



# The Effects of Cannabinoids on Individuals with Chronic Pain:



## A Critically Appraised Topic

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### Clinical Scenario

As of 2020, cannabis has been legalized for medicinal purposes in 33 states and the District of Columbia<sup>1</sup>. The most common reason for the use of medicinal cannabis treatments is chronic pain<sup>1,2</sup>. Within the cannabis plant there are two main components; delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD). Because of the analgesic and anti-inflammatory effects of cannabinoids and the fight against the opioid epidemic, there has been an increase in research of the effects of THC and CBD on patients experiencing chronic pain<sup>1,2,3</sup>. As the growth of this treatment method continues to increase, the need for more data and research becomes more crucial. There needs to be more conclusive evidence either for or against the use of cannabis treatments to have any serious clinical applications<sup>2,4</sup>. Therefore, there was a need to critically appraise the literature regarding the effects of cannabinoids and/or cannabis on chronic pain. In doing this, important insight into the use of this treatment in clinical practice for patients suffering from chronic pain may be found.

### Clinical Question

Does the use of cannabinoids reduce pain levels in patients who suffer from chronic, non-cancer pain?

### Methods

#### Terms Used to Guide Search Strategy

- Population: Adults with chronic non-cancer pain
- Intervention: Cannabinoids or cannabis
- Outcome: Chronic pain levels

#### Sources of Evidence Searched

- CINAHL Plus (EBSCO)
- PubMed Central

#### Inclusion Criteria

- Subjects with chronic non-cancer pain
- Treatment plan including cannabis and/or cannabinoids
- Published in the last five years (2016-2021)
- Randomized controlled trials
- Pain was the outcome measure
- Subjects 18 and older

#### Exclusion Criteria

- Studies that used minors as participants
- Studies concerning chronic pain due to cancer
- Studies that were not randomized controlled trials
- Studies that did not involve cannabinoid or cannabis intervention
- Articles older than 2016

### Results

- The literature search resulted in 249 studies: four studies met the inclusion and exclusion criteria (Table 1).
- In the four studies that met criteria, cannabinoids were used to treat chronic pain due to pancreatitis<sup>1</sup>, fibromyalgia<sup>2</sup>, diabetes or complex regional pain syndrome<sup>3</sup>, sickle cell disease<sup>4</sup>.
- In all four studies, a variation of a Visual Analog Scale was used at baseline and following intervention to determine the presence and severity of pain<sup>1,2,3,4</sup>.
- The PEDro scores were determined by the authors of the CAT. Two of the articles scored an 8/11<sup>2,4</sup>, and two of the articles scored a 10/10<sup>1,3</sup>.
- Three of the studies concluded no significant difference between cannabinoids and a placebo in chronic pain reduction<sup>1,2,4</sup>. One study concluded that low doses with a specific type of inhaler result in chronic pain reduction<sup>3</sup>.

### Discussion and Future Research

Although high-quality studies, there was no conclusive evidence to show that cannabinoids and/or cannabis are effective in producing analgesic effects in individuals suffering from chronic pain. Based on the inconclusiveness of the selected studies, determining the effectiveness of cannabis and/or cannabinoids on chronic pain cannot be achieved. Further studies involving larger patient populations over a longer period of time need to be performed. Additionally, if athletic trainers intend to apply this into clinical practice, it is necessary to determine methodology that can easily be applied in the clinic. These studies should expand to include patients suffering from chronic musculoskeletal pain with no underlying cause. Future studies should also focus on the appropriate dosage, variety of cannabis, and means of administration to determine the most effective intervention for analgesic effects. Based on the findings of the researchers, it appears that there is not substantial evidence at this time to justify the use of cannabinoids and/or cannabis in the treatment of chronic pain. Future studies should be done to continue to explore this topic prior to its implementation in clinical practice.

TABLE 1: Characteristics of Included Studies

	de Vries et al. (2016) <sup>1</sup>	van de Donk et al. (2019) <sup>2</sup>	Almog et al. (2020) <sup>3</sup>	Abrams et al. (2020) <sup>4</sup>
<b>TITLE</b>	Single dose delta-9-tetrahydrocannabinol in chronic pancreatitis patients: analgesic efficacy, pharmacokinetics and tolerability.	An experimental randomized study on the analgesic effects of pharmaceutical-grade cannabis in chronic pain patients with fibromyalgia.	The pharmacokinetics, efficacy, and safety of a novel selective-dose cannabis inhaler in patients with chronic pain: A randomized, double-blinded, placebo-controlled trial.	Effect of Inhaled Cannabis for Pain in Adults With Sickle Cell Disease: A Randomized Clinical Trial.
<b>PARTICIPANTS</b>	24 adult subjects (mean age=52, 9 female, 15 male) with chronic pancreatitis and corresponding chronic abdominal pain, subdivided into daily opioid (n=12) and non-opioid users (n=12).	20 subjects, all female, with a mean age of 39 ± 13 years with chronic pain from physician diagnosed fibromyalgia.	27 adult subjects, 70.37% of which were male, 21 with chronic diabetic neuropathic pain and 6 with complex regional pain syndrome.	23 patients with chronic pain resulting from Sickle Cell Disease (mean age=37.6, 13 female, 10 male)
<b>OUTCOME MEASURE(S)</b>	Visual Analogue Scale (VAS) to quantify pain intensity at rest and following five situps, measured pre-dose and post-dose	11-point VAS at baseline and at specific intervals after inhalation, used with a pressure pain test and an electrical pain test.	11-point VAS before inhalation and at numerous intervals following inhalation.	VAS from 0-100 upon arrival and repeated daily for 5 days. Brief Pain Inventory was administered on day 1 and day 5.
<b>MAIN RESULTS</b>	Primary linear mixed model analysis showed no effect was found for Δ9-THC compared with the placebo (mean difference Δ9-THC - diazepam -1.17, 95% CI of the difference -0.95, 0.61, P = 0.65)	None of the treatments had an effect greater than placebo on spontaneous pain scores or electrical pain responses. Largest effect was observed for the variety with high doses of THC and CBD (P < 0.001 vs placebo), with a decrease in pain score by 30%.	The reduction in VAS score was significantly larger in the 1.0 mg dose compared to the placebo and the 0.5 mg dose (p = .0015 [95% CI, 0.53;2.23], p = .0058 [95% CI, 0.35;2.08], respectively)	The mean difference in pain rating using the VAS between the active and placebo groups was -5.3 (8.1) on day 1 (P = .51), -10.9 (7.0) on day 2 (P = .12), -16.5 (9.2) on day 3 (P = .07), -8.9 (6.7) on day 4 (P = .19), and -8.2 (8.1) on day 5 (P = .32). No statistically significant period effect was observed.
<b>LEVEL OF EVIDENCE</b>	PEDro Scale Rating: 10	PEDro Scale Rating: 8	PEDro Scale Rating: 10	PEDro Scale Rating: 8
<b>CONCLUSIONS</b>	A single dose of Δ9-THC was not efficient in reducing chronic pain due to chronic pancreatitis, but did produce very few adverse effects.	In exploration of 3 active cannabis varieties in chronic pain patients with fibromyalgia, none of the varieties were effective in reducing spontaneous pain scores in comparison with the placebo.	Chronic pain patients can benefit from low THC doses with the Syqe Inhaler, as compared to much larger THC doses that are generally administered.	There was no significant difference in pain rating between cannabis and placebo.

### References

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