

White paper

Therapeutic potential of FreshFlower-CBD SanaCan

Based on literature study and consumer survey on efficacy of FreshFlower-CBD

Executed by T. Tamsma for the Free University of Amsterdam, 2021 and Dutch Cannabis Processing

Comparison literature and empirical study

The goal of this research was to investigate the possible therapeutic applications of the FreshFlower-CBD oil comparing (where possible) the results found in the literature study, with the final data that was found during the empirical research.

To date, the exact mechanism of CBD and other cannabinoids is not fully understood due to its complexity. However, this complexity also explains the wide range of therapeutic possibilities discussed later on, making phytocannabinoids possible multitarget therapeutic use, interacting with an array of signaling systems.

All researched cannabinoids have certain mechanisms of action through the endocannabinoid system. This is mostly due to affinity with cannabinoid receptors CB₁ and CB₂, although almost all target molecules interact with the endocannabinoid system in one way or another. Most cannabinoids are not direct ligands for these receptors and depending on the interaction, they can have both enhancing, as inhibiting signaling (Ronan, Wongngamnit, & Beresford, 2016).

Therapeutic potential

As all cannabinoids have affinity with the endocannabinoid system, either through endocannabinoid receptors, endocannabinoids, neurotransmitters and certain GPCRs, they influence the homeostatic role that the endocannabinoid system plays (Piscitelli et al., 2021).

This role includes regulating appetite, energy and metabolism, stress levels, nervous systems, analgesia, thermoregulation and sleep (Di marzo, 2009). While most of these mechanisms remain unclear, some target cells and their therapeutic results are better understood.

CBD and CBG showed affinity for 5HT receptors, also known as serotonin receptors, and thus can influence stress and anxiety by regulating serotonin and dopamine uptake. CBG could also positively effect stress and anxiety disorders by regulating noradrenaline and adrenaline as potent agonist at the α_2 -adrenoceptor (Levick, 2013). MentalBalance was given to people who experienced or were diagnosed with stress related symptoms and experienced 49% reduction of complaints after the given period of 5 weeks. Complaints and their influence on the quality of life and limitations in daily activities lessened, confirming the possible application found in earlier literature. This is likely due to the regulating mechanisms caused by the cannabinoids in SanaCan MentalBalance. How participants rated their complaint experience, negative influence on quality of life and limitations on daily activities dropped from 4,1 to 2,1, from 6,3 to 2,4 and from 5,7 to 2,1 respectively during the five weeks. (see appendix for the survey and graphs)

CBD	CBG	CBN	CBC
<ul style="list-style-type: none"> • Epilepsy • Movement disorders • Neurodegenerative diseases (Fraguas-Sánchez et al., 2018) • Anti-inflammatory • Pain • Psychosis and anxiety • Addiction (Bih et al., 2015), (Grotenhermen, 2003) • Nausea (Grotenhermen, 2003) • Sleeping disorders (Kesner et al., 2020) 	<ul style="list-style-type: none"> • Neuroprotection • Neuromodulation • Gastrointestinal diseases • Metabolic syndrome • Antibacterial agent • Sleeping disorders (Cascio et al., 2010), (Rock et al., 2011), (Granja et al., 2012) 	<ul style="list-style-type: none"> • neuroprotective function, (Turner et al., 2017), • Chronic muscle disorders (Wong et al., 2019) • Sleeping disorders (Kesner et al., 2020) 	<ul style="list-style-type: none"> • Antinociceptive effects (pain relief) • anti-inflammatory (Maurya et al., 2018) • Skin diseases (Pollastro et al., 2018) • Sleeping disorders

Table 1

As summarized in table 1, did all researched cannabinoids show neuroprotective properties, often accompanied by potential use for movement disorders, chronic movement pains and even epilepsy as muscle signaling goes through the nervous system, for which the latter there are even multiple drugs approved globally (Fraguas-Sánchez et al., 2018), (Turner et al., 2017). Especially CBN and CBG were promising against neurodegeneration and movement disorders (Wong et al., 2019), (Maurya et al., 2018). CBG is most abundant in MuscleFunction, which reduced symptoms and discomforts with 45% for the participants using the product for 5 weeks. Even though the dosage was much lower than approved drugs, was MuscleFunction effective against similar symptoms. How participants rated their complaint experience, negative influence on quality of life and limitations on daily activities dropped from 5,5 to 3, from 5,3 to 2,8 and from 4,8 to 2,6 respectively during the five weeks. (see appendix for the survey and graphs)

Kesner et al. (2020) did extensive research on sleeping disorders and found CBD and CBN potentially useful as a drug, whereas CBG as a remedy for sleeping disorders was supported by Cascio (2010), Rock (2011), and Granja et al. (2012). Besides CBD did SanaCan SleepQuality also contain CBN. For the participants using SleepQuality, the complaints reduced by 34% during the 5 weeks. How participants rated their complaint experience, negative influence on quality of life and limitations on daily activities dropped from 6,4 to 4,2, from 5,3 to 4,3 and from 4 to 3,6 respectively during the five weeks. (see appendix for the survey and graphs)

Therapeutic potential was shown for a multitude of chronic pains, discomforts and complaints in the survey with FreshFlower-CBD SanaCan. Participants experienced a reduction and sometimes even disappearance of sleeping problems, movement complaints, joint pains, pain in general, stomach/intestinal complaints, stress, anxiety and more.

Note: When using medication it is advisable to consult a medical professional before using CBD as a co-therapy.

Effectivity test on SanaCan SleepQuality, MuscleFunction and MentalBalance

April-May 2021, 54 participants, the Netherlands

Quantification of complaints and discomforts

Before using the product, participants were asked to quantify their complaints, the negative influence of these complaints on the quality of their life and how these complaints limited them in their daily activities. After the first week, participants were asked to do this again, for up to five weeks. The important data to analyze was to see if the means of these parameters would differ and the percentage of people for whom their complaints, the quality of their life, or the limitations on their daily activities bettered.

Research set-up for efficacy test

Dosage

Participants were asked to take the FreshFlower-CBD for 5 consecutive weeks. Each week increasing the intake by 1/3 pipet until they had reached the desired dosage.

Online survey and diary

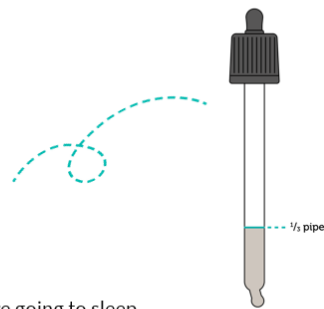
Participants were asked to fill out an online survey each week and to keep a daily diary with any additional comments and effectiveness.

Directions for use

- Week 1 1 x 1/3 pipette a day
- Week 2 2 x 1/3 pipette a day
- Week 3 3 x 1/3 pipette a day
- Week 4 4 x 1/3 pipette a day
- Week 5 5 x 1/3 pipette a day

1/3 pipette = 0,8ml

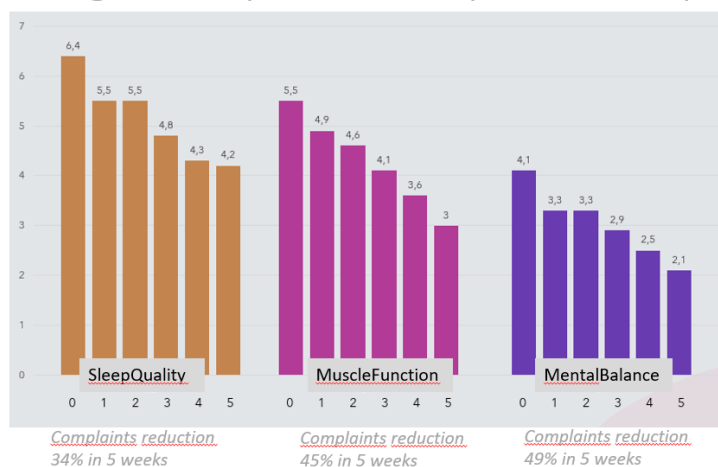
Take the oil daily, an hour before going to sleep. Or you can choose to take the oil at a different time according to your own experience. Like in the morning or afternoon. Please do not exceed the recommended daily intake.



Part of the thesis of T. Tammsa
Science, Business and Innovation
Free University of Amsterdam



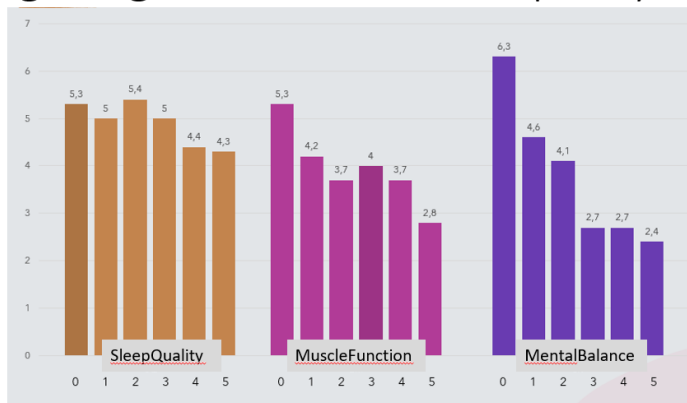
Average Complaint Size per Week per Product



Part of the thesis of T. Tammsa
Science, Business and Innovation
Free University of Amsterdam



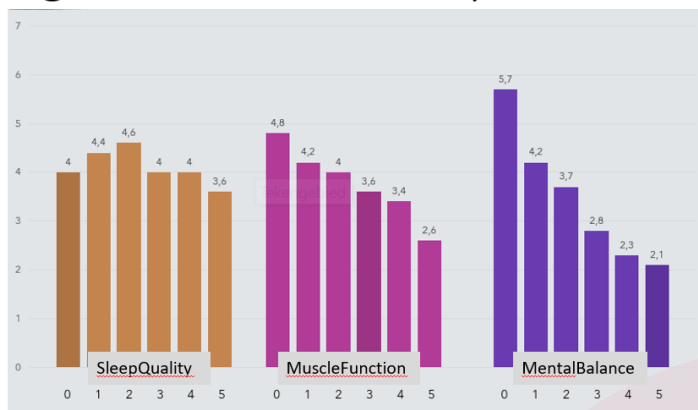
Average negative influence on quality of life



Part of the thesis of T. Tamme
Science, Business and Innovation
Free University of Amsterdam



Average limitations on daily activities



Part of the thesis of T. Tamme
Science, Business and Innovation
Free University of Amsterdam



Main conclusions on the effectivity test:

- Decrease of complaints

SleepQuality = 34,38% decrease

MuscleFunction = 45,45% decrease

MentalBalance = 48,78% decrease

- The complaints decreased per week and on average between weeks 4 and 5 the maximum result was achieved.
- The ideal dose for most testers was 3 pipettes per day

References

- Ronan, P. J., Wongngamnit, N., & Beresford, T. P. (2016). Molecular mechanisms of cannabis signaling in the brain. *Progress in molecular biology and translational science*, 137, 123-147.
- Piscitelli, F., & Di Marzo, V. (2021). Cannabinoids: a class of unique natural products with unique pharmacology. *Rendiconti Lincei. Scienze Fisiche e Naturali*, 1-11.
- Di Marzo, V. (2009). The endocannabinoid system: its general strategy of action, tools for its pharmacological manipulation and potential therapeutic exploitation. *Pharmacological Research*, 60(2), 77-84.
- Levick, J. R. (2013). Chapter 14.1, Sympathetic vasoconstrictor nerves, *An introduction to cardiovascular physiology* (3rd Edition). Butterworth-Heinemann.
- Fraguas-Sánchez, A. I., & Torres-Suárez, A. I. (2018). Medical use of cannabinoids. *Drugs*, 78(16), 1665-1703.
- Turner, S. E., Williams, C. M., Iversen, L., & Whalley, B. J. (2017). Molecular pharmacology of phytocannabinoids. *Phytocannabinoids*, 61-101.
- Wong, H., & Cairns, B. E. (2019). Cannabidiol, cannabinol and their combinations act as peripheral analgesics in a rat model of myofascial pain. *Archives of oral biology*, 104, 33-39.
- Maurya, N., & Velmurugan, B. K. (2018). Therapeutic applications of cannabinoids. *Chemico-biological interactions*, 293, 77-88.
- Kesner, A. J., & Lovinger, D. M. (2020). Cannabinoids, endocannabinoids and sleep. *Frontiers in molecular neuroscience*, 13, 125.
- Granja, A. G., Carrillo-Salinas, F., Pagani, A., Gómez-Cañas, M., Negri, R., Navarrete, C., ... & Muñoz, E. (2012). A cannabigerol quinone alleviates neuroinflammation in a chronic model of multiple sclerosis. *Journal of Neuroimmune Pharmacology*, 7(4), 1002-1016.