Current Psychiatry Reports (2021) 23: 17
https://doi.org/10.1007/s11920-021-01231-1

COMPLEX MEDICAL-PSYCHIATRIC ISSUES (MB RIBA, SECTION EDITOR)

Cannabis Legalization and College Mental Health

Ludmila De Faria[1] · Lillian Mezey[2] · Aaron Winkler[3]

Accepted: 22 January 2021 / Published online: 3 March 2021

Abstract

Purpose of Review To assess how the changing landscape of marijuana use affects the developing brain and mental health of college students.

Recent Findings Legalization of cannabis may facilitate use in the college population, with 38% of college students, whose brains are still maturing, regularly using marijuana products. Earlier and increased use, higher potency, pre-existing issues, and genetic predispositions increase negative outcomes by precipitating or worsening mental illness and ultimately impacting academic success.

Summary In the USA, the sharpest increase in cannabis users following legalization has been in the college age population (18–25 years of age). This population is especially vulnerable to the negative impacts and risks associated with cannabis use, including risk for the onset of major psychiatric illness. College mental health practitioners should remain informed about health effects of cannabis use, assess patient use on a regular basis, provide education and be familiar with interventions to reduce harm.

Keywords Cannabis use · Decriminalization · Legalization · Cannabis-induced psychosis · College mental health · College students · Cannabis use disorder · Provider education

Introduction

Since 1996, when both California and Arizona introduced ballot initiatives to legalize cannabis use, there has been rapid progression in laws decriminalizing its use [1]. Over the last two decades, decriminalization has led to increased availability and use, both for medical and recreational purposes in the USA. As of 2020, 28 states allow medical cannabis with reduced penalties for possession, and 12 states plus DC have legalized recreational use [2]. These changes have created a profitable market with a large consumer base and very little, if any, regulations [3, 4]. In states which have legalized medical use, cannabis growers and vendors market directly to consumers with health claims that have little to no basis. Public health effects of legalization, including affordability [5], social justice [6], increased revenue for local and state governments through taxation [6], and decreased spending on law enforcement and judicial system [6], can mask the health and occupational consequences of increased in heavy use [5], especially in already marginalized populations [7•].

Adolescents and emerging adults may be particularly susceptible to the effects of legalization since genetic predisposition accounts only in part to cannabis and other substance use in early adulthood [8] and legislative, institutional, and interpersonal controls can attenuate risk. Recent data available from SAHMSA [9] indicates that the sharpest increase in use has been in the college age population (18–25 years of age). That is in part due to their perception of low risk of using cannabis, when compared to other drugs. According to SAMHSA, the percentage of young adults (ages 18–25) that consider the use of cocaine, heroin, alcohol and tobacco to be harmful has remained relatively stable over a 3-year period. On the other hand, there has been a steady decline in the percentage of those who perceive cannabis as harmful [9].

Lower perceived risk and market forces are only two among many factors influencing increased cannabis use in college-aged individuals. Other reasons include easy availability (especially following legalization), peer influence

This article is part of the Topical Collection on *Complex Medical-Psychiatric Issues*

✉ Ludmila De Faria
L.BarbosaDeFaria@ufl.edu

[1] Young Adult Clinic, University of Florida School of Medicine, Gainesville, FL, USA

[2] Student Health, Counseling and Psychological Services, University of Virginia, Charlottesville, VA, USA

[3] College Mental Health Program, Department of Psychiatry & Behavioral Sciences, Stanford University School of Medicine, Stanford, CA, USA

(desire to be accepted by peers who use), low parental monitoring, social facilitation (enhance feelings of well-being, conviviality, and social interaction), and self-medication for emotional pain (to distract from personal and academic problems and depression) [10]. Following legalization, there have been more opportunities for non-users to come into contact with cannabis, and studies have shown increase in the number of people having tried cannabis after legalization, including underage individuals [11] and marginalized populations [7•]. Although the effects of cannabis on health and wellness are multifactorial and complex and more research is still needed, there is some evidence that widespread and increased use may lead to serious health consequences [12].

The current paper starts with a very brief overview of our current understanding of the pharmacological effects of cannabis on the young adult brain and its potential clinical consequences. The subsequent case vignette illustrates how complex and confusing the clinical presentation can be in highly functioning young adults. After reviewing the impact of cannabis use in specific clinical disorders based on current research, we finish with a discussion of the importance of training college health providers about the effects and risks of cannabis use in young adults, prevention strategies, screening for substance use, and harm-reduction and treatment interventions. This includes the recognition and treatment of psychosis in heavy users, as well as educating students about this underappreciated risk.

Pharmacological Effects of Cannabis and the Young Adult Brain

Early adulthood remains a crucial period of major developmental tasks, such as individuation from family, accepting responsibility for one's self, making independent decisions, and establishing an adult relationship with parents [13]. For a significant number of young adults, this will take place while they are engaged in a demanding academic environment, with limited parental and social support. Young adults attending college have a fully matured amygdala (responsible for emotional recognition and regulation) and nucleus accumbens (responsible for motivation, passion, and pleasure), but as yet not fully developed prefrontal and frontal cortical regions, responsible for attentional control, concentration, and mood regulation [14]. It is also a time when most major psychiatric disorders often initially present, with 50% of most mental illnesses emerging by age 14 and 75% by age 24 [15]. During this vulnerable period, sometimes referred to as emerging adulthood, the brain is undergoing critical developmental changes [16] that can be severely disrupted by cannabis use. Approximately 4% of college students are regular cannabis users (i.e., using on 20 or more occasions in the past month), and the rate has doubled from 6 to 13% among same-age non-college transition-age youth in recent years [17].

In addition to an increase in use in the USA, cannabis has changed over time. The past decade has seen an influx of high-potency cannabis grown from clones rather than from seeds [18] [19]. The result is cannabis products that are much more potent than what was available in the past. THC concentration in commonly cultivated cannabis plants increased threefold between 1995 and 2014, from about 3.8 to 12.2% [20]. Furthermore, cannabis available in dispensaries in some states has average concentrations of THC between 17.7 and 23.2% [21]. The lack of standardized "dosing" in available products usually means wide variation in the amounts of Δ9-tetrahydrocannabinol (THC) and cannabidiol (CBD) present. For example, some concentrated products, commonly known as dabs or waxes, may contain between 24 and 75% percent THC. The resulting dose-dependent mental health effects that include psychotic-like symptoms, anxiety, and memory impairment [19], as well as poor performance in school and at work and potential for addiction, have all been downplayed by the industry.

It is well known that cannabis has particular effect in the dopaminergic system [22]. Dopaminergic neurons are modulated by the endocannabinoid system and endocannabinoid ligands are abundant in dopaminergic pathways where they have a role in modulating dopaminergic transmission [22]. Among the more than 104 different psychoactive chemical compounds found in the cannabis plant, Δ9-tetrahydrocannabinol (THC) and cannabidiol (CBD) tend to receive the most attention [23, 24••]. They are responsible for the effects desired by both recreational and medicinal cannabis users. Δ9-tetrahydrocannabinol (THC) is responsible for the intoxicated state after recreational use due to partial agonist action at the type 1 cannabinoid receptors (CB1), causing relaxation and euphoria [25•]. Cannabidiol (CBD) is non-intoxicating, non-psychoactive, with low affinity for CB1 and CB2 receptors. It is an agonist of 5HT1A serotonin receptors and appears to have a role in pain and inflammation [25•].

Even though the direction of causality has not been conclusively demonstrated, heavy cannabis use is associated with an increased risk of mental disorders [26•] including psychosis [27], addiction [28, 29], depression [30, 31], suicidality [30••], cognitive impairment [32••], and amotivation [26•].

The following case report illustrates many aspects of the difficulties inherent in treating college students who develop severe symptoms. Inadequate screening for substance use, failure to initially recognize substance use-related syndromes, and psychosocial factors such as family, culture, and peer-environments can all contribute to delays in the implementation of well-informed comprehensive treatment plans. The risks of delays in accurate diagnosis and treatment for mental disorders are well described and can include substantial psychosocial and academic disruptions, as well as worse long-term outcomes.

Case Report

M. is a 22-year-old college student presenting to the outpatient clinic for follow-up after being released from an inpatient psychiatric unit. This was his second hospitalization in 2 years, each time after several months of heavy cannabis use that resulted in psychosis. After the first hospitalization, he withdrew from school for the semester while receiving treatment with an oral antipsychotic, which was tapered after stabilization of symptoms. On return to campus, cannabis use began again, resulting in another psychotic episode followed by hospitalization. During the second hospitalization, stabilization required two oral antipsychotics followed by long-acting injectable medication, and he was eventually discharged into the care of his parents with tapering instructions and told to seek care in his hometown. During his initial assessment, the student was noticed to have severe psychomotor retardation and cognitive impairment (difficulty with simple calculations), despite a history of high-level of academic success he had achieved in a mathematical field.

Over the next 10 months, the patient improved slowly. He was initially seen weekly for Cognitive Behavior Therapy but did not engage in the homework. He was referred to the local first-episode psychosis clinic but was denied admittance because it was felt he did not meet criteria for schizophrenia and because, with return to college possible, he would not be remaining within the geographic area covered by the clinic. He returned to previous levels of functioning and was invited back to a high-level professional internship he had completed the year before. After the first 4 months, his parents expressed concerns that he was over-medicated on anti-psychotics. A few weeks later, just after starting part-time work where his previous internship had taken place, he was admitted to the hospital with severe abdominal pain and diagnosed with Crohn's disease.

After 8 months, anti-psychotic therapy was tapered and stopped. After 10 months, the patient was able to return to school part-time. His treating physician coordinated care with college counseling office to work out a follow-up plan that included substance use peer group organized by the center, referral to disability resource office for academic assistance based on both psychiatric and medical illnesses and medical follow-up.

The presentation described above is fairly typical in college. The substance use often muddles the clinical presentation, especially in the presence of vague family history, potentially delaying appropriate diagnosis and treatment. In addition to that, access to treatment while in college, including intensive dual-diagnosis programs, is limited and, in some areas of the country, almost impossible. This severely impacts not only the course of the illnesses but also the ability for the young adult to complete their education. In the following session, we look at the impact of cannabis in the most prevalent diagnosis in young adults.

Cannabis and the Most Common Diagnoses in the College Age Population

Psychosis

The association between cannabis use and psychosis is well documented [24••, 26•, 33–36]. This is true of synthetic cannabinoids as well as plant-based cannabis. Cannabis-induced psychosis (CIP) is a well-described syndrome of acute-onset psychosis after cannabis use, often presenting with agitation, anxiety, paranoia, and mood lability. In most cases, CIP resolves completely. However, a substantial number of those with CIP, possibly up to 45%, go on to develop persistent psychotic disorders [36, 37••]. Studies suggest that adolescents may be at higher risk to developing a schizophrenia-spectrum disorder after an episode of CIP. Although it is not clear whether there is a causal relationship between cannabis use and longer-term psychotic illnesses such as schizophrenia, there are indicators that such might be the case, including a dose-response relationship, a temporal relationship, and evidence of psychotogenic properties of THC in controlled laboratory experiments in humans [26•, 33, 35].

There are several plausible neurobiological mechanisms linking cannabinoid use with psychosis, including, but not limited to, THC's effects on dopamine pathways (including on dopamine synthesis and release) and increasing evidence of the role of the endocannabinoid system (ECS) in psychosis [35]. It is not clear whether heavy and early use of cannabis in a vulnerable individual can cause schizophrenia per se, or whether it triggers, accelerates, and/or exacerbates processes that would have occurred anyway. One clear risk factor for developing a persistent psychotic disorder after an episode of CIP is pre-existing genetic vulnerability, including the family history of psychotic disorders and certain genetic polymorphisms [24••, 26•].

Other risk factors for progression to schizophrenia-spectrum disorders include early onset of cannabis use, early age of first psychotic episode, longer period of cannabis use, and higher THC dose [26•, 34, 37••]. Perhaps the most important factor is continued use (or relapse) after the first psychotic episode; the risk of developing a chronic psychotic disorder is substantially reduced if abstinence is achieved and sustained after the first episode of CIP [34, 36].

In people with pre-existing schizophrenia, cannabis use is associated with a worse course of illness, including higher rates of relapse and worsening of symptoms and level of functioning [24••].

As adolescents and young adults who have experienced an episode of CIP are at substantially higher risk for developing a longer-term psychotic disorder, especially if they have a family history of psychosis and/or continue to use cannabis, it is important to schedule follow-up visits and closely monitor these individuals in the months to years after the psychotic

episode. Psychoeducation about the risks, along with psychosocial interventions and motivation interviewing to support abstinence, are crucial. Initiation of timely treatment for ongoing psychosis is also key, to prevent further deterioration of functioning or worsening of illness course [34, 37••].

Anxiety

Anxiety is one of the most common reasons people cite for their cannabis use [38, 39]. College students who use cannabis often report that they use it to help relieve and cope with their anxiety, describing a sense of calm and relaxation. The endocannabinoid system (EDS) appears to be involved in the regulation of fear and anxiety, so there is some basis for thinking that cannabis may affect anxiety [40]. However, there is no clear scientific evidence of the efficacy of plant-based cannabis in treating anxiety disorders, and, in fact, it can have an adverse impact [39, 41••]. The mix of cannabinoid compounds in a specific strain, dosage, chronicity of use, and genetic susceptibility all influence how cannabis impacts anxiety in a particular individual [40]. Developmental and personality factors, gender, pre-existing anxiety, environment, context of use, and use of other substances are contributing factors as well [38].

For THC, there seems to be a dose-response difference, where lower doses can have an anxiolytic effect, while higher doses can worsen anxiety and even cause paranoia (especially in susceptible people) [38, 40]. Cannabidiol (CBD), on the other hand, appears to have an anxiolytic effect across the dosage range [38–40]. Strains with a higher THC:CBD ratio tend to be more anxiogenic. It is useful to note that cannabis used in research studies tends to have much lower THC content than that found on the street and sold in dispensaries.

There is also the issue of long-term vs. short-term efficacy. Short-term effect on anxiety disappears over time due to tolerance building, with reduced efficacy in the longer term [38]. In addition, long-term use can be associated with adverse outcomes such as paranoia, psychosis, increased anxiety, depression, suicidal ideation, and the development of cannabis use disorder (CUD) (as well as other substance use disorders) [24••]. Tolerance is thought to be due to CB1 receptor down-regulation, reducing the production of endocannabinoids, and otherwise altering/disrupting the complex endogenous system [38], causing anxiety to increase with discontinuation. Therefore, cannabis is not a sustainable long-term solution to address anxiety. The EDS has extensive effects on multiple neurotransmitter systems (including dopaminergic, serotonergic, glutaminergic, and GABA systems), not yet clearly elucidated [40, 42••], and chronic use does seem to alter brain stress response systems.

Some small sample size, single-dose studies, and chart reviews suggest possible benefits of specific synthetic cannabinoid compounds for some anxiety disorders, including PTSD-related sleep disturbance (synthetic cannabinoid nabilone), generalized anxiety disorder (nabilone), and social anxiety disorder (CBD), but the evidence is limited and does not address the effects of long-term consumption [39]. The science is even less clear for plant-based cannabis. Social anxiety disorder (SAD) often correlates with cannabis use disorder, suggesting that people with SAD may turn to cannabis in an attempt to address their anxiety and that cannabis may be effective in the short term in some people for social anxiety [38]. In a couple of single-dose studies of CBD (400–600 mg), people with SAD reported a lower level of subjective anxiety after taking the dose [39].

Currently, while there is no good evidence that cannabis use in population studies leads to the development of anxiety disorders, there is some evidence that chronic use of cannabis may decrease the effectiveness of prescribed anti-anxiety medications and that it may worsen the course of the anxiety and mood disorders [40, 41••]. There is a correlation between anxiety and cannabis use, but causality is not clear. Earlier onset and higher frequency of use seems to be associated with increased risk of developing mood and anxiety disorders. In one review article, three out of the four studies reviewed exploring the use of cannabis in adults being treated for PTSD showed a negative effect of cannabis use on treatment course, with better outcome in those who discontinued use [41••].

In addition to dosage, potency, and chronicity effects, there are significant individual variations in how cannabis affects people, which are not fully understood. In susceptible people, cannabis use can precipitate acute intense anxiety, panic, distrust, and paranoid thoughts [24••]; these individuals also seem to be a higher risk for psychosis, probably related to genetic factors (such as polymorphisms in the COMT and AKT1 genes).

Overall, the current literature suggests that recent cannabis use is associated with worse outcomes in patients with anxiety disorders.

Depression

Some people use cannabis in the hopes that it will relieve depression [39]. Endocannabinoids can mediate positive mood states, and users of cannabis often report a sense of well-being or euphoria. However, as of this writing, studies have not shown evidence for anti-depressant effects of cannabis. In contrast, some studies show the opposite [39]. Although the evidence is not as strong as it is for psychosis, cannabis use in adolescents seems to be associated with onset of depression and suicidal ideation [24••], especially with earlier onset and higher frequency of use, as well as in those with genetic vulnerability to psychiatric disorders [41••, 34]. Long-term use in adolescents is associated with negative mood and a diagnosis of depression [42••]. Prolonged cannabis use seems to lead to alterations in neural emotional processing systems,

including serotonin neurotransmission, even after discontinuation of use [42••]. Youth, adolescents, and young adults are especially vulnerable to these effects, as their brains are still developing. CB1 receptors are present throughout multiple brain regions, and chronic cannabis use causes neurobiological changes in these pathways [34].

Several studies looked at cannabis use in people being treated for depression and anxiety. In those with pre-existing anxiety and/or mood disorders, prolonged cannabis use (6 months+) was associated with an increased number of depressive symptoms, increased symptom severity, and worsened outcome [41••]. It is thought that cannabis use may interfere with the efficacy of treatment for these disorders. And there is no evidence that ongoing cannabis use improves symptoms or outcomes for those with anxiety and mood disorders. Cannabis may have acute mood-elevating and anxiolytic effects in some people, mediated through the brain's endocannabinoid system, but does not seem to be a sustainable benefit [41••].

Also relevant to depression, long-term use of cannabis has been associated with avolition and an amotivational syndrome, which may be related to decreases in dopamine signaling [26•, 40].

In addition to the depressogenic potential of cannabis use, acute and prolonged withdrawal symptoms can include dysphoria, irritability, anxiety, decreased appetite, sleep disturbance, and low motivation, making things worse [42••].

ADHD

Some people with ADHD report anecdotally that the use of cannabis improves attention, makes them feel calmer, decreases restlessness, and reduces impulsivity [43]. One theory, a self-medication hypothesis, is that cannabis works to improve ADHD symptoms via a short-term increase in dopamine signaling [44]. Longer-term cannabis use, however, has a dopamine depleting effect and may worsen the course of the underlying disorder [45]. The current state of the scientific research does not support efficacy of cannabis to treat ADHD [44, 45].

The co-morbidity between ADHD and substance use disorders (SUD) is high, although the directionality is not clear [46]. Especially relevant to the college population, children and adolescents with ADHD have higher rates of SUD, earlier onset of SUD, and more severe SUD as compared to their non-ADHD peers [46]. Studies show a higher prevalence of ADHD in those with cannabis use disorders (CUD) than in the general population [43]. There is also an association between cannabis use as an adolescent and ADHD symptoms as an adult [43].

One study of Sativex Oromucosal Spray (CBD:THC 1:1) in 30 adults with ADHD showed no significant improvement in the primary outcome measures of cognitive performance and activity level, nor in measures of hyperactivity/impulsivity and emotional dysregulation [44].

We do know that cannabis can adversely impact cognition and academic performance [24••, 26•, 34]. Chronic cannabis use is associated with cognitive impairment in a broad range of functional domains such as cognitive impulsivity, cognitive flexibility, attention, short-term memory, and long-term memory [32••]. These effects are especially pertinent to the college student population. Intoxication impairs short-term memory, learning, concentration, attention, and attentional shifting. Negative impact can persist for days to weeks after discontinuing use. In adolescents and young adults, studies have shown adverse effects of cannabis use on educational achievement, graduation rates, and economic and employment outcomes, especially with heavy and chronic use. With adolescent cannabis use, memory deficits are associated with hippocampal volume loss [34]. These young people may be able to compensate when intellectual demands are lower but once they get to college, or a cognitively demanding job, performance may decline. Other longer-term cognitive effects, especially with chronic use starting in adolescence, include impairments in learning, motivation, verbal and spatial memory, planning, decision-making, and possibly a drop in IQ [24••]. More studies are needed to clarify these effects.

Sleep

Many people, including college students, use cannabis at bedtime to help with sleep [47]. An internet search of cannabis and sleep brings up multiple websites and message boards describing the benefits of cannabis use in promoting sleep and addressing insomnia. However, there is not much in the way of recent evidence-based guidance about cannabis' effects on sleep. As discussed above, cannabis is difficult to study, as it is a very complex plant containing dozens of cannabinoid compounds, and effects differ according to plant variety, composition, context of use, and individual variables.

Studies from the 1970s, looking at effects of the cannabis plant, suffered from methodological issues and showed mixed results [47]. Some studies suggest that, in low doses, cannabis may be sedative and may decrease sleep latency, while moderate-to-high doses may be stimulating. Also, cannabis might suppress REM sleep. Some studies show an increase in deep, slow wave sleep initially, but this was not a sustained effect with ongoing use [23]. In contrast, tolerance seems to develop, prompting people to use larger and larger doses to get the sleep-promoting effect.

More recently, some research has looked at differentiating the effects of specific cannabinoid compounds on sleep [23]. CBD, for example, seems to affect sleep in a bi-phasic way, with lower doses worsening sleep, while higher doses (160 mg) promoting sleep. And low-dose THC may decrease sleep latency in the short term but worsen sleep longer term.

In addition, there is good evidence that sleep disturbance after discontinuation of cannabis is common, tends to be severe, and can be sustained, lasting up to 45 days after discontinuing use [24••, 47]. Cannabis withdrawal has been associated with initial insomnia, decreased time asleep, and strange dreams (REM rebound). This makes it very difficult to sustain abstinence, increasing the risk for developing a CUD [23].

Addiction/CUD

With more states legalizing the use of cannabis, along with its potential attraction as a "natural" or "herbal" remedy, the perception of its risks is changing [42••]. Many people, including college students, do not understand the very real chance of developing cannabis use disorder (CUD). Good evidence shows that approximately 9% of regular cannabis users will develop addiction [48]. The rate is significantly higher in those who begin using before the age of 18; in this population, the addiction rate is as high as 17% [24••]. Other predisposing factors include regular use, heavy use, and history of childhood anxiety, ADHD, and a family history of substance abuse. Cannabis withdrawal symptoms, which can be long lasting, make it especially difficult to discontinue use and to maintain abstinence [42••]. These include anxiety, sleep disturbance, dysphoria, irritability, and craving to use. Given nationwide increases in use, decreases in perceived risk, legalization and increased access, and continuing increases in THC concentrations, we need to better understand which factors predispose people to develop CUD, including the impacts of dose, route of administration, potency, duration of use, and frequency of use. And it is crucial to educate college students that cannabis is, in fact, addictive.

Recommendations

Based on current available data and the potential long-term consequences of exposure to cannabis, it is fundamental that its use be monitored by providers. College mental health providers have an opportunity to screen for and offer information regarding the use of cannabis and other substances [48]. For optimal treatment plan design, it is important to ensure the following:

1. An initial thorough substance use history that includes substances used, age of first use, amount used, and mode of use.
2. Frequent updates in current use and amount at every visit. College students tend to minimize use or provide inaccurate information to other staff members (RNs, counselors), so an ongoing conversation about fluctuations in use is very important.
3. The use of motiovational interviewing techniques, aiming towards harm reduction. As more research data becomes available, it will be easier to incorporate specific information when educating patients, including safer (if any) amounts and ways to consume.
4. For students with problematic levels of substance use who are ready to consider making changes in their use, assisting them engage in SUD treatment by identifying local treatment resources as well as building clinical expertise within the college mental health center.

Barriers that can interfere with screening for and addressing cannabis use in college include providers' attitudes and knowledge about the subject, an insufficient understanding of a student's cultural background and potential implications of substance use within their culture, and lack of unbiased information materials that are easy to access.

Multiple generations of health professionals since the 1960s were educated in a system where cannabis was considered purely illicit and had no formal education across undergraduate, postgraduate, and professional development curricula [49]. Most health professionals would like to learn more about medicinal use of cannabis [49–51]. However, current research in the field is not easy to translate into clinical guidelines and most providers are unsure how to approach medicinal or recreational use in their clinical practice. A comprehensive review of medicinal use of cannabis published by the National Academies of Science [25•] has provided a solid primer for those interested in acquiring knowledge.

Once informed, providers can use visits as brief "check-up" interventions. These are opportunities to assess use and provide feedback without pressure to change and may help engaging individuals whose use is problematic but who might not have otherwise sought treatment [52]. It may be useful to incorporate objective measures of use and its consequences. Start by obtaining a complete history of cannabis use, including frequency, duration, and stability of use, previous attempts to reduce and quit using, typical location of consumption, typical means of consumption, forms of cannabis consumed, and current experience of intoxication. Existing questionnaires (Marijuana Refusal Self-Efficacy Questionnaire (MRSEQ); Rutgers Marijuana Problem Index (RMPI)) can help both patient and provider to start a dialog about harm reduction, as opposed to abstinence. Including objective information on other drug and alcohol use can help in risk assessment.

It is important to provide young people with objective information. Encouraging these intelligent young adults to research some of that information themselves may help build self-efficacy. It is particularly important to provide information that neither exaggerates nor minimizes risks and can be useful in making informed choices regarding cannabis use [52].

Once the clinician and patient identify problematic use, there are many strategies for managing it [53, 54]. These include manualized therapies (CBT), motivational interviewing, and contingency management approaches [53]. Working on

small achievable goals (creating electronic prompts to remind oneself to reduce use or deciding on a specific number of days or amount to be used per week) can increase self-efficacy and improve coping strategies [54]. Most important of all, providers seeing college students need to remember that more important than translating current research, empathy remains one of the strongest predictors of effectiveness in treating substance use disorders (SUDs).

Conclusion

Current trends in legalization of cannabis will continue to increase availability and access by adolescents and young adults in college. The mental health impact of widespread use will tax available resources and potentially impact college graduation. It is important to disseminate accurate information to providers, including assessment tools and intervention strategies that can be easily implemented in outpatient settings. Equally important are further research on the effects of long-term use, both recreational and medicinal, and public health policies regulating production and sale.

Acknowledgements The editors would like to thank Dr. Edward A. Jouney for taking the time to review this manuscript.

Declarations

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

Conflict of Interest Ludmila De Faria and Aaron Winkler each declare no potential conflicts of interest.

Lillian Mezey owns stock in Cigna and Merck.

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- • Of importance
- •• Of major importance

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