Dear Alice,

I typically don't smoke that much weed, especially during the school year. Last year, for instance, I smoked maybe once a month. This summer, though, my friends and I have all hit the bong pretty hard. I'm worried such frequency over a few months could impair my long-term capacity for learning. Is there any salt to this concern?

Thanks,
Smokin' too much

Answer

Dear Smokin' too much,

Summertime when the living's easy… your concern does carry some weight — heavy marijuana (also frequently called pot or weed) use over an extended period of time is associated with cognitive impairments, including changes to the brain structure. Studies that look into the effects of short-term use haven’t been able to find conclusive evidence of any long-term effects on learning, as some note that it may affect learning capabilities, while others had no such findings. However, you may also want to pay attention to the short-term effects of smoking pot (also called getting high or being stoned) and how it may affect daily life.

The active ingredient in marijuana is tetrahydrocannabinol (THC), which rapidly moves from the lungs to the bloodstream when weed is inhaled. THC acts on specific sites in the brain, called cannabinoid receptors (part of the endocannabinoid system), setting off a string of reactions that ultimately leads to the cannabis high. Most cannabinoid receptors are in the parts of the brain that regulate pleasure, memory, thoughts, concentration, coordinated movement, and sensory and time perception. So, while research demonstrates that marijuana does have medicinal uses for these parts of the brain (such as treatment of muscle spasms, seizure disorders, and nausea cause by chemotherapy), excessive marijuana use may cause changes to focus, impaired coordination, decreased motivation, and distorted perceptions (i.e., paranoia or giddiness).

Not only is brain performance affected, but some studies have also shown that the physical brain is affected. When compared with those who don’t smoke pot, those who did had changes to the
volume, shape, and density of gray matter of the two brain regions that house the endocannabinoid system. However, some newer studies have contradicted these findings, which might not have adequately controlled for alcohol use [2] among participants.

Studies on long-term use do show that age at first use, duration, and longevity of use may be influential factors in potential cognitive impairment. In studies that looked at the effects of substance use on cognitive development, those who smoked pot performed worse on tests of memory recall, inhibition, and reasoning. They also found that increased use over time was correlated with lower performances on tests of memory and inhibition. Keep in mind that the brain region that influences decision-making, emotional regulation, and personality isn’t fully developed until a person reaches their late twenties, so marijuana use beginning in adolescence and early adulthood may have larger and longer-lasting effects than marijuana use later in life.

A summer of heavy bong hitting may not lead to these cognitive impairments overnight, but you may want to consider the short-term effects of heavy marijuana use while you’re in school. Weed may impact your daily life without causing severe problems for your brain. Getting high, even infrequently, still has the potential to fog your thinking, which may still increase the risk of academic or social challenges. You may also want to consider your reasons for smoking pot — do you enjoy the high? Is it a social activity? How would you like to use marijuana in the future (if you use it at all)? Thinking through this may offer some clarity that may affect your choice to use in the future. You may also find it helpful to think about whether or not you’ve noticed any changes in your cognitive capabilities over time. Are there any differences that you’ve observed? If so, how do you feel about them? Thinking about what changes you’ve noted may also help you make decisions about your use moving forward.

Some recreational use might not change your cognitive abilities drastically, but it’s wise to consider what could result from prolonged bong use in the future. Your mind is a powerful asset — kudos to you for looking out for your brain health.

Alice!
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Published date:
Aug 14, 2009
Last reviewed on:
Mar 08, 2019