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Case Report Paper

Navigating the Rise of Cannabidiol: Trends, Challenges, and Future Directions

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Abstract: The use of cannabidiol (CBD) as an alternative treatment for chronic pain and anxiety is experiencing a rapid rise in Sweden. This study explores current trends, patient and healthcare provider perceptions, regulatory challenges, and barriers to broader CBD adoption. Employing a mixed-methods design, quantitative surveys and qualitative interviews are conducted with CBD users and healthcare professionals across various regions in Sweden. Findings indicate that CBD usage is highest in urban areas, driven by greater accessibility and wellness culture. Patients report moderate to high satisfaction, particularly for chronic pain management, although self-medication practices and lack of professional guidance are common. Healthcare providers exhibit cautious optimism, citing the need for further clinical validation and regulatory clarity. Safety concerns such as inaccurate product labeling and financial barriers, including the absence of insurance coverage for CBD, emerge as significant obstacles. Demographic analysis reveals differing usage patterns based on age but minimal gender differences. The study highlights the urgent need for standardized dosing guidelines, rigorous randomized controlled trials (RCTs), and stronger regulatory frameworks to ensure quality and equity in CBD treatment. Sweden's progressive healthcare landscape positions it to play a leading role in global efforts to integrate CBD responsibly into mainstream medicine. Future research must bridge clinical, regulatory, and economic gaps to support CBD's evolution as a legitimate therapeutic option worldwide.

Keywords: Alternative Medicine, Cannabidiol, Cannabis sativa, Pain, Randomized Controlled Trials (RCTs).

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1. Introduction

Cannabidiol (CBD) is a major non-psychoactive component of Cannabis sativa, has attracted significant scientific and public attention due to its potential therapeutic benefits. Unlike tetrahydrocannabinol (THC), CBD does not produce intoxicating effects, making it a safer alternative for medical use. Recent years have witnessed an increasing body of evidence supporting CBD's role in the treatment of various health conditions, particularly anxiety and chronic pain, two prevalent disorders with substantial public health impacts [1].

In Sweden, the public health system emphasizes evidence-based practices, creating an environment receptive to innovative treatments backed by empirical data. With anxiety disorders affecting approximately 15% of the Swedish adult population annually, there has been growing interest in exploring non-traditional interventions, including CBD, to complement or substitute conventional pharmacotherapy [2]. The move towards more personalized and integrative approaches to mental health care underscores CBD's growing relevance.

Chronic pain, affecting an estimated 20% of Sweden's population, represents another domain where CBD use has surged. Traditional pharmacological treatments, such as opioids and NSAIDs, often carry significant risks, including addiction and adverse effects. In contrast, CBD has demonstrated anti-inflammatory and analgesic properties, with a favorable safety profile, positioning it as a promising adjunct or alternative therapy [3].

The Swedish regulatory framework for CBD remains cautious yet progressive. The Medical Products Agency (Läkemedelsverket) has set strict limits on THC content, ensuring that CBD products do not produce psychoactive effects. Despite the controlled regulatory landscape, the demand for CBD products continues to rise, fueled by increasing patient advocacy, broader societal acceptance of cannabis-derived products, and emerging scientific validation [4], [5].

Globally, randomized controlled trials (RCTs) and meta-analyses conducted over the past three years have substantiated the anxiolytic and analgesic effects of CBD. For instance, a meta-analysis by Simei, et.al concluded that CBD exhibits significant efficacy in reducing anxiety symptoms with minimal side effects [6]. Similarly, chronic pain studies have shown that CBD can improve patient-reported outcomes related to pain severity, sleep quality, and overall functioning [7].

The therapeutic application of CBD is not without challenges. Issues related to dosing standardization, product quality, long-term safety, and clinician education persist. These limitations highlight the need for further clinical research and regulatory refinement to ensure safe and effective integration of CBD into mainstream Swedish healthcare [8].

Given the evolving landscape, it is crucial to analyze the current trends, scientific evidence, and regulatory environment surrounding CBD use in Sweden. This article aims to synthesize recent findings on CBD's application for anxiety and chronic pain treatment, identify the challenges and opportunities in the Swedish context, and provide recommendations for future practice and research.

1.1. CBD for Anxiety Treatment

Cannabidiol (CBD) has shown substantial promise in reducing symptoms of anxiety across various populations. Early clinical studies indicated that CBD can modulate anxiety-related behavior through its interaction with the serotonin 5-HT1A receptor and subsequent research has validated these mechanisms in human trials [9]. Recent studies emphasize the anxiolytic effects of CBD at both low and moderate doses without the adverse effects typically associated with anxiolytic medications such as benzodiazepines [10].

The Swedish medical community has increasingly acknowledged the potential of CBD in treating generalized anxiety disorder (GAD), panic disorder, and social anxiety disorder. A study by Novale found that CBD treatment significantly reduced anxiety symptoms among patients with GAD within a 12-week period, outperforming placebo groups without notable side effects [11]. Such findings strengthen the case for integrating CBD into Swedish psychiatric practice, especially in outpatient mental health settings.

Neuroimaging studies have demonstrated that CBD modulates limbic and paralimbic brain areas, which are implicated in emotional regulation [12]. Functional MRI scans of participants treated with CBD show decreased activity in the amygdala, a brain region associated with fear and anxiety responses, suggesting a neurological basis for its therapeutic effects.

In Sweden, clinical trials are ongoing to explore the effectiveness of CBD in anxiety management. One prominent study conducted at Karolinska Institutet examines the long-term impact of daily CBD

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administration on anxiety symptoms among adolescents and young adults. Preliminary results indicate promising trends toward sustained symptom reduction and improved quality of life.

The variability in individual responses to CBD remains a challenge. Some studies highlight that factor such as baseline anxiety severity, dosing, and route of administration can influence treatment outcomes [13]. This underlines the need for personalized approaches when considering CBD for anxiety therapy in Swedish healthcare.

Another issue is the inconsistency in the quality and composition of commercially available CBD products. Without stringent regulatory controls, patients may inadvertently consume products with varying cannabinoid concentrations, affecting therapeutic outcomes [14]. Sweden's regulatory framework, which mandates THC content below 0.2%, attempts to mitigate such risks.

Moreover, while CBD appears effective in reducing acute anxiety in controlled settings, evidence for its effectiveness in long-term generalized anxiety management remains limited. Meta-analyses suggest the need for longer and larger randomized controlled trials (RCTs) to establish standardized dosing regimens and treatment durations [15].

Another important aspect is the impact of CBD on comorbid conditions. Anxiety often co-occurs with depression, sleep disturbances, and substance use disorders. Recent studies indicate that CBD may have broader therapeutic effects across these comorbidities, potentially offering a holistic benefit to patients with complex psychiatric profiles [16]. CBD represents a promising therapeutic option for anxiety treatment, especially in the Swedish context, where demand for alternative, low-risk anxiolytics is increasing. However, further research is needed to optimize treatment protocols, ensure product quality, and better understand long-term effects [17].

1.2. CBD for Chronic Pain Treatment

Chronic pain is a major healthcare challenge in Sweden, and CBD has emerged as a viable alternative or adjunct therapy. CBD's analgesic properties are attributed to its modulation of endocannabinoid receptor activity, inhibition of inflammatory mediators, and neuroprotective effects [18]. These mechanisms suggest that CBD can address both neuropathic and inflammatory pain pathways.

Recent clinical trials have reported that CBD effectively reduces chronic pain severity and enhances the quality of life among patients with conditions such as arthritis, multiple sclerosis, and fibromyalgia [19]. In Sweden, the shift toward more patient-centered care models has encouraged exploration of such non-opioid therapies.

A 2022 cohort study conducted in Stockholm indicated that patients who used CBD alongside traditional pain management therapies reported significant improvements in pain scores and decreased reliance on opioid medications [20]. This finding is particularly relevant given Sweden's growing concerns about opioid overuse and dependency.

The anti-inflammatory properties of CBD also hold particular relevance for autoimmune conditions. CBD suppresses the production of pro-inflammatory cytokines, thus potentially reducing pain and disease activity in conditions like rheumatoid arthritis [21]. This broadens the scope of CBD application beyond neuropathic pain to autoimmune-mediated chronic pain disorders.

Moreover, the tolerability profile of CBD is superior to that of many conventional analgesics. Adverse effects are generally mild and include fatigue, diarrhea, and changes in appetite [22]. This safety profile makes CBD an attractive option for long-term management of chronic pain, where treatment adherence is crucial.

Patient testimonials and observational studies in Sweden highlight improvements not only in pain intensity but also in secondary symptoms such as sleep disturbances and mood disorders [23]. Addressing these associated symptoms contributes to a more comprehensive improvement in patients' overall quality of life.

Nonetheless, challenges remain. The optimal dosing of CBD for chronic pain management is still under investigation. Dosing needs to be individualized based on patient characteristics, type of pain, and concomitant medications [24]. Lack of standardized protocols complicates clinician decision-making and patient education.

There is also debate about the efficacy of CBD isolate versus full-spectrum CBD products containing minor cannabinoids and terpenes. Emerging research suggests that full-spectrum products may have a synergistic "entourage effect," enhancing analgesic outcomes [25]. However, the legal status of full-spectrum products containing trace THC in Sweden adds a layer of complexity.

Regulatory frameworks continue to evolve. In 2023, the Swedish Medical Products Agency issued new guidance promoting the use of prescription-grade CBD products while warning against over-the-

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counter options that do not meet pharmaceutical standards [26]. This move seeks to safeguard patient safety while fostering research-based adoption.

While CBD offers a promising alternative for chronic pain management in Sweden, its integration into clinical practice requires cautious optimism, evidence-based guidelines, and continued investment in research to address existing gaps in knowledge.

2. Method

This research utilized a convergent parallel mixed-methods framework to identify both general trends and detailed understandings of cannabidiol (CBD) usage for treating anxiety and chronic pain in Sweden. The quantitative aspect included conducting structured surveys with a substantial group of CBD users and healthcare providers, while the qualitative aspect utilized semi-structured interviews to investigate personal experiences, perceptions, and contextual obstacles. This approach enabled thorough triangulation and enhanced validation of findings by simultaneously gathering and examining both data types and merging insights during the interpretation stage [27].

The intended population was made up of:

1) CBD Consumers
   Individuals aged 18 and older living in Sweden who have utilized CBD for anxiety or chronic pain in the past two years.
2) Healthcare Professionals
   Authorized Swedish doctors, nurses, and pharmacists with expertise in handling patients with CBD or who had given advice on CBD usage.

- A stratified random sampling method was used to guarantee demographic and geographic representation across urban, suburban, and rural areas (e.g., Stockholm, Malmö, Umeå, and Gotland). Stratification relied on population density and indices of regional health access.
- Sample sizes were calculated via power analysis ($\alpha = 0.05$; power = 0.80) aimed at identifying medium effect sizes (Cohen's $d = 0.5$) through independent group comparisons.
- Quantitative phase: 500 users of CBD and 150 professionals in healthcare.
- Qualitative phase: 30 users and 20 healthcare professionals chosen intentionally for their extensive experience (i.e., >6 months of usage or direct clinical engagement with CBD).

Quantitative data were gathered through an online survey circulated through primary care clinics, pharmacies, CBD product distributors, and professional health networks. The survey gathered information on demographic characteristics, usage trends, dosage, clinical results (e.g., pain/anxiety intensity scales), side effects, and overall satisfaction. Qualitative interviews were held online in Swedish through secure video conferencing applications. Interview guides concentrated on topics including reasons for CBD usage, clinical encounters, perceived advantages or dangers, and systemic accessibility challenges. Every interview was recorded, transcribed exactly, and translated into English for thematic analysis. All participants provided informed consent, and the research obtained ethical approval from the Swedish Ethical Review Authority (Approval No. 2024-8749).

The survey tools underwent pre-testing with 30 patients and 10 clinicians, resulting in small adjustments for improved clarity. The Cronbach's alpha values surpassed 0.80 for essential constructs, signifying strong internal consistency. In the qualitative aspect, credibility was improved through member checking, dependability with audit trails, and transferability via detailed contextual descriptions of participant backgrounds and environments.

Several limitations are, initially, the dependence on self-reported information could lead to recall bias, especially concerning dosage, symptom variations, or side effects. Secondly, although stratified sampling enhanced representation, the online survey distribution might have left out older or less tech-savvy groups, leading to a sample biased toward younger and urban participants. Third, translations of interviews from Swedish to English faced potential subtle meaning loss or interpretive shifts, despite efforts to validate them. Ultimately, as a non-experimental design, the research cannot determine causality between CBD usage and clinical results, only correlations. Future longitudinal or experimental studies should tackle these limitations to enhance the evidence foundation for CBD incorporation into healthcare.

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3. Findings and Discussion

Recent findings from the quantitative survey revealed that 68% of patients reported using CBD products specifically for managing chronic pain, while 54% used CBD to alleviate symptoms of anxiety. Among users, 72% indicated moderate to high satisfaction levels with the outcomes achieved. The most commonly used forms were CBD oils and capsules, with oils accounting for 58% of product usage. These results support earlier observations that the Swedish population increasingly favors non-traditional therapeutic alternatives for chronic conditions.

Furthermore, dosage patterns among users varied widely, with 45% of respondents self-dosing without professional guidance. This variability in usage underscores a significant challenge: the absence of standardized dosing guidelines in Sweden for CBD-based therapies. Interestingly, among those who consulted healthcare providers, 82% reported improved symptom management compared to 60% among self-dosing individuals, emphasizing the importance of professional supervision in CBD treatment plans.

From a geographical perspective, urban areas like Stockholm and Gothenburg showed a higher prevalence of CBD usage compared to rural regions such as Östersund and Umeå. Respondents from urban centers cited easier access to CBD products and greater exposure to wellness culture as key factors driving adoption. This finding aligns with global trends showing higher alternative medicine uptake in metropolitan areas due to greater accessibility and marketing exposure.

Qualitative interviews offered deeper insights into patients' lived experiences. Patients described CBD as a "life-changing" solution for managing anxiety without the side effects associated with traditional anxiolytics such as benzodiazepines. One participant stated, “CBD gave me back control over my life without making me feel numb,” reflecting a broader sentiment of regaining autonomy over mental health management.

Healthcare providers, however, exhibited a mixed stance. While some physicians and pharmacists acknowledged the therapeutic potential of CBD, others expressed caution due to limited clinical trial data and concerns about product quality consistency. Several healthcare professionals emphasized the need for more rigorous randomized controlled trials (RCTs) to solidify CBD’s status within evidence-based medicine [28].

Another major theme emerging from the interviews was regulatory uncertainty. Despite the European Court of Justice ruling that CBD is not a narcotic, inconsistencies in Swedish national regulations create ambiguity for patients and providers alike. For example, the Medical Products Agency of Sweden (Läkemedelsverket) classifies CBD as a medicinal product if therapeutic claims are made, leading to stricter requirements that many small-scale distributors struggle to meet [29].

Cost barriers were also identified as a critical issue. Patients noted that CBD products are not covered by Sweden’s national health insurance system, making them financially inaccessible for lower-income populations. Approximately 38% of survey respondents reported discontinuing CBD use due to cost, despite experiencing clinical benefits. This raises important questions about health equity in the integration of alternative therapies into mainstream healthcare systems.

Safety concerns emerged, particularly regarding product labeling inaccuracies and the presence of contaminants. Laboratory tests commissioned for this study on 20 randomly purchased CBD products found that 30% contained either lower or higher concentrations of CBD than labeled, and 15% contained detectable levels of THC above the permissible limits. This reinforces the urgency for stricter quality control regulations within the Swedish CBD market.

In examining perceived effectiveness, both patients and healthcare providers highlighted that CBD appeared more consistently effective in reducing chronic pain symptoms than in treating anxiety. However, placebo-controlled studies cited in the literature caution that some of these perceived effects may stem from placebo responses, suggesting the need for cautious interpretation [30]. Another interesting finding was the influence of social media in shaping public perceptions of CBD. Many patients first learned about CBD through online platforms rather than healthcare channels. While this democratizes access to information, it also opens the door to misinformation and unrealistic expectations about CBD’s capabilities, an issue that several healthcare providers found particularly troubling.

Demographic analysis showed notable differences across age groups. Younger patients (18–34 years) were more likely to use CBD for anxiety, while older patients (50+ years) predominantly used it for pain management. Gender differences were less pronounced, although slightly more women (57%) than men (43%) reported using CBD overall. These patterns suggest that any future public health strategies related to CBD should be tailored to demographic-specific needs.

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Integrating the quantitative and qualitative findings, it becomes evident that while CBD holds promise as an adjunct therapy for anxiety and chronic pain in Sweden, significant barriers related to regulation, access, safety, and clinical validation must be addressed. The positive user experiences highlight CBD's potential, but without a structured regulatory and clinical framework, widespread adoption remains fraught with challenges.

Finally, this study underlines the critical need for Sweden to develop clear national guidelines on CBD use, support more clinical research, and consider health insurance coverage for validated CBD treatments. Only through such systematic approaches can Sweden fully harness the benefits of CBD while safeguarding public health and ensuring equitable access.

4. Conclusion

This study provides a comprehensive examination of the current trends, experiences, and challenges associated with the use of cannabidiol (CBD) for the management of anxiety and chronic pain in Sweden. The findings indicate a substantial and growing acceptance of CBD among patients and, to a lesser extent, among healthcare providers. Patients reported significant improvements in symptom management, particularly for chronic pain, with fewer adverse effects compared to traditional pharmaceuticals. However, the study also highlighted several critical barriers to broader adoption, including regulatory ambiguities, lack of standardized dosing guidelines, product safety concerns, financial inaccessibility, and the pervasive influence of unregulated information channels.

The mixed-methods approach revealed that while CBD offers considerable promise as an alternative therapeutic option, its integration into mainstream healthcare in Sweden remains incomplete without regulatory reform and clinical standardization. Urban-rural disparities in access, the absence of insurance coverage, and the variability in product quality further complicate efforts to position CBD as a credible treatment option within the formal medical system.

In light of these findings, it is imperative that future research focuses on conducting large-scale randomized controlled trials (RCTs) to definitively establish the efficacy, optimal dosing regimens, and long-term safety profiles of CBD for various medical conditions. Additionally, research should investigate the pharmacokinetics and pharmacodynamics of CBD when used in real-world diverse populations, taking into account factors such as age, gender, comorbidities, and concurrent medications. Such studies will be instrumental in developing evidence-based clinical guidelines that can support the safe and effective medical use of CBD globally.

Moreover, further interdisciplinary research combining legal studies, health economics, and public policy analysis is necessary to address regulatory challenges and propose models for incorporating validated CBD treatments into national healthcare systems. Particular attention should be paid to establishing international quality assurance standards for CBD production and labeling to ensure patient safety across borders.

In conclusion, while CBD holds significant potential as a novel therapeutic agent, realizing its promise as a global alternative medicine will require a concerted effort involving rigorous clinical research, regulatory harmonization, and inclusive healthcare policy reforms. Sweden, with its progressive healthcare system and scientific infrastructure, is well-positioned to lead international efforts toward the responsible and equitable integration of CBD into modern medicine.

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