outcomes of ADHD. Teachers possess many misconceptions concerning ADHD. These misconceptions are exemplified by teachers' beliefs that ADHD behaviors can be modified through diet and that children with ADHD will outgrow their symptoms by adulthood (Sciutto, 2000).

Educators are faced with the dilemma of how best to help ADHD children (Schulz, 1997). Events that lead to an ADHD diagnosis almost always takes place at school. The teacher usually makes the first report that a child may be ADHD (Livingston, 2000). Educators should play a significant role in the assessment process of the ADHD child. Teachers can provide valuable information to the parents and physicians as they seek to make decisions (Runnheim, 1996).

Teachers can provide valuable information that can be used in the diagnosis of ADHD. Teacher interviews provide important information about the ADHD child's behavioral symptoms, social behavior, and academic performance (Brown, 2000). The teacher can provide information concerning instructional methods used in the classroom and how well the ADHD child performs in class when compared to other students in the class (Brown, 2000).

The teacher can play an important role in stimulant medication management (Schultz, 1997). Unfortunately, teachers are often unclear about their responsibilities. Teachers should maintain confidentiality and not let classmates know that a student is on medication. They should also not discuss students receiving Ritalin with adults who do not need to know. Teachers can assure medication is properly stored, dispersed, and can notify parents when the supply of Ritalin is low. Today many states require that all medication be placed in a secure location with principals administering the medication (Easterling, 2002).

Teachers should keep a constant line of communication with the parents of the ADHD child. Teachers should be proactive in providing information concerning the ADHD child and the use of Ritalin to the parents so the information can be relayed to the physician (Schultz, 1999). Many times the teacher is the only observer of the effects of Ritalin on the child. Reports from

teachers provide a rich source of information related to the medication response to the target goals and side effects experienced by the ADHD child.

Summary

Attention Deficit Hyperactivity Disorder is a condition that includes many symptoms and modes of behavior. Symptoms include impulsivity, inattention, and hyperactivity. For over fifty years stimulant therapy has been used to treat this disorder. Methylphenidate (Ritalin), which stimulates the frontal lobes of the brain, has become the drug of choice to treat the ADHD child. Methylphenidate (Ritalin), along with amphetamines, are Schedule II drugs with tightened prescription regulations and imposed quotas on production.

The exact effects of Ritalin on the ADHD child cannot be clearly defined. The drug affects different children in various ways, so there is no set standard for dosage. Although Ritalin may influence the ADHD child for seven hours, the drug's peak influence on the child varies from one to three hours. With improper dosage patterns the ADHD child may experience a "roller coaster" type of behavior where the down cycle may be a lower level than the child experiences without Ritalin.

Studies on the effects of Ritalin in the classroom and its side effects are inconclusive. Ritalin appears to work well on behavioral issues. In academic areas the success of Ritalin is not clear. Many conflicting studies have been reported concerning the use of Ritalin on the ADHD child. Potential side effects of Ritalin include, a loss of appetite, inability to sleep, increased heart rate, and blood pressure and in very rare instances conditions such as anorexia.

As with many aspects of attention deficit hyperactivity disorder, the methods of determining treatment of ADHD is varied and no universal procedure for diagnosis and treatment exists. Although physicians should play a vital part in the diagnosing the ADHD child, this is not always the case. It has been reported that teachers refer 76% of ADHD cases. One study reported that only 24% of the ADHD children were evaluated by a physician.

Teachers, parents, and caregivers are among those interviewed in the process of identifying the ADHD child. The data gained from these groups are attained through surveys and questionnaires. The survey results may be used to diagnose ADHD or to determine the proper amount of Ritalin to be administered. Surveys such as the School Situations Questionnaire are used to gather information about the ADHD child.

Ritalin (methylphenidate) is a controversial drug for many reasons. Since it is a Schedule II drug and is an amphetamine-like compound, concerns have arisen about the possibility of its use leading to further drug use. World wide the use of Ritalin increased 300% between 1990 and 1994. The demand for Ritalin as an illegal drug has prompted many thefts from schools and pharmacies. The Church of Scientology in 1987 published a pamphlet "Ritalin: A Warning for Parents" to educate families to the dangers of the drug.

Teachers perform a valuable role in the reporting, diagnosis and treatment of the ADHD child. It is vital teachers maintain confidentiality when dealing with an ADHD child in the classroom. Teachers must also be responsible for proper storage and dispensing of Ritalin. It is imperative the teacher maintain a good line of communication with parents. The ADHD child's social behavior, academic achievement, and any possible side effects of Ritalin usage should be reported to parents on a regular basis.

CHAPTER THREE

Methodology

Design of the Study

The research design of this study is to

- 1) Identify the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio concerning the effects of the use of Ritalin on children with ADHD?
- 2) Identify the level of knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the effects of the use of Ritalin on children with ADHD?
- 3) Identify the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio concerning the characteristics of the child diagnosed with ADHD?
- 4) Identify the level of knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the characteristics of the child diagnosed with ADHD?
- 5) Identify the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio concerning the methods used to determine the treatment of ADHD?
- 6) Identify the level of knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the methods used to determine the treatment of ADHD?
- 7) Identify the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio concerning the controversies surrounding the use of Ritalin with children with ADHD?
- 8) Identify the level of knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the controversies surrounding the use of Ritalin with children with ADHD?

- 9) Identify the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio concerning the role of the teacher in the education of the ADHD child.
- 10) Identify the level of knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the role of the teacher in the education of the ADHD child.

The elementary schools chosen for this study were the Maryland Avenue Elementary School in Bexley, Ohio and the Eastern Elementary School in Reedsville Ohio. The Maryland Avenue Elementary School was chosen for its wealth and suburban setting. Eastern Elementary School was chosen for its lack of funds and rural setting.

Population and Sample

The Maryland Avenue Elementary School is located in the Bexley City School District in Bexley, Ohio. The district is in Franklin County, Ohio. Bexley is adjacent to Ohio's capital, Columbus. The Maryland Avenue Elementary School contains grades K-6 and has an enrollment of 284. The student body consists of 155 males and 129 females. Student ethnic make up consists of 261 white students with 16 African American students with an attendance rate of 96.5%. Forty-one students have disabilities. Total spending per pupil at Maryland Avenue Elementary is \$9,281 per year.

During the 2000-2001 school year, the Maryland Avenue Elementary School attained excellent results on the Ohio Proficiency Tests. The 4th and 6th grade proficiency test scores exceeded state averages in all testing areas. On the 4th grade exam the school exceeded the 75% state standard in Citizenship, Reading, and Writing. The 4th grade scored 73.7% in math, and 71.1% in Science. The 6th grade exceeded the 75% state standard in all five testing areas. Scores include: Citizenship 94.2%, Math 86.3%, Reading 89.8%, Writing 97.9% and 90.2% in Science.

Twenty-one teachers work at the Maryland Avenue Elementary School. The sixteen women and five males on the staff members earn, an average salary of \$57,467, which is far above the state average teacher salary of \$42,995. All teachers are certified in their teaching areas.

The Eastern Elementary School is located in the Eastern Local School District in Reedsville, Ohio. The district is in Meigs County, Ohio. Reedsville is approximately 130

miles southeast of Ohio's capital, Columbus. The Eastern Elementary School contains grades K-8 and has an enrollment of 558. The student body consists of 281 males and 276 females. Student ethnic make up consists of 552 white students with six African American students with an attendance rate of 94%. Eighty-seven students have disabilities. Total spending per pupil at Eastern Elementary is \$5,275 per year.

During the 2000-2001 school year, the Eastern Elementary School attained fair results on the Ohio Proficiency Tests. The 4th grade proficiency test scores were above the state average in Writing. The 4th grade proficiency test scores were below state averages in Citizenship, Math, Reading, and Science. The 6th grade proficiency test scores were above the state average in Reading and Writing. The 6th grade proficiency test scores were below state averages in Citizenship, Math, and Science. The 4th grade exam results exceeded the 75% state standard in Writing. The 6th grade exam scores also exceeded the 75% state standard in Writing.

Forty teachers work at the Eastern Elementary School. The thirty-one women and nine males on the staff members earn an average salary of \$27,273, which is far below the state average teacher salary of \$42,995. Seventy-nine percent of the teaching staff are certified in their teaching areas.

Instrument

The instrument used to obtain information for this study was a questionnaire. The questionnaire consisted of five questions that dealt with teacher knowledge of the use of Ritalin and the ADHD child. A graphic ordinal rating scale was used to measure teacher responses. The graphic rating scale included: #1 No Knowledge, #2 Little Knowledge, #3 Somewhat Knowledgeable, #4 Knowledgeable, and #5 Very Knowledgeable. The research instrument was modified and approved by the Marshall University faculty.

Data Collection

The questionnaires were mailed to the principals of the Maryland Avenue Elementary School and the Eastern Elementary School. The principals were asked to distribute and collect the questionnaires and return them to the researcher. The surveys were mailed in March 2002. Forty-six surveys were returned to the researcher.

Data Analysis

The results were analyzed by making comparisons using the data obtained from the Maryland Avenue Elementary School and Eastern Elementary School surveys. In an effort to attain the most accurate results, responses in the Little Knowledge and No Knowledge categories on the surveys were combined and presented numerically and as a percentage. The Knowledgeable and Very Knowledgeable categories were also combined in a similar manner. The differences and similarities between teacher's knowledge of ADHD children are presented in tables and graphs.

CHAPTER FOUR

Introduction

The purpose of this study was to examine the knowledge level of elementary teachers from a wealthy suburban school district in Central Ohio and a poor rural district of Southeastern Ohio regarding the effects of Ritalin on children with ADHD, characteristics of attention-deficit/hyperactivity disorder, the methods for determining the treatment of children with ADHD, the controversy that surrounds the use of Ritalin, and the role of the teacher in the education of the ADHD child.

Research Questions

This study is guided by the following research questions:

- 1) What is the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio and a poor rural school district in Southeastern Ohio concerning the effects of the use of Ritalin on children with ADHD?
- 2) What is the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio and a poor rural school district in Southeastern Ohio concerning the characteristics of the child diagnosed with ADHD?
- 3) What is the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio and a poor rural school district in Southeastern Ohio concerning the methods used to determine the treatment of ADHD?
- 4) What is the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio and a poor school district in Southeastern Ohio concerning the controversies surrounding the use of Ritalin with children with ADHD?
- 5) What is the level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio and a poor rural school district in Southeastern Ohio concerning the role of the teacher in the education of the ADHD child.

Research Hypotheses

The research hypotheses for this study are:

- 1) The level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio will not be similar to the knowledge possessed by elementary teachers of a poor rural school district in Southeastern Ohio concerning the characteristics of the child diagnosed with ADHD.
- 2) The level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio will not be similar to the knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the methods used to determine the treatment of ADHD.
- 3) The level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio will not be similar to the knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the effects of the use of Ritalin on children with ADHD.
- 4) The level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio will not be similar to the knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the controversies surrounding the use of Ritalin with children with ADHD.
- 5) The level of knowledge possessed by elementary teachers from a wealthy suburban school district in Central Ohio will not be similar to the knowledge possessed by elementary teachers from a poor rural school district in Southeastern Ohio concerning the role of the teacher in the education of the ADHD child.

Analysis of Data for Research Hypotheses

The results were analyzed by making comparisons using the data obtained from the Maryland Avenue Elementary School and Eastern Elementary School surveys. In an effort to attain the most accurate results, responses in the Little Knowledge and No Knowledge categories on the surveys were combined and presented numerically and as a percentage. The Knowledgeable and Very Knowledgeable categories were also combined in a similar manner.

Population and Sample

The elementary schools chosen for this study were the Maryland Avenue Elementary School in Bexley, Ohio and the Eastern Elementary School in Reedsville Ohio. The Maryland Avenue Elementary School was chosen for its wealth and suburban setting. Eastern Elementary School was chosen for its lack of funds and rural setting.

The Maryland Avenue Elementary School is located in the Bexley City School District in Bexley, Ohio. The district is in Franklin County, Ohio. Bexley is adjacent to Ohio's capital, Columbus. The Maryland Avenue Elementary School contains grades K-6 and has an enrollment of 284. The student body consists of 155 males and 129 females. Student ethnic make up consists of 261 white students with 16 African American students with an attendance rate of 96.5%. Forty-one students have disabilities. Total spending per pupil at Maryland Avenue Elementary is \$9,281 per year.

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Twenty-one teachers work at the Maryland Avenue Elementary School. The sixteen women and five males on the staff members earn, an average salary of \$57,467, which is far above the state average teacher salary of \$42,995. All teachers are certified in their teaching areas.

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The questionnaires were mailed to the principals of the Maryland Avenue Elementary School and the Eastern Elementary School. The principals were asked to distribute and collect the questionnaires and return them to the researcher. The surveys were mailed in March 2002. Forty-six surveys were returned to the researcher.

Data analysis included a three-step process. Questionnaire responses from the wealthy urban and poor rural elementary school were totaled and averaged. Total responses as well as the average responses from each of the five research questions from the urban and rural schools were compared.

Presentations of Findings

The data for this study resulted from a response survey being administered to elementary teachers at Maryland Avenue Elementary School in Bexley, Ohio, and Eastern Elementary School in Reedsville, Ohio. The first survey question dealt with the amount of formal ADHD training received by the elementary teachers in the two districts. Survey question two polled staff members regarding the type of training they had received. Question three

examined the number of classes or in-service/professional development sessions the elementary teachers had experienced. The survey also contained five questions that were aligned with the research questions and hypotheses. Using a graphic rating scale, the elementary teachers were asked to rate their responses on a scale of 1 to 5 with # 1 symbolizing no knowledge, and #5 representing very knowledgeable.

Twenty surveys were received from Maryland Avenue Elementary School. Eighteen of the teachers reported they had received formal training concerning ADHD, including nine who received such training in college classes. In-service/professional development sessions provided ADHD training for seventeen of the twenty teachers at Maryland Avenue Elementary School. The teaching staff reported attending a total of thirty-eight classes or in-service/professional development sessions. Results of the survey are given in Table One.

Table 1

Hypothesis-based Survey Results from Maryland Avenue Elementary School

Distribution of Responses and the Percentage of Responses based upon Twenty Respondents

5 = Very Knowledgeable, 4 = Knowledgeable, 3 = Somewhat Knowledgeable,
2 = Little Knowledge, 1 = No Knowledge

<u>Hypothesis-based Question</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
The characteristics of ADHD children	1 5%	1 5%	5 25%	8 40%	5 25%
Methods used to determine the treatment of ADHD	1 5%	2 10%	8 40%	7 35%	2 10%
The effects of Ritalin on children with ADHD	1 5%	1 5%	7 35%	9 45%	2 10%
Controversies surrounding the use of Ritalin with ADHD children	1 5%	2 10%	8 40%	7 35%	2 10%
The role of the teacher in the education of ADHD children	1 5%	4 20%	7 35%	6 30%	2 10%

Twenty-six surveys were received from Eastern Elementary School. Sixteen of the teachers reported they had received formal training concerning ADHD. During college classes, eleven teachers received ADHD training. In-service/professional development sessions provided ADHD training for twelve of the twenty teachers at Eastern Elementary School. The teaching staff reported attending a total of sixty-four classes or in-service/professional development sessions. Results of the survey are given in Table Two.

Table 2

Hypothesis-based Survey Results from Eastern Elementary School

Distribution of Responses and Percentage of Respondents based upon Twenty-Six Respondents

5 = Very Knowledgeable, 4 = Knowledgeable, 3 = Somewhat Knowledgeable,
2 = Little Knowledge, 1 = No Knowledge

<u>Hypothesis-based Question</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
The characteristics of ADHD children	3 12%	2 8%	9 35%	12 46%	0 0%
Methods used to determine the treatment of ADHD	6 23%	5 19%	11 42%	4 15%	0 0%
The effects of Ritalin on children with ADHD	2 8%	8 31%	10 39%	6 23%	0 0%
Controversies surrounding the use of Ritalin with ADHD children	3 12%	7 27%	7 27%	9 35%	0 0%
The role of the teacher in the education of ADHD children	3 3%	7 27%	7 27%	9 35%	0 0%

In an effort to probe deeper into the world of ADHD, the researcher has broken the survey down into its various survey questions. Data attained from the survey questions provides information vital to the research hypotheses. The first research hypothesis dealt with the teachers' knowledge of the characteristics of the ADHD child. Two of the twenty teachers or

10% of the survey respondents at Maryland Avenue Elementary reported having no or little knowledge of the characteristics of the ADHD child, while five of the twenty-six or 19% of the respondents from Eastern Elementary gave the same response. Thirteen of the twenty teachers or 65% of the survey respondents at Maryland Avenue Elementary reported being knowledgeable or very knowledgeable of the characteristics of the ADHD child. Twelve of the twenty-six respondents or 46% of the respondents from Eastern Elementary gave the same response. Results are illustrated in Table 3 and Figure 1.

Table 3

Teacher Responses Concerning Teacher Knowledge of the Characteristics of the ADHD child, from the Maryland Avenue Elementary School and the Eastern Elementary School Distribution of Responses and the Percentage of Responses based upon Twenty and Twenty-Six Respondents Respectively.

School	1	2	3	4	5	N
Maryland Avenue Elementary	1	1	5	8	5	20
	5%	5%	25%	40%	25%	
Eastern Elementary	3	2	9	12	0	26
	12%	8%	35%	46%	0%	

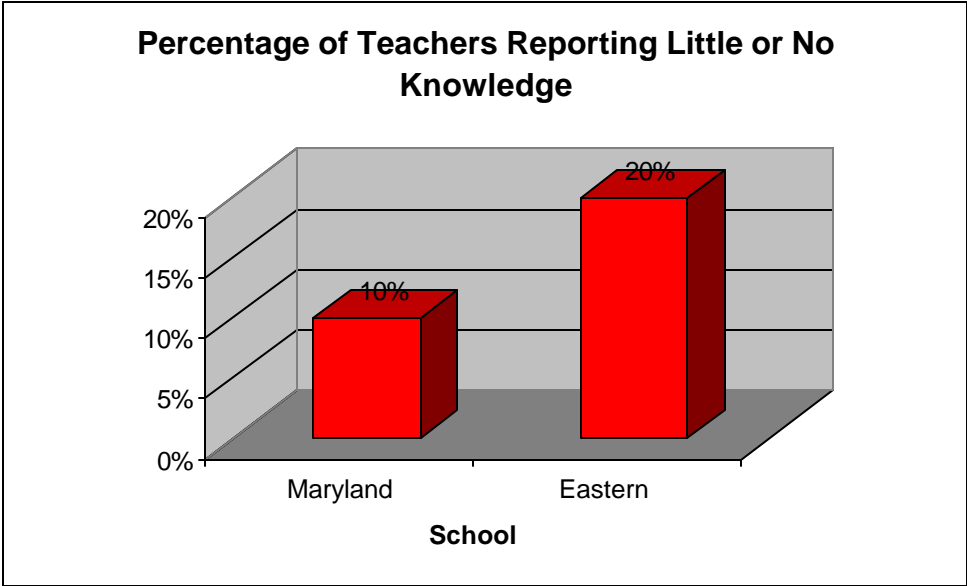


FIGURE 4.1 A

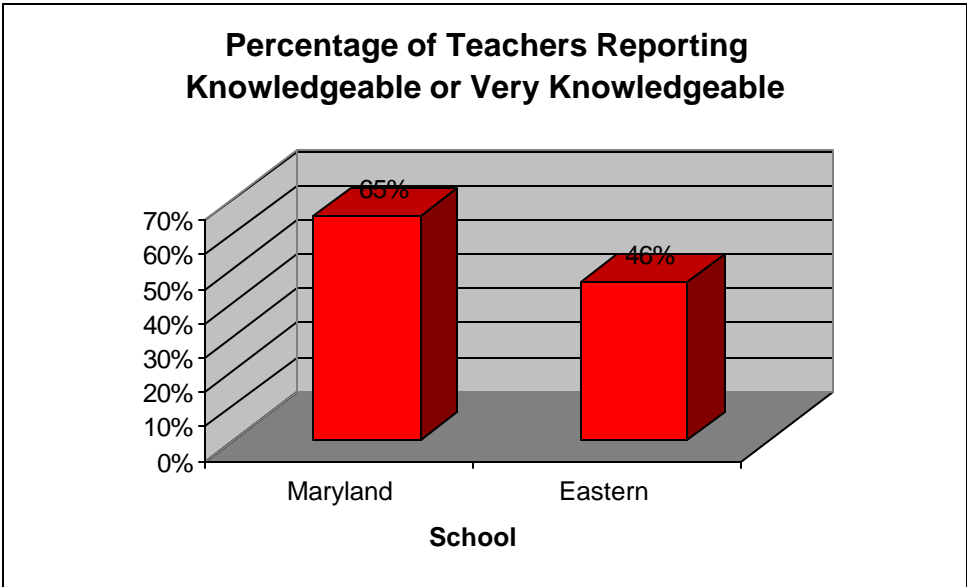


FIGURE 4.1 B

Teacher Responses, Concerning Teacher Knowledge of the Characteristics of the ADHD child, from the Maryland Avenue Elementary School and the Eastern Elementary School Distribution of Responses and the Percentage of Responses based upon Fifteen and Seventeen Respondents Respectively

The second research hypothesis dealt with the teachers' knowledge of the methods used to determine the treatment of ADHD children. Three of the twenty teachers or 15% of the survey respondents at Maryland Avenue Elementary reported having no or little knowledge of the methods used to determine the treatment of the ADHD child, while eleven of the twenty-six or 42% of the respondents from Eastern Elementary gave the same response. Nine of the twenty teachers or 45% of the survey respondents at Maryland Avenue Elementary reported being knowledgeable or very knowledgeable of the methods used to determine the treatment of the ADHD child. Four of the twenty-six respondents or 15% of the respondents from Eastern Elementary gave the same response. Results are illustrated in Table 4 and Figure 2.

Table 4

Teacher Responses, Concerning Teacher Knowledge of the Methods Used to Determine the Treatment of ADHD, child from the Maryland Avenue Elementary School and the Eastern Elementary School Distribution of Responses and the Percentage of Responses based upon Twenty and Twenty-Six Respondents Respectively

<u>School</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>N</u>
Maryland Avenue Elementary	1	2	8	7	2	20
	5%	10%	40%	35%	10%	
Eastern Elementary	6	5	11	4	0	26
	23%	19%	42%	15%	0%	

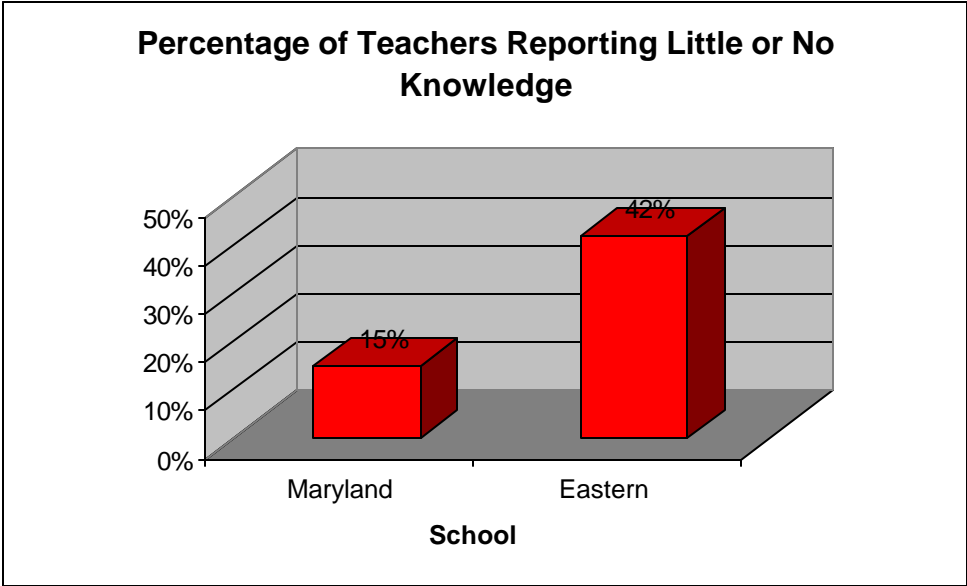


FIGURE 4.2 A

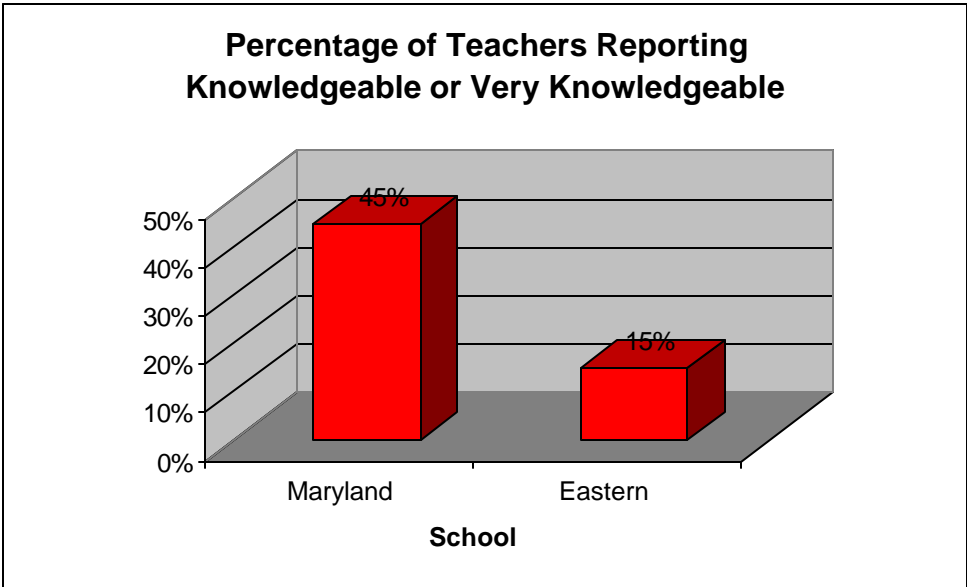


FIGURE 4.2 B

Teacher Responses, Concerning Teacher Knowledge of Methods of Treatment Used to Determine the Treatment of the ADHD child, from the Maryland Avenue Elementary School and the Eastern Elementary School Distribution of Responses and the Percentage of Responses based upon Twelve and Fifteen Respondents Respectively

The third research hypothesis dealt with the teachers' knowledge of the effects of Ritalin on the ADHD child. Two of the twenty teachers or 10% of the survey respondents at Maryland Avenue Elementary reported having no or little knowledge of the effects of Ritalin on the ADHD child, while ten of the twenty-six or 39% of the respondents from Eastern Elementary gave the same response. Eleven of the twenty teachers or 55% of the survey respondents at Maryland Avenue Elementary reported being knowledgeable or very knowledgeable of the effects of Ritalin on the ADHD child. Six of the twenty-six respondents or 23% of the respondents from Eastern Elementary gave the same response. Results are illustrated in Table 5 and Figure 3.

Table 5

Teacher Responses, Concerning Teacher Knowledge of the Effects of Ritalin on the ADHD child, from the Maryland Avenue Elementary School and the Eastern Elementary School
Distribution of Responses and the Percentage of Responses based upon Twenty and Twenty-Six Respondents Respectively

<u>School</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>N</u>
Maryland Avenue Elementary	1	1	7	9	2	20
	5%	5%	35%	45%	10%	
Eastern Elementary	2	8	10	6	0	26
	8%	31%	39%	23%	0%	

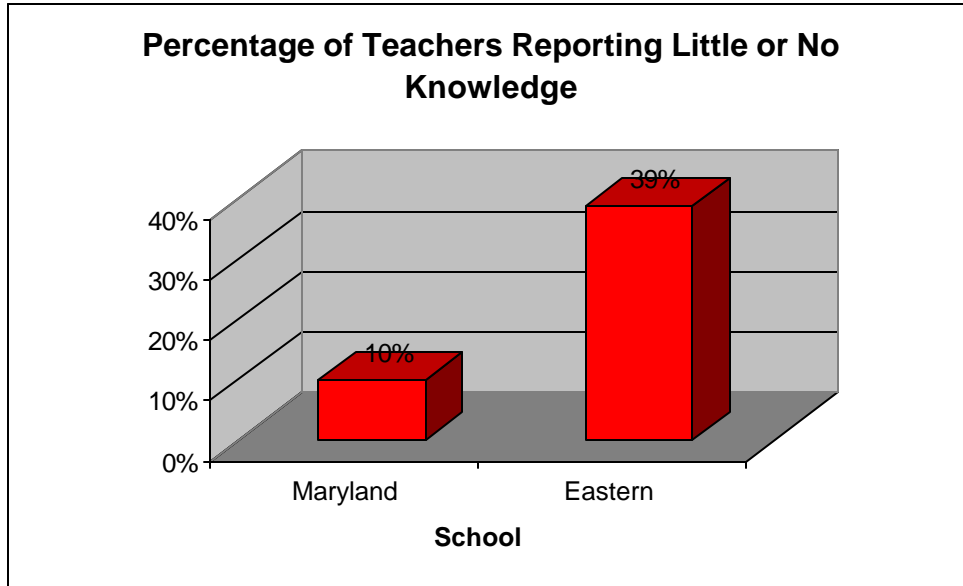


FIGURE 4.3 A

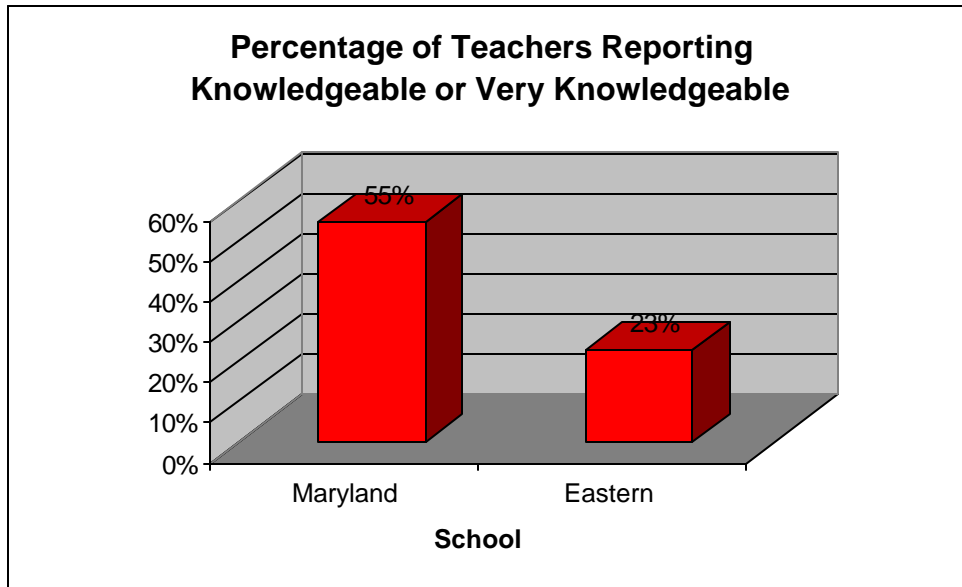


FIGURE 4.3 B

Teacher Responses, Concerning Teacher Knowledge of the Effects of Ritalin on the ADHD child, from the Maryland Avenue Elementary School and the Eastern Elementary School Distribution of Responses and the Percentage of Responses based upon Thirteen and Sixteen Respondents Respectively.

The fourth research hypothesis dealt with the teachers' knowledge of the controversies surrounding the use of Ritalin with ADHD children. Three of the twenty teachers or 15% of the survey respondents at Maryland Avenue Elementary reported having no or little knowledge of the controversies surrounding the use of Ritalin with ADHD children, while ten of the twenty-six or 38% of the respondents from Eastern Elementary gave the same response. Nine of the twenty teachers or 45% of the survey respondents at Maryland Avenue Elementary reported being knowledgeable or very knowledgeable of the controversies surrounding the use of Ritalin with ADHD children. Nine of the twenty-six respondents or 35% of the respondents from Eastern Elementary gave the same response. Results are illustrated in Table 6 and Figure 4.

Table 6

Teacher Responses, Concerning the Controversies Surrounding the Use of Ritalin with ADHD children, from the Maryland Avenue Elementary School and the Eastern Elementary School
Distribution of Responses and the Percentage of Responses based upon Twenty and Twenty-Six Respondents Respectively

<u>School</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>N</u>
Maryland Avenue Elementary	1	2	8	7	2	20
	5%	10%	40%	35%	10%	
Eastern Elementary	3	7	7	9	0	26
	12%	27%	27%	35%	0%	

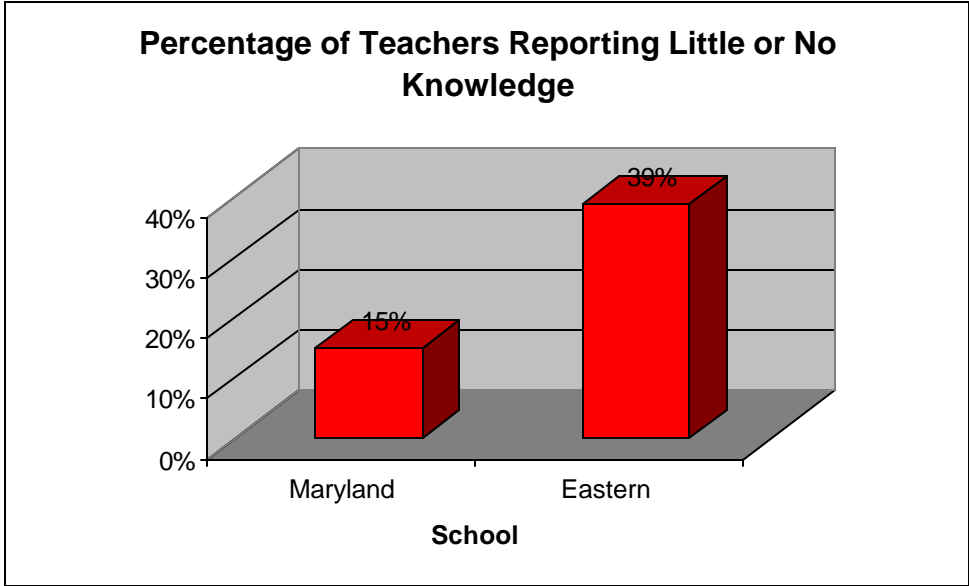


FIGURE 4.4 A

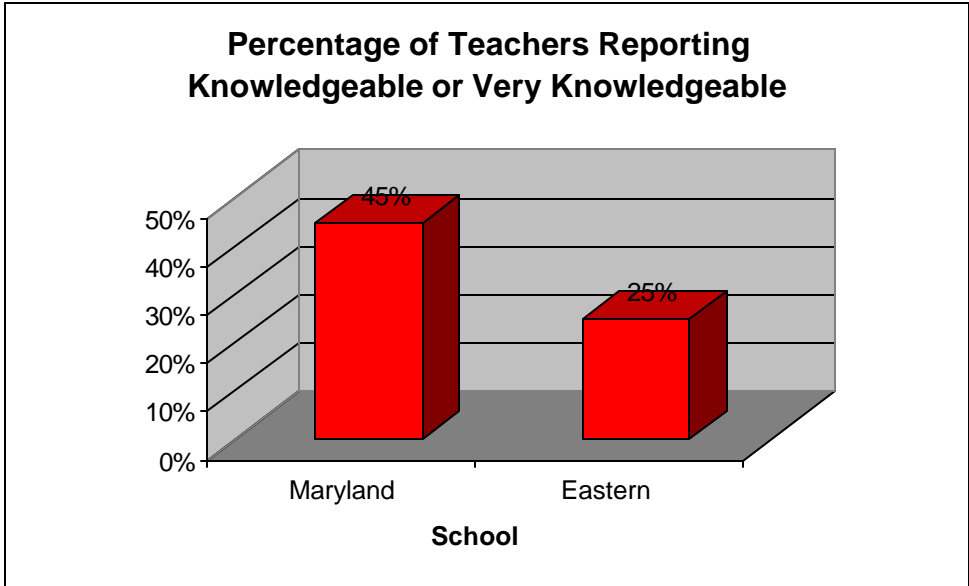


FIGURE 4.4 B

Teacher Responses, Concerning the Controversies Surrounding the Use of Ritalin with ADHD Children, from the Maryland Avenue Elementary School and the Eastern Elementary School Distribution of Responses and the Percentage of Responses based upon Twelve and Nineteen Respondents Respectively

The fifth research hypothesis dealt with the teachers' knowledge of the role of the teacher in the education of ADHD children. Five of the twenty teachers or 25% of the survey respondents at Maryland Avenue Elementary reported having no or little knowledge of the role of the teacher in the education of ADHD children, while eight of the twenty-six or 31% of the respondents from Eastern Elementary gave the same response. Ten of the twenty teachers or 50% of the survey respondents at Maryland Avenue Elementary reported being knowledgeable or very knowledgeable of the role of the teacher in the education of ADHD children. Nine of the twenty-six respondents or 35% of the respondents from Eastern Elementary gave the same response. These results are illustrated in Table 7 and Figure 5.

Table 7

Teacher Responses, Concerning the role of the teacher in the education of ADHD children, from the Maryland Avenue Elementary School and the Eastern Elementary School
Distribution of Responses and the Percentage of Responses based upon Twenty and Twenty-Six Respondents Respectively

<u>School</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>N</u>
Maryland Avenue Elementary	1	4	7	6	2	20
	5%	20%	35%	30%	10%	
Eastern Elementary	3	7	7	9	0	26
	3%	27%	27%	35%	0%	

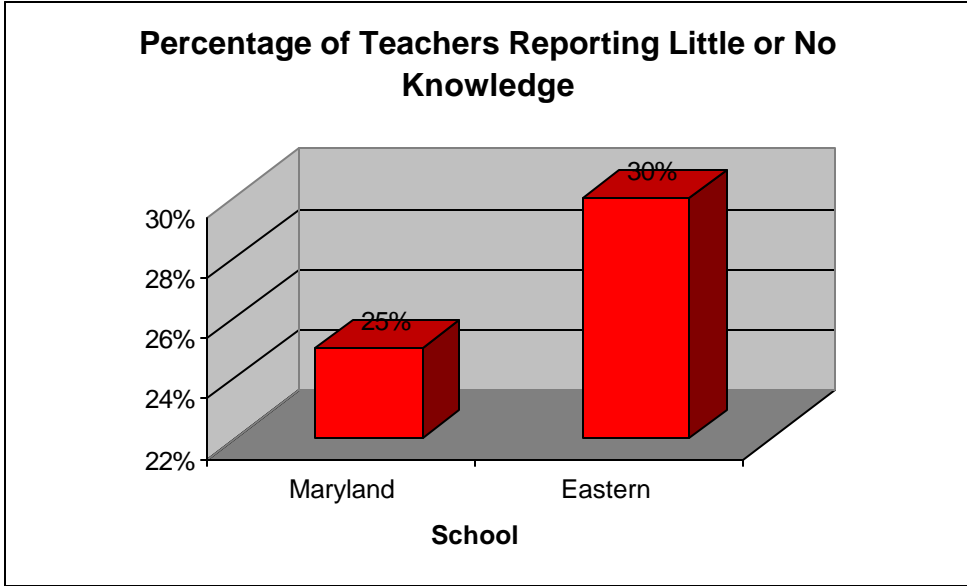


FIGURE 4.5 A

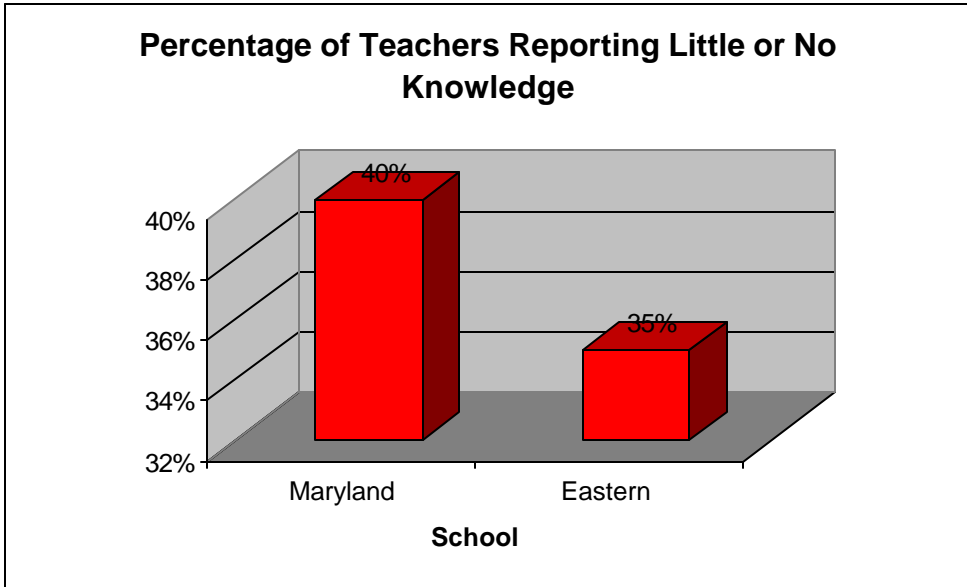


FIGURE 4.5 B

Teacher Responses, Concerning the Role of the Teacher in the Education of ADHD Children, from the Maryland Avenue Elementary School and the Eastern Elementary School Distribution of Responses and the Percentage of Responses based upon Thirteen and Nineteen Respondents Respectively

Conclusions

After analyzing the surveys, the researcher has come to the conclusion that a difference does exist between the knowledge of teachers in wealthy suburban elementary schools and poor rural elementary schools. During the initial phase of the data analysis, it was obvious a difference between the two schools existed. The surveys indicated that the Maryland Elementary teaching staff had received on the average more training sessions than the teaching staff of Eastern Elementary. While observing Table 1 and Table 2, a general overview of the raw data was given. From observing the overview, one could discover the tendencies for the teachers at Maryland Avenue Elementary to be better informed on ADHD than their fellow teachers at Eastern Elementary.

By probing deeper into the analysis of the survey, trends were discovered between the two schools by studying individual hypothesis-based survey questions. A 29% difference existed between the teachers at the two schools in the area of teachers having little or no knowledge of the effects of Ritalin on the ADHD child. While Maryland Avenue Elementary had only 10% of the respondents claimed to have little or no knowledge of the effects of Ritalin, 39% of the respondents at Eastern Elementary claimed little or no knowledge.

Maryland Avenue also outpaced Eastern in the area of being knowledgeable and very knowledgeable in the area of the effects of Ritalin on the ADHD child. Fifty-five percent of the respondents from Maryland Avenue Elementary reported being knowledgeable or very knowledgeable. Only 23% of the Eastern Elementary respondents made a similar report. The 32% gap between the two schools is the largest difference in the survey.

A smaller gap between the two schools was discovered in the knowledge of the characteristics of the ADHD child. Only a 9% difference existed between the two schools in having little or no knowledge of the characteristics of the ADHD child. The knowledgeable and very knowledgeable gap was 19% with Maryland Avenue Elementary having a score of 65% as compare to Eastern's 46%.

Another large difference could be found between the two schools in the teacher knowledge of the methods used to determine the treatment of ADHD. On the little knowledge and no knowledge level, a 27% gap was discovered. The Maryland Avenue school reported a 15% while Eastern Elementary's score was 43%. In the knowledgeable

and very knowledgeable area a 30% difference was discovered with Maryland Avenue attaining a 45% as compared to Eastern's 15%.

In regards to the controversies surrounding the use of Ritalin, Maryland Avenue Elementary attained a lower score on the little or no knowledge level and a higher knowledgeable or very knowledgeable level than Eastern Elementary. As illustrated in Table 11, a 23% gap was discovered between the schools in the lower ratings. In the higher rating, a 10% gap occurred.

The last area analyzed contained least amount of difference between the two schools. In the area of teacher knowledge in the education of the ADHD child, the schools were 6% apart in the lower ratings category (little or no knowledge). In the knowledgeable and very knowledgeable area a 15% gap was found.

Throughout the study the wealthy suburban school, Maryland Avenue Elementary School consistently outscored the poor rural Eastern Elementary School of Meigs County. It can be deducted from the analysis of the data that all the research hypotheses are correct.

Recommendations for Research

1. Conduct studies on ADHD in other wealthy suburban elementary schools in Ohio to discover statewide trends.
2. Conduct studies on ADHD in other poor rural elementary schools in Ohio to discover statewide trends.
3. Conduct studies into the type of ADHD in-services and workshops provided for Ohio elementary schools.
4. Conduct studies into the type of college courses offered in the area of ADHD.
5. Conduct studies into faculty members' age, years of experience, and type of college training as factors influencing the knowledge of ADHD.

Recommendations for Practice

1. Survey staff members on their knowledge of ADHD.
2. Conduct teacher in-service to enhance knowledge of ADHD.
3. Create staff support groups to encourage teachers of ADHD children.
4. Create family support groups to encourage parents of ADHD children.

5. Conduct follow up studies on the paths of ADHD children after they leave the elementary grades.

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APPENDIX A

2002 Survey of Teachers' Knowledge On The Effects of Ritalin On ADHD Children

Marshall University

ATTENTION DEFICIT HYPERACTIVITY DISORDER THESIS SURVEY

SCHOOL DISTRICT _____

Have you received any formal training concerning the ADHD child? _____

What is the nature of the training?

_____ College class _____ In-Service/Professional Development

How many classes or in-service/professional development sessions have you attended?

Please answer the following questions covering your knowledge of ADHD children by placing an "x" or check mark on the appropriate line on the graphic rating scale. ADHD = Attention Deficit Hyperactivity Disorder

- 5 = VERY KNOWLEDGEABLE**
- 4 = KNOWLEDGEABLE**
- 3 = SOMEWHAT KNOWLEDGEABLE**
- 2 = LITTLE KNOWLEDGE**
- 1 = NO KNOWLEDGE**

	1	2	3	4	5
1. The characteristics of ADHD children	_____	_____	_____	_____	_____
2. Methods used to determine the treatment of ADHD	_____	_____	_____	_____	_____
3. The effects of Ritalin on children with ADHD	_____	_____	_____	_____	_____
4. Controversies surrounding the use of Ritalin with ADHD children	_____	_____	_____	_____	_____
5. The role of the teacher in the education of ADHD children	_____	_____	_____	_____	_____