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# Neurodevelopmental Disorder Depicted By Impairing Levels Of Inattention

## Attention-Deficit Disorder with Hyperactivity in Children

Did you know that males are more likely to suffer from ADHD than females? Known as Hyperkinetic Disorder (HKD) outside of the United States, the Center for Disease Control and Prevention (CDC) has declared it as one of the most common childhood neurodevelopmental disorders. Despite its popularity, many persons are uninformed; for this reason, the symptoms/clinical features, demographic details, and causes will be discussed. ADHD is a developmental disorder meaning that it originates in childhood with several impairments. This discussion will focus primarily on children, mentioning key points on adulthood ADHD. ICD codes are used to classify diseases and store diagnostic information for clinical, quality, and epidemiological purposes. ICD-9-CM was used up until September 30, 2014, replaced by ICD-10-CM effective October 1, with ICD-11 scheduled to come into effect on January 1, 2022. 293.84 and F06.4 are the respective codes for ADHD.

ADHD is defined by the American Psychiatric Association (APA) as a neurodevelopmental disorder depicted by impairing levels of inattention, dis-organization, and/or hyperactivity-impulsivity. Childhood ADHD is known to overlap with externalizing disorders such as opposition defiant disorder and conduct disorder. There are three types of ADHD, differentiated based on the symptoms most strongly exhibited. First is the Predominantly Inattentive Presentation (ICD-9-CM: 314.00/ICD-10-CM: F90.0), then the Predominantly Hyperactive-Impulsive Presentation (ICD-9-CM: 314.01/ICD-10-CM: F90.1), and finally the Combined Presentation (ICD-9-CM: 314.01/ICD-10-CM: F90.2). This disorder generally persists into adulthood, resulting in social, academic, and occupational functioning impairments.

## DSM-5 Symptoms and Clinical Features

Today, there exists a vast number of classification systems. Most mental health professionals in the United States use the Diagnostic and Statistical Manual of Mental Disorders (DSM), with the fifth and most recent edition (DSM-5) being published in 2013 by the APA. Like many other disorders, there is no single test to diagnose ADHD; several steps are involved in diagnosis someone with this condition. Persons are advised to consult with a healthcare professional to determine whether the symptoms exhibited fit the diagnosis.

A pattern of inattention is characterized by the presence of six or more symptoms of inattention for children up to age sixteen, and five or more for ages seventeen years and above; they have been present for six months at minimum and are unsuitable for the level of development. The symptoms must be exhibited often or frequently. These symptoms include failing to give close attention to detail in schoolwork, at work, or with other activities; difficulty maintaining attention in play or with general tasks; appearing not to listen when directly spoken to; an inability to follow through on instructions, failing to complete schoolwork, chores or workplace duties; an incapability to arrange tasks and activities; evading and appearing disinclined to do activities demanding mental effort over a lengthy period of time; becoming easily distracted, and

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appearing forgetful in daily activities.

A pattern of hyperactivity is similarly characterized by the presence of six or more symptoms of hyperactivity-impulsivity for children up to age sixteen, and five or more for ages seventeen years and above; they have been present for six months at minimum and are both disruptive and unsuitable for the level of development. The symptoms must be exhibited often or frequently: fidgeting, tapping hands or feet, or squirming in seat; leaving the seat in an instance where remaining seated is anticipated; running about or climbing at inappropriate times; an inability to quietly partake in leisure time activities (for adolescents or adults this may be restlessness); appears to always be “on the go,” as is “powered by batteries”; excessive talking; blurting out answers before question completion; an inability to wait their turn; and constant intrusions.

Numerous conditions must be met in addition to the symptoms mentioned. Several inattentive or hyperactive-impulsive symptoms must have been demonstrated before age twelve. The symptoms must occur in two or more settings, such as at home, school, or work; with friends or relatives; and/or in other activities. There must be a strong indication that the indicators interfere with, or reduce the quality of, social, school, or work functioning. The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder, or personality disorder). The symptoms do not happen only during schizophrenia or another psychotic disorder. Low frustration tolerance, irritability, and mood lability are associated features of ADHD. Minor language, motor, or social development delays are not exclusive to ADHD but tend to coincide. Problems with attention, executive function, or memory test are often exhibited by ADHD patients, these assessments however are insufficiently sensitive or specific to be considered as diagnostic manifestations (American Psychiatric Association, 2013).

Based on the types of symptoms displayed, three presentations (types) can occur. The Combined Presentation occurs if adequate symptoms of both criteria (inattention and hyperactivity-impulsivity) were present. Predominantly Inattentive Presentation occurs if enough symptoms of inattention, but not hyperactivity-impulsivity, were present. Lastly, Predominantly Hyperactive-Impulsive Presentation occurs if ample symptoms of hyperactivity-impulsivity, but not inattention, were present. Presentations may change as symptoms can vary over time (Davidson, Odle, & Laura, 2011). ADHD is diagnosed under different degrees: mild, moderate, and severe. When little, if any, symptoms surplus to diagnosis requirements are demonstrated and produce at most, minor social or occupational functioning impairments, the condition is diagnosed as mild. The moderate diagnosis comes about when symptoms or impairments amid “mild” and “severe” are displayed. The occurrence of symptoms surplus to requirements or several symptoms that cause outstanding impairments in social or occupational function results in the classification of patients as severe.

## **Demographic Details**

Demographic details refer to statistical data about the characteristics of a population such as age, culture, gender, and other socioeconomic factors. The use of demographics allows for the identification of trends, improving the understanding of how conditions affect specific populations. The data provided as a result of demographic studies aids in the identification of key areas to be developed in the school system, for example, estimations can be provided for

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research funding and healthcare system development. Several credible sources have been consulted for the data in this study. The data has been gathered from information in the DSM-5 as well as information put forth by the CDC. The 2016 National Survey of Children's Health (NSCH) uses different methods for data collection from previous years, as a result, not all estimates are directly compatible with one another.

Before speaking about (is it sex or gender?), both sex and gender must be defined. In terms of nomenclature, sex differences are variations attributable to an individual's reproductive organs and XX or XY chromosomal complement. Gender differences are variations that result from biological sex as well as an individual's self-representation that includes the psychological, behavioral, and social consequences of one's perceived gender. ADHD has been found to be more common in males than in females in the general population, with a ratio of approximately 2:1 in children and 1.6:1 in adults. Females are more likely than males to present primarily with inattentive features. The National Ambulatory Medical Care Survey (NAMCS) is a comprehensive survey performed yearly on outpatient US visits. Data were analyzed in Statistical Analysis System (SAS) 9.1 by chi-squared tests. From 2009 to 2012 there were 53,051,522 outpatient encounters involving children with ADHD. Of those visits, sixty-five percent were male with the remaining thirty-five percent being females. This statistic supports this claim; in that time period, the ratio of male to female ADHD patients is found to be 1.86:1, making men almost two times more likely to suffer from this condition.

Culture provides interpretive frameworks that shape the experience and expression of the symptoms, signs, and behaviors that are criteria for diagnosis. Culture is transmitted, revised, and recreated within the family and other social systems and institutions. The boundaries between normality and pathology vary across cultures for specific types of behaviors. Thresholds of tolerance for specific symptoms or behaviors differ across cultures, social settings, and families. Hence, the level at which an experience becomes problematic or pathological will differ. The judgment that a given behavior is abnormal and requires clinical attention depends on cultural norms that are internalized by the individual and applied by others around them, including family members and clinicians. Differences in ADHD prevalence rates across regions appear attributable mainly to different diagnostic and methodological practices. However, there also may be cultural variation in attitudes toward or interpretations of children's behaviors. Clinical identification rates in the United States for African American and Latino populations tend to be lower than for Caucasian populations. In the SAS 9.1 statistic mentioned earlier, eighty-seven percent of the male population were of Caucasian ethnicity. It must be noted that informant symptom ratings may be influenced by a cultural group of the child and the informant, suggesting that culturally appropriate practices are relevant in assessing ADHD.

According to a 2016 national parent survey in the United States, the estimated number of children ever diagnosed with ADHD is about 6.1 million. It must be noted that CDC's page contains ADHD data from several sources, resulting in certain discrepancies. At that point in time, it was believed that a total of 380,000 children between the ages of 2-5 years old suffered from ADHD; 4 million children between the ages of 6-11 suffered from ADHD, and three million children between the ages of twelve and seventeen suffered from ADHD. This paper opened by stating the interesting fact that the average age is seven years old, it is no coincidence that the age mentioned falls within the majority range. Though that is the average age, parents reported their children as having more severe ADHD were diagnosed earlier. The average age of diagnosis for children reported as having severe ADHD was just five years of age; the average age of diagnosis for children reported as having moderate ADHD was seven years of age, and

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the average age of diagnosis for children reported as having mild ADHD was eight years of age.

## What are the Causes?

Although the exact causes of ADHD are not known, specific parts of the brain are concerned: the frontal cortex, parietal lobe, and possibly the cerebellum. Functional magnetic resonance imaging (fMRI) studies comparing the brains of children with and without the disorder show that children with ADHD have weaker brain activation of the frontal area when responding to tasks that require inhibition. Researchers believe this is related to an imbalance in certain neurotransmitters. A neurotransmitter refers to one of a group of chemicals secreted by a nerve cell (neuron) to carry a chemical message to another nerve cell, often as a way of transmitting a nerve impulse. Examples include acetylcholine, dopamine, serotonin, and norepinephrine. Deficits in the neurotransmitters dopamine and norepinephrine are strongly suggested. Dopamine is simply the precursor of norepinephrine—a hormone (which also functions as a neurotransmitter) that is released by the adrenal medulla, in addition to nerve cells, that causes constriction of blood vessels. One characteristic of drugs used to treat ADHD is that they make dopamine and/or norepinephrine more available in the brain. ADHD also appears to have a hereditary component. Children with a parent or sibling with ADHD are two to eight times more likely to develop the disorder. Scientists have suggested at least twenty genes that may make a person more vulnerable to ADHD or contribute to the disorder in some way. Family and twin studies indicate that genetics play a significant role in the development of ADHD. Burt (2009), in a review of twenty-six studies, reported that the median rate of concordance for identical twins was .66 (one study reported a rate of .90), whereas the median concordance rate for fraternal twins was .20. This study also found that the median concordance rate for unrelated (adoptive) siblings was .09; although this number is small, it is greater than zero, thus suggesting that the environment may have at least some influence. Another review of studies concluded that the heritability of inattention and hyperactivity were seventy-one and seventy-three percent, respectively (Nikolas & Burt, 2010).

A widely publicized study conducted by Dr. Ben Feingold in the early 1970s suggested that allergies to certain foods and food additives caused the characteristic hyperactivity of ADHD children. Although some children may have adverse reactions to certain foods that can affect their behavior (for example, a rash might temporarily cause a child to be distracted from other tasks), carefully controlled follow-up studies have uncovered no link between food allergies and ADHD. Another popularly held misconception about food and ADHD is that the consumption of sugar causes hyperactive behavior. Again, studies have shown no link between sugar intake and ADHD. It is important to note, however, that a nutritionally balanced diet is important for normal development in all children. Numerous studies, however, have shown a significant relationship between exposure to nicotine in cigarette smoke during the prenatal period and ADHD (Linnet et al., 2003). Maternal smoking during pregnancy is associated with the development of more severe symptoms of the disorder (Thakur et al., 2013).

Is ADHD caused by poor parenting? Not likely. Remember, the genetics studies discussed above suggested that the family environment does not seem to play much of a role in the development of this disorder; if it did, we would expect the concordance rates to be higher for fraternal twins and adoptive siblings than has been demonstrated. All things considered, the evidence seems to point to the conclusion that ADHD is triggered more by genetic and neurological factors and less by social or environmental ones.

