

A Review on Effects of Cannabis Use on Sleep in Adolescents

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Abstract

The aim is to examine the effects of cannabis use on pain, trauma, and obstructive sleep apnea in adolescents regarding sleep patterns. With the recent legalization of cannabis as well as my role as a clinical sleep therapist for nearly a decade, I strongly believe there is a connection between both topics, and I strive to showcase the positive influence that cannabis can have on sleep patterns. This literature review strives to highlight the benefits on sleep that may be provided to those with pain, trauma, OSA as well as adolescent use. I have selected a wide variety of current literature to share the potential benefits of cannabis in relation to sleep.

Keywords: Pain • Trauma • Sleep apnea • Cannabis

Introduction

One of the most prevalent causes that patients report the use of medical cannabis is for pain reduction as well as to improve mood and sleep [1]. Chronic neuropathic pain affects 1% to 2% of the adult population and can often be resistant to conventional pharmacologic treatment [2]. Ware et al. [2] found that a single dose of 25 mg of 9.4% tetrahydrocannabinol herbal cannabis inhaled three times daily for five days decreased the intensity of pain, improved sleep and was tolerated well.

Literature Review

Previous epidemiological research also identified a decrease in opioid overdose deaths in US states with legalized medical cannabis [3]. Piper et al. [3] suggest a potential explanation of this phenomenon may be a possible substitution effect of medical cannabis for opioids. Among the participants that responded with regular opioid use, over three-quarters (76.7%) indicated that they had decreased their opioid use since commencing medical cannabis [3]. Piper et al. [3] also found that approximately two-thirds of participants reduced their use of anti-anxiety (71.8%), migraine (66.7%), and sleep (65.2%) medications subsequent to initiation of medical cannabis [3] (Figure 1).

Post-Traumatic Stress Disorder (PTSD)

The two most prevalent mental health disorders in Iraq and Afghanistan veterans are post-traumatic stress disorder (PTSD) and major depressive disorder (MDD), [4]. Metrik et al. [4] found that when studied concurrently, sleep motives, but not situational anxiety or coping with negative affect motives, significantly mediated the correlation between PTSD and MDD with cannabis use.

Previous studies suggest that people with PTSD often use cannabis to aid in coping with their condition [5]. Sleep improvement also appears to be a primary motivator for coping- oriented cannabis use [5]. Bonn-Miller et al. [5] found that the frequency of cannabis use was increased among those with high

PTSD scores when used for sleep-promoting purposes in comparison to those with low PTSD scores or those who did not use cannabis for sleep-promoting purposes (Figure 2).

Obstructive Sleep Apnoea

Ramar et al. [6] indicate the urgency and priority required in diagnosing and providing effective treatment of obstructive sleep apnoea (OSA) in the adult population. Positive airway pressure (PAP) therapy remains the most efficient treatment modality for OSA, however, alternate treatment options continue to be explored [6]. Innovative research analyzing OSA and cannabinoids suggest that synthetic cannabinoids such as nabilone and dronabinol may have short-term benefit for sleep apnoea based on their regulatory effects on serotonin-mediated apnoea's [7]. Ramar et al. [6] indicate that dronabinol is not approved by the Food and Drug Administration (FDA) for treatment of OSA. Medical cannabis and synthetic extracts other than dronabinol have not been studied in patients with OSA therefore, it is the position of the American Academy of Sleep Medicine (AASM) that medical cannabis and/or its synthetic extracts should not be used for the treatment of OSA due to unreliable delivery methods and insufficient evidence surrounding effectiveness, tolerability, and safety [6].

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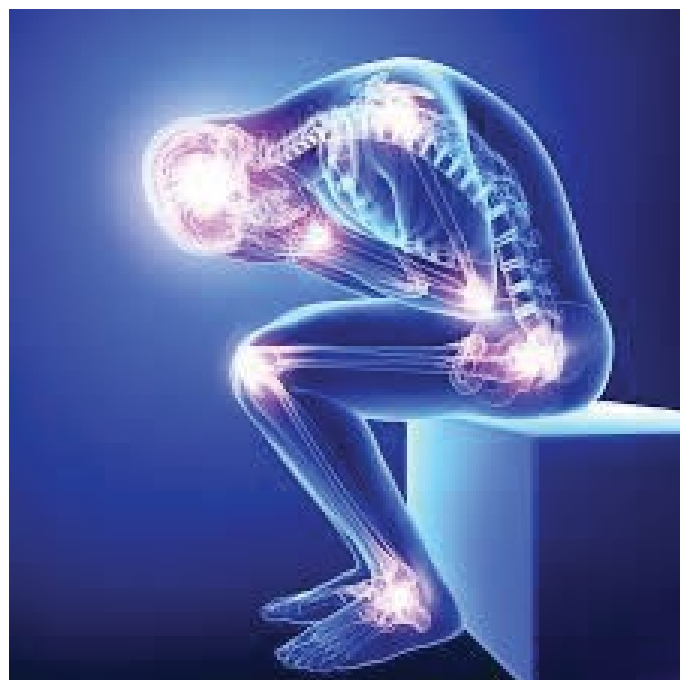


Figure 1. Pain.



Figure 2. Post traumatic stress disorder.



Figure 3. Obstructive sleep apnea.

Ramar et al. [6] recommend patients with OSA should discuss their treatment options with a licensed medical provider at an accredited sleep facility (Figure 3).

Adolescents

Mike et al. [8] found that both sleep quality and duration in early adolescence may have correlations to the development of alcohol and cannabis use throughout adolescence. Quality of sleep and duration at age 11 were associated with multiple earlier substance use outcomes after accounting for race, socioeconomic status, neighbourhood danger, active distraction, internalizing problems, and externalizing problems [8]. Participants were then interviewed regarding lifetime alcohol and cannabis use at ages 20 and 22 [8]. Mike et al. [8] indicate that decreased sleep quality was associated with earlier alcohol use, intoxication, and repeated use, as well as earlier cannabis intoxication and repeated use, however, not first use. Reduced sleep duration correlated with earlier use, intoxication, and repeated use of both alcohol and cannabis [8] (Figure 4).

it is unclear whether the effects of cannabis use on pain are mediated by the effect of improved sleep, or vice versa [1].

Research examining the effect of cannabis on objective sleep measures obtained by an experienced observer rating sleep by polysomnography (PSG) largely confirm the subjective reports [9]. Angarita et al. [9] showed that administration of 10, 20, or 30 mg of cannabis decreased total time to fall asleep and a PSG study showed both shorter sleep latency (SL) as well as decreased time awake after sleep onset (WASO). Babson et al. [7] found that cannabis may be promising for those experiencing rapid eye movement (REM) sleep behaviour disorder as well as excessive daytime sleepiness, while nabilone may decrease nightmares associated with PTSD and increase sleep among patients with chronic pain. Although, the long-term effects on other sleep quality measures, tolerability, and safety are still unknown [6]. Ramar et al. [6] also suggest that further studies are required to better understand the functionality of medical cannabis extracts before recommending them as an OSA treatment option.

The effects of cannabis on sleep promotion may vary by cannabis species [10]. Ferguson & Ware [1] indicate that this distinction may have critical therapeutic implications as different cannabis preparations have different pharmacokinetic properties. Short-acting cannabinoids may therefore; initiate sleep however, may not maintain it; while longer-acting cannabinoids may be better at sleep maintenance than initiation [1].

The effect of cannabis on sleep seems to depend on multiple factors such as composition, dosage and route of administration [11]. Mondino et al. [11] suggest that vaporization is the recommended route for the administration of medical cannabis however, there is not yet any published research about the effects of vaporized cannabis on sleep. Vaporization of low doses of a specific type of cannabis produced a slight increment of non-rapid eye movement (NREM) sleep and subtle modifications of high frequency bands power during the light (resting) phase as well as spindle coherence during the dark phase, which are associated with cognitive processing [11]. Mondino et al. [11] also reassure the importance of further exploring the sleep-promoting properties of cannabis (Figure 5).



Figure 4. Adolescents.

Discussion

Research on cannabis and sleep is still in its infancy with the need for additional controlled and longitudinal studies to advance our current understanding of research as well as clinical implications [7]. Ware et al. [2] also indicate the need for additional studies regarding long-term safety and efficacy surrounding the use of cannabis for chronic neuropathic pain. Further,

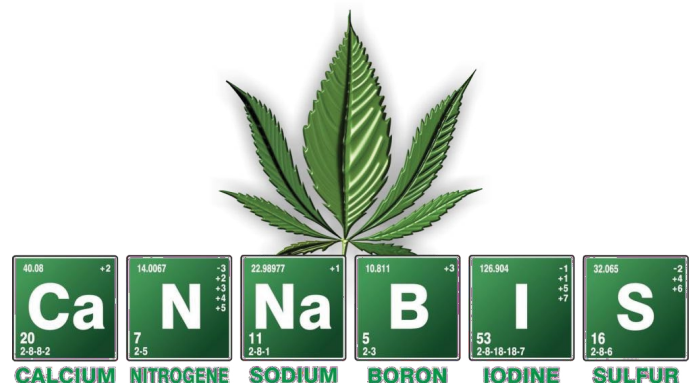


Figure 5. Cannabis.

Conclusion

As you can see, the main issue at this time is the need for more research on cannabis use for sleep purposes. I strongly believe in the innovative correlation that exists between cannabis use and sleep. I would like to further my own research by connecting with local physicians, clinical educators, and cannabis providers to better my knowledge and understanding on the subject. Current research congruently supports the notion that further studies are required to bridge the gaps that exist at this time.

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