



Background

Chronic pain affects millions of people worldwide and is defined as persistent pain lasting more than three months. Approximately 20-30% of these patients are prescribed opioids, such as oxycodone and morphine. Many of these patients also self-treat with cannabinoid-containing products. Studies have shown that cannabis has analgesic properties, as well as holistic benefits, including improved sleep, mood, and quality of life for chronic pain patients. With the legalization of cannabis, there has been an increase in the production of FDA-approved cannabinoid-containing products, such as Nabiximols (Sativex) and Dronabinol. With the increasing use of cannabis for pain and various conditions and with proven efficacy and safety over the years, use of cannabis may be useful in curbing opioid use and dependency, particularly in patients with chronic pain and opioid use disorder. Cannabis may have fewer and less severe adverse effects compared to opioids, and dramatically reduced risks of addiction and death.

Methods

Systematic review of the current literature (as of March 2025)

PubMed, EMBASE, and Cochrane databases were searched for human studies & clinical trials evaluating the benefits of cannabis-derived compounds on patients with chronic pain on opioid therapy.

We analyzed data from 12 studies involving chronic pain patients, examining the impacts of various cannabis formulations and opioid therapies. The studies included randomized controlled trials, observational surveys, and qualitative assessments, with sample sizes ranging from 24 to 790 participants with non-cancer-related chronic pain.

Inclusion criteria:

- chronic pain
- opioids
- cannabinoid, cannabis

Exclusion criteria:

- cancer-related pain
- healthy patients

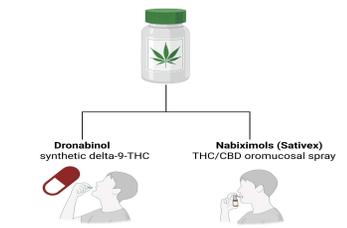


Figure 1: Cannabis-derived pharmaceuticals and administration routes. Dronabinol (synthetic THC) is taken orally, while Nabiximols (THC/CBD) is delivered via oromucosal spray. Both are used in clinical management of pain.

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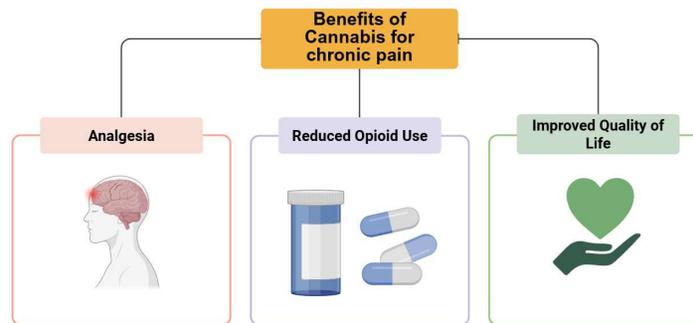


Figure 2: Therapeutic benefits of cannabis for chronic pain management. Cannabis use in chronic pain is associated with analgesic effects, reduced reliance on opioids, and improvements in overall quality of life.

Year	Title	Study Type	Time	Treatment groups	N=	Results	Conclusion
2008	Efficacy of Dronabinol as an adjunct treatment for chronic pain patients on opioid therapy	Phase 1 - randomized, double-blind, placebo-controlled crossover trial	9 days	1. Placebo 2. 10mg dronabinol 3. 20mg dronabinol	24 chronic pain taking opioids	Dronabinol increased pain relief and decreased pain intensity.	Dronabinol provided increased analgesia in patients with chronic pain on opioids.
2016	Medical cannabis use is associated with decreased opioid medication use in a retrospective cross-sectional survey of 6 patients with chronic pain	Retrospective cross-sectional survey	no control group	1 cross-sectional survey of 6 patients with chronic pain	244 chronic pain	Cannabis use associated with 64% decrease in opioid use (n=118), 45% increase in quality of life, reduced number of medications	Potential benefit of replacing opioids with cannabis.
2018	Cannabis use is associated with lower odds of prescription opioid analgesic in HIV-infected individuals with chronic pain	Secondary data analysis of screening interviews for a parent randomized trial	Past 30 days	790 HIV+ with chronic pain, n=177 receiving methadone	47% on prescription opioids	44% admit to illicit drug use (40% cannabis)	Cannabis users were less likely to be on opioids.
2018	Comparative effectiveness of medical cannabis for chronic pain versus prescription medication	Retrospective cohort study	6 mo	1. Certified for medical marijuana by pain specialist 2. Controls - no MJ	440 pain patients, 157 prescribed opioids	40% reduction in morphine at 6 months, 2.8x in favor of cannabis over prescription opioids.	Medical cannabis was comparatively more effective than prescription medications for chronic pain treatment at 3 months.
2018	The holistic effects of medical cannabis compared to opioids on pain experience in Finnish patients with chronic pain	Cross-sectional survey	1MC users (n=40) 2 Opioid users (n=161)	201 chronic pain	Negative side effects, positive holistic effects, positive emotional effects.	Medical cannabis similar effect of opioids in reducing pain. MC positively affected emotion, functionality, and well-being.	Medical cannabis has analgesic effects of opioids (can use to decrease dosage of opioid treatment, with fewer side effects).
2018	Cannabinoid-opioid interaction in chronic pain	1. Morphine group (n=10) 2. Oxycodone group (n=11)	21 chronic pain on 2x daily morphine or oxycodone	5 day inpatient with vaporized cannabis, 27% reduction in pain	73% decrease in MME at 6 months	MCP patients had increased likelihood of ceasing opioid prescriptions and reducing daily opioid dosages. They also reported improvements in pain reduction, quality of life, social life, activity levels, and concentration with few side effects.	Suggests a potential association between MCP enrollment and reduced opioid use, along with improved quality of life.
2018	Medical Cannabis Used as an Alternative Treatment for Chronic Pain Demonstrates Reduction in Chronic Opioid Use	Prospective study	6 mo	no control group Patients given medical cannabis certifications.	115 chronic pain on opioid therapy	67% average decrease in daily MME at 3 months; 73% decrease in MME at 6 months	
2018	Associations between medical cannabis and prescription opioid use in chronic pain patients: A preliminary cohort study	Historical cohort study	21 mo	1. n=37 enrolled in the Medical Cannabis Program (MCP) 2. n=29 not enrolled (control)	66 chronic pain, habitual opioid users		
2019	Changes in Prescribed Opioid Dosage Among Patients Receiving Medical Cannabis	Cohort study	8 mo	1. Nonexposure group - MC for <30 days (n=411) 2. Exposure group - MC for >30 days (n=4124)	8165 using opioids for chronic pain treatment		
2019	Within subject double blind randomized controlled trial combining the cannabinoid Dronabinol and opioid 3 Hydromorphone in adults with chronic pain	Double-blind randomized controlled trial	4 wk	1. Placebo-placebo 2. Hydromorphone-placebo 3. Dronabinol-placebo 4. Hydromorphone-dronabinol	37 knee osteoarthritis chronic pain	Little benefit of combining or adding THC/dronabinol to hydromorphone.	
2020	Comparison of analgesic effects and patient tolerability of nabiximol and dihydrocodeine for chronic neuropathic pain	Randomized, crossover, double-blind study	14 wk	1. Nabiximol (synthetic cannabinoid) 2. Dihydrocodeine	96 chronic neuropathic pain	Reduced pain, improved mood, quality of life, sleep, and psychometric function	Dihydrocodeine was superior to Nabiximol in pain relief with fewer side effects.
2020	The Impact of Medical Cannabis on Intermittent and Chronic Opioid Users with Back Pain	Retrospective cohort study	Long-term	no control group	61 low back pain, prescribed opioids	51% stopped opioid use in average of 6.4 years; of 29 patients who didn't stop opioids, 31% reduced opioid use	Cannabis worked as an alternative to prescription opioids in just over half of patients with low back pain and diminished use in some chronic opioid users. Patients who used higher doses of cannabis were more likely to stop opioids.

Figure 3: Summary of key studies evaluating the effects of medical cannabis on chronic pain and opioid use. This table highlights the peer-reviewed studies included in this research, assessing cannabis-based therapies in chronic pain populations. Overall, findings suggest potential benefits of cannabis, including analgesia, reduced opioid consumption, and improved quality of life.

Results

Significant benefits of cannabinoid-containing treatments in patients with chronic pain were observed in eleven of the twelve studies reviewed systematically. Several studies showed that cannabinoids have analgesic effects, in many cases, equal to those of opioids. Adjuvant cannabis use was associated with a reduction in opioid usage, a decrease in the number of medications prescribed, and reduced adverse effects of opioid treatment. The most common benefits of cannabis reported in these studies involved enhancing mood, quality of life, sleep, pain relief, and reducing opioid-dependence. The comprehensive evidence presented in these studies supports medical cannabis as a valuable therapeutic option for chronic pain management, either as an adjunct or an alternative to traditional opioids, potentially reducing dependence on opioids.

- Pain Reduction:** Multiple clinical trials have demonstrated the significant analgesic effects of medical cannabis. THC/CBD formulations and cannabinoids such as dronabinol notably enhanced pain relief in patients experiencing cancer-related, neuropathic, and chronic musculoskeletal pain. Cannabis combined with opioids produced a synergistic analgesic effect, enabling effective pain management at lower opioid doses.
 - Narang (2008) reported that Dronabinol significantly improved pain relief and reduced pain intensity in chronic pain patients on opioids.
 - Boehnk (2016) found a 64% decrease in opioid use associated with medical cannabis, accompanied by improved quality of life for chronic pain patients.
- Decreased Opioid Use:** Cannabis consistently showed potential for substantial opioid-sparing effects. Over half of patients in one long-term study were able to completely discontinue opioid medications, primarily when higher doses of cannabis were utilized. Additionally, cannabis use was associated with significantly lower odds of prescription opioid use among chronic pain populations, emphasizing its potential role in mitigating opioid dependency and reducing opioid-related risks.
 - Sohler (2018) demonstrated lower odds of opioid use among HIV-infected patients who used cannabis.
 - Wasan (2025) observed a 40% reduction in morphine use among patients opting for medical cannabis.
- Improved Quality of Life:** Cannabis not only reduced pain intensity but also provided additional holistic benefits unavailable through opioids alone. Patients using cannabis reported significant improvements in emotional well-being, functionality, sleep quality, anxiety, mood stabilization, and overall sense of normality in daily life. These holistic effects highlight the broader potential of cannabis to positively influence the chronic pain experience and substantially enhance the overall quality of life.
 - Jylkka (2023) concluded from a cross-sectional survey that medical cannabis had similar analgesic effects to opioids while enhancing emotional well-being.

Conclusion

Cannabinoid-based therapies demonstrate potential as effective adjuvants or alternatives to opioids for chronic pain management. Medical cannabis emerges as a multifaceted treatment option that effectively reduces pain, lowers opioid dependence, and significantly enhances quality of life for chronic pain patients. Clinical trials and other human studies examining the use of cannabis to treat chronic pain have shown promising results, though outcomes can vary significantly based on the specific pain conditions, dosages, and cannabinoid formulations used.

There are limitations to cannabis research, including its legality in some states and countries. As a result, many studies have small sample sizes, lack control groups, lack precise dosing methods, or have methodological differences that make it difficult to draw universally applicable conclusions. More rigorous, large-scale trials are needed to better understand the long-term effects and ideal treatment protocols. Future research efforts should continue to optimize dosing strategies, assess long-term safety, and further clarify the mechanisms behind cannabis-opioid interactions, thus advancing the integration of cannabis into comprehensive pain management protocols.