



ADHD

The ability to pay attention and stay focused is central to being able to function well in life. Having no attention is found in states like being asleep or unconscious, and minimal focus occurs when one is very drowsy. How much can you do effectively then?

Common symptoms of ADHD include: not paying close attention to details, making careless mistakes, not being able to stay focused at school or work; not following through on responsibilities at school, work or home; and difficulty with organization and planning. Others include being easily distracted, forgetful, over fidgety, talking excessively, problems with waiting as needed, and always 'being on the go' (1).

Estimates on how many people have ADHD are varied. The American Psychiatric Association says 5% of American kids have it. The CDC puts the number at 11% for kids ages 4-17. Boys have it maybe three times as often, but girls can be easily overlooked from acting lady like and not drawing attention to their problems. 'Boys will be boys' gets more attention from parents and teachers (2).

Causes of ADHD are many. The most common factor is genetic, with this being responsible for perhaps 80-85% of all cases. It may not have been diagnosed in earlier generations such as the parents' or grandparents, but it is often suspected. Other risk factors include being born premature, lack of oxygen at birth (e.g. the cord around the neck and the infant being blue; 3), being jaundiced at birth for a few days, fetal alcohol syndrome, exposure to cocaine in utero, preeclampsia, maternal smoking or low thyroid during pregnancy, and maternal use of Tylenol (acetaminophen;4) during pregnancy, to name a few.

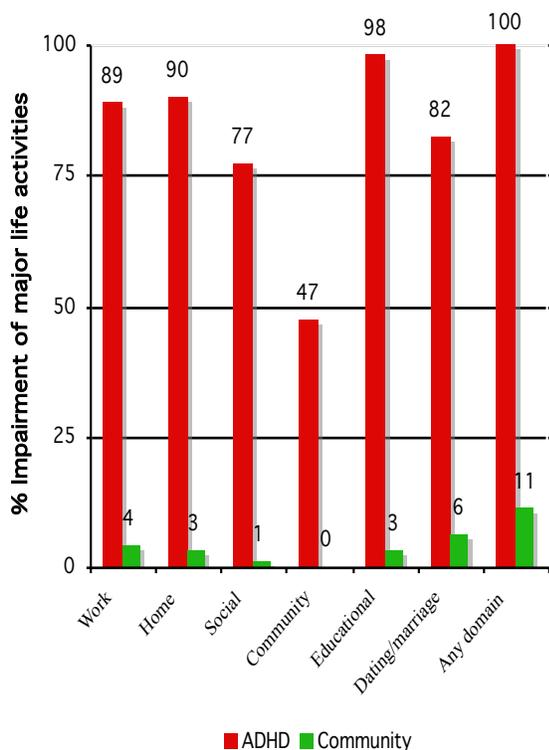
There has been the belief since at least the 1970's that too much sugar in kids causes ADHD hyperactivity, with the phrase most commonly used being that they 'bounce off the walls.' Research results on this have been mixed over the years. The bottom line is that sugar might affect some kids and make them more active. But as to curing ADHD in all who have it simply by reducing sugar in the diet, don't expect miracles. Avoiding a high sugar diet does have other virtues as to reducing the likelihood of cavities, weight gain, diabetes, etc. (5).

There has also been a concern that food colors, such as red dye #40, along with other additives such as sodium benzoate (a preservative) may adversely affect kids with ADHD (6). As with sugar described above, there is a debate as to whether or not food dyes are truly a cause of ADHD (7). Reducing exposure to artificial colors and other chemicals has other health virtues, and maybe it will help your child as to ADHD.

What is the impact of ADHD on a person's life? With kids, grades typically jump by two points (e.g. from F to C, or C to A) when ADHD is effectively treated. One of the most common complaints of younger students and even more so high school and college age ones is that they are struggling so hard and doing poorly. Or, that they earn good grades but with far more effort being applied than their peers. ADHD is also estimated to cause about a third of kids to drop out or delay high school graduation (8). And estimates are that roughly 70-90% of college students with ADHD never graduate with a common reason given that they no longer have the structure, discipline and oversight of parents to make sure that classes are attended and homework is completed on time (9).

Young adults with childhood histories of ADHD have twice the rate of suicidal ideation and attempts (9). Kids with the hyperactive side of ADHD but not those predominantly inattentive are at high risk for suicide through adolescence, especially females. There is also a higher likelihood of completed suicide in kids with ADHD followed into adulthood.

Substance abuse in ADHD is higher with nicotine being used the most, and alcohol and illicit drugs less (10). Some of this may be due to attempts to self-medicate through substances that calm the nervous system (such as alcohol or nicotine). Or to boost it up in focus such as through stimulants like amphetamine and cocaine. Such attempts always fail, and come with obvious health consequences and potentially legal ones too (DUI, possession, etc.) Research also suggests that having ADHD is like being drunk while driving as to the risk of having a car accident. Even without a crash there are legal and financial repercussions such as a teen driver running red lights or the like.



ADHD in adults has an impact on executive skills such as time management, organization, motivation, concentration, and self-discipline (11). There is a higher rate of divorce and lower level of marital satisfaction. Simply put the non-ADHD partner ends up with heavier responsibilities (12). ADHD takes a toll on employment, with a 30% greater likelihood of chronic employment issues, and 60% greater likelihood of being fired, along with three times greater chance of quitting impulsively (13).

What can be done to effectively treat ADHD? You can try a lot of approaches, but only two have been proven through research to be effective: medication, and neurofeedback (also known as EEG biofeedback). Research has shown that both of these work for about 75% of people who use them. Stimulant drugs (e.g. Adderall, Vyvanse, Ritalin) and non-stimulants (e.g. Strattera, Wellbutrin) can be used. Research has shown “a robust protective effect” of meds for ADHD patients including with mood disorders, suicidality, criminality, substance abuse, accidents & injuries, TBIs, and motor vehicle crashes (14). Numerous side effects arise with medication, and parents and/or kids may not always like the idea of their being used and either refuse to initiate or stay on them (15).

U. of Mass. study, on community vs. ADHD individuals with impairments. (9)

Neurofeedback employs an EEG machine that measures brain waves, with audio and/or visual feedback being given to the person to enable their brain to reach its peak performance. It can be thought of as being like a person who says to another, “Pay attention! Pay attention!” but in a fun way, and with repetition the brain is trained to do so. Research has shown it to be effective (16,17). One of the major advantages of neurofeedback over medication is that with drugs you take a pill today, it works for some number of hours, reduces symptoms, and wears off. And then you take another pill every day thereafter with no long term improvement ever occurring. With neurofeedback the brain gets trained over a few weeks or months, and at some point you are done, and do not need to do it any more. Plus, there is some research that finds that the effect of neurofeedback even *increases* after training ends (18). And it can persist after the training ends as well (19). The American Academy of Pediatrics said in 2012 that neurofeedback is a ‘level 1’ or ‘best support’ treatment option for kids with ADHD.

In summary, ADHD has serious consequences on many aspects of a person’s life. About two-thirds of people do not outgrow it in adulthood (20), and so a new set of problems arise as discussed above. To be more effective in leading one’s life it is important to get ADHD effectively treated.

1. DSM5, American Psychiatric Association, 2013
2. “ADHD by the numbers: facts, statistics and you” <https://www.healthline.com/health/adhd/facts-statistics-infographic#demographics>
3. “Association between perinatal hypoxic-ischemic conditions and ADHD: a meta analysis” *Journal of Child Neurology*, 2016 T. Zhu et al
4. “Acetaminophen exposure and future risk of ADHD in children” *Annals of Pharmacotherapy*, 2015 R.M. Hoover, et al
5. “Busting the sugar-hyperactivity myth” <https://www.webmd.com/parenting/features/busting-sugar-hyperactivity-myth#1>
6. “Brain health guide to red dye #40” <https://www.amenclinics.com/blog/brain-health-guide-red-dye-40/>
7. “Feed your child’s focus” Laura Stevens, M.S., <https://www.additudemag.com/feed-your-childs-focus-adhd-diet-nutrition/>
8. “Teens with ADHD more likely to drop out” <https://www.futurity.org/teens-with-adhd-more-likely-to-drop-out/>
9. “ADHD in adults: what the science says” Russell Barkley et al, 2008
10. “Prevention of health risk behaviors in ADHD youth: is ADHD treatment enough?” *ADHD Report*, 6/2014, 22(4), E. Schoenfelder et al
11. “Impairment in occupational functioning and adult ADHD: predictive utility of executive functions ratings vs. tests” R. Barkley et al, *Archives of Clinical Neuropsychology*, 25(3), 157-173.
12. “Pay attention to me: undiagnosed ADHD affects millions of adults and their romantic relationships” Kirsten Weir, 3/2012, 43(3) <http://www.apa.org/monitor/2012/03/adhd.aspx>
13. “Impact of ADHD at work” <https://adhdwork.add.org/impact-of-adhd-at-work/>
14. “Managing medication for children and adolescents with ADHD” www.chadd.org/Portals/0/Content/CHADD/NRC/Factsheets/medication.pdf
15. “A literature review and meta-analysis on the effects of ADHD medications on functional outcomes.” *Journal of Psychiatric Research*, H. Boland et al, 123, 21-30
16. “Efficacy of neurofeedback treatment in ADHD: the effects on inattention, impulsivity and hyperactivity: a meta-analysis” *Clinical EEG Neuroscience*, July 2009 40(3), 180-189, M Arns et al.
17. “Strong new support for neurofeedback treatment for ADHD” <http://www.helpforadd.com/2014/april.htm>
18. “fMRI based neurotherapist for ADHD” *ADHD Report*, Sept. 2018, 26(6), Katya Rubia
19. “In-school neurofeedback training for ADHD: sustained improvements from a randomized control trial” NJ Steiner, *Pediatrics*, March 2014
20. “Do kids grow out of ADHD? Not all do, researchers say” <https://www.healthline.com/health-news/mental-adhd-causes-problems-into-adulthood-030413#1>