

Factors Contributing to the Recent Increase
of Attention Deficit Hyperactivity Disorder Diagnoses

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Abstract

Over the past twenty years, the number of Attention Deficit Hyperactivity Disorder (ADHD) diagnoses has steadily climbed. According to the Centers for Disease Control (CDC), 11% of American school-aged children and roughly 5% of American adults have ADHD (CDC, 2016; Manos, 2010). This literature review will investigate possible influences on the increasing rates of ADHD diagnoses. There are many different hypothesized etiologies for ADHD, but no one factor can be labeled as the exclusive cause of ADHD developing in children (DuPaul & Stoner, 2003). To date, researchers have not reached consensus on the etiology of the disorder, which may be a factor influencing the increased prevalence. Also, the diagnostic criteria have changed in various editions of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) (Mash & Wolfe, 2016). Several different mental health professionals are able to diagnose a person with ADHD, meaning that diagnostic practices and treatments are not uniform in the United States. (Smith, 2011). Lastly, the changing culture of the United States may indicate that societal influences have contributed to the increase in diagnoses of ADHD in America.

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Factors Contributing to the Recent Increase of
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First defined as hyperkinetic impulse disorder in 1968, the diagnostic criteria and official symptomology of Attention Deficit/ Hyperactivity Disorder (ADHD) have changed in the years leading up to the release of the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-V), in 2013. ADHD is defined by periods of inattention, hyperactivity, and impulsive behaviors that occur in multiple settings (American Psychiatric Association [APA], 2013). Hypothesized causes of this disorder include heredity, maternal cigarette use during pregnancy, abnormalities in brain structure and chemistry, and diet. To date, researchers have not reached a consensus regarding which hypothesis can be pinpointed as the true cause.

Over the past twenty years, the rate of ADHD in school-aged children ages 4 to 17 was estimated to range between three and seven percent. Since 1997, the Centers for Disease Control (CDC) reports that the rates of children being diagnosed with ADHD has steadily risen about three percent each year until 2006 and five percent per year until 2011 (CDC, 2016). Recently, the CDC released that that number has climbed to 11%, or 6.4 million of American children (CDC, 2016; Perry, 2013). This significant increase in children that are diagnosed with ADHD concerns many professionals. Experts point to several different factors that may explain the rising rates.

Many professionals have expressed that changes in diagnostic criteria have more accurately identified people with ADHD. Others have responded with concern over the increase of ADHD diagnoses in recent years. This literature review will investigate possible factors influencing this increasing rate of ADHD diagnosis by first considering the history of

the disorder. The current definition as outlined in the DSM-V has been greatly expanded since the first mention of hyperactive behavior back in 1775 (Mash and Wolfe, 2016). The symptom list has been expanded to include three subtypes, and adults are now included in the DSM-V as being able to be diagnosed legitimately with ADHD (APA, 2013). Secondly, the lack of agreement regarding the etiology of ADHD makes it difficult to diagnose. Current diagnostic practices are not uniform across the country. Many different licensed mental health professionals can officially diagnose someone with ADHD, and that could be problematic due to the different perspectives that different disciplines provide. Treatment practices are also not uniform; because it is considered a medical diagnosis, medication is currently the most used treatment even though behavioral therapy is the recommended first-line treatment for children (McCormack, n.d.). Lastly, there are also other hypothesized cultural factors affecting rising rates of ADHD diagnosis. The current American education system testing procedures, teacher expectations, and a misunderstanding of typical child development are possible factors influencing the recent increase in ADHD diagnoses (Smith, 2011). Because adults can now be diagnosed and treated for ADHD, there could be a rise in drug-seeking adults faking symptoms. College student abuse of stimulant medication is rampant, and it is estimated that between four and 38% of college or university students will have used a stimulant medication without a prescription by the time they graduate (Ward, Oswald, & Galante, 2016). While these factors have made it easier for children who do have ADHD to be diagnosed, get treatment, and be successful in their academic and social lives, it has also become easier for children who do not have ADHD to be misdiagnosed.

History and Symptoms

The first reference to symptoms related to ADHD appeared in a medical textbook written by Weikard in 1775. An 1845 children's story about a child with hyperactive symptoms is indicative of public awareness of ADHD-like behaviors in that time period (Mash and Wolfe, 2016). Despite early recognition of common behaviors associated with ADHD, it was nearly a century before a disorder with many of the symptoms recognized today was included in the second edition of the DSM. Originally referred to as hyperkinetic impulse disorder, the name was changed to attention deficit disorder (ADD) in the third version of the DSM in 1980. In addition, DSM-III specified two subtypes of ADD. The hyperactive subtype of ADD was diagnosed when the symptoms were predominately hyperactive in nature. ADD without hyperactivity was diagnosed when the majority of symptoms were associated with inattention. In a revised version of the DSM-III that was released in 1987, the name was changed to attention deficit hyperactivity disorder. It was not until the DSM-IV was released in 2000 that ADHD's symptom list began to look like it does today. The DSM-IV specified three subtypes of ADHD, and included an expanded list of symptoms (Holland & Higuera, 2015). In 2013, the most recent revision of the DSM was released (DSM-V). Major changes include the ability to diagnose adults with ADHD and a change in the age of symptom onset from seven to 12 years old (APA, 2013).

In general terms, ADHD has always been defined by inattentive, hyperactive, and impulsive behaviors that appear in home, school, and social settings (APA, 2013). Many consider it to be a neurodevelopmental disorder because symptoms tend to begin in early childhood and persist throughout development into adulthood (Mash & Wolfe, 2016). Many children with ADHD exhibit difficulties in language, social interaction, attention, and occasionally motor skills. These symptoms must be age or developmentally inappropriate

and must also impair the child from fully being successful in day-to-day activities. Children must show difficulties in more than one setting; if their disruptive, hyperactive, or inattentive behavior is only occurring in one setting, it may be that the environment is influencing their behavior rather than ADHD (APA, 2013). Therefore, the diagnosing professional must be very diligent in their assessment of every aspect of the person.

Of the 18 symptoms listed in the DSM-V, only six are required for the diagnosis. These may come from either or both of the inattentive or hyperactive/impulsive categories. DSM-V designates three subtypes of ADHD: Predominately Inattentive subtype (ADHD-PI), Predominately Hyperactive/Impulsive subtype (ADHD-HI), and Combined subtype (ADHD-C) (APA, 2013)

People with ADHD-PI display at least six of the symptoms under the “inattention” heading (APA, 2013). According to Mash and Wolfe (2016), “inattention refers to an inability to sustain attention... to tasks or play activities, to remember and follow through on instructions or rules, and to resist distractions” (p. 233). Inattention symptoms also include deficits in planning and organizing both thoughts and behaviors. However, if a child struggles with inattention it does not mean that they cannot ever focus on anything. In fact, children with ADHD frequently can attune to tasks that they find interesting, enjoyable, or fun while they can truly struggle to focus on new, uninteresting, or difficult tasks or games (Mash & Wolfe, 2016).

People with ADHD-HI display both symptoms of hyperactivity and impulsivity. Features of hyperactivity include symptoms such as uncontrollable, consistent fidgeting or other movement. The DSM-V (2013) explains this behavior by saying that it is almost as though the child seems to be “driven by a motor” (para. 4). Children that exhibit hyperactive

behaviors typically are always moving; tapping fingers or feet, running around the classroom from task to task, or generally not being able to sit still when the environment calls for stillness. However, even though these children exhibit elevated levels of activity, they do not accomplish as much as their high energy peers who do not have ADHD because their hyperactivity is not goal-directed (Mash & Wolfe, 2016).

Impulsivity can exhibit itself in many different contexts as well. Children showing symptoms of impulsivity will have difficulty keeping their thoughts to themselves; they have no filter to tell them what and when it is, or is not, appropriate to say something. A child with high levels of impulsivity will frequently blurt out questions, comments, and answers instead of waiting to be called on no matter how many times they have been scolded or disciplined with the hope that the behavior would decrease. Children with impulsive symptoms of ADHD frequently report experiencing racing thoughts that they cannot organize into meaningful summaries (Mash & Wolfe, 2016). Socially, impulsivity can have very negative effects. Turn taking in conversations can be difficult for children with ADHD symptoms, and they can struggle to connect with peers. They may also insert themselves into activities in ways that are socially inappropriate. Risk-taking behavior can become a problem for these children. Impulsive rule breaking or failing to think through the consequences of behavior has the potential to result in injury or even death. In addition, impulsivity can affect the child's emotional well-being. Poor emotional regulation is frequently experienced in children with ADHD (Mash & Wolfe, 2016). Easily frustrated, angered, or irritated children tend to perform less successfully on academic tasks as well as within social situations. Impulsivity can have many negative effects on a child's academic, social, and personal life.

Another major criteria to be considered before making a diagnosis is the age at which the symptoms first appeared. Previous versions of the DSM required that symptoms be present before the age of seven. The current edition has raised the age of onset to twelve, allowing older children to be more easily diagnosed (DSM, 2013; Perry, 2013). In addition, it includes adults in the description for the first time in the history of the disorder. Previously, it was widely thought that children with ADHD grew out of the disorder when they reached late adolescence or early adulthood. However, recent research by Barkley, Fischer, Smallish, and Fletcher (2002) has shown that over 50% of children diagnosed with ADHD will continue to show effects of the disorder when they are followed into early adulthood (18 to 25 years old). Symptoms of hyperactivity typically decrease, possibly due to the natural course of development or to the individuals learning effective coping mechanisms or outlets for their high energy. Inattention and impulsivity tend to lessen, but are still noticeable by the young adult as well as their peers and family (DuPaul & Stoner, 2003). Perry (2013) suggests that inattention, hyperactivity, and impulsivity in children above age 7 may be linked to early pubertal symptoms and not necessarily ADHD. His concern is that the raised age of onset may lead to misdiagnosis.

Hypothesized Causes of ADHD

The body of research completed cannot consistently explain how or why ADHD develops in children. In fact, DuPaul and Stoner (2003) make the compelling claim that, like most disorders, there is no single cause of ADHD in humans. There is a significant correlation between parental and offspring ADHD; parents with symptoms of ADHD frequently have children who have a diagnosis of ADHD as well. This disorder is more heritable than schizophrenia, autism, and generalized anxiety disorder; if a parent has

ADHD, their child has a 60% chance of having the disorder as well (DuPaul & Stoner, 2003; Mash & Wolfe, 2016). However, there are risk factors for ADHD that parents can contribute to other than their genes. For example, newborns with low birth weights are at risk for later developing ADHD. Many prenatal factors may be responsible for low birth weights, but the one most connected to ADHD and learning disabilities is the rate at which pregnant mothers smoked cigarettes (DuPaul & Stoner, 2003).

There is also ample research on the structures of the brain in relation to ADHD. MRI and PET scans of the brains of people with ADHD revealed fronto-striatal networking differences in the brain. People process information differently when they have a differently designed network of neurons. In addition, the prefrontal cortex has been noted to have minor structural abnormalities that may account for the symptoms of impulsivity and lack of inhibition (DuPaul & Stoner, 2003). Even though there has been research on the brain and its link to ADHD symptomology, there is much that researchers cannot fully explain about ADHD. For example, a link has been shown in the research between neurotransmitters dopamine and norepinephrine uptake and ADHD in the research (DuPaul & Stoner, 2003). However, this correlation is based on the fact that medications such as Ritalin or Adderall increase dopamine and norepinephrine uptake in their design, and increasing the quantity of these neurotransmitters seems to decrease the effect of ADHD symptoms. It is not based on an observable effect on the ADHD brain, it is instead based on an observable decrease in symptoms (Perry, 2013).

Other studies on the etiology of ADHD have claimed to find links between ingredients in food and ADHD symptoms. Most of the blame has been placed on artificial food dyes, specifically red dye #40 (Eigenmann & Haenggeli, 2004). However, these effects

have been shown to be minimal, and most researchers do not recommend that parents go through the trouble of eliminating it in their child's diet for such a small effect on symptom presentation. However, pediatricians will not object if a family wishes to attempt an artificial dye-free diet for their child (Eigenmann & Haenggeli, 2004). Sugar has also been advertised in the media as an aggregate of ADHD. Of course, if a child is hyperactive already, giving them high quantities of sugar in their diet will only cause that child to have even more energy. Many of the processed foods in the United States have very high levels of sugar content, so if a child is only eating fast food, processed snacks, and soda, the amount of sugar in their system could potentially be extremely high. There may be a logical need to limit sugar intake in a severely hyperactive child, but there is no need to cut out sugar completely (Eigenmann & Haenggeli, 2004).

In sum, there is no one cause of ADHD. Per the recent research, it seems as though genetic predisposition and brain structure are the most significant contributors to the presentation of ADHD symptoms. However, as noted by the classic Nature vs Nurture conflict, genes and brains may never be able to accurately explain all of the symptoms of ADHD. Thankfully there has been a push in the media in recent years discussing ADHD, making parents and teachers aware of the disorder, and subsequently motivating researchers to design studies on various aspects of ADHD and its effect on children. More research is needed before something can be labeled as a definite cause of ADHD; there are many correlates that have been found, but nothing is unquestionably linked exclusively to ADHD. There also needs to be more research performed on adults with ADHD; there have been few studies that investigate into how the disorder presents itself in adults. With the DSM-V

(2013) being the first diagnostic manual to include adults in the symptoms list, research is only just now beginning to study adults in regards to their unique symptoms of ADHD.

Diagnostic Practices

Typically a child's teacher is the first person to bring up concerns about a child's development to parents or guardians. If a child is not successful in their class, one of the first assumptions is that there is something wrong with the child, instead of considering the school environment. ADHD has steadily been reported in academia and the media since 1985 as something that children can suffer from that effects their schoolwork, so it is possible that teachers are more likely to jump to an assumption of ADHD than to look deeply at their lesson plans (Ray & Hinnant, 2009). Parents grow worried about their child's success in school. Then, the child's developmentally appropriate behavior in a potentially developmentally inappropriate classroom is misunderstood by a professional, who might not know the child intimately, who then diagnoses the child with ADHD.

Historically, ADHD has been viewed through a disease model lens; it is defined by a deficit within the person, and to treat it, key behaviors and ways of thinking within a person's personality must be changed (Manos, 2010). Although not officially recognized by the DSM until 1980, medication to combat hyperactive behavior was invented in 1936; Dr. Charles Bradley discovered that Benzedrine, when given to children, improved school performance by seemingly focusing attention. Later, in 1955, Ritalin was introduced and quickly became the most popular medication prescribed to treat hyperactive behavior (Healthline, n.d.). Because ADHD typically is viewed through the medical disease model, primary care doctors were the first to diagnose children with ADHD and prescribe medication. Once this disorder was in the public eye, pediatricians began diagnosing the disorder and prescribing medication

to treat the symptoms. Then, after the deinstitutionalization movement in the 1960's when mental health practices vastly improved for the good of the patient, mental health practitioners became involved as well (Healthline, n.d.).

Unfortunately, there is no standardized, regulated practice to diagnose ADHD. Anyone with a mental health license can do it. Pediatricians, clinical psychologists, counselors, primary care doctors, and others can look at a person through the very specific lens of their job and choose if a person will be diagnosed with ADHD or not (Smith, 2011). For example, a pediatrician will look at a child very differently than a clinical psychologist would. Pediatricians assumedly have more experience assessing children's physical development from a medical lens, but a clinical psychologist is most likely looking through a lens that focuses on how people think. However, a clinical psychologist may not have ample education in child development or have as much access to the child's school as a school psychologist would have. There are pros and cons to every discipline diagnosing ADHD (Smith, 2011).

Pediatricians typically are the first professionals that parents go to when told by a teacher that their child may be struggling. In fact, the number visits to a primary care doctor that resulted in an ADHD diagnosis increased by 66% from 2000 to 2010 (American Academy of Pediatrics [AAP], 2011). Many of those visits ended with children leaving with a prescription in hand for a stimulant medication, even though the recommended first line of treatment is behavioral therapy (McCormack, n.d.). The process of diagnosing is heavily reliant on the DSM-V criteria; the first time that the AAP published an official guide to diagnose ADHD was in 2000, twenty years after it was first included in the DSM-III (AAP, 2011).

Updated in 2011, the current guidelines for diagnosing ADHD in children four to 18 years old include an appointment with the family and child. Discussing concerns, family history, and current symptoms are important to amass a background on the child before assessment. Next, the pediatrician would compare the stated symptoms to the criteria list in the DSM-V and might use an ADHD rating scale to assess the impact of the symptoms. However, even the official guidelines state that “no current instruments routinely used in primary care practice reliably assess the nature or degree of functional impairment in children with ADHD,” meaning that even the AAP admit that they might not be in the best position to diagnose children with ADHD (AAP, 2011). The pediatrician can only talk to outside professionals (i.e. teachers) if the parents give informed consent. Only then will they be able to access teacher insight, school reports, or test scores. After the pediatrician has compiled their data, if the child exhibits 6 or more symptoms listed in the DSM-V in multiple settings, they will diagnose the child with ADHD. The way of diagnosing is more akin to checking off boxes than assessing the whole child (Hoekstra & Dietrich, 2014). Lastly the pediatrician will implement a treatment plan. The first listed option is medication if the child has ADHD only, and it is recommended that the medication is started at a low dose to minimize the side-effects. Next, behavior management is listed as an option if the child has a developmental variation plus ADHD. Lastly, collaboration with the child’s school to let them know about the child’s new diagnosis, treatment, and needs in the classroom would be implemented (AAP, 2011). McCormack (n.d.), quoted Dr. Stephen Hinshaw, a Professor of Psychology at UC Berkeley, as saying, “You can’t diagnose on the basis of a 10-minute chat with a pediatrician and you can’t just rely on a six-month follow-up visit” (para. 14).

Diagnosis and treatment should be a continuous and intimate process, which is not always possible with a pediatrician who only sees a child in a doctor's office.

Perhaps the most qualified professional to diagnose a child with ADHD is a school psychologist. They cannot diagnose medication; the school psychologist, pediatrician, and the family have to work closely together to find the best treatment to support the child (Kidder, 2002). Disciplines working together in this way is called a transdisciplinary model, and is the best practice to provide accurate diagnoses and proper levels of treatment to children who have any kind of learning disability or disorder (Sandall, Hemmeter, Smith, & McLean, 2005; Power, Karustis, & Habboushe, 2001).

School psychologists have a unique opportunity to see the child in their natural environment. As stated above, pediatricians typically only see the child in the settings of a waiting room and a small, sterilized room. A school psychologist can easily enter a school to observe the child in the classroom, in special class periods (i.e. art, physical education, computer instruction), at lunch, and during recess without interrupting their typical behavior during the day. They also typically have more access to teachers; they can directly interview a teacher about their student and look at classwork, tests, and homework of the child in comparison to their peers.

The most comprehensive diagnostic practice within the school system by a school psychologist follows this pattern: interviews with parents and teachers, questionnaires with parents and teachers, observation of the child in multiple settings, and assessment of academic products of the child. According to DuPaul & Stoner (2003), "the results of cognitive, neuropsychological, and educational tests are not helpful in determining whether a child had ADHD or not" (p. 29).

Teachers are typically the first to refer a student with the concern that they might have ADHD. The first step in a school-based assessment would be to perform a screening. In this case, a screening is a simple interview with the teacher who submitted the referral and inquiring about the symptoms the child is exhibiting. If the teacher reports that the child is showing signs of six or more symptoms listed in the DSM-V, the assessor will move on to step two. Step two consists of gathering data about the extent of the child's symptoms. The assessor will conduct interviews and give questionnaires to parents and teachers to figure out when the child is exhibiting symptoms and to what extent those symptoms or behaviors are impairing their success in school and other contexts (DuPaul & Stoner, 2003).

Next, an observation of the child may be conducted in the classroom to ascertain the validity of the parent and teacher claims. The observer will likely begin with completing an ADHD rating scale. There are many types of observational assessments that look at behavior: ADHD Behavior Coding System (Barkley, 1998) and the Hyperactive Behavior Code (Jacob, O'Leary, & Rosenblad, 1978) to name a few. The observer will also spend time looking for antecedents, behaviors, and consequences (ABC data) that the child experiences during the school day and decide if those are a result of ADHD or if they could more easily be explained by something else. For example, the symptoms of ADHD also can appear in disorders like depression, several anxiety disorders, oppositional defiant disorder, conduct disorder, and puberty (DuPaul & Stoner, 2003; Perry, 2013). However, these disorders also have a high comorbidity with ADHD, so it is imperative to label symptoms accurately and precisely. In addition, it is important to look at teacher responses to the child's behavior, as they may be reinforcing unwanted behaviors.

An additional assessment is the Conners' Behavior Rating Scale, arguably the most commonly used rating scale to assess for ADHD in children. It includes a parent rating scale with 203 items to rate the child's behavior, a teacher rating scale with 204 items, and a self-report scale with 179 items. These may be used on their own or in combination with one another to give the assessor as much data as they need (Connors, 2008). There are enough questions to ensure validity; many questions are repeated versions of the same question intended to ensure that the answers are filled in consistently. Both the teacher and parent scales are intended for use in assessing a child aged six to 18, while the self-report scale can begin to be used at 8 years old (Connors, 2008).

Academic work of the child may also be assessed in an attempt to find the age of onset if the child is nearing or past the maximum age of onset at 12 years old (DuPaul & Stoner, 2003). This includes looking at completed work based on the amount of work that was assigned or the standard of other students in the same class. For example, information regarding the amount of work completed as well as the number of correct answers by the entire class will likely be compared to the amount of work completed and correct by the child referred.

DuPaul and Stoner (2003) make an interesting observation related to the work that children with ADHD complete, or fail to complete. They point out that if a child is completing less work than the larger group, it could be due to multiple reasons. One reason could be whether or not there is an instructional match between the student's level of achievement and the work they are presented. Frustrational work consists of assignments that are too difficult for the child to complete independently, leading them to give up altogether and fail to complete the assignment. Conversely, DuPaul and Stoner (2003) also

make the point that it could be that the child is being asked to frequently complete work that is too easy for them, leading them to not be as engaged in the work and exhibit attention-deficit behaviors in frustrational response to the unchallenging assignment. More successfully completed work is turned in when a child is taught at their appropriate instructional level (DuPaul & Stoner, 2003).

In addition to completion of work, it is also important to examine the quality of the student's work. A child may also have inefficient study skills, taking hours to complete a simple homework assignment (Power, Karustis, & Habboushe, 2001). They may also answer the first few questions correctly, then quickly become frustrated or bored and guess random answers to the remaining questions. Another common feature of homework completed by a child with ADHD is frequent erasing of work, thus adding much more time and effort into a task.

Outside Factors Influencing Referrals and Diagnoses

In school-aged children approximately ages 12 and under, the symptoms of ADHD described in the DSM-V are commonly seen in normal development (ADHD, n.d.; DuPaul & Stoner, 2003). Coincidentally, age 12 is the maximum age of onset as defined by the DSM-V and there is not a specified minimum age of onset. The younger the child, the more likely the symptoms listed in the DSM-V (2013) are to be seen within the course of normal development. Typically developing preschoolers lack inhibition, are egocentric, and generally have high amounts of energy, and these natural developmental traits can contribute to impulsive, hyperactive behavior that has the potential to be mislabeled as symptoms of ADHD. With the pressure put on teachers by standardized testing, No Child Left Behind, Common Core, and other government mandated, high-stakes testing programs to teach

developmentally inappropriate lessons to young children, it should be obvious that some children will act out and not be successful (Madaus, Russell, & Higgins, 2009).

High stakes testing, now a common practice in public schools across the country, can be detrimental to children with ADHD. Designed to narrow the academic achievement gap between student groups, these types of programs end up preventing teachers from using best-teaching practices (Abbott, 2012). Many states implementing high stakes testing as a standard for grade promotion have unintentionally caused a trickle-down effect, forcing teachers to teach to the test due to the sanctions placed on schools (Katsiyannis, Zhang, Ryan, & Jones, 2007; Dworkin, 2005; Madaus, Russell, & Higgins, 2009). This emphasis on specific curriculum in the older grades “trickles down,” resulting in unofficial, unstated requirements in younger and younger grades until developmentally inappropriate academic expectations are placed on young students (Madaus, Russell, & Higgins, 2009).

For example, today’s kindergarteners (i.e. five and six year olds) spend the majority of their time sitting. Also, a limited amount of time is devoted to creative activities and rest. Five and six year old bodies are not meant to sit still for long periods of time, and their minds are not meant to focus on specific tasks for extended periods of time (Zigler, 1987; Smith, 2011). As stated earlier, the government has mandated third graders to be experts in reading, trickling down the need for skilled reading to begin in kindergarten and the mastery of letters and sounds to occur in preschool (Madaus, Russell, & Higgins, 2009).

However, multiple resource and developmental problems become obvious when you begin to think about what it means for a child to be expected to have mastered letters and sounds in preschool. Firstly, some children do not go to preschool. On average, American children are not legally mandated to enter the school system until age six, and no regulation

of at home curriculum is required until that time (National Center for Education Statistics, 2015). In addition to this lack of regulation, access to early education resources varies widely in families across the country. Single parent households frequently have a lower socioeconomic status, placing the child at risk for less parental interaction due to that parent being required to work long hours in order to support the family. If the parent is always at work, the child might not be spoken to or read to in the home. That single parent may not be able to afford for their child to be enrolled in a high-quality child care program, so the child would not have access to organized, quality curriculum that other children of higher socioeconomic status are exposed to every day. If the child does not have access to books and quality scaffolding of learning in regards to their emerging language and reading skills, how could we expect them to have mastered letters and sounds by the time they turn six years old and eventually have excellent reading skills by grade three? They would already be behind by the time they entered kindergarten due to this trickle-down effect. Not to mention the fact that children's reading readiness skills emerge at a range of ages all the way up to 7 years old; with some children, that age could be even later (U.S. Department of Education, 2003). Due to these developmentally inappropriate expectations in schools, some preschoolers are being diagnosed with ADHD after habitual acts of misbehavior. Could they really have ADHD? Yes, they could, but they also might be communicating that the education system does not fit their needs.

Perry (2013) expresses concern about the raise in the maximum age of onset by pointing out that inattention, hyperactivity, and impulsivity may be linked to early pubertal symptoms in older children and may lead to misdiagnosis due to these recently loosened standards of diagnosis. In addition, there is a trend of children with later school-year

birthdays being more likely to be diagnosed with ADHD when their behavior could be explained by natural, subtle developmental differences in age. Bruchmuller, Margraf, and Schneider (2012) point out that males, in general, are two times more likely to be diagnosed with ADHD than females, which could be a product of developmental and culturally taught differences in gender. Boys are generally more active than girls throughout early childhood, and are thus more likely to be noticed by teachers and labeled as disruptive in a setting where young children are required to sit still for long periods of time. Boys are also socially encouraged to participate in more physically demanding activities (i.e. sports, rough and tumble play), thus perpetuating the stereotype that little boys are all full of uncontrollable energy. This systematic cultural belief could be leading to a bias in diagnosis due to the assessor entering a referral with the assumption that boys will show higher rates of hyperactivity, thus turning the child into a self-fulfilling prophesy (Bruchmuller, Margraf, & Schneider, 2012).

The desire for instant gratification in American culture has led to a rise in the use of pharmaceutical drugs (Gu, Dillon, & Burt, 2010), and consequently ADHD medication is heavily prescribed to school-aged children. Eighty-seven percent of children diagnosed with ADHD in the United States are prescribed medication (e.g., Ritalin or Adderall); however, these medications are designed to treat severe cases of ADHD, even if taken at a low dosage (Perry, 2013). Only about 14% of the 6.4 million children diagnosed with ADHD have severe cases. Therefore, there are about 5.6 million school-aged children who are taking serious medication at a strength that they may not need. The long term effects of these serious medications have not been studied and replicated. Hoekstra and Dietrich (2014) claim that there is no evidence for effectiveness of stimulant drugs past two years of use in

treatment. In one of the only studies looking at long term effectiveness of medication as treatment for ADHD, it was found that children who were prescribed stimulant medication for eight years had no reduction of negative symptoms of ADHD and no more improvement in social functioning than those that stopped medication after two years. Could this desire for an easy fix be affecting the rates at which children are being diagnosed with ADHD and then subsequently prescribed stimulant drugs?

Some of these commonly prescribed medications are not designed for children under the age of six and are not approved by the FDA for use in young children (Perry, 2013). Behavior therapy is listed as the recommended treatment for young children with ADHD above medication; however, 75% of children ages two to five with ADHD are being treated with off- brand medication to get around the lack of FDA approval of Ritalin (CDC, 2016; Hoekstra & Dietrich, 2014). Only 33% of children ages six and older received the recommended combination treatment of medication and behavior therapy that is supported by the research to most effectively reduce unwanted ADHD symptoms and behaviors. Why is there such a large population of American children not receiving the appropriate care for their ADHD?

In addition to children being diagnosed with ADHD when in fact they do not suffer from the disorder, there is also a risk for adults claiming to have ADHD, when in fact they do not, to their primary care doctor in order to obtain a prescription for medication (Manos, 2010). With the lack of regulation of diagnostic practices and the loosening standards of the DSM-V, it is fairly simple to come away with a diagnosis and medication. Yes, the maximum age of onset is 12 years old, but adults can be pretty easily diagnosed if they wanted to be by simply claiming that their symptoms began in their childhood. As previously

discussed, diagnostic practices leave room for error due to lack of comprehensive assessment. It is estimated that 4 to 6% of the adult population has ADHD, while only 11% of those diagnosed seek treatment for the disorder. However, the number of adults seeking stimulant treatment for ADHD increased annually by 15.3% from 2000 to 2005 alone (Manos, 2010). Diagnostic criteria for diagnosing adults with ADHD is even less comprehensive than it is to diagnose children with ADHD. While spousal interviews and use of school records are listed as possible routes of assessment, they are rarely used in practice. Most rating scales used are surveys and questionnaires; all are self-reports (Manos, 2010). Hypothetically, an adult knowledgeable about the symptomology of ADHD could go to their primary care doctor and fake their way through a self-report assessment by “correctly” rating the scale of their experiences to match the requirements to be diagnosed with ADHD.

There has been much media attention given to the increasing rates of people in the general public abusing stimulant medication. Research supports that the prevalence rates of stimulant abuse is highest among college students, with 4 to 38% of a sample of 375 students at a mid-sized Midwestern university reporting that they had misused prescription stimulants by their senior year (Ward, Oswald, & Galante, 2016). Of the 24.2% of students who reported that their misuse was a life-long problem, 89.6% claimed that academic success was their reason for misusing stimulant medication. These students report that they take the medication in order to better concentrate and increase duration of study sessions. About 7% of the lifelong misusers reported their misuse as a function of recreation: to get high, to lengthen the effects of alcohol or other drugs, or to stay awake for longer periods of time at parties. Only 2% of lifelong misuse reporters stated that they misuse prescription stimulant medication for weight loss (Ward, Oswald, & Galante, 2016). However, this study by Ward,

Oswald, and Galante produced a wide range of percentages that varies from a similar study by McCabe, Knight, Teter, & Wechsler (2005). These researchers found that about 6.9% of 10,904 college students from 119 US four-year colleges report lifetime use. This difference could be due to differences in sample size as well as the McCabe et al. (2005) study looking at a wider net of universities. However, this wide discrepancy could also be due to an immense increase of stimulant abuse on college campuses from 2005 to 2016.

Regardless of the reasons given, misuse of prescription stimulant medication intended for use in people with ADHD has been a growing concern on college campuses. These medications are considered to be Schedule II medications by the DEA, in the same category as morphine, codeine, and OxyContin, because of the potential of users to develop a dependency on the medication (Wyandt et al., 2016). Any stimulant medication is considered to be a controlled substance, thus federal and state criminal charges can be placed on anyone who buys or sells these medications. While people take them in order to increase attention, stay awake for long periods of time, suppress appetite, or to get high, other more dangerous side effects include dangerous symptoms of cardiovascular failure, high blood pressure, other general heart problems, as well as paranoia; all side effects can be potentially quite dangerous and may not be known by the general public (Wyandt et al., 2016).

Conclusion

In conclusion, there are many factors that could be contributing to the significant rise in ADHD diagnosis rates other than a significant rise in true ADHD children. Loosening definitions of the disorder, a nationwide push to medicate, and a misunderstanding of developmentally appropriate behavior, are all reasonable hypotheses to consider for further exploration of this topic. Additional research is also needed on possible alternative treatments

to medicine until it is undeniable that child does have severe ADHD and needs medication to regulate the disorder. While some young children truly do suffer from ADHD and do need the help of medication and intervention to be successful in the school system, it has been harder to find them among the children who have been misdiagnosed with ADHD due to other factors (Wolraich & DuPaul, 2010).

In general, students with ADHD complete about two and a half years less of formal educational programs than students without a diagnosis of ADHD (Mannuzza, Klein, Bessler, Malloy, & LaPadula, 1993). This statistic is limited in its generalizability by the fact that it comes from a study from 1993; however, it brings up a startling phenomenon. Students with ADHD are no less able to learn and perform well in any profession they choose, yet they tend to struggle so much with the way our education system is set up that it seems like they give up short of their potential.

ADHD is defined by exhibited behaviors brought about by executive function deficits in response to inhibition and working memory, not deficits in their cognitive ability and potential (Daley & Birchwood, 2009). Executive functioning skills, including cognitive, language, motor, and emotional processes, can be affected by ADHD. Most mainstream assumptions about ADHD include an idea that children with ADHD are not smart (i.e., they cannot succeed academically due to their disorder). However, Mash and Wolfe (2016) state that executive functioning deficits are seen in only half of children with ADHD. Most children with ADHD act as though they would lie within the average intelligence range when taking an IQ test, but typically end up scoring five to nine points lower than their peers or siblings. This is more likely to be a product of their ADHD symptoms affecting test taking skills rather than an actual deficit in cognitive ability (Mash & Wolfe, 2016).

Swingle (2015) claims that bullying exacerbates symptoms for children with ADHD. If a student has ADHD, they struggle with attention, and that can negatively affect academic performance when they are trying to go through the American school system. As the student moves through the system that does not cater to their learning needs, their peers begin to notice their struggle. Bullying can begin, resulting in the student with ADHD having lowered self-esteem and at risk for anxiety or depression symptoms. As shown simply in the DSM-V (2013) symptom lists, anxiety and depression are correlated with difficulties in attention, thus beginning the cycle over again. This can lead to a concept called Learned Helplessness (Milich, 1994). If a student is bullied for so long that they believe what their aggressor is saying about their abilities, they might stop trying to succeed altogether. As professionals, parents, teachers, and friends, we must decide that ADHD is not a reason to give up on education and must continue to advocate for these children. Our education system in the United States needs to change; developmentally inappropriate expectations need to be eradicated, children need to be given equal opportunity to learn in flexible classrooms fit to their needs, and high stakes testing practices need to be changed to allow teachers to focus on their students' whole selves, not just their test scores.

Early intervention is crucial to the success of a child with ADHD. The sooner that a child can be correctly diagnosed, the sooner that child can receive the proper treatment. However, because medication is now the first line of treatment for young children diagnosed with ADHD, this can be problematic for children who are misdiagnosed. As mentioned above, there is a growing risk of children taking stimulant medication who have no true reason to be on that medication. For children who truly do have ADHD, early intervention is vitally important to their success in the education system. Beginning behavior modification,

considering a small dose of medication, and collaborating with teachers to ensure an appropriately structured curriculum as soon as possible after a diagnosis is key for a child with ADHD to not fall behind their peers.

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