



HEALTH & WELLNESS / LIFESTYLE

Cannabidiol (CBD) for Stress and Sleep

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Anxiety disorders plague a substantial percentage of the population. These disorders represent the most prevalent mental illnesses in the world.¹ According to data from the [National Comorbidity Survey Replication](#), 19.1 percent of U.S. adults suffer from an anxiety disorder.² Insomnia is often a comorbidity to anxiety, but it can be present on its own in otherwise mentally healthy people. Many of my patients who are experiencing everyday stress know all too well what it's like to toss and turn all night long.

Anxiety and Sleepless Nights: Role of the Endocannabinoid System

It has become more and more apparent that an imbalanced endocannabinoid system can affect anxiety and sleep. As a reminder, the endocannabinoid system comprises the cannabinoid receptors 1 and 2 (CB₁ and CB₂), their endogenous ligands known as endocannabinoids, and the enzymes responsible for their synthesis and degradation. The two major endocannabinoids are anandamide and 2-arachidonoylglycerol (2-AG).

Endocannabinoids' effects on anxiety-related responses occur through the CB₁ receptor, which is highly expressed in brain areas - such as the prefrontal cortex, amygdala, and hippocampus - that directly regulate emotional behavior.³⁻⁴ Knockout mice lacking the CB₁ receptor experience increased anxiety-like responses compared to rodents that still possess the receptor.⁵⁻⁶ Deleting the CB₁ receptor led to anxiety under stressful conditions.⁶⁻⁷ Benzodiazepine drugs are also less effective in CB1-knockout mice.⁸



Further evidence the endocannabinoid system is involved in stress is the fact that anandamide is found in the pituitary gland in the morning when cortisol levels begin to spike.⁹ Additionally, stress is known to increase anandamide levels in human subjects.¹⁰

The Role of Cannabidiol in Supporting a Calm Mood

The phytocannabinoid cannabidiol (CBD) is also involved in a healthy stress response, only it achieves its positive actions through a different mechanism. Unlike endogenous cannabinoids, which work on the CB₁ receptor, CBD supplementation leads to direct activation of the 5-HT_{1A} serotonin receptor.¹¹⁻¹² CBD's stress-relieving properties are also related to its ability to modulate cerebral blood flow in brain regions involved in anxiety including the amygdala, hippocampus, hypothalamus and cingulate cortex.¹³

A number of clinical trials have demonstrated that CBD can have a calming effect. Linares and associates observed the effects of different doses of CBD and placebo in 57 healthy male participants performing a simulated public speaking test.¹⁴

In this double-blind study, subjects were given oral CBD at doses of 150 mg, 300 mg or 600 mg, or a placebo, prior to the public speaking test. Compared with the placebo, 300 mg of CBD markedly lowered anxiety during the speech. The other CBD doses had no effect, which is consistent with animal studies that show there is a sweet spot in regards to supplementation.

I would note that clinically, not all CBD products are created equal when it comes to absorption and bioavailability, and I routinely find lower doses of highly available CBD work in a superior fashion.

However, Bergamaschi and colleagues found that in patients with generalized social anxiety

disorder, a higher dose of CBD (600 mg) before a public speaking test markedly lowered anxiety, cognitive impairment and discomfort in speech performance.¹⁵ The placebo group demonstrated higher anxiety, cognitive impairment and discomfort. In patients with generalized social anxiety disorder, CBD has also been found to have a calming effect through modulation of blood flow in certain brain regions and regulation of endocannabinoid levels in the limbic and paralimbic brain areas.¹¹

Cannabidiol & Restful Sleep

The endocannabinoid system is involved in the modulation of the circadian sleep-wake cycle.¹⁶ It is therefore logical that CBD has been shown to affect circadian rhythm. Low-dose CBD can be stimulating and promote wakefulness.¹⁷ However, higher doses of CBD can be sedating.¹⁷ Carlini and Cunha discovered that subjects with insomnia who received 160 mg cannabidiol slept more and awakened less during the night compared with the placebo.¹⁷ Low doses of CBD (15 mg), when combined with THC, the psychoactive component of marijuana, are known to counteract THC's sedative effect and promote wakefulness.¹⁸

CBD can support healthy sleep both in people with anxiety and mentally healthy individuals. A case study of a 10-year-old girl with post-traumatic stress disorder found that 25 mg of CBD at bedtime and 6 to 12 mg of CBD during the day as needed for anxiety reduced the girl's stress, and improved the quality and quantity of her sleep.¹⁹ Furthermore, Babson and colleagues, in a review of the literature, noted that CBD may be useful in REM sleep behavior disorder and excessive daytime sleepiness.²⁰

Closing Thoughts

The endocannabinoid system plays an important role in the stress response and circadian rhythm. The clinical studies investigating CBD's effect on stress and sleep have mirrored what I observe in my clinical practice: This phytocannabinoid can calm mood and, with the right dose, improve sleep.

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