

Why is ADHD more common in boys than girls?

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Credit: AI-generated image ([disclaimer](#))

About one in 20 children [are diagnosed](#) with attention deficit hyperactivity disorder (ADHD) at some point during their school life. Interestingly, for every girl diagnosed, there are between three and seven boys who receive an ADHD diagnosis.

Children and adolescents who are affected by ADHD have difficulty with things like sitting still, organisation and concentrating on work. These and other symptoms often make the school environment hard to cope with, and have a negative impact on academic achievement, relationships, and future employment opportunities. Some children do grow out of their ADHD symptoms, but many continue to experience problems as adults.

Though medication has been developed to relieve the symptoms, little is known about [ADHD's exact causes](#). Our biggest clue has come from family studies – particularly those comparing ADHD symptoms in identical and fraternal twins – which have long indicated that ADHD is [largely genetic](#). And recently, [groundbreaking research](#) has begun to identify the specific genetic [risk factors](#) related to ADHD, and to reveal the complexity of the condition. We now know that thousands of different [genetic risk factors](#) – including common variants in genes known to affect healthy brain development – collectively contribute to increase the risk of ADHD. But it is still not yet clear why there is a gender difference in prevalence.

There are many theories as to why ADHD is more commonly diagnosed in boys than [girls](#). One possibility is that girls are in some way "protected" from developing ADHD, and so it takes a [higher burden of risk factors](#) than in boys for girls to develop problems. Another possibility is that ADHD symptoms are [missed in girls](#) or that mental health problems in girls develop into [problems other than ADHD](#).

Girls and boys

Together with a large international team of researchers, I have been investigating the possible explanations for the childhood gender difference in ADHD in a series of studies.

We looked into the genetic risk factors which occur commonly in lots of people (known as [single nucleotide polymorphisms](#)). To do this we used the world's largest genetic dataset of people with and without ADHD (about 55,000 people). [We found that](#) the same genetic variants increase risk of ADHD in girls and boys.

However, in contrast to [previous smaller studies](#), we found no evidence to suggest that girls have a greater burden of these types of risk factors compared to boys. So, our results suggest that genetic risk factors which occur less commonly – or some other factors – may contribute to the lower rates of ADHD diagnosis in girls.

We also looked at family data from 2m people in Sweden, where we found some small but important [gender differences](#). [These results suggested](#) that girls with ADHD may have a more clinically complex presentation. That is to say they may have a greater risk of having autism and other developmental problems at the same time as ADHD.

We also found that the siblings of girls with ADHD are at a slightly greater risk for ADHD than the siblings of affected boys. This indicates that there might be a somewhat greater burden of risk factors in families with girls who are diagnosed with ADHD. Given that commonly occurring genetic risk factors do not seem to be elevated in girls, other familial factors will be important for future investigation, to help us understand what is going on.

Mental health

In [a separate study](#) we examined the possibility that genetic risk factors for ADHD might be linked to different mental health problems in boys and girls. We studied data from about 1,000 Swedish and British children with anxiety or depression, and found that in the group of children who had received real-life clinician's diagnoses (based on

national registry data) of anxiety and depression, girls had a higher burden of the genetic variants known to increase risk for ADHD compared to boys. But the difference was not present when all children were screened for anxiety and depression as part of the research studies.

These results indicate that genetic risk factors related to ADHD may be more likely to be clinically diagnosed as anxiety or depression in girls than in boys. If confirmed in other studies, this could give important clues as to why ADHD is less commonly diagnosed in girls than in boys.

More work is needed to confirm and further explore these results. Genetic effects are complex, and how they affect individuals can be rather small. There also needs to be more research examining different types of risk factors, such as less commonly occurring genetic mutations found in genes that are important for [brain development](#).

What our results do suggest is that girls who are presenting with any anxiety, depression or ADHD symptoms, as well as their family members, might benefit from careful screening for these clinical problems. In any case, gender-specific early and accurate diagnosis of [mental health problems](#) is necessary to make sure that all children have the support they need.

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