Cannabis v. Alcohol for Sleep: What Are the Differences?

What the science says about how alcohol and cannabis perform, when it comes to making sleep better—or worse.

March 12, 2020 By Michael Breus, PhD

They are the two most commonly used sleep aids in the world—alcohol and cannabis. Alcohol regularly tops the list of self-medicating sleep aids. And today, cannabis is among the most frequently used natural therapies, with people who use cannabis routinely identifying help with sleep as a prime reason for doing so.

Alcohol and cannabis have very different effects on sleep, however. Today, I'll take a look at what the science says about how alcohol and cannabis perform, when it comes to making sleep better—or worse.

Cannabis and alcohol have distinctly different effects on sleep

For centuries, people have sought relief for sleep problems from the intoxicating, sedating effects of alcohol and the relaxing, sedating effects of cannabis. But there's a profound gap between how alcohol and cannabis impact sleep, and how these substances are regarded as therapeutic tools for sleep. Alcohol, for all its popularity as a self-medicating sleep aid, is essentially universally discouraged by sleep experts and physicians as a tool to help sleep and other health conditions that affect sleep. Cannabis, on the other hand, is increasingly being investigated and regarded as a valuable therapy for sleep and sleep disorders, as well as for co-morbid conditions both physical (pain, cancer) and psychological (anxiety, depression, PTSD) that have an impact on sleep.

Before we dive into a look at all the differences between these two substances and their effects on sleep, let's take a moment to examine some basic characteristics they share.

Both alcohol and cannabis can have sedative and stimulating effects in the brain and body.

But the differences in how the sedating and stimulating effects of cannabis and alcohol unfold, however, are significant. Alcohol's role as a sedative and a stimulant, depending on several factors, including how much and how often it's consumed. But even over the course of a single night, the presence of alcohol in the body can both sedate and stimulate. It's common for alcohol to have initial sedating effects, helping sleep come about more quickly. As the night wears on, however, and alcohol consumed close to bedtime is metabolized, stimulant effects kick in, which frequently lead to sleep disruptions in the later part of a night's sleep. Recent research has shown

that alcohol consumption increases both alpha and delta brain waves at the same time. Delta waves are brain waves present during deep, slow-wave sleep. Alpha waves are present in a waking brain. We see these types of brain wave changes in patients with pain syndromes like fibromyalgia, who constantly complain of restless and unrefreshing sleep. These data suggest alcohol contributes to this type of push-pull between different states of consciousness that may result in restless, disrupted sleep.

Cannabis contains chemical compounds that are stimulating, and others that are sedating. But unlike with alcohol, it's possible to isolate and select specific strains and compounds of cannabis that favor relaxing, sleep-promoting effects (an Indica-based hybrid) or alerting, stimulating effects (a sativa-based hybrid). This can lead to a more controlled, consistent set of effects than those delivered by alcohol. (More on this key difference between alcohol and cannabis in just a minute.)

Both alcohol and cannabis can be used excessively, with negative effects for sleep, mood, and health.

I'll be talking about the heavy use effects of cannabis, and sleep issues related to cannabis withdrawal, in an upcoming article. Heavy alcohol use can lead to chronic sleep problems, including insomnia and other sleep disorders. Research also shows that moderate levels of drinking can contribute to more restless sleep, and impact the severity of sleep disorders such as sleep apnea.

With such long histories—ancient, really—as sleep aids and recreational substances, alcohol and cannabis often get grouped together in discussions about their impact on sleep. Digging into the research, however, reveals some key differences between the way alcohol and cannabis interact with sleep and sleep problems.

Alcohol is 'one-size-fits-all." Cannabis can be highly targeted.

When we talk about alcohol, what are we really talking about? The alcohol we consume in beverages is ethanol, and it's produced through fermentation—of fruits, vegetables, grains or other starches, and sugar. There are a lot of persistent myths out there about alcohol and its effects, including the idea that some drinks are more "alcoholic" than others—say, whiskey compared to beer or wine—and therefore more or less potentially disruptive to sleep. No matter what you drink, while you're always consuming the same intoxicating ingredient—ethanol (ETOH). The effects on your sleep, mood, cognition and motor skills may vary greatly depending on the amount you drink, and the concentration of alcohol in what you're drinking. But the impact of consuming ethanol is essentially the same, no matter what you're drinking (beer, wine, or whisky).

Cannabis, on the other hand, comprises a whole genus of plants (that's a group of distinct, yet related plants), and has a broad variety of strains found naturally, along with the capacity for strains to be cultivated with particular compounds, characteristics, and effects in mind. You've probably heard about two major cannabis strains: indica and sativa. Sativa strains are generally regarded as alerting and stimulating, while indica strains are considered relaxing, calming, and sedating. Recent research has shown indica strains are often being used to help with insomnia,

and with sleep-disrupting conditions including chronic body pain and headache.

But there's a whole lot more variation to cannabis—and its effects on sleep—than the indica-sativa divide. Cannabis contains hundreds of chemical compounds, including cannabinoids and terpenes, that have distinctly different effects. Some of these compounds are sleep-promoting, and others are not. Identifying and cultivating hybrid strains that combine the sleep-boosting compounds of cannabis (for example, combining sedating terpenes combined with relaxation-inducing levels of cannabidiol [CBD] and relatively low levels of THC), is one critical way cannabis can be tailored to deliver therapeutic benefits for sleep, while minimizing or avoiding altogether disruptions to sleep (provided cannabis is used as directed).

For all its popularity as a self-administered "sleep aid," alcohol doesn't have anything like this breadth or adaptability, to isolate specific benefits and minimize negative consequences. That's a powerful difference between the two. The difference between cannabis and alcohol and their impact on sleep in many ways comes down to this distinction, and to the multitude of potential sleep-benefitting compounds in cannabis, paired with our ability to cultivate, extract and apply them in targeted ways for sleep.

There's also the question—and likely differences—in amounts consumed. Broadly speaking, people may be more likely to consume more alcohol than cannabis. A big factor in this potentially significant difference may be wrapped up in the speed with which these substances take effect in the body. Cannabis can be consumed in several different methods, each of which have distinct times for onset of effects. Vaping and smoking cannabis delivers effects within seconds, whereas some topicals may take a few minutes, and other delivery methods (oils, tinctures, edibles) can take 15 minutes or longer. When the effects of cannabis are delivered quickly, there may be less of a tendency to continue consuming—and risk overconsumption that might disrupt sleep.

The effects of drinking alcohol can begin as quickly as 10 minutes after first consumption. But several factors will influence that speed, including whether you're drinking on an empty stomach or a full one, the alcohol content in what you're drinking, and how quickly you drink it. A person's body weight also has an effect. Drinkers may not notice the effects of their alcohol consumption until they've consumed more than what is optimal for maintaining healthy sleep. The very quick onset of effects of cannabis in forms such as smoking and vaping can actually help people manage and limit consumption to optimize benefits for sleep.

How alcohol and sleep affect sleep disorders

Another way to compare cannabis and alcohol in relation to sleep is to look at what research says about their impact on sleep disorders, including insomnia, sleep apnea, and others. I recently wrote about cannabis and insomnia, and the emerging evidence around cannabis' ability to address symptoms of insomnia and comorbid conditions that are associated with insomnia. In particular, cannabis appears effective in helping insomnia that occurs alongside conditions including chronic pain, as well as anxiety and other psychological conditions such as PTSD, and insomnia that results from treatment of diseases such as cancer.

There's also emerging evidence that cannabis may be useful as a therapy in treating obstructive sleep apnea. Some fascinating research shows that a synthetic version of cannabis helps the brain to exert better control of the airway muscles during sleep, helping to reduce the shallow and temporarily interrupted breathing of sleep apnea. (I'll talk more in depth about this cannabis-sleep apnea research soon.)

Still other scientific research has begun to suggest that cannabis can help with restless leg syndrome, a sleep disorder that creates highly disrupted sleep along with intensely uncomfortable leg sensations that occur most frequently at night. The research here is new, and limited, for now; results of a small study from 2017 show that cannabis in different forms was highly effective in alleviating RLS symptoms in people with severe cases of this sleep disorder—and in cases where pharmaceutical drugs had failed to work. People who ingested cannabis through smoking it and who used the cannabinoid CBD, all reported significant improvements to their RLS symptoms and their sleep.

One of the commonly-cited effects of cannabis on sleep and its architecture is the potential for suppression of REM sleep. This makes cannabis and some of its chemical components (including CBD) a promising therapeutic tool for REM Sleep Behavior Disorder. This sleep disorder involves dysfunction to normal REM sleep from altered activity in the brain, and it leads to severe, sometimes violent and dangerous (to self and others) physical movements during this sleep stage. In healthy REM sleep, the body enters a state called "REM atonia," which temporarily paralyzes major muscles of the body, keeping us still and unable to physically react during this sleep stage, which is often filled with active dreaming. Research indicates cannabis can be useful in reducing disruptive nightmares, in particular for people with post-traumatic stress disorder (PTSD). Cannabinoids have been found effective in treating other symptoms of PTSD beyond nightmares, including insomnia and chronic pain.

The evidence of alcohol's effects on sleep disorders offer a pretty stark contrast. There's a robust body of research that shows the presence of alcohol increases risks for insomnia. How? One major mechanism is through alcohol's disruption of the body's internal sleep drive, also known as sleep homeostasis. Alcohol elevates levels of adenosine, a neurotransmitter that induces drowsiness and sleep. Adenosine, like nearly all our hormones and brain chemicals, functions on a bio-time cycle: levels of adenosine build gradually throughout the day, contributing to a gradually growing need for sleep that peaks in the evenings. Increasing adenosine—and bringing on drowsiness and sleep—may sound like a good thing, and the very opposite of insomnia. While it's true that alcohol can make it easier to fall asleep, by artificially boosting adenosine and interfering its natural, 24-hour rises and falls, alcohol disrupts the body's internal sleep-wake cycle. That disruption can, over time, create insomnia, particularly the symptoms of waking in the middle of the night or the early morning.

Alcohol also interferes with melatonin production. Research indicates that a moderate intake of alcohol in the evening hours may lower melatonin production by 19%, more than 3 hours after consumption.

Alcohol also increases risks for obstructive sleep apnea. Studies show that risks for developing OSA increase by an average of 25% among people who consume moderate or higher amounts of alcohol, compared to people who consume lower amounts, or no alcohol at all. (Research indicates that people with OSA consume an average of 2 drinks a week more than people without the sleep disorder.) Among people who have OSA, even moderate alcohol consumption can result in significant increases to the severity of their sleep apnea. Whereas cannabis may help retain the muscle control of the upper airway during sleep, alcohol consumption can create excessive relaxation of airway muscles, thereby making sleep apnea more likely and potentially more severe.

Alcohol is also recognized as a factor in the risk and severity of restless leg syndrome. My patients with RLS are among the many RLS patients who say drinking alcohol makes their symptoms more frequent and more intense.

Co-morbid sleep problems: how alcohol and cannabis compare

Sleep problems and sleep disorders such as insomnia aren't always primary, stand-alone conditions. Often, disordered sleep occurs in tandem with other health issues. Medically speaking, these are known as co-morbid conditions. The relationship between sleep problems and other conditions is typically quite complicated. Almost always, there's a 2-way street dynamic: sleep (or a lack of sleep) affects other health conditions, and those other conditions simultaneously and in turn affect how we sleep. It's a difficult cycle, one that's tough to break, and a cycle that's responsible for a lot of chronic sleep issues, including insomnia in many cases.

Some of the most common comorbid conditions with sleep include chronic pain, anxiety and depression. The combination of sleep problems with other health issues frequently sends people in search of relief through alcohol and cannabis. With that in mind, it's worth a comparison of the effects of alcohol and cannabis on these conditions.

It's common for people with chronic pain to self-medicate, and to do so with alcohol. Research indicates that 25% of people with chronic pain use alcohol in an attempt to relieve their pain. And somewhere between half and three-quarters of people with alcohol use disorder also have chronic pain.

The relationship between alcohol and pain is complicated. Some research, like this 2019 study of fibromyalgia patients, shows that moderate alcohol consumption (typically defined as 1 drink a day for women, and 2 for men) may reduce pain. Other scientific research shows that the amount of alcohol needed to improve chronic pain is equivalent to binge drinking (that's about 4-5 drinks in a 2-hour timespan, for women and men, respectively). This level of alcohol consumption is nearly certain to lead to sleep problems, as well as other health and safety issues. Over long periods of time, tolerance develops, and sensitivity to pain may increase. It's not surprising that alcohol use disorder and chronic pain frequently occur together, with sleep problems also present. Chronic drinking—particularly when it's heavy—also can lead to alcohol-related liver damage and liver diseases, including cirrhosis and liver cancer.

Alcohol use can also aggravate anxiety and depression. As with physical pain, alcohol is commonly used by people to cope with emotional distress. Alcohol may deliver very short-term relief from the symptoms of mood disorders, but the research is abundant in showing links between alcohol consumption and more frequent and severe anxiety and depression, particularly when alcohol use is frequent and heavy. Studies also show that reducing alcohol intake can improve anxiety and depression. And there's a deep, powerful connection between mood disorders and sleep problems, which is likely to be exacerbated by alcohol use in the presence of anxiety or depression.

Like sleep problems, physical pain is a top reason for people to use cannabis. How does cannabis affect physical pain? As with most cannabis-related questions, we definitely need to see more research. But there's some compelling evidence to suggest that cannabis used therapeutically can treat a range of chronic pain conditions. Certain strains of cannabis will be better suited for pain therapy. As this 2014 study shows, people using cannabis therapy for pain found indica strains effective in reducing joint pain, headache pain, and neuropathy, or nerve-related pain. (But remember, there's more to selecting cannabis strains than indica and sativa.) Components of cannabis, including cannabinoids (THC, CBD and others) and terpenes, all have been shown to have analgesic, or pain-relieving properties, which is a promising sign for the ability to target cannabis for pain treatment. Late last year, the National Institutes of Health announced several studies investigating the analgesic effects of cannabinoids and terpenes. That's great news.

And what about cannabis' effects on anxiety and depression? This is another complex question that needs more scientific investigation. Recent research found no link between cannabis use and an increased risk of either anxiety or depression. And several prominent compounds in cannabis, including different cannabinoids and terpenes, have been shown to have anxiety reducing abilities, and to improve symptoms of depression. Getting the right dose and composition of the strain appears critically important in any use of cannabis to help with mood disorders and stress. There appears to be a great deal of promise in the capacity of cannabis to be applied as a therapy for these mood disorders, which so often occur alongside sleep issues.

This post originally appeared on The Sleep Doctor on March 10, 2020. It is republished with permission.
