

Teenage Brains May Be Especially Vulnerable to Marijuana and Other Drugs

Teenagers are more likely to get hooked on marijuana, stimulants and other recreational drugs than college-aged or older adults.



By Anahad O'Connor

March 29, 2021

Adolescents and teenagers who experiment with marijuana and prescription drugs are more likely to get hooked on them than young people who try these drugs for the first time when they are college-aged or older, according to a new analysis of federal data.

The research suggests that young people may be particularly vulnerable to the intoxicating effects of certain drugs, and that early exposure might prime their brains to desire them. The findings have implications for public health policymakers, who in recent years have called for increased screening and preventive measures to reverse a sharp rise in [marijuana vaping among teenagers](#).

The new study, [published in JAMA Pediatrics](#) and led by a team of scientists at the National Institute on Drug Abuse, sought to gain a better understanding of how adolescent brains respond to a variety of recreational drugs. Previous research suggested that early exposure to marijuana, nicotine and alcohol might lead to faster development of substance use disorders. But the new analysis cast a wider net, looking at the effects of nine different drugs, including opioid painkillers, stimulants, marijuana, alcohol, cigarettes, cocaine, heroin, methamphetamine and tranquilizers.

The researchers used data from the government's National Survey on Drug Use and Health, a closely watched annual study that tracks substance use and mental health issues among Americans. The new research focused on two age groups: adolescents between the ages of 12 and 17, and young adults aged 18 to 25. Alcohol was by far the most commonly used substance in both groups: A quarter of adolescents and 80 percent of young adults said they had used it. About half of young adults said they had tried cannabis or tobacco. But among adolescents, that number was smaller: Roughly 15 percent said they had experimented with cannabis, and 13 percent said they had tried tobacco.

Most troubling to the authors of the new study was how many people went on to develop a substance use disorder, indicating that their experimentation had spiraled into an addiction. The researchers found that within a year of first trying marijuana, 11 percent of adolescents had become addicted to it, compared to 6.4 percent of young adults. Even more striking was that within three years of first trying the drug, 20 percent of adolescents became dependent on it, almost double the number of young adults.

Adolescents who tried prescription drugs were also more likely to become addicted. About 14 percent of adolescents who took prescription stimulants for recreational use went on to develop a substance use disorder within one year, compared to just 4 percent of young adults. And while 7 percent of young adults who tried opioid painkillers became addicted soon after taking them, that figure rose to 11.2 percent among younger users.

For alcohol and tobacco, however, there was not much of a difference between the two age groups: Both older and younger youth had a similar rate of developing a substance use disorder. And for illicit drugs such as cocaine and heroin, the number of adolescents using them was too small for the researchers to draw any meaningful conclusions.

One possible explanation for the findings is that young people who have a greater predisposition to developing an addiction may be more likely to seek out illicit drugs at an earlier age. But Dr. Nora Volkow, a senior author of the new study and the director of NIDA, said it is known that cannabis and other drugs can have a potent effect on adolescent brains because they are still developing. Younger brains exhibit greater plasticity, or ability to change, than the relatively static brains of older individuals. As a result, drugs like cannabis are more likely to alter synaptic connections in younger brains, leading to stronger memories of pleasure and reward.

“It’s a learning process when you become addicted,” said Dr. Volkow. “It’s a type of memory that gets hard-wired into your brain. That occurs much faster in an adolescent brain.”

Studies show that regularly using marijuana can affect cognition in adolescents, leading to impairments in parts of the brain that are involved in learning, reasoning and paying attention. Yet in recent years the booming popularity of e-cigarettes has led to a sharp increase in the number of adolescents who vape nicotine and marijuana, a trend that has alarmed public health officials. Some studies suggest that adolescents may also be more likely to try marijuana as more and more states legalize its recreational use.

Dr. Volkow said that as states implement new marijuana regulations, policymakers should work on measures aimed at protecting adolescents. She stressed that pediatricians and dentists should screen for drug use in their young patients by asking them about it. And she cautioned parents not to dismiss marijuana use in teens and adolescents as something that is harmless.

“As it relates to marijuana, the drugs that were available when parents today were teenagers are very different from the drugs that are available now,” she said. “The content of THC is much higher, and the higher the THC content, the greater the risk of adverse effects.”

Anahad O’Connor is a staff reporter covering health, science, nutrition, and other topics. He is also a bestselling author of consumer health books such as “Never Shower in a Thunderstorm” and “The 10 Things You Need to Eat.”