Marijuana Use: What Do We Really Know?

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Marijuana is the most widely used illegal substance in America, with a reported 19.8 million adults using at least once in the last 30 days.[1] With legalization of marijuana for recreational purposes spreading to more and more states, the demand for scientifically sound information about marijuana has outpaced the capacity of the scientific community to accurately answer many questions.

The mismatch between demand for accurate information and the availability of scientific knowledge has created both gross exaggerations and complacent dismissals of the short and long term risks of using marijuana. In this document, we present a brief summary of the most frequently discussed issues about possible negative effects of marijuana use. Our intent is to educate the public on what is known and where the knowledge gaps are.[2]

No Exaggeration, No Minimization: What We Know

Marijuana and the Teenage Brain. The human brain is not fully developed until the mid-twenties. Some research has shown that regular use of marijuana during teen years may impact the development of the pre-frontal cortex and other areas of the brain, resulting in permanent difficulties with memory, learning, planning and problem-solving. A contrary finding was reported in a recent longitudinal study that followed males from adolescence into their mid-thirties, which found no differences in any of the mental or physical health outcomes measured regardless of the amount or frequency of marijuana used during adolescence.

In Washington State, 27% of high school seniors reported using marijuana in the last month.[3] Adolescents that are already using marijuana will not necessarily develop irreversible damage, but they are risking it. There is no clear threshold for safe use – teenagers should not use marijuana or other substances such as alcohol, tobacco and other drugs until their brain is fully developed.

School Performance. It is well documented in Washington State and nationwide that marijuana users present poorer school performance and higher rates of school dropout. This could be related to short memory impairment caused by marijuana use. It could be also be related to other factors: Marijuana use is highly correlated with other risky behaviors such as smoking, drinking, rebellious lifestyle, peers who do not value academics and disinterest in school in general. Singling out marijuana use as the cause of low school performance can result on missing the mark – a comprehensive approach to improving teenage school performance is more likely to be effective.

The factsheet Adolescents and Marijuana discusses this age group in more detail.

Addiction. Marijuana addiction is well documented, affecting 9% of all marijuana users. Marijuana addiction is more common among people who started using marijuana in their teens (about 16%). The rate of life time dependence among near daily users is estimated to be 35-50%.

The fact sheet Dependence on Marijuana discusses marijuana addiction in more detail.

Marijuana and Driving. There is insufficient research on marijuana use and driving to definitively answer some of the most pressing questions on this topic. A robust body of research informs legal limits for driving after drinking, supporting guidelines on number and types of drinks consumed and time needed to wait before driving, according to gender. The same is not true for marijuana; we do know however that marijuana affects coordination, reaction time, alertness and concentration. It also impairs our ability to judge distances. Based on these facts, the general recommendation has been to wait at least 4 hours after smoking and much longer after ingesting marijuana.

The fact sheet Marijuana and Driving - Research Brief discusses this topic in more detail.

Pregnancy. Several large epidemiological studies report that marijuana use in pregnancy is associated with reduced birth weight, even after adjusting for other variables. However, smoking tobacco and marijuana overlap so often in this group that is difficult to entirely tease apart the two behaviors. Some studies report cognitive problems in children of heavy marijuana users; other studies with more than 5 years of follow-up found no problems. More research is needed since marijuana using mothers are different than non-marijuana abusing mothers in many other aspects. In the meanwhile, total abstinence of marijuana during gestation and while breastfeeding is strongly recommended and the safest alternative, giving insufficient knowledge in this area.

The fact sheet Marijuana and Reproduction/Pregnancy discusses this topic in more detail.

Mental Health.

Anxiety and paranoia: Many users report feeling less anxious and depressed when under the effect of marijuana. By the same token, many users report episodes of anxiety and paranoia when high on marijuana. It is possible that the specific components of the marijuana used play a role on triggering or buffering these symptoms. Cannabis plants with high levels of THC are more likely to produce generalized anxiety of paranoia, while plants with relatively high levels of Cannabidiol (CBD) can have calming effects. The plant composition may also interact with users' specific genetic makeup and the environment. At this point in time, the relationship between anxiety, paranoia and marijuana use is poorly understood.

Schizophrenia: Research suggests that marijuana may trigger schizophrenia in those who are already at risk of developing the disorder, such as having a family history of the illness. Those with a vulnerability to develop schizophrenia should be strongly advised against using marijuana. People with existing psychotic disorders should be strongly advised and assisted to cut-down and/or cease their cannabis use. More studies are needed to determine if marijuana use can cause schizophrenia and psychosis – at this point in time, there is no clear evidence one way or another.

The fact sheet Mental Health and Marijuana discusses these topics in more detail.

Lung Cancer. Marijuana use affects the respiratory system and can cause cough, airways inflammation and wheezing. So far, studies have not shown that marijuana causes lung cancer. However, as many marijuana users also smoke tobacco (with or right after marijuana) it is possible that the relationship is hard to detect. It is also possible that it does not exist at all.

The fact sheet Respiratory Effects of Marijuana discusses this topic in more detail.

Medicinal Cannabis (medical marijuana). Half of the states in the US have legalized the use of marijuana for medical purposes, despite federal regulations deeming marijuana as a substance with no medical benefit. The lack of research

is also concerning when it comes to determine marijuana use benefits, particularly because the use of marijuana as a medicine.

While a lot of research is still needed regarding medicinal cannabis, the National Institutes of Health explains cannabis therapeutic potential: "Currently, the two main cannabinoids from the marijuana plant that are of medical interest are THC and CBD. THC increases appetite and reduces nausea. The FDA-approved THC-based medications are used for these purposes. THC may also decrease pain, inflammation (swelling and redness), and muscle control problems. CBD is a cannabinoid that does not affect the mind or behavior. It may be useful in reducing pain and inflammation, controlling epileptic seizures, and possibly even treating mental illness and addictions." [4]

The fact sheet Medicinal Cannabis and Chronic Pain discusses this topic in more detail.

Final Comments

This fact sheet presents key marijuana-related topics of great societal interest and for which there are not clear scientific answers to date. Fortunately, things seem to be slowly changing, as state and federal funding agencies have been expressing interest in supporting research projects that can shed light on the topics presented. Meanwhile, the best approach is to be aware of the uncertainties surrounding marijuana use risks – and cautious when making decisions surrounding a topic with not enough research evidence to back them up.

References

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