Marijuana: Sorting the Research

Currently, several states have legalized marijuana, while the federal government officially considers it a dangerous and highly addictive drug. It is clear from this that there are varying views on the effects of marijuana. Unfortunately, the research on marijuana use is incomplete and at times contradictory, and sorting the evidence about marijuana usage is a complex endeavor. For many years, much of the research, both in favor and against, was anecdotal, as marijuana was illegal in the United States, and rigorous research was not permitted to be conducted. Fortunately, there has been renewed interest in, and availability of, research looking at marijuana use in (1) different demographic subgroups; (2) tracking the impact of usage patterns; and (3) exploring the possible connections between marijuana use and the developing adolescent brain.

While acknowledging that there are limitations, in this research, such as a lack of standardization of product dosage, potency, quality and consistency, it does point to health issues that are important for public policy makers, parents, educators and others concerned about adolescent development and the impact of marijuana on brain functioning.

In 2018, the Canadian Journal of Behavioral Science published an article on the impact of marijuana on Canadian youth. The researchers collected data from 662 participants over a 10 year period. The Public Significance Statement that resulted was that early-onset and persistent high-frequency of marijuana use leads to negative outcomes for young people, specifically in terms of educational attainment, relationship satisfaction and employment options. These results were focused on a group of young adults, about 11% of the youths in the study, who began to use around age 13 and became chronic users. Another sub-group, categorized as occasional users, (27% of the participants), had a higher probability of behavioral issues and mental health symptoms than any of the other subgroups except chronic users. Both groups, chronic users and occasional users, reported ongoing symptoms of depression and anxiety.
Other studies have focused on marijuana use and the potential impact on brain functioning. One study looked at the connection between early marijuana use and verbal memory impairment. In this study, those who started marijuana use before age 16 demonstrated reduced capacity in verbal memory. The authors of this study cite other studies investigating the relationship between early marijuana use and brain functioning in specific areas, such as the prefrontal cortex, a region of the brain that affects planning, decision making, and social behavior. Important brain functions such as self-regulation, self-control, mental flexibility, working memory, and emotional regulation become stronger and more efficient during adolescence. Imaging studies of the brain support a concern about negative neurophysiological changes in key brain centers related to marijuana use.

Ongoing research using advanced imaging techniques will further our understanding of the means by which marijuana use is thought to disrupt the development of the adolescent brain. Current brain studies are looking at how using marijuana changes the cannabinoid receptors that naturally exist in our brain. They are trying to find out how marijuana use affects the brain, and why increasing amounts of marijuana are needed to create the same “high”. This research suggests that marijuana use makes the brain’s natural cannabinoid receptors less responsive. This translates into diminished ability to experience pleasure and increased negative feelings like depression and apathy.

What do these research studies suggest as a public health focus? From a demographic perspective, the Canadian study highlights those adolescents at greatest risk: one group, chronic users, need intense intervention to address co-occurring social, educational and psychological issues while a second group, occasional users, need psychological attention to deal with issues of anxiety and depression. The research on marijuana’s effects on adolescent brain development suggests the importance of educating adolescents and young adults about consequences of marijuana use. Important questions for psychological research include the following: What
are effective ways of educating adolescents about the risk factors in early onset and occasional marijuana use? What factors connect marijuana use and depression and anxiety in adolescents?

It is also important for public policy makers to be informed about the status of the marijuana industry today and the public health problems that are on the horizon. Here is a list of some of the significant issues: There are new forms of the product on the market with increased potency. The distribution model has become more sophisticated, resulting in easier availability for both legal and black market product. There is an attempt to divide the components of marijuana into those that are mind-altering and those that address pain management. This has led to a sense of the usefulness of marijuana for a multitude of purpose without any evidence based research. There is a marketing campaign to promote cannabis oil for mental health issues and even for opioid detox. This campaign targets adolescents. Current public policy and protect adolescents by limiting alcohol and tobacco use. Public policy makers need to extend these protections to the use of marijuana.

**References available upon request.**
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