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A REVIEW ARTICLE ON THE ADVERSE EFFECT OF MARIJUANA

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Abstract

Although marijuana has been used for many years, interest in its potential medical benefits has recently increased. Research on the therapeutic properties of cannabis has led to the development of drugs including nabilone, dronabinol, and nabiximols. Among marijuana users, marijuana use disorder is becoming more prevalent. The use of marijuana, an illicit drug that is bad for people's health, is become more and more common among teens and young adults. This analysis looks at the most frequent worries people have about marijuana use and how it affects people's health. The review centers on the ramifications and gravity of the impacts on human existence, encompassing modifications to the body, mind, emotions, and behavior. This research indicates that the most widely used illegal substance, marijuana, contains the psychoactive active component delta-9-tetrahydrocannabinol (THC). The most popular recreational drug, cannabis, is illegal in many parts of the world. Cannabis use is rising in the US and other nations as a result of growing decriminalization and legalization [2]. Cannabis is classified as a Schedule 1 substance in the US, which limits study into its potential negative effects. In spite of the lack of evidence, cannabis is often believed to be a safe or even helpful substance. Recent research, however, indicates that cannabis is associated with cancer and has detrimental effects on the lungs and cardiovascular system. Furthermore, a correlation between cannabis usage and neuropsychiatric diseases has been demonstrated by case studies. As cannabis becomes more widely available, youth abuse of the drug has increased the number of overdose and toxic cases. Cannabis intoxication may be associated with impaired driving and auto accidents, although being hard to detect.

Keywords: Cannabis, Psychiatric, Marijuana, THC (tetrahydrocannabinol).

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Introduction

Cannabis has been cultivated by humans for thousands of years for recreational and medicinal uses. Consumed in various modalities, including smoking, hookah, vaping, and edibles, cannabis is one of the most used recreational drugs and is illicit in many areas of the world with growing decriminalization and legalization, cannabis use has increased worldwide [1]. With the rising availability of medical and recreational marijuana also known as Cannabis. There are over 500 chemicals in cannabis, and the chief psychoactive component, delta9-tetrahydrocannabinol (19 -THC), is the most abundant cannabinoid. Though, cannabis contains more than 100 other cannabinoids that are structurally like 19 -THC, including cannabidiol (CBD), the second most abundant component, which is non psychotropic. The effects of cannabinoids are mediated by cannabinoid receptor 1 (CB1) and cannabinoid receptor 2 (CB2), which belong to

the G protein-coupled receptor (GPCR) superfamily. CB1, the most abundant GPCR in the mammalian brain, regulates the psychoactive effects of 19 -THC (Figure 1). CB1 is also expressed in other peripheral cells, tissues, and organs such as the heart, vasculature, and smooth muscle. CB2 is expressed in immune cells, particularly in macrophages. The cannabinoid receptors modulate adenylyl cyclase, ion channels, mitogen-activated protein (MAP) kinases [p44/42 MAP kinases, p38, extracellular regulated kinases (ERK), Janus N-terminal kinase (JNK)], and ceramide signalling there has been worry over whether greater marijuana availability will have unexpected repercussions for young people who use marijuana before they become adults



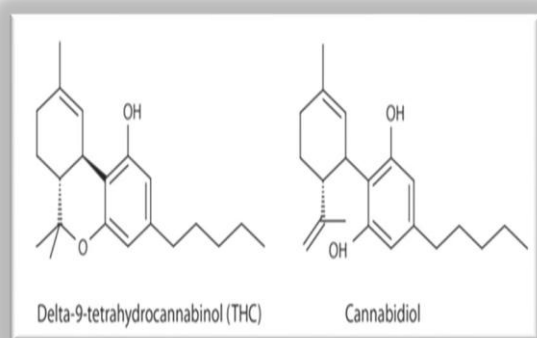
Cannabis and Malignancy:

Cannabinoids are approved for treating cancer symptoms, including pain, nausea, and vomiting. Preclinical evidence suggests that cannabinoids might be effective therapy for glioblastoma multiforme, colon cancer, skin cancer, prostate cancer, and breast cancer. However, the clinical data on the efficacy of cannabinoids in cancer are unclear. There is a paucity of clinical trials showing cannabis improves cancer survival [2]

Modes of Marijuana Consumption:

Cannabis can be ingested in a variety of methods, all of which require heating to decarboxylate the plant's THCA into THC. The following are examples of commonly available forms:

1. Smoking - Small pipes, bong (portable versions of hookahs with a water chamber), paper wrapped joints or tobacco-leaf-wrapped blunts, and other things are commonly used to burn and inhale vaporized cannabis ("smoke").
2. Vaporizing - which raises the temperature of any type of cannabis to 165–190 °C (329–374°F), causing the active components to evaporate into vapor without burning the plant material (under atmospheric pressure, THC's boiling point is 157 °C (315 °F)).
3. Cannabis Tea - Because THC is an oil (lipophilic) and is only slightly water-soluble, it has relatively low quantities (with a solubility of 2.8 mg per liter). To make cannabis tea, combine a saturated fat (e.g., cream or any milk except skim) with a tiny amount of cannabis in hot water.
4. Edibles are cannabis products that are mixed into a range of foods, such as butter and baked pastries. Bhang, a popular beverage in India, is created from it. Green dragon tincture, often known as cannabis tincture, is an alcoholic cannabis concentrate.
5. Capsules and other dietary supplement items containing cannabis oil, of which 220 were approved in Canada in 2018.



Cannabinoids' high lipid solubility allows them to stay in the body for long periods. THC can be detected in the body for weeks or longer after a single dosage. Cannabinoids may accumulate in the body, particularly in the lipid membranes of neurons, according to researchers [3].

Beneficial Effects of Marijuana:

The following list of marijuana benefits are some of the most discussed in scientific research, as well as anecdotally.

• Pain management

Cannabis in marijuana may reduce pain by altering pain perception pathways in the brain. This may be helpful to treat conditions that cause, chronic pain such as:

- arthritis
- fibromyalgia
- endometriosis

it may also minimize cancer treatment side effects, like loss of appetite.

In some instances, medical marijuana is reported to help replace the long-term use of nonsteroidal anti-inflammatory drugs (NSAIDs) like ibuprofen, which can have negative side effects.

• Reduced inflammation

Neurological and mental disorders marijuana to treat the following neurological and mental health conditions:

- Anxiety
- epilepsy
- multiple sclerosis
- Parkinson's disease
- post-traumatic stress disorder (PTSD)
- Tourette syndrome

Sleep management

The relaxing effects of marijuana may help improve sleep disorder, such as insomnia. An improved sleep may also occur when pain is reduced from marijuana usage.

Immediate Effects of Smoking Marijuana:

We included nine studies in our analysis (eight cohort studies and one cross sectional study).

Long-term Effects of Smoking Marijuana:

Since the 1970s, the respiratory effects of long-term marijuana use have been studied. However the results of the studies are diverse and sometimes contradictory. The predominant research approach has been to use tobacco consumption as a reference point.

Adverse Effect of Cannabis on Body Parts:

Effect on Brain:

You might find it harder to focus, learn, and remembering things when you use marijuana. Short term effect can last up to 24 hours after you stop smoking. Long term use especially in your teens, may have more permanent effects. The brain remains in a state of active, experience-guided development from the prenatal period through childhood and adolescence until the age of approximately 21 years [4]. During these developmental periods, it is intrinsically more vulnerable than a mature brain to the adverse long-term effects of environmental insults, such as exposure to tetrahydrocannabinol, or THC, the primary active ingredient in marijuana. As compared with

unexposed controls,

Effect of Respiratory system:

Marijuana smoke can inflame your lungs. If you're a regular user, you could have the same breathing problems as a cigarette smoker. That means a cough, sometimes long lasting, or chronic. You could also be more likely to get lung infections. The tar from cannabis smoke also contains greater concentrations of Benz anthracenes and benzo pyrenes, both of which are carcinogens, than the tar in marijuana smoke [5]. Chronic cannabis smoking is associated with bronchitis, emphysema and squamous metaplasia (a pre-cancerous change) of the tracheobronchial epithelium.

Effect on Heart:

Your normal heart rate of 50 to 70 beats per minute can rise by 20 to 50 beats or more for up to 3 hours after you use marijuana. Scientists think that this, along with tar and other chemicals in the drug, may raise your chance of a heart attack or stroke. The risk could go up further if you're older or you already have heart problems.

Effect on Stomach:

By itself, THC seems to ease nausea, especially if your symptoms are from chemotherapy treatment for cancer. Some people say the stomach -setting effects work better when you use marijuana instead of THC alone. This may be because other chemicals enhance the effects of THC. But the long-term marijuana use can have the opposite effect and cause more vomiting. Cannabinoid hyperemesis syndrome can occur in regular users and leads to frequent vomiting.

Effect on Eyes:

Some evidence suggests that marijuana, or chemicals in it, can lower the eye pressure that's main symptom of glaucoma. The problem is the effect only last 3 to 4 hours. To keep it low,

Mental Illness:

Regular marijuana use is associated with an increased risk of anxiety and depression, but causality has not been established. Marijuana is also linked with psychoses especially among people with a preexisting genetic vulnerability and exacerbates the course of illness in patients with schizophrenia. Heavier marijuana use, greater drug potency, and exposure at a younger age can all negatively affect the disease trajectory.

Effects on Health others:

The effects of long-term marijuana smoking on the risk of lung cancer are unclear. For example, the use of marijuana for the equivalent of 30 or more joint years was associated with an increased incidence of lung cancer and several cancers of the upper aerodigestive tract [6].

Marijuana use has also been associated with vascular conditions that increase the risks of myocardial infarction, stroke, and transient ischemic attacks during marijuana intoxication. The actual mechanisms underlying the effects of marijuana on the cardiovascular and cerebrovascular systems are complex and not fully understood. However, the direct effects of cannabinoids on various target receptors (i.e., CB1 receptors in arterial blood vessels) and

the indirect effects on vasoactive compounds may help explain the detrimental effects of marijuana on vascular resistance and coronary microcirculation.

Other consequences:

Numerous respiratory conditions have been linked to marijuana smoking. We reviewed 19 studies on this topic. Of these, four studies reported cases of spontaneous pneumothorax associated with marijuana use. while one study reported cases of simultaneous bilateral spontaneous pneumothorax. Six studies reported the presence of pulmonary bullae, with two cases related with pneumothorax and one case showing pulmonary fibrosis. Historically, marijuana has been labelled as a bronchodilator, stimulating interest in its potential to treat asthma. Indeed, in the 19th century, marijuana was occasionally employed as a treatment for this respiratory condition. The most common reason for exclusion was a lack of reporting of a health effect or harm [7]. All were published between 1997 and 2017, and the most recent review was conducted in 2015. The most searched databases were MEDLINE, Embase, PsycINFO and PubMed. Twenty-two reviews examined mental health outcomes, 15 reported on functional and structural brain changes, 10 examined neurocognitive effects, 4 reported on cancer, 5 reported on prenatal exposure and 12 examined overall health effects. Our final sample included 17 cohort studies—15 of high quality and 2 of acceptable quality — 10 case-control studies of high quality, 14 case reports, 3 high-quality case series, and 11 cross-sectional studies, 6 of which were high quality and 5 of moderate quality.

Current literature demonstrates that marijuana use negatively impacts lung function, triggeringsymptoms like chronic cough, sputum production, and wheezing, and diminishing FEV1/FVC ratio in spirometry tests [8]. Moreover, prolonged or chronic marijuana use augments the risk

of respiratory function impairment. While the carcinogenic effects of marijuana are still contested, a weak correlation between marijuana use and lung cancer has been observed in some studies.

Interpretation:

This review provides important information regarding the need to consider adverse health effects of recreational or medical marijuana use. This information should be of use to policy- makers and health care systems as jurisdictions prepare to address the health effects of increased accessibility of marijuana [9]. Data regarding harms associated with marijuana, including those related to mental health and brain changes should be considered when evaluating the potential impacts of legalizing marijuana, particularly related to the potential for increases in health care costs (10)

. Policy-makers and Physicians should also note this differential effect and advise youth, pregnant women and those with mental illnesses against use.

However, none of the above evidence is causal; only

relative evidence is available. The study designs are possible that the observed positive associations are due to systematic differences between marijuana users and nonusers in underlying risks, social exposures or environmental factors (11). Nonetheless, clinicians should be aware that there is a variety of health harms associated with marijuana use and consider additional preventive measures for their patients, such as additional behavioural counselling and more assertive diagnostic approaches if symptoms arise. Only 1 review examined dependency and was limited to examining only self-reported surveys; however, this review provides important information for physicians. This review reported that 10% of users meet criteria for marijuana dependency (12)

Limitation:

Our systematic review has several notable limitations. This review is limited in the range of potential harms that could be examined, as only topics previously systematically reviewed were

included. Some adverse effects may therefore have been missed in this review. Compared with alcohol and tobacco, legal and often-used substances, marijuana is less toxic at the population-level [13]. Further, because of the nature of marijuana function on the brain, death due to overdose is not possible and marijuana has therefore been classified as a relatively safe drug, which it is in the short term. The safety profile of marijuana in the short term may have overshadowed some of the longer-term health risks that appear to be associated with even moderate use (14).

Our understanding of the long-term effects of prenatal exposure to marijuana in humans is very poor. The THC content of marijuana, as detected in confiscated samples, has been steadily increasing from about 3% in the 1980s to 12% in 2012 (15). This increase in THC content raises concerns that the consequences of marijuana use may be worse now than in the past and may account for the significant increases in emergency department visits by persons reporting marijuana use and the increases in fatal motor-vehicle accidents. This increase in THC potency over time also raises questions about the current relevance of the findings in older studies on the effects of marijuana use, especially studies that assessed long-term outcomes (16).

This issue is further complicated by differing measures of marijuana use across studies, making assessments challenging. In the context of the studies investigating cancer, several did not account for crucial variables like environmental factors or participants' genetic factors. Similarly, when assessing marijuana-induced pathologies, many studies did not clarify whether participants were regular users of other drugs or had exposure to toxic substances. Although our review primarily focuses on the respiratory system, marijuana use also affects other systems, such as the cardiovascular, endocrine, and nervous systems. Consequently, our conclusions may not fully capture the broad health effects of marijuana use

(17).

Lastly, the everchanging landscape of marijuana legalization and regulation could constrain the applicability of our findings to different legal contexts, necessitating future updates to this review as marijuana legalization broadens (18).

Discussion:

The increasing legalization of marijuana across multiple countries may inadvertently give rise to a misconception that legal substances, such as alcohol and tobacco, are inherently safe. Despite their legal status, these substances can have significant health implications. Moreover, the health benefits linked to cannabis derivatives, like the alleviation of chronic pain or mitigation of chemotherapy induced nausea and vomiting, might foster a misbelief that marijuana use is without harmful effects [19]. Historically, marijuana has been labelled as a broncho dilator, stimulating interest in its potential to treat asthma. Indeed, in the 19th century, marijuana was occasionally employed as a treatment for this respiratory condition.

Finally, it's important to underscore the necessity for more comprehensive research in this area. With the increase in marijuana use, our understanding of its effects is likely to evolve, shedding light on areas that currently remain uncertain. However, until then, it's vital to approach marijuana consumption with caution and awareness of its potential impacts on health (20).

Conclusion

Cannabis has been cultivated for thousands of years for leisure as well as health care. Legal limitations restricted its use in the early 20th century. Cannabis is now more widely available than it was twenty years ago thanks to legalization and allowance. HIV-related cachexia, chemotherapy-induced nausea and vomiting, and neurodegenerative illnesses may all benefit from medicinal marijuana use [29]. Cannabis is anticipated to have a negative impact on human health in a number of ways, according to preclinical research and newly available epidemiological data.

Tobacco cigarettes entered the American way of life at the start of the 20th century and quickly spread over the globe. It is now known that this resulted in millions of deaths due to sharp rises in cancer, cardiovascular disease, and respiratory illnesses. Cannabis may have therapeutic uses, but no drug is perfect; all medications have negative side effects. There is mounting evidence that increased cannabis use will probably worsen cancer and heart problems down the road. Racial groups have historically experienced different levels of enforcement as a result of cannabis criminalization. Many thanks to the changes in laws that have been made in the US and other countries recognizing the medical use of cannabis. In addition, the discovery of the molecular mechanisms underlying these advantages has sparked the continuous creation of medications derived from cannabis that could offer targeted medical advantages devoid of adverse effects. One such chemical that does this is peridole, which separates CBD from the cannabis plant. As of right now, Americans can access it. The overall quality and

clinical significance of the existing evidence are, nevertheless, low. That makes it difficult to make a strong recommendation. In assistance with standard clinical practice we'll be using cannabis-based pharmaceuticals till then. There's a current increase in clinical studies.

Author contributions

All authors are contributed equally.

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Declaration of Competing Interest

The authors have no conflicts of interest to declare.

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