



## ABSTRACT

### Assessing the Role of Cannabis in Managing Spasticity in Multiple Sclerosis: A Systematic Review and Meta-Analysis

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**Background:** Multiple sclerosis (MS) is a complex, heterogeneous disease, and its management remains challenging due to varying symptoms and patient responses to treatments. While injectable therapies like glatiramer acetate and beta-interferon are common, they have limitations such as side effects and varying efficacy. Cannabis has garnered attention as a potential alternative treatment, particularly for symptoms like spasticity and pain.

**Objective:** This study aims to evaluate the efficacy of cannabis-based therapies for managing MS-related spasticity.

**Methods:** Nine clinical studies were analyzed, conducted between 2003 and 2021 in the United Kingdom, Denmark, the United States, and other countries, involving 2544 MS patients with different subtypes of the disease. Treatments investigated included THC and CBD-based therapies such as whole-plant extracts, oils, and smoked cannabis. Spasticity, measured using scales like the Ashworth Scale, Visual Analog Scale, and Numeric Rating Scale, was the primary outcome.



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**Results:** Cannabis-based treatments demonstrated significant reductions in spasticity, with an overall mean difference of 7.1 (95% CI: 0.67 to 13.54). Subgroup analyses showed mean differences of 20.36 (Ashworth Scale) and 1.18 (Numeric Rating Scale), further supporting the efficacy of cannabis. Pain relief and improved sleep quality were also reported, particularly with balanced THC-to-CBD ratios. Side effects were generally mild, including dry mouth and dizziness. Long-term data showed sustained benefits in some patients.

**Conclusion:** Cannabis-based therapies show promise for alleviating MS-related spasticity and pain, though further research with standardized protocols and larger sample sizes is needed to confirm these findings and assess long-term safety.

**Keywords:** Multiple sclerosis, cannabis, spasticity, pain, cannabinoid therapies, treatment efficacy.