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GENERAL ARTICLE

The Legalization of Medical/Recreational Marijuana: Implications for School Health Drug Education Programs*

JOSEPH DONNELLY, PhD^a MICHAEL YOUNG, PhD, FAAHB, FSSSS, FAAHE, FASHA^b 

ABSTRACT

BACKGROUND: More than half of US states have legalized medical marijuana. Several states have also legalized it for recreational use. In spite of states' actions, marijuana remains illegal under federal law. It remains to be seen, however, if the Trump administration will enforce federal law in states that have legalized marijuana. For now, it appears the move toward state legalization of marijuana will increase. Because of its legal status, research concerning the medical benefits of marijuana has been limited.

METHODS: We reviewed the literature pertaining to medical use and legalization of marijuana.

RESULTS: Available research shows that marijuana can benefit some conditions. There are also concerns about harmful effects on both individual and public health and whether legalization will lead to increased marijuana use among youth. Each of these elements has implications for school-based drug education programs. Researchers have shown that the 10 states with the highest rate of past month marijuana use by youth all have legalized recreational and/or medical use of marijuana, whereas none of the 10 states with the lowest rate of past month marijuana use by youth, has legalized marijuana. In the debate over legalization schools can potentially serve as a community resource, providing accurate information concerning marijuana.

CONCLUSIONS: Teachers and parents should continue to discourage young people from using marijuana (as well as alcohol, tobacco, and other drugs).

Keywords: marijuana; medical marijuana; recreational marijuana; marijuana legalization; drug education.

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In 1996, California became the first US state to legalize the use of medical marijuana. Since then, another 28 states plus the District of Columbia, Guam, and Puerto Rico have legalized medical marijuana.¹ Not only has medical marijuana been legalized in most states, 8 states and Washington, DC,² led by Colorado and Washington in 2012,³ have legalized recreational use of marijuana. States have viewed the legalization of marijuana as an economic boom. The industry is on track to post \$20.2 billion in annual sales by 2021.⁴

Everything seems to point to increased efforts to making legal marijuana even more widely available. Before we rush headlong into doing so, however, it may be prudent to take a closer look at some of the issues relative to this drug. Thus, in this

paper we examine the legal status of marijuana, the benefits and concerns about marijuana use, both as a medicinal and as a recreational drug, the impact of the legal availability of marijuana on adolescent use of marijuana, and other substances, and the implications that potentially even wider availability of legal marijuana has for school health/drug education programs.

REVIEW OF LITERATURE

Legal Status

Although most states have provided legal access to medical marijuana, and some of these states also have legalized its recreational use, at the federal

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level, marijuana remains illegal. Differing messages, however, have been given relative to enforcement of the federal law. For example, under the Obama administration, Attorneys General Eric Holder and Loretta Lynch generally declined to challenge state laws that legalized marijuana. Also, in response to the legalization of marijuana in several states, James Cole, the Deputy Attorney General, in August 2013, sent a memo to all US attorneys to provide “Guidance Regarding Marijuana Enforcement.” In the memo, Cole reconfirmed several federal enforcement priorities concerning marijuana. He made clear that this guidance did “not alter in any way the Department’s authority to enforce...federal laws related to marijuana, regardless of state law.” At the same time he indicated that individuals who possessed small amounts of marijuana for personal use on private property and those engaged in marijuana operations, but were in compliance with the state law in those jurisdictions that had “implemented strong and effective regulatory and enforcement systems” were low priority.⁵ Finally, Congress passed a short-term spending bill that included the Rohrabacher-Farr Amendment (first passed in 2014). This amendment prohibits the use of federal funds to prevent states from “implementing their own state laws that authorize the use, distribution, possession, or cultivation of medical marijuana.”⁶ It also has been included in subsequent federal spending bills, eg, in the disaster relief package signed by President Trump on September 8, 2017. This action allows the provisions of the amendment to continue to be in effect for the period of the spending bill but they will expire when the spending bill ends, unless Congress votes to also include it in the next spending bill.⁷

On the other side of the issue the US Drug Enforcement Administration (DEA), in 2016, confirmed marijuana’s status as a Schedule I drug. The agency indicated: (1) Marijuana has a high potential for abuse; (2) Marijuana has no currently accepted medical treatment use in the United States; and (3) Marijuana lacks accepted safety for use under medical supervision.⁸ Additionally in April of 2016, then Senator, now Attorney General, Jeff Sessions, at a Senate hearing entitled, “Is the Department of Justice adequately protecting the public from the impact of state recreational marijuana legislation,” stated “...good people don’t smoke marijuana.” and “we need grown-ups in charge in Washington to say marijuana is not the kind of thing that ought to be legalized ... that it is, in fact, a very real danger.”⁹ In the January 2017 confirmation hearings, however, Sessions admitted during questioning by his fellow US senators that disrupting states’ legal marijuana markets by enforcing federal marijuana laws could create an undue strain on federal resources.¹⁰

However, the following month, in a White House briefing, White House Press Secretary Sean Spicer said the White House expects there will be greater enforcement of federal laws concerning marijuana in states that have legalized recreational marijuana. He also noted that the President was supportive of medical marijuana, but not recreational use of marijuana.¹¹

Since his confirmation as Attorney General, Jeff Sessions has indicated he is opposed to the legalization of marijuana, that marijuana continues to be against federal law, including in states that have legalized marijuana, and also stated that the Justice Department will enforce the law “in an appropriate way nationwide.”¹² He has also established a taskforce that will provide a review of crime reduction and public safety including a review of marijuana.¹³

If there is a real effort by the federal government to shut down existing marijuana operations, functioning openly as legal businesses in the states that have legalized the drug for recreational and/or medical purposes, the federal government can expect major pushback from the states. States will make marijuana a state’s rights issue. It appears likely, that over the next few years, even more states will legalize marijuana for recreational and/or medical use. Pressure by those who view marijuana as an important alternative/complementary treatment, states seeing marijuana tax money as a cure for budget woes, and entrepreneurs viewing marijuana as an opportunity to make big money will all be factors leading to increased legalization.

As the legal landscape changes there are also implications for the messages school health/drug education programs provide young people about marijuana. For example, is marijuana legal or not? The current answer to that question is: “It depends.”

What We Know About the Medical Benefits of Marijuana

Do the medical benefits of marijuana justify its increased legal availability for medical purposes? Because of the legal status of marijuana, research related to the medical benefits has been relatively limited. Research has, however, found marijuana to have therapeutic potential in several areas. For example, marijuana use has been found to relieve chronic neuropathic pain.^{14,15} Also, researchers have long recognized marijuana’s effect on appetite stimulation in debilitating disease.^{16,17} Additionally, research also has shown that an orally administered cannabis extract can help multiple sclerosis patients by reducing the frequency of muscle spasms and increasing mobility,^{15,18,19} and that marijuana may be effective in controlling nausea and vomiting caused by chemotherapy in cancer patients.^{19,20} The National

Academies of Sciences, Engineering, and Medicine also indicated there is limited evidence that does suggest that exposure to cannabis may have anti-inflammatory activity.¹⁹

What Concerns Are Related to the Use of Medical Marijuana

Whereas marijuana has been shown to have medical benefits, we also know that marijuana use has a number of negative side effects. Among the most consistently seen side effects are an increase in heart rate and an increase in systolic blood pressure.²¹ There is also some evidence suggesting that cannabis smoking may trigger a heart attack.¹⁹ Other side effects include increased appetite, increased thirst, drowsiness, insomnia, anxiety, panic attacks, hallucinations, and short-term memory loss.²¹ Marijuana use also has been shown to produce changes in perception of time.²² Additionally the National Institute on Drug Abuse has indicated marijuana produces altered senses (eg, seeing brighter colors), changes in mood, impaired body movement, and difficulty with thinking and problem-solving.²³

Research has suggested that smoking cannabis on a regular basis is associated with more frequent chronic bronchitis episodes and poorer respiratory symptoms.¹⁹ Other researchers have noted that marijuana smoke contains tar with carcinogens similar to those in the tar from tobacco smoke.²⁴ Although it would seem that frequent smoking of marijuana may, like tobacco, could have cancer-causing effects, the report from the National Academies indicates that existing evidence suggests cannabis does not increase the risk for the type of cancers most often associated with tobacco use. The report did, however, indicate that cannabis use is associated with one subtype of testicular cancer.¹⁹

We know that no one in the United States has ever died directly from a documented case of marijuana overdose,²⁵ but many of the noted side effects can contribute to serious injury or death. For example, marijuana use can severely impair driving performance while operating a motor vehicle,²⁶ and research indicates that cannabis use prior to driving increases the risk of being involved in a motor vehicle crash.¹⁹

The Concerns About Legalizing Marijuana for Recreational Use

One major concern about legalizing the recreational use of marijuana is the possibility of increased motor vehicle crashes due to marijuana intoxication. Researchers in Washington state examined this issue. They studied the prevalence of THC in the blood of drivers involved in fatal crashes from 2010 to 2014. They found that the proportion of drivers in fatal crashes who had detectable amounts in the blood did

not increase immediately after legalization, but began increasing rapidly in September 2013, about 9 months after legalization. In 2014, the proportion of drivers involved in fatal crashes who were identified as having THC in their blood was double that of previous years.²⁷

Colorado also has seen an increase in marijuana related traffic deaths, reporting an increase in 62% since recreational marijuana was legalized in 2013. The percentage of marijuana-related traffic deaths, as a percentage of all traffic deaths, has also increased. For example, in 2009 traffic deaths involving drivers who tested positive for marijuana represented 10% of all traffic deaths. In 2015 this had risen to 21%.²⁸

Hospital emergency department visits have risen since the legalization of recreational marijuana. In Colorado, emergency department visits likely related to marijuana use were 313/100,000 in 2011 and 358/100,000 in 2012. In 2013, the year recreational marijuana was legalized the rate grew to 443/100,000. In 2014 that rate was 554/100,000.²⁸ Young children have also been involved in marijuana exposure visits to hospitals and poison centers. For example, researchers in Colorado examined the rates of visits, due to marijuana exposure, a single children's hospital and a regional poison center, both before and after legalization of marijuana, among children less than 10 years of age. The median age of children visiting the hospital was 2.4 years; the median age for those visiting the poison center was 2 years. Rates for the 2 years prior to legalization were compared to the rates 2 years following legalization. At the hospital the mean rate of visits prior to legalization was 1.2/100,000; the rate following legalization was 2.3/100,000 ($p = .02$). At the poison center the number of visits increased from 9 in 2009 to 47 in 2015. Over half of the exposures involved edible products and poor child supervision or product storage was reported for a more than one-third of the exposures.²⁹

Another concern regarding the legalization of marijuana has to do with the role of regulations relative to public health and risk reduction, versus a focus on profits, with little concern for public health. Clearly marijuana is big business and we have seen how big tobacco companies have for years placed profits before public health.³⁰ Pacula et al³¹ noted states that have legalized marijuana are writing the rules that will allow for the legal production and sale of marijuana products, but that they are doing so with no modern examples of marijuana regulation to provide guidance. For example, what measures will be taken to reduce: access, availability and use by youth; driving under the influence; consumption of products with unwanted contaminants and uncertain potency; and risk of dependency and addiction? We do have experience and lessons that have been learned from examining public health approaches to regulating alcohol and tobacco. It is unclear, however, the degree

to which these lessons will be applied in developing policy regarding marijuana sales. Neither is it clear as to what research will be sponsored that will help us understand the effects of these policies.

Legal Marijuana and Its Impact on Adolescent Use and Use of Other Substances

A concern voiced by a number of authorities is that the legal availability of marijuana for recreational and/or medical purposes will lead the public, and specifically young people, to believe that marijuana use is safe. Additionally, there will be easier and more widespread access to marijuana, and marketing efforts targeting young people. The result will be an increase in the use of marijuana for recreational purposes and increased marijuana dependence among school-aged youth.³²

We also know that marijuana use is potentially more problematic among adolescents than among older adults. Adolescent use of marijuana is associated with a number of different problems, including inattention, academic learning, and processing speed; subtle abnormalities in brain structure; increased activation during cognitive tasks despite intact performance; and compromised objective indicators of sleep quality. According to researchers some of these abnormalities may persist beyond a month of cessation, but may resolve within 3 months if cessation is maintained.³³

To date, the published evidence base does not clearly support the concern that legalization of recreational and/or medical marijuana will lead to increased marijuana use among adolescents. Several studies have been conducted, including work that examined the effect of decriminalization. For example, 2 studies used data from the Monitoring the Future Study to examine youth use of marijuana in states that had decriminalized marijuana and came to different conclusions. In 1981 Johnston et al³⁴ published data that showed the decriminalization of marijuana in some states from 1975 to 1980 did not seem to impact high school students' use of marijuana. Chaloupka et al,³⁵ however, examined data from 1992 to 1994 and found that youth who lived in states that had decriminalized marijuana were more likely to report current use and may have used marijuana more frequently than youth in states that had not decriminalized marijuana. Ammerman et al³² used YRBS data to compare marijuana use rates among youth from states that had legalized medical marijuana with national use rates. These researchers found no significant increases or decreases in marijuana use rates among youth, except in Alaska and New Mexico. New Mexico showed an increase from 2011 to 2013 among 12th graders, but Alaska showed an 8.5% decrease in current use rates among youth. More recently, Choo et al³⁶ found no increase in current use rates after legalization.

However, Colorado researchers report data that are consistent with the view that legalization leads to increased use. They compared the past month marijuana use by youth in the 2-year average (2013-2014), this is since Colorado legalized recreational marijuana, with the 2-year average prior to legalization (2011-2012). They found rates of past month use 20% higher in the 2-year period since legalization than in the 2-year period prior to legalization. The researchers noted that during the same time period national figures for past month marijuana use by youth declined by 4%. Also, 2013 to 2014 results show Colorado youth had the highest rate of past month use of marijuana in the nation, compared to a #4 ranking in 2011 to 2012, and a #14 ranking in 2005 to 2006. The 2013 to 2014 rate was 74% higher than the national average. Additionally, the researchers showed that the 10 states that had the highest rate of past month use of marijuana by youth were all states that had legalized recreational and/or medical use of marijuana. This was compared with the 10 states that had the lowest rate of past month use of marijuana by youth, none of which had legalized recreational or medical marijuana use.³¹

The findings of some researchers that have indicated legalization of recreational and/or medical marijuana has not impacted youth marijuana use seem counter-intuitive. As Ammerman,³² however, indicates there are a number of factors that may influence youth marijuana use. Some of these may be unrelated to legalization, per se. Factors such as perception of social norms, perceived susceptibility to, and perceived severity of the harmful effects of marijuana, as well as parent behaviors may influence rates of marijuana use. The effect of legalization of marijuana on rates of youth marijuana use, may involve more than whether or not marijuana use in a particular state is legal for recreational and/or medical use. It may depend on the specifics of how legalization is operationalized.

For example, medical use of marijuana use is now legal in Kentucky. However, the law, as passed, has a number of provisions that are problematic for anyone seeking to use medical marijuana. These include (1) the law does not make it legal for anyone to grow marijuana; (2) the use of marijuana is legal only under the written order of a physician practicing at a hospital or clinic affiliated with the University of Kentucky or the University of Louisville—thereby authorizing only a relatively small group of physicians to participate; and (3) it is against federal law for a physician to issue a prescription for marijuana.³⁷ Thus, it seems reasonable to assume that legalization per Kentucky's law will have less influence on increasing rates of youth marijuana use than legalization in states that make it easy for adults to legally purchase marijuana for recreational purposes.

CONCLUSIONS

Over half of the US states have legalized medical marijuana and several states have also legalized recreational use. Marijuana still remains illegal under federal law, creating a confusing legal landscape. Although research on the actual effects of marijuana has been limited, because of its legal status, it is clear there are some medical benefits. There are also negative effects, especially indirect effects such as its negative influence on driving. There are also concerns about the impact legalization is having on youth marijuana use. In general it appears that legalization may increase use among youth, but use may depend both on the specifics of the legislation and additional factors not related to the legislation.

IMPLICATIONS FOR SCHOOL HEALTH

An important part of school health programs and the whole school, whole community, whole child model is the concept of community involvement.³⁸ One way schools could involve the community on the matter of legalizing marijuana for recreational and/or medical purposes is to sponsor public/community forums on the issues involved. It is likely that parents and other community members may have a wide range of opinions regarding the safety and potential medical benefits of marijuana. The idea is to provide accurate information that will allow community members to make informed decisions. It will be important to have speakers who are truly experts in the subject matter, and who can provide a research perspective, but who are not zealots for or against a particular policy position. Opportunities should be given for attendees to ask questions and to share their opinions regarding policy options.

Additionally, school-based drug education programs should make every effort to provide accurate information to students, including information reflective of current research, legislation, and legal decisions. Programs should also continue to discourage young people from using marijuana. We often hear some people make the argument that marijuana is no worse than alcohol or tobacco. Based on the research currently available, they may be right. Even if they are right, that's not much of a recommendation. Remember 88,000 people die each year in the United States from alcohol-related deaths³⁹ and tobacco is responsible for 430,000 deaths per year in the United States (and millions of deaths each year worldwide).⁴⁰ Thus, saying something is no worse than alcohol or tobacco, certainly does not mean it is safe. It is not just the direct physical effects that are of concern, but also effects on behavior and decision-making, such as impaired driving, unsafe sex, and other risky behaviors. Regardless of legal status, it is important for teachers and parents

to encourage young people to avoid using marijuana (as well as alcohol, tobacco, and other drugs).

Human Subjects Approval Statement

As a review paper, this work did not require Institutional Review Board examination.

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