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Why are we concerned about the Legal Use of Cannabis for Recreational Purposes?

Jacob Barg*, Avi Brochman

Former lecturers and emeritus of the Department of Criminology, Ashkelon Academic College, Israel

ABSTRACT

Introduction: The cannabis plant, whose best-known species include sativa, indica, and rhododendris has been a subject of controversy and debate. It has also been the subject of intense political debates, with proponents of legalization arguing that it should be decriminalized and regulated, while opponents argue that it is a dangerous drug that should remain illegal. One of the most significant arguments in favor of cannabis legalization is that it could reduce drug addiction by providing a safer alternative to more harmful substances. **Methodology:** Review of published articles, some research suggests that access to legal cannabis may reduce the use of prescription opioids, which are a major driver of addiction and overdose deaths. Contrary, proponents of legalization argue that regulating the cannabis market can help reduce the availability of more dangerous drugs, undermine the black market. A protocol was developed to study the impact of cannabis use on health and mental health, while also considering the role of genetics. **Results:** Critics argue that the legalization of recreational cannabis could have the opposite effect, leading to an increase in drug addiction. They point to research showing that cannabis use in adolescence is associated with an increased risk of developing substance use disorders later in life. **Conclusion:** There are concerns that the normalization of cannabis use could lead to an overall increase in drug use, particularly among vulnerable populations. Along with the aforementioned, new studies show that in some of the population there is an innate risk of developing dangerous side effects, especially in the field of mental health. This aspect must be taken into account when allowing the legal use of cannabis.

Keywords: Drug Addiction, Mental Health, Legalization, Substance Use Disorders.

INTRODUCTION

Cannabis is a subject of ongoing debate and scientific investigation. While traditionally classified as having three distinct species – Cannabis sativa, Cannabis indica, and Cannabis ruderalis – the current consensus is leaning towards recognizing only one species, Cannabis sativa, with several subspecies and varieties. Inside the shape of its dried bloom buds, it is known as marijuana. The plant gum is known as hashish. Flavonoids, cannabidiol, terpenoids, and cannabinoids are some of the bioactive molecules that oversee the

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***Corresponding Author**

Jacob Barg

Former lecturers and emeritus of the Department of Criminology, Ashkelon Academic College, Yitshak Ben Zvi St 12, Ashkelon, Israel, Tel: 972528749260

Email: bargrja07@gmail.com

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qualities of diverse cannabis strains. The relative extents of the sorts of cannabinoids in a given strain determine the psychoactive control. Of the about 100 sorts of cannabinoids, the two known that are of interest are delta-9-tetrahydrocannabinol (THC), the most psychoactive component of cannabis, and cannabidiol (CBD), which is an anti-inflammatory substance. THC binds to the cannabinoid receptor (CB1 receptor), though CBD binds to the CB1 receptor [1-3].

The mechanism of action by which cannabinoids apply their affect includes binding to CB1 and CB2 receptors, which cause the enactment of the intracorporeal cannabinoid system. Changing the levels of endocannabinoids, and inhibiting the release of their neural flag-bearers such as gamma-aminobutyric acid (GABA) and glutamate, allow other shapes of changing neural and synaptic properties by nerve cells or through substances made by nerve cells, counting an increased release of dopamine, a reduction within the release of acetylcholine, and a decrease inside the discharge of norepinephrine. The endocannabinoids have a portion within the compensation handle, memory pathways, learning and torment. High concentrations of the receptors are found inside the central nervous system and immune cells, respectively [2,3].

The statement about the increase in recreational cannabis use among young individuals and young adults and its global spread is partially true, but it requires further context and nuance. Despite the aforementioned, the following aspects concerning the use of cannabis cause unease and should be given a lot of attention [4-6]:

1. Recreational cannabis use has increased significantly among young adults. Studies show a rise in past-month use from 17% in 2011 to 29% in 2021 among young adults in the US. Similar trends are observed in other developed countries. The statement that it's "nearly as common as tobacco use" is not entirely accurate. While cannabis use has increased, tobacco use remains much higher. In the US, 19.3% of young adults used tobacco in 2021, considerably higher than cannabis use.
2. It's true that recreational cannabis use has spread to other developed countries, including Canada, Uruguay, and several European nations. Many of these countries have implemented legalization or decriminalization policies, leading to increased accessibility and acceptance. The statement about its spread to "low- and middle-income nations" requires further investigation. While there are some exceptions, cannabis use generally remains less prevalent in these regions compared to developed countries. Cultural factors, legal restrictions, and lack of access likely contribute to this difference.
3. The rise of cannabis use increases concerns about potential health and social impacts, especially among young people. Research suggests potential negative effects on brain development, mental health, and academic performance.
4. As legalization and social acceptance increase, it's crucial to develop effective policies and regulations to minimize harm and promote responsible use. Public education and harm reduction strategies are critical components of responsible cannabis policy.
5. While the statement accurately reflects the increasing trend of recreational cannabis use among young adults and its spread to some developed countries, it's important to avoid generalizations and oversimplifications. Further research and accurate data are necessary to fully understand the global landscape of cannabis use and its associated impacts.

The social and legal perceptions of cannabis have changed in recent years. Cannabis was nationally legalized in Canada in October 2018 and is experiencing a trend towards legalization in the United States. In 2017, it was estimated that 43% of individuals aged 16-24 and 18% of people over the age of 25 used cannabis in Canada. Nationwide use of cannabis in the United States has increased from 5.8% of people aged 12 and over in 2007 to 7.5% in 2013. From what has been observed in Canada and parts of the United States such as Colorado and Washington, it is thought that with legalization come increased acceptance, reduced risk perception and increased use of cannabis by both adults and adolescents. It is essential to improve the current understanding of both the basic science and clinical applications of cannabis, delineate the effects of cannabis on people with mental illness, and delve into the mechanism of action by which cannabis produces its physical and psychiatric effects. The "high" i.e. sought by most recreational cannabis users are created through the agonistic effects of THC on CB1 receptors. The action of CBD somewhat opposes that of THC, after early studies have shown that it exhibits potential therapeutic effects it has an anti-anxiety effect. A different strain Cannabis has variable proportions of THC and CBD. These proportions also vary depending on the preparation of cannabis such as resin, oil, or medicinal plants and the method of cultivation. The most common strains in recreational use, regulated and unregulated, have become characterized by high THC and potency CBD is low. This proportion of THC and CBD can vary, partly due to the diffuse distribution of CB receptors throughout the brain and the variety of neurotransmitters involved, and can range from positive (relaxation, euphoria) to negative (anxiety, psychosis). Vulnerable populations, like those with mental illness, are often characterized as

having strong motivations to seek short-term reward. Almost 60% of people with schizophrenia have been shown to use illicit drugs. In relation to cannabis, this short-term reward consists of the aforementioned feelings of relaxation and euphoria. Context This may explain why cannabis use disorder (CUD) is more common in people with mental illnesses such as schizophrenia, anxiety disorder, post-traumatic stress disorder and personality disorders. Observations dating back hundreds of years also indicate that acute cannabis intoxication can cause specific symptoms of psychosis such as paranoia and hallucinations, as well as cognitive dysfunction such as attention and memory deficits. Psychiatric symptoms predict not only problematic use of cannabis but also the perception of cannabis as harmless. These reasons, as well as the high prevalence of cannabis use in mentally ill populations, emphasize the importance of delineating the potential therapeutic of cannabis versus its harms [7-12].

Social and legal perceptions of cannabis are undergoing significant shifts across the globe. This shift is driven by a number of factors, including [8-11]:

1. Growing body of scientific evidence. Research is increasingly highlighting the potential medical benefits of cannabis for various conditions, such as chronic pain, anxiety, and epilepsy.
2. Changing societal attitudes. Public opinion polls consistently show growing support for cannabis legalization, particularly among younger generations.
3. Evolving legal landscape. A growing number of countries and US states have legalized or decriminalized cannabis for recreational and/or medical use.

Canada, in 2018, became the first G7 nation to legalize cannabis nationwide. Since then, acceptance and use have increased, particularly among young adults. Statistics Canada reports that in 2017, 43% of 16–24-year-olds and 18% of those over 25 used cannabis. United States has seen a patchwork of legalization and decriminalization laws at the state level. This has led to increased availability and use, particularly in states with legal recreational cannabis. The survey on drug use reports a rise in past-month use from 17% in 2011 to 29% in 2021 among young adults. Global trends indicate that Canada and the US are leading the way in terms of legalization, other countries are also exploring policy changes. Uruguay became the first nation to legalize recreational cannabis in 2013, and several European countries have implemented decriminalization or medical cannabis programs [7-12].

In view of the above, the thought was raised that cannabis is a potential cure for depression based on the following aspects:

1. Legalization and decriminalization have led to increased public acceptance of cannabis use. This is particularly evident among young people, who are more likely to view cannabis as less harmful than other substances.
2. Studies suggest that legalization may lead to increased risk assessment among users, potentially resulting in safer consumption practices. This trend needs to be confirmed.
3. Legalization has been associated with increased cannabis use, particularly among young adults and individuals with prior history of use. This highlights the importance of implementing responsible regulation and public health education campaigns.

It was suggested that as the global landscape of cannabis policy continues to evolve, it is crucial to:

1. Promote evidence-based decision making. Policy decisions should be informed by the latest scientific research on the health, social, and economic impacts of cannabis use.
2. Develop comprehensive regulatory frameworks. Legalized cannabis markets require strong regulations to ensure product safety, quality control, and minimize potential harms.
3. Prioritize public health education. Comprehensive public education campaigns are essential to educate individuals about the risks and benefits of cannabis use, promote responsible use, and prevent potential harms.

The changing social and legal landscape of cannabis presents an opportunity for a more informed and responsible approach to this plant. By focusing on evidence-based policy, comprehensive regulation, and robust public education, we can maximize the potential benefits of cannabis while minimizing associated risks [13-16].

The complex relationship between cannabis and mental health includes:

1. The effects of cannabis vary due to the widespread distribution of CB receptors in the brain and the multitude of neurotransmitters involved. These effects can be positive (relaxation, euphoria) or negative (anxiety, psychosis).
2. Individuals with mental health issues are more likely to seek short-term rewards like the relaxation and euphoria cannabis can provide. This increased motivation for these rewards may explain why cannabis use disorder is more prevalent among these populations.
3. Links between cannabis and mental health include

correlation with co-occurrence, studies have shown a significant correlation between cannabis use disorder and various mental illnesses, including schizophrenia, anxiety disorders, PTSD, and personality disorders. Acute cannabis intoxication can cause symptoms of psychosis like paranoia and hallucinations, as well as cognitive impairments.

4. Perception and prediction: Psychiatric symptoms can predict both problematic cannabises use and a harmless insight of the drug.
5. Due to the potential therapeutic benefits of cannabis and the high frequency of use among mental health populations, it's crucial to differentiate between potential therapeutic applications and potential harms.

Recently, a study was published that yields new insights into the genetic architecture of cannabis use disorder and how this risk interacts with traits essential to public health, and raises important concerns about the potential negative consequences of the secular trend of increased cannabis use as a result of legalization. This information highlights the need for further research to understand the complex interplay between cannabis and mental health. It emphasizes the importance of tailoring treatment approaches to individual needs, considering both potential benefits and risks of recreational use [17].

METHODOLOGY

A protocol was developed to study the impact of cannabis use on health and mental health, while bearing in mind the role of genetics. This opens up some important avenues for research, considering both substance use and health outcomes, including mental health, provides a more comprehensive understanding of potential impacts. Incorporating genetics acknowledges the complex interplay between individual biology and environmental factors like cannabis use. This helps tease apart causal relationships and identify vulnerable populations. Which specific mental health conditions are related to the use of cannabis? Some, like psychosis, have stronger links to cannabis use than others. Observational studies can identify associations, but can't prove causation. Interventional studies, like clinical trials, can provide stronger evidence, but have ethical and logistical limitations. Other factors, like socioeconomic status or pre-existing mental health conditions, can influence both cannabis use and health outcomes. Genetic factors were assessed and raised questions about specific genes or broader polygenic risk scores and how are environmental factors being accounted. Figure 1 addresses the above-mentioned questions regarding cannabis use, recreational cannabis use, and the genetic vulnerability to cannabis effects on mental health.

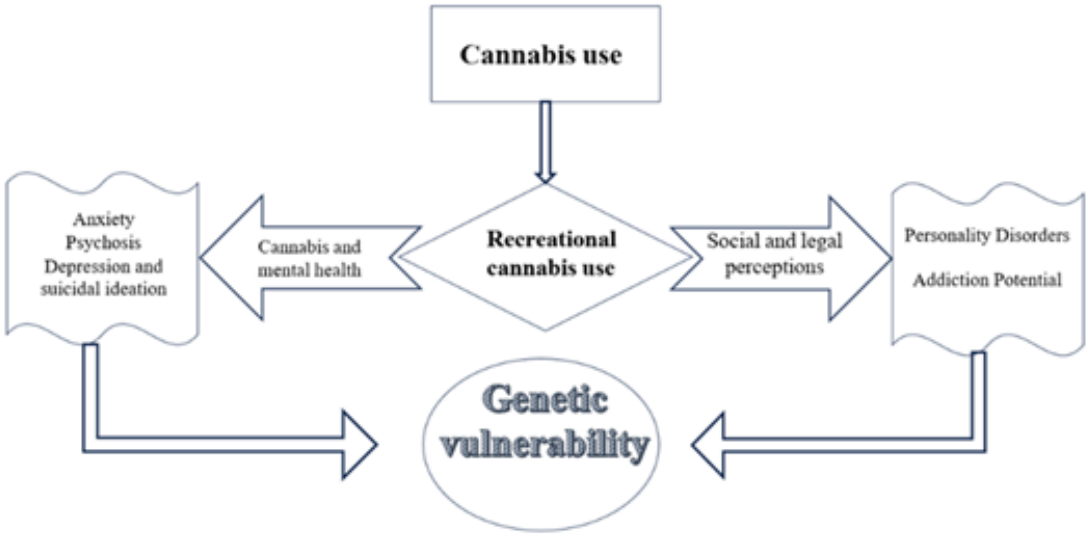

Figure 1. Shows the process of literature review. From a database research article were selected. Special emphasis was given to articles describing the results of using cannabis, the dangers of cannabis recreational use, and the genetic basis for these dangers.

RESULTS

Cannabis and Anxiety Symptoms

Anxiety disorders involve excessive worry, fearfulness, restlessness, and physiological arousal. These conditions often arise due to a combination of genetic factors, environmental stressors, and neurotransmitter imbalances within the brain's circuits responsible for emotional regulation. Anxiety disorders affect millions of individual's worldwide, causing significant distress and impairing their daily lives. With the increasing popularity and legalization of cannabis, it is essential to examine its potential impact on mental health, particularly anxiety symptoms. While some people believe cannabis can alleviate anxiety, there is growing evidence suggesting that high-THC strains may actually exacerbate these symptoms, especially in individuals already predisposed to anxiety disorders. Tetrahydrocannabinol (THC) is the primary psychoactive compound found in cannabis. It binds to specific receptors in the brain's endocannabinoid system, leading to various physiological effects. While low doses of THC may induce relaxation and euphoria for many users, higher doses or chronic use can have adverse consequences.

Emerging research suggests a complex relationship between high-THC cannabis use and anxiety symptoms. Some studies indicate a possible bidirectional association – while individuals with pre-existing anxiety disorders may be more likely to use cannabis as a form of self-medication; others suggest regular consumption of high-THC strains can increase susceptibility or intensity of anxious feelings even among those without prior diagnoses [18,19]. The following aspects are the most prominent in the context of the interaction between cannabis use and the phenomenon of anxiety:

Acute Effects

Acute intoxication from high levels of THC has been associated with increased heart rate variability (HRV), subjective feelings of nervousness or paranoia during marijuana intoxication sessions – commonly referred to as "being too high" by users themselves.

Chronic Use

Long-term exposure to high levels of THC through regular consumption may contribute significantly to the development or worsening of anxiety symptoms. Studies have found a positive correlation between heavy cannabis use and increased risk of developing anxiety disorders or experiencing elevated anxiety levels, especially among individuals with genetic predispositions. Moreover, chronic consumption of high-THC strains could potentially disrupt the natural balance of neurotransmitters such as serotonin and dopamine – both vital for mood regulation – leading to dysregulation and increased vulnerability for anxious states.

Individual Differences

It is important to acknowledge the considerable variability in individual responses to THC. While some people may experience reduced anxiety after cannabis use, others report heightened feelings of paranoia, panic attacks, and worsened overall mental well-being. This discrepancy can be attributed to variations in genetics, personal biology, dosage levels consumed, route of administration (smoking versus edibles), and environmental factors.

Predisposition to Anxiety Disorders

Individuals already prone to anxiety disorders may be particularly vulnerable when using high-THC cannabis strains. Research suggests a strong link between genetic markers associated with anxiety susceptibility and negative reactions to THC exposure. These individuals tend to exhibit heightened activation within brain regions involved in fear processing when exposed to stressful situations or substances like high-THC cannabis.

While cannabis continues gaining acceptance for its potential therapeutic benefits across various medical conditions, including certain forms of epilepsy or pain management; caution should be exercised regarding its impact on mental health. High-THC strains possess the potential to exacerbate anxiety symptoms particularly among those already predisposed and thus require careful consideration before use. As research into the effects of cannabis on mental health expands further it will help provide clearer insights into how different compounds within the plant interact with individual neurobiology. Ultimately fostering a better understanding can guide appropriate recommendations regarding strain selection while minimizing any adverse effects associated with cannabis consumption specifically related to anxiety disorders [20].

Research regarding the relationship of cannabis to psychiatric disorders has been unevenly distributed among different diagnoses. Rresearch on the relationship between cannabis use and psychiatric disorders has indeed been varied, with a substantial focus on cannabis and psychosis. There is less literature on cannabis and anxiety despite the speculation that THC may trigger anxiety symptoms through its effects on serotonin and norepinephrine. Some studies suggest that cannabis, particularly high-THC strains, may exacerbate anxiety symptoms, especially in individuals predisposed to anxiety disorders. THC's interaction with neurotransmitters like serotonin and norepinephrine has been proposed as a potential mechanism. THC is known to influence neurotransmitter systems, including serotonin and

norepinephrine. The exact mechanisms are complex and not fully understood, but it's theorized that THC's impact on these neurotransmitters may contribute to mood and anxiety-related effects. Of the existing evidence, very little data comes from studies available for longitudinal analysis. The data also do not reflect the potential for reverse causation, in which anxiety acts as a predisposing factor to use. In cannabis due to the short-term relaxation effects associated with the drug. Meta-analysis of ten studies was designed to address some of the shortcomings of previous work on cannabis and anxiety. Anxiety was diagnosed using the Diagnostic and Statistical Manual of Mental Disorders (DSM). The main analysis supported the association of cannabis use with anxiety indicating that the use of cannabis is, at most, a slight risk factor for the development of anxiety symptoms in the general population. These data are complemented by a molecular-developmental genetics study of adolescent cannabis users that focused on polymorphisms involving the serotonin transporter gene. Considering the effects of cannabis on symptoms of anxiety, it was determined that cannabis use was associated with an increase in anxiety symptoms only in carriers of the short allele of the 5-HTTLPR gene. It was determined that cannabis use in the first wave was significantly associated with any substance disorder, any alcohol use disorder, any cannabis use disorder. Any other drug use disorder, as well as nicotine dependence. These findings, should not be ignored considering that substance abuse disorders cost the US approximately 700 billion dollars per year Current literature suggests that cannabis use alone is not sufficient for the development of long-term anxiety and is at most a minor risk factor that may act in combination with other factors. The evidence for the mixed anxiety-cannabis relationship likely stems at least in part from the opposing biological effects of THC and CBD [18,19,21].

CANNABIS USE AND THE RISK OF PSYCHOSIS

There is growing evidence that cannabis use can increase the risk of developing psychosis, a severe mental illness characterized by a loss of contact with reality. This risk appears to be particularly high for young people and individuals with a family history of mental illness [22].

Here are some key points to consider:

1. Increased risk: Research shows a consistent link between cannabis use and an increased risk of developing psychosis, especially in individuals with pre-existing vulnerabilities.
2. Potency plays a role: The risk of psychosis appears to be related to the potency of the cannabis used. Higher THC levels, the main psychoactive compound in cannabis, are associated with a greater risk.
3. Age matters: Young people are particularly vulnerable to the effects of cannabis on brain development, potentially increasing their risk of psychosis.
4. Non-medical use: The increased risk of psychosis is primarily associated with non-medical cannabis use, where individuals may be more likely to use higher-potency products and consume larger quantities.
5. Legality: The legalization of cannabis in some parts of the world has raised concerns about potential increases in psychosis rates. More research is needed to assess the impact of legalization on mental health outcomes.

It is important to note that the relationship between cannabis use and psychosis is complex and not fully understood. While cannabis can increase the risk for some individuals, it is not the sole cause of psychosis. Other factors, such as genetics, family history, and environmental stressors, also play a role. Research Findings shows a consistent link between cannabis use and an increased risk of developing psychosis, especially in individuals with pre-existing vulnerabilities. When considering the relationship between cannabis use and the risk of developing a psychotic state, the following aspects must be considered [22,23].

Understanding psychosis and its risk factors

Understanding psychosis and its risk factors is crucial when examining the connection between cannabis use and the onset of psychosis. Psychosis refers to a mental state where an individual experiences a loss of touch with reality, often marked by delusions, hallucinations, and disorganized thinking. It is a complex condition influenced by various factors, including genetic predisposition, environmental stressors, and substance use. While the relationship between cannabis uses and psychosis has been a subject of intense research, it is important to note that not everyone who uses cannabis will develop psychosis. Studies have shown that there is an increased risk for individuals who use cannabis, particularly those with a predisposition to psychosis or a family history of psychotic disorders. One of the key risk factors is the potency of the cannabis being used, specifically the levels of tetrahydrocannabinol (THC), the psychoactive component of cannabis. Higher levels of THC have been associated with a greater risk of psychosis, as it can disrupt the normal functioning of the brain's endocannabinoid system, which plays a role in regulating mood, cognition, and perception. Additionally, the age at which cannabis is first used can impact the risk of developing psychosis. The adolescent brain is still in the process of development, and early exposure to cannabis may disrupt this delicate process, potentially increasing vulnerability to psychosis. Other risk factors, such as a history of trauma, childhood adversity, and social isolation, can further contribute to the development of

psychosis in individuals using cannabis. It is important to note that while the research suggests a link between cannabis use and psychosis, it does not imply causation. There are many factors involved, and individual susceptibility varies. It is crucial to approach this topic with a nuanced understanding and to consider the potential implications for individuals at risk. Further research is needed to fully understand the complex interplay between cannabis use, psychosis, and other contributing factors. This knowledge can inform public health efforts, education, and policies surrounding cannabis use, with the aim of promoting mental well-being and reducing potential risks for vulnerable populations.

The association between cannabis use and psychosis

The association between cannabis use and psychosis has been a topic of significant research and debate in recent years. Numerous studies have explored the potential link between these two factors, and the findings have been both intriguing and concerning. Research has indicated that regular cannabis use, particularly in high doses or during the formative years of brain development, may increase the risk of developing psychosis. Psychosis is a mental health condition characterized by a loss of touch with reality, hallucinations, delusions, and disorganized thinking. While cannabis itself does not directly cause psychosis, some studies suggest that it can trigger or exacerbate symptoms in individuals who are already predisposed to the condition. One of the main compounds in cannabis, THC (tetrahydrocannabinol), is believed to play a crucial role in the association with psychosis. THC has psychoactive properties that can alter brain chemistry and neurotransmitter functions, potentially leading to the onset of psychotic symptoms. It is important to note that not all cannabis users will develop psychosis, as individual susceptibility varies based on genetic, environmental, and other factors. Several large-scale studies have provided compelling evidence of a dose-response relationship between cannabis use and the risk of psychosis. For instance, a study published in The Lancet Psychiatry found that individuals who used high-potency cannabis daily were at a significantly higher risk of developing a psychotic disorder compared to non-users. Other study published reported that early and regular cannabis use was associated with an increased risk of experiencing hallucinations and delusions. It is important to highlight that research in this area is complex and ongoing. Some studies have found conflicting results, and the precise mechanisms by which cannabis may contribute to psychosis are not yet fully understood [8]. Additionally, other factors such as genetic predisposition, mental health history, and co-occurring substance use could influence the relationship between cannabis and psychosis. As the understanding of this association evolves, it is crucial for individuals to be aware of the potential risks associated with cannabis use, especially for those with a personal or family history of psychosis or other mental health conditions. It is recommended to approach cannabis use cautiously and seek professional advice if there are concerns about its impact on mental well-being. In conclusion, the association between cannabis use and psychosis is a complex and multifaceted topic. While research has provided compelling evidence of a link, further studies are needed to fully elucidate the underlying mechanisms and clarify the extent of the risks involved. As with any substance, it is important to make informed choices and prioritize mental health when considering cannabis use [24,25].

Research findings on the link between cannabis and psychosis

Over the years, there has been a growing interest in understanding the potential link between cannabis use and the development of psychosis. Numerous research studies have shed light on this complex relationship, providing valuable insights into the effects of cannabis on mental health. One of the key findings from these studies is that cannabis use, particularly heavy and long-term use has been associated with an increased risk of developing psychosis. Psychosis is a mental health condition characterized by a loss of touch with reality, including hallucinations, delusions, and disorganized thinking. A landmark study conducted by researchers at King's College London found that individuals who used cannabis daily were three times more likely to experience psychosis compared to those who had never used cannabis. Furthermore, the risk increased with the potency of cannabis, with those using high-potency strains being at even greater risk. Another important finding is the role of age in the relationship between cannabis and psychosis. Research suggests that cannabis use during adolescence, when the brain is still developing, may have a more significant impact on the risk of developing psychosis. Study found that individuals who started using cannabis in their teenage years had a higher likelihood of experiencing psychotic symptoms later in life. Moreover, evidence suggests that genetic factors play a role in the susceptibility to cannabis-induced psychosis [8]. Individuals with a family history of psychosis or other mental health disorders may be more vulnerable to the effects of cannabis on their mental well-being. While these research findings provide valuable insights, it is crucial to note that the relationship between cannabis use and psychosis is complex and multifaceted. Not everyone who uses cannabis will develop psychosis, and other factors such as individual susceptibility and co-occurring mental health conditions may also contribute to the development of psychosis. As the understanding of this connection continues to evolve, it is important for individuals, especially those at higher risk, to be aware of the potential risks associated with

cannabis use. This knowledge can inform decision-making and promote informed discussions around the responsible use of cannabis [24-26]. Additionally, further research is needed to fully understand the mechanisms underlying this relationship and explore potential preventive strategies.

Implications for cannabis users and public health

The research findings on the connection between cannabis use and psychosis have significant implications for both cannabis users and public health. It is crucial to understand that while cannabis has been legalized for medical and recreational use in some regions, there are potential risks associated with its consumption, particularly in individuals predisposed to mental health conditions. For cannabis users, it is essential to be aware of the potential link between cannabis use and psychosis. The research suggests that heavy or prolonged cannabis use, especially during adolescence when the brain is still developing, may increase the risk of developing psychotic disorders such as schizophrenia. This information should be taken seriously, and individuals who choose to use cannabis should consider moderation and informed decision-making. Public health implications are also paramount. Educating the public about the potential risks of cannabis use and psychosis is vital for promoting responsible consumption and minimizing harm. This includes targeted awareness campaigns, educational programs in schools and communities, and clear communication of the scientific evidence to the general public. Moreover, healthcare professionals should be well-informed about these research findings to provide accurate guidance to patients. They play a crucial role in assessing individuals' mental health histories, advocating for safe cannabis use, and recognizing early signs of psychosis in cannabis users. This is particularly important in regions where cannabis use is legal, as there may be an increase in overall consumption. Overall, understanding the connection between cannabis use and psychosis has important implications for both individuals and public health. It emphasizes the need for responsible consumption, informed decision-making and ongoing research to further explore this complex relationship. By prioritizing education, awareness, and evidence-based practices, we can strive towards a balanced approach that minimizes potential risks and promotes overall well-being [21-23].

DEPRESSION AND SUICIDAL IDEATION

The relationship between cannabis uses and major depressive disorder (MDD) is a complex landscape. MDD is a prevalent mental health condition affecting millions of individuals worldwide. With its debilitating symptoms, including persistent sadness, loss of interest or pleasure in activities, changes in appetite or weight, disturbed sleep patterns, fatigue, feelings of worthlessness or guilt, difficulty concentrating, and recurrent thoughts of death or suicide; MDD poses significant challenges to those affected as well as their loved ones. As researchers seek effective treatments for MDD to alleviate the burden on individuals and society as a whole, the potential role of cannabis has been a subject of considerable debate. The aims to explore the relationship between cannabis use and major depressive disorder by examining studies comparing higher cannabis usage rates among patients with MDD compared to the general population. Additionally, delve into the effects of cannabis on depression itself [27,28].

Higher cannabis usage among patients with MDD includes several important factors:

1. Numerous studies have investigated whether individuals diagnosed with MDD exhibit higher rates of cannabis use compared to those without the disorder. These investigations aim to shed light on any potential association between MDD and increased engagement with cannabis.
2. Findings from these studies demonstrate contrasting results regarding whether there is indeed a higher prevalence of cannabis use among patients diagnosed with MDD when compared to the general population. Some authors report heightened levels of cannabis consumption within these populations while others present conflicting evidence suggesting no significant correlation.

The mixed effects of cannabis on depression are influenced by several aspects including:

1. The impact of cannabis use on depression remains a topic rife with divergent findings. Researchers have reported both therapeutic benefits and adverse effects associated with its usage among individuals suffering from major depressive disorder.
2. Some authors argue for the therapeutic potential by pointing out specific compounds found in certain strains known for their antidepressant properties. They suggest cannabinoids such as cannabidiol (CBD) may positively influence brain chemistry related to mood regulation. Additionally, CBD's anti-inflammatory and neuroprotective properties have been hypothesized to contribute to its potential antidepressant effects.
3. On the other hand, some studies caution against cannabis use for individuals with depression. These investigations highlight the possibility of exacerbating depressive symptoms through cannabis consumption. They suggest a complex interplay between cannabinoids and neurotransmitters involved in mood regulation, potentially leading to adverse outcomes such as

increased emotional bluntness and reduced ability to experience pleasure (anhedonia).

In view of the above, the thought was raised that cannabis is a potential cure for depression based on the following aspects:

1. An alternative perspective posits that cannabis may act as a coping mechanism or outlet for individuals struggling with major depressive disorder. Some argue it can provide temporary relief from distressing emotions by altering perception, inducing relaxation, or fostering feelings of euphoria.
2. It is essential to approach these claims with caution due to limited scientific consensus on whether such experiences associated with cannabis usage genuinely mitigate the underlying causes of depression in the long term or merely offer transient respite.

The relationship between cannabis uses and major depressive disorder remains multifaceted and warrants further investigation. While some studies report higher levels of cannabis usage among patients diagnosed with MDD compared to the general population, conflicting evidence exists suggesting no significant correlation. Similarly, opinions regarding the effects of cannabis on depression diverge greatly. While certain compounds found in specific strains show promise for their therapeutic potential in alleviating depressive symptoms, others argue against its use due to possible exacerbation of negative emotions and reduced ability to experience pleasure. Further research is necessary not only to elucidate whether there is indeed a heightened prevalence of cannabis use among those living with major depressive disorder but also to ascertain both its potential benefits and risks when used for treating depression specifically. Accurate understanding will enable healthcare providers and policymakers alike to make informed decisions regarding treatment options available for individuals affected by MDD while ensuring their safety and well-being remain paramount considerations throughout the process.

There are concerns about increased suicidal ideation or suicide attempts with acute or chronic cannabis use, although there is insufficient evidence to assert causality. Review studies with meta-analysis have demonstrated an association. There is a higher prevalence of cannabis use among patients with major depressive disorder compared to the general population. Cannabis use and increased risk of suicidal ideation or suicide attempts. It is important to note that these studies have limitations and further research is needed to fully understand the relationship between cannabis use and suicide. One factor contributing to the concern about cannabis use and its potential impact on suicidality is the psychoactive properties of tetrahydrocannabinol (THC), the main active compound in cannabis. THC can alter mood, cognition, and perception, which may influence individuals' mental states. Some studies have suggested a link between heavy or chronic cannabis use and higher rates of depression and anxiety, both of which are known risk factors for suicidal ideation. It remains imperative to acknowledge the potential psychological effects of acute intoxication from high doses of THC present in some strains of cannabis. Studies have shown a dose-dependent relationship between THC exposure and altered mood states, including feelings of anxiety or paranoia, which could conceivably contribute to distress and potential suicidal thoughts. It is crucial for further research to address these limitations by utilizing longitudinal designs with comprehensive assessment methods, including clinical diagnoses of mental health conditions and objective measures of cannabis use. Such studies would provide more robust evidence regarding the association between cannabis use and suicide risk. Moreover, it is essential to consider differentiating factors within the diverse population of cannabis users. Age, gender, frequency of use, potency levels of THC consumed concurrent substance abuse patterns, personal resilience factors like social support systems or coping mechanisms—all these elements might influence the relationship between cannabis consumption and suicidality outcomes differently. By conducting rigorous research with carefully designed methodologies while accounting for confounding variables and evaluating subpopulations separately, we can gain a more nuanced understanding of the complex interplay between cannabis use and suicide risk [29,30].

Ultimately, addressing concerns about increased suicidal ideation or suicide attempts in relation to acute or chronic cannabis use requires more extensive investigation. While existing review studies suggest associations exist between cannabis consumption patterns and suicidality outcomes, they cannot establish causality definitively. Additional research is needed to clarify the nature and extent of any potential causal relationships accurately. Only then can evidence-based interventions be developed to mitigate any risks associated with cannabis use in relation to suicidality [27-30].

THE RELATIONSHIP BETWEEN PERSONALITY DISORDERS AND CANNABIS USE: A GENETIC AND PHENOTYPIC CORRELATION

Personality disorders have long been a topic of interest in the field of psychology, as they significantly impact individuals' thoughts, emotions, and behaviors. Among the various personality disorders identified, two types - antisocial

personality disorder (ASPD) and borderline personality disorder (BPD) - have garnered particular attention due to their association with substance use. In recent years, strengthening knowledge in the field of addictions shed light on the strong correlation between these personality disorders and cannabis use and abuse. This finding not only emphasizes the need for increased awareness but also highlights potential genetic and phenotypic factors contributing to such associations [31-33].

The study's findings suggest a significant link between (ASPD) or (BPD) diagnosis, cannabis use, and abuse. Individuals diagnosed with ASPD were found to be more likely to engage in regular cannabis consumption compared to those without the disorder. Similarly, individuals diagnosed with BPD displayed a higher prevalence of cannabis abuse than those without BPD. One possible explanation for these correlations is rooted in genetic factors. Research indicates that certain genes may influence both personality traits associated with these disorders as well as susceptibility to substance abuse. Genetic studies exploring specific gene variants related to impulsivity or reward-seeking behavior could provide further insights into how predispositions towards both personality disorders and cannabis use may coexist within certain individuals. Furthermore, it is important to consider environmental influences when examining such correlations systematically. Growing up in households where substance abuse is prevalent can increase one's likelihood of developing both ASPD or BPD symptoms as well as engaging in illicit drug use like cannabis consumption [32-34].

Beyond genetics and environmental factors lies another crucial aspect worth considering: shared underlying neurobiological mechanisms among people suffering from either ASPD or BPD alongside their cannabis use. The endocannabinoid system, responsible for regulating various physiological processes such as pain sensation, mood regulation, and reward pathways, has been implicated in both personality disorders and the effects of cannabis on the brain. Dysregulation within the endocannabinoid system could potentially contribute to the observed correlations. Although personality disorders often require specialized treatment approaches targeting specific symptoms and behaviors, it is imperative for healthcare professionals to recognize the potential correlation between these disorders and cannabis use or abuse. By understanding how these factors interact with one another, clinicians can develop more comprehensive treatment plans tailored to each individual's needs. Moreover, further research is required to establish a clearer understanding of the underlying mechanisms linking personality disorders with cannabis consumption. Longitudinal studies tracking individuals diagnosed with ASPD or BPD from adolescence through adulthood would provide valuable insights into developmental trajectories concerning substance abuse patterns [31-34].

Addressing such issues should go beyond merely acknowledging their existence; there must be a systematic approach involving education campaigns targeted towards raising public awareness about these correlations among mental health professionals, policymakers, patients themselves, and even their families. By fostering dialogue surrounding early identification and intervention strategies for both personality disorder symptoms and substance abuse tendencies like cannabis use or abuse, we can work towards reducing associated risks and improving outcomes for affected individuals. Although findings underscore a significant correlation between (ASPD) or (BPD) diagnoses and cannabis use/abuse. Results highlight potential genetic predispositions as well as shared neurobiological mechanisms contributing to such associations while emphasizing the need for increased alertness regarding these interrelationships which may not always be systematically addressed in current clinical practices [20,35-37].

THE ADDICTION POTENTIAL OF CANNABIS USE

Cannabis, commonly known as marijuana, has gained significant attention in recent years due to its increasing legalization and use for both medicinal and recreational purposes. It is important to recognize the potential risks associated with cannabis use, including the possibility of addiction. Just like other substances such as alcohol or nicotine, cannabis can lead to a pattern of repeated use and dependence. The desire for repeated use is one key factor contributing to the addictive nature of cannabis. The pleasurable sensation experienced by users when they become "high", this euphoric state induced by THC, the primary psychoactive compound found in cannabis, can create a desire for repeated usage. The pleasurable effects may include relaxation, heightened sensory perception, altered time perception, and a general sense of well-being [38-40].

Research suggests age at onset and frequency of exposure are important factors. Individuals who start using cannabis at a younger age have a higher likelihood of developing problematic patterns of use later in life. Adolescents' brains undergo crucial developmental changes during adolescence, making them more susceptible to substance abuse disorders. Early exposure to cannabis may disrupt normal brain development processes related to decision-making skills and impulse control. Moreover, the frequency at which someone uses cannabis plays a significant role in determining their vulnerability to addiction. Regular or frequent users have been shown to be more prone to developing dependency on the drug compared to occasional users [41,42].

Evidence supporting cannabis abuse as common addiction. Existing research supports the notion that cannabis abuse is indeed becoming increasingly prevalent as a form of addiction. Studies indicate a steady rise in individuals seeking assistance for problems related specifically to their excessive consumption or reliance on marijuana. The Diagnostic and Statistical Manual (DSM-5) recognizes CUD as a defined condition characterized by impaired control over marijuana consumption despite negative consequences on various aspects of life such as work, relationships, and health. The inclusion of CUD in the DSM-5 underscores its recognition as a legitimate and significant addiction. Research suggests that seeking assistance for cannabis addiction is rising. The growing number of individuals seeking help for cannabis addiction further highlights the need to address the issue. Treatment options for cannabis use disorder typically involve a combination of behavioral interventions, support groups, and sometimes medication-based therapies. These approaches aim to assist individuals in reducing their dependence on marijuana and developing healthier coping mechanisms. While cannabis may have numerous potential benefits when used responsibly and under medical supervision, it is crucial to acknowledge its addictive potential. The desire for repeated use generated by the pleasurable effects of being "high," along with factors such as early age at onset and high frequency of exposure, contribute to the development of problematic patterns of cannabis consumption. Research indicating a rise in individuals seeking assistance specifically for cannabis-related issues further emphasizes the importance of addressing cannabis addiction as a recognized condition requiring proper treatment strategies. As society continues to navigate discussions around legalization and regulation concerning marijuana use, it is essential to remain mindful of the potential risks associated with excessive or compulsive consumption [39-44].

THE IMPACT OF HEAVY AND EARLY-ONSET CANNABIS USE, THE LINK BETWEEN UNUSUAL CANNABIS EXPERIENCES AND GENETIC VULNERABILITY TO SCHIZOPHRENIA

The relationship between cannabis uses and mental health has long been a subject of scientific inquiry. Recent findings have shed light on a concerning aspect: heavy and early-onset cannabis users are more likely to report unusual experiences related to cannabis, and individuals with a higher genetic vulnerability to schizophrenia are at an elevated risk for these experiences, particularly cognitive difficulties. The implications of these findings, exploring the complex interplay between cannabis use, genetics, and mental health. In recent years, the relationship between heavy cannabis uses and mental health has garnered significant attention. Studies have found that heavy and early-onset cannabis users often report unusual experiences associated with their cannabis consumption. This intriguing finding has led researchers to explore the potential link between heavy cannabis use, genetic vulnerability to schizophrenia, and the emergence of these uncommon phenomena. This article delves into this topic, shedding light on the complex interplay between cannabis, genetics, and the risk of cognitive difficulties [42-45].

The impact of heavy and early-onset cannabis use has highlighted that individuals who engage in heavy and early-onset cannabis use are more likely to experience unusual cannabis-related effects. These experiences encompass a range of subjective phenomena, including alterations in perception, temporary psychosis-like symptoms, and heightened states of euphoria or anxiety. While not everyone who uses cannabis will experience these effects, heavy users are more prone to these cognitive disruptions. Unusual cannabis experiences have long been known for its psychoactive effects, which can vary from person to person. Heavy users have reported experiencing unusual and even distressing effects. These experiences include heightened anxiety, paranoia, perceptual alterations, and impaired cognitive functioning. Researchers have begun to identify a connection between these unusual experiences and the age at which cannabis use starts and the intensity of use. Studies of early-onset and heavy cannabis use have revealed that individuals who initiate cannabis use at an early age (e.g., during adolescence) and consume it in high quantities are more likely to report these unique experiences. The developing brain during adolescence may be particularly vulnerable to the negative effects of cannabis, leading to aberrant experiences. Moreover, heavy cannabis use may result in the accumulation of cannabinoids in the body, further intensifying these effects [8,9,13,15,17,18].

Schizophrenia is a severe mental disorder characterized by abnormal thought processes and a distorted perception of reality. Numerous studies have established a genetic component to this disorder, with a higher prevalence observed among individuals with family members diagnosed with schizophrenia. The quest to identify specific genes associated with schizophrenia susceptibility has fueled extensive research in recent years. The link between cannabis uses and schizophrenia is a subject of ongoing research. Schizophrenia is a complex disorder with a known genetic component. Individuals with a genetic predisposition to schizophrenia have been found to be at significantly increased risk of developing the disorder if they use cannabis regularly. Furthermore, even in the absence of a formal diagnosis of schizophrenia, individuals with genetic vulnerability may be more prone to experiencing cognitive difficulties and other psychotic-like symptoms following

cannabis use. Recent studies the role of genetic vulnerability in cannabis-induced unusual experiences have found evidence suggesting that individuals with a higher genetic vulnerability to schizophrenia are at an increased risk of experiencing unusual effects when using cannabis. Genetic variants associated with an elevated risk of developing schizophrenia may interact with the active constituents of cannabis, such as Δ9-tetrahydrocannabinol (THC), leading to heightened cognitive difficulties. These findings contribute to our understanding of the complex relationship between cannabis use, genetic predisposition, and the occurrence of unusual experiences. Understanding the interplay between cannabis and schizophrenia susceptibility are devoted to the mechanisms underlying the interactions between cannabis and genetic vulnerability to schizophrenia. THC, the main psychoactive component of cannabis, can alter the activity of neurotransmitters in the brain, specifically targeting dopamine, a neurotransmitter implicated in schizophrenia. This suggests a potential pathway through which cannabis may exacerbate the symptoms of schizophrenia or increase the risk of experiencing unusual cannabis-related effects in those genetically predisposed. Emerging evidence suggests that a genetic predisposition to schizophrenia may amplify the unusual experiences reported by heavy and early-onset cannabis users. This genetic vulnerability could be responsible for the unique cognitive difficulties and perceptual alterations experienced by individuals, signifying a possible interaction between cannabis use and an underlying neurobiological susceptibility.

Understanding the correlation between heavy and early-onset cannabis use, genetic vulnerability to schizophrenia, and unusual cannabis experiences is vital for mental health professionals and policymakers alike. Recognizing the potential risks associated with cannabis use in susceptible individuals, particularly in adolescence, may pave the path for targeted prevention and intervention strategies. It is crucial to educate the public about the potential consequences of heavy cannabis use and to provide support to those who may be more vulnerable to adverse experiences. The findings regarding heavy and early-onset cannabis use, genetic vulnerability to schizophrenia, and unusual cannabis-related experiences carry important implications for both policy and mental health education. Policymakers should consider these insights when shaping legislation related to cannabis use. Furthermore, mental health professionals and educators should raise awareness among cannabis users about the potential risks associated with heavy use, genetic susceptibility to schizophrenia, and the possibility of experiencing cognitive difficulties. The above-mentioned findings emphasize the importance of examining the complex interplay between heavy and early-onset cannabis use, genetic vulnerability to schizophrenia, and unusual cannabis experiences. The evidence suggests that heavy users who initiate cannabis use at an early age are more likely to experience cognitive difficulties and psychosis-like symptoms. As our understanding of this relationship improves, efforts can be directed towards mitigating the potential risks associated with cannabis use, protecting vulnerable individuals from the negative effects, and promoting mental well-being. The link between heavy and early-onset cannabis use, genetic vulnerability to schizophrenia, and unusual cannabis-related experiences provides a better understanding of the potential risks associated with cannabis use among individuals with a genetic predisposition to schizophrenia and is vital for promoting informed decision-making, improving mental health outcomes, and ensuring the well-being of individuals who consume cannabis. By exploring this complex interplay, we can strive for a comprehensive understanding of the impact of cannabis on mental health and reduce potential harm [6-9,13,15,19,21,22].

A recent study that is the largest genetic study of CUD so far, included data from multiple international cohorts in more than one million participants compered four ancestral groups. The study reported to replicate two prior genome-wide significant findings while identifying 25 novel loci, and leverage these novel data to investigate genetic overlap with other traits. The research identified a clear difference between cannabis use and CUD, with genetic liability to CUD being much more closely associated with psychopathology and disability. It was also reported a greater heritability enrichment in fetal than adult brain tissue, supporting an important role of development in laying the biological basis for CUD. Using Mendelian randomization analyses to assess causal relationships revealed evidence of bidirectional causal effects between CUD and schizophrenia and unidirectional effects of multi-site chronic pain on CUD, and of CUD on lung cancer. Finally, using genomic structural equation modeling, we found that CUD loads on a latent factor with other substance dependence traits, consistent with clinical observation, genetic epidemiology and prior genetic studies of other substance use disorder traits. In particular, the study highlighted the possible relationship revealed herein between CUD and lung cancer risk. This study yields new insights into the genetic architecture of CUD and how this risk interacts with traits crucial to public health and raises important concerns regarding the potential adverse consequences of the secular trend toward increased cannabis use consequent to legalization [23-26,31].

DISCUSSION

CUD has garnered significant attention in recent years, as

the legalization and normalization of cannabis use have led to an increase in its consumption. While some individuals maintain a healthy relationship with the use of cannabis, others find themselves trapped in the grips of CUD, facing numerous psychopathological and functional impairments. Understanding the genetic underpinnings of CUD can shed light on its etiology and potential therapeutic interventions [4-6,13,16,22,23,31].

Recent research has provided compelling evidence for a strong genetic component in the development of CUD. Studies have consistently shown that individuals with a higher genetic liability for CUD are more likely to experience comorbid psychiatric disorders such as schizophrenia and suffer from increased disability. This suggests that the genetic predisposition to CUD is closely associated with psychopathology and functional impairment. Interestingly, the genetic architecture of CUD seems to be most pronounced during fetal development. Analysis of fetal brain tissue has revealed higher heritability enrichment compared to adult brain tissue, emphasizing the importance of early developmental processes in laying the groundwork for CUD. This finding highlights the need for targeted interventions and preventive measures during critical periods of brain development [32,35,38,46,47]. Examining causal relationships between CUD and other conditions has also yielded intriguing results. Bidirectional causal effects have been observed between CUD and schizophrenia, suggesting a complex interplay between these two disorders. Additionally, unidirectional effects have been found between multi-site chronic pain and CUD, as well as between CUD and lung cancer, as well as cardiovascular diseases [48,49]. These findings underscore the potential adverse consequences of CUD and its comorbidities, raising important concerns for public health [32,35,38].

Further exploration using genomic structural equation modeling has revealed that CUD manifests as a latent factor closely associated with other substance dependence traits. Using genomic structural equation modeling, researchers have also found that CUD loads as a latent factor with other substance dependence traits. This means that individuals with CUD may also be at an increased risk for other substance use disorders. This finding aligns with clinical observations and prior genetic studies on substance use disorder traits, further reinforcing the genetic underpinnings of CUD. Confirming the existence of shared genetic vulnerabilities across addictive behaviors. Understanding these shared genetic factors could pave the way for more targeted treatments and interventions for individuals struggling with CUD. One particularly fascinating finding from genetic studies of CUD is the possible link between CUD and lung cancer risk as well as cardiovascular diseases [48,49]. This association raises concerns about the long-term health consequences of increased cannabis use following its legalization. While further research is needed to fully elucidate the underlying mechanisms, it is crucial to be aware of the potential risks associated with the rising trend of cannabis use [6,17,19,22,24].

CONCLUSIONS

Genetic studies have provided valuable insights into the complex nature of CUD. Moreover, the studies provided valuable insights into the biological basis of this disorder and its relationship with other mental health conditions and diseases. The findings highlight the importance of early intervention, comprehensive assessment, and targeted treatment approaches that address the complex interplay between genetics, psychopathology, and substance use. As the trend towards increased cannabis use continues, it is imperative to consider the potential adverse consequences and develop strategies to mitigate the risks associated with CUD. The evidence for a strong genetic component, the involvement of early developmental processes, and the interplay with comorbid conditions highlight the need for preventive interventions, early identification, and targeted treatments. Furthermore, the association between CUD and lung cancer risk emphasizes the importance of considering the long-term health consequences of increased cannabis use. By unraveling the secrets of CUD at the genetic level, allows fostering a better understanding of this disorder and working towards mitigating its adverse impacts on individuals and society. Further research is needed to elucidate the specific genes and genetic variants involved in CUD, paving the way for more personalized and effective interventions in the future. Understanding the biological basis of the relationship between the use of cannabis and the appearance of psychopathological conditions largely undermines the trend to allow the use for pleasure purposes. Overall, this research has the potential to contribute valuable insights into the complex relationship between cannabis use, mental health, and genetics. However, careful consideration of the study design, analysis methods, and potential confounding factors is crucial for drawing robust conclusions. The research findings strongly reinforce the need to take increased precautions in the trend of countries that have made it easier legally to use cannabis for recreational purposes.

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