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A Qualitative Study of Medical Cannabis Policy for Multiple Sclerosis in Kansas and Colorado

Haydn Primrose
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Walden University

College of Health Sciences and Public Policy

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Haydn Michael Primrose

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Walden University
2026

Abstract

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Colorado

By

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MPhil, Walden University, 2024

MDiv, Baptist Seminary of Kentucky, 2024

DMin, Liberty University, 2022

MTS, Nations University, 2021

MPA, National University, 2009

BBS, Hardin-Simmons University, 2006

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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February 2026

Abstract

Medical cannabis may alleviate symptoms associated with multiple sclerosis (MS), yet access to cannabis-based treatment (CBT) remains inconsistent across U.S. states. The research problem was that state policy variation and administrative implementation produce inequitable access and clinical uncertainty for individuals with MS and for clinicians and policymakers responsible for compliant care decisions. Existing literature on cannabis for MS primarily addresses symptom relief, including spasticity reduction, pain relief, and improved sleep quality; however, access policies vary by state. The purpose of this qualitative systematic review was to synthesize evidence on policy and administrative barriers shaping access to medical cannabis for MS by comparing Kansas (CBT prohibition) and Colorado (CBT legal). Interest group theory guided the analysis of stakeholder influence and regulatory environments that shape physician engagement and access conditions. Using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) procedures, 17 sources, including scholarly articles and legislative testimony published between 2015 and 2025, were identified, screened, and thematically analyzed. Six themes emerged linking legal context, knowledge gaps, professional division, education, documentation/communication, and policy learning/standards to MS-specific access. Findings reflected legislative and administrative ambiguity and interest-group pressures shaping clinical decision-making related to CBT for MS and other conditions. Implications for positive social change include strengthening policy advocacy and clinician education in jurisdictions where CBT remains illegal for MS symptoms to reduce disparities and support equitable MS care.

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Chapter 1: Introduction to the Study

There is a lack of consistent legal access across states to cannabis for chronic medical conditions, including multiple sclerosis (MS) treatment. While cannabis is useful in treating a variety of chronic conditions, the focus within the study was on MS. This inconsistency results in patients who may prefer alternative, natural therapies being left to rely on pharmacological treatments such as opiates (Orenstein & Glantz, 2020; Salter et al., 2021). Researchers have shown that Kansas, a state that prohibits the use of cannabis treatment, has a higher rate of opioid addiction than Colorado, a state with no prohibitions (Salter et al., 2021). A comprehensive treatment strategy for many MS patients involves both disease-modifying therapies and multiple medications to control symptoms, leading to a high incidence of polypharmacy in this group (Langston et al., 2021). Although opioids are frequently used to relieve pain while other drugs are employed to manage symptoms, many patients still experience significant discomfort (Jones & Vlachou, 2020).

Advances have been made in developing treatments that modify the disease of MS to slow its progression and maintain nerve function, but managing MS symptoms remains challenging. Typical symptoms of MS include muscle spasms, difficulty walking, pain, tremors, depression, fatigue, and cognitive issues (Langston et al., 2021). Socially, the consequence of the problem is that healthcare disparities concerning equitable, consistent access to care options become exacerbated.

Kansas is frequently described as having among the most restrictive cannabis laws in the United States, whereas Colorado's post-legalization framework has been

characterized as among the most permissive in the nation (McGregor et al., 2020; Weiss, 2013). The specific research problem I addressed in this study was that when public policymakers are presented with evidence-based solutions concerning cannabis treatment for MS, thus having the potential to narrow the healthcare access gap, they have continued to adopt conservative legal stances that fail to equitably provide healthcare resources to underserved citizens. This is especially concerning due to the legal status of cannabis use in treating MS patients in Kansas (Kansas Cannabis Information, 2024).

Despite the promise shown by cannabis (Chisari et al., 2020; Orenstein & Glantz, 2020), the legal landscape for alternative therapies such as cannabis to manage MS symptoms varies significantly between these two states. A greater understanding of this challenge can contribute to more effective policies to help those with MS receive effective treatment (Pathak et al., 2022). The uneven legal landscape has contributed to unequal patient outcomes (Salter et al., 2021). In Colorado, for instance, both medical and recreational marijuana are legal. The legality of both provides patients with MS access to tetrahydrocannabinol (THC) products that can alleviate a variety of typical MS symptoms (Salter et al., 2021). Colorado also has a comprehensive regulatory framework that includes a wide range of cannabis products, thereby enabling patients and healthcare providers to tailor treatments individually. Such accessibility helps patients benefit from the therapeutic effects of THC according to evidence-based practice, research, and development.

To address this problem of practice concerning equitable healthcare access, the purpose of the qualitative systematic review was to examine the perspectives concerning

the legal and administrative policies that led to substantially inequitable access for to cannabis for MS treatment between Colorado and Kansas and understand what measures may promote more equitable healthcare access, using a systematic review of the literature and Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Chapter 1 includes a background overview of the study's problem context and regulatory environment. Chapter 1 also includes a discussion of the study's nature and design, followed by a review of the framework, key definitions, assumptions, limitations, delimitations, and the anticipated significance of the study.

Background

Cannabinoids (CBD) have shown promising potential in effectively treating symptoms of MS (Haroutounian et al., 2021). Cannabinoids are useful in alleviating chronic pain, muscle spasticity, and disturbances in sleep (Fragoso et al., 2020). More specifically, oral cannabinoids and oromucosal sprays like nabiximols containing THC and CBD reduce these symptoms. They thus can minimize dependency on highly addictive opioid analgesics (Chisari et al., 2020), which can be socially helpful. The opioid epidemic continues to be an issue in the United States. (Chisari et al., 2020). While the effectiveness of cannabis varies according to individual and contextual factors such as diet, exercise, genetic predisposition, and more, many individuals have experienced statistically significant MS symptom reductions as a result of cannabinoid use (Chisari et al., 2020; Jones & Vlachou, 2020). Side effects of CBD use for MS are

generally mild to moderate, such as dizziness, dry mouth, and fatigue (Jones & Vlachou, 2020).

Kansas remains conservative in terms of its views on cannabis use for medical purposes. Strict prohibitions against cannabis use for both medical and recreational purposes are maintained by the state (Orenstein & Glantz, 2020; Pathak et al., 2022). Kansas was chosen, among other states bordering Colorado, as it is characterized by some of the most conservative cannabis laws in the United States. (Pathak et al., 2022). Such conservative laws mean that MS patients living in Kansas lack equitable access to the benefits of cannabis treatments for anxiety and other symptoms associated with MS and consequently may resort to using pharmacological treatments such as opioids, which generally encompass more harmful side effects and can exacerbate disparities in healthcare outcomes (Kansas Cannabis Information, 2024).

From a policy standpoint, the use of medical cannabis is regulated differently in different states. Some policymakers and scholars argue that the states' rights to determine the will of the people in that state are upheld by the U.S. Constitution, Article IV and/or Amendment XI (Orenstein & Glantz, 2020). However, the issue of unequal access to cannabis across states such as Kansas is still problematic, considering that state-specific laws can exacerbate healthcare and treatment disparities and opioid abuse issues (Orenstein & Glantz, 2020). Nonetheless, the political landscape shifted in 2023 when the federal courts ruled that state-level bans on medical cannabis violated constitutional protections concerning patient rights and access to care (Martinez-Paz et al., 2023).

Despite the ruling, conservative states, including Kansas, have been slow to amend their restrictive policies, which has prolonged disparities regarding access to treatment.

The resistance also points to the broader debate concerning states' rights versus federal oversight in healthcare policymaking. Such considerations also illuminate possible polarities of democracy (Benet, 2006) concerning fair, equitable democracy and social change. Such differences in state laws highlight the tension between individual rights and collective policy decisions regarding equitable access to healthcare. Access to medical cannabis being contingent upon state residency reinforces systemic barriers that disproportionately affect vulnerable populations, thereby raising questions about whether democratic institutions are effectively balancing public health priorities with state autonomy. Hence, although Kansas's restrictive stance exemplifies such a conflict, the broader issue remains whether legal frameworks can evolve to promote individual freedoms and equitable healthcare access across states.

The Kansas Two Step practice (Benet, 2006) is a pertinent concept relevant to understanding the background context of focus within this study. The Kansas Two-Step is a legal enforcement tactic that is used in Kansas and other states that have strict prohibitions against cannabis. The law involves stopping a vehicle for a minor traffic violation, concluding the stop, and re-engaging the driver to seek consent for a search (Kansas Cannabis Information, 2024). The practice involved in the two-step is claimed, by some (Inglet et al., 2020), to be problematic because it disproportionately targets individuals who are suspected of carrying cannabis across state lines, including individuals who are traveling from cannabis-friendly states like Colorado into

noncannabis-friendly states. Hence, opponents of the law suggest that the two-step exacerbates systemic inequities in legal enforcement, thereby exacerbating disparities in healthcare access for patients seeking cannabis treatment for chronic conditions (Orenstein & Glantz, 2020).

The Kansas Two-Step practice (Inglet et al., 2020) exemplifies how Kansas' strict cannabis prohibition and similar cannabis prohibition laws enacted by other conservative states can contribute to healthcare access inequities across state lines. Furthermore, Benet's polarities of democracy (Inglet et al., 2020) is a framework through which it is posited that it is important to balance polarities such as freedom and authority, justice and due process, and equity and diversity to promote democratic ideals and social change. Through the lens of Benet's polarities framework (2006), and in the context of the study, it can be suggested that Kansas's restrictive cannabis policies oppose equitable access to healthcare. Thus, better addressing these polarities can illuminate pathways to resolve state-level disparities and promote fairness, social justice, and improved health outcomes for MS patients. Hence, Benet's polarities framework can be used in part to justify the need for the research.

The focus on cannabis as a treatment for MS has evolved into a significant area of research in general medicine. Cannabis-based treatments incorporating CBD and both THC and CBD have shown promise for managing chronic pain, inflammation, and neurological symptoms across diverse populations without many of the side effects associated with standard opioid use, the latter of which is a gold-standard treatment for MS (Hollingsworth et al., 2022). Liberal cannabis laws in states like Colorado have

allowed for increased use for pain relief and symptom management. Furthermore, the expansion of medical marijuana use has contributed to reductions in traditional pharmaceutical use, such as benzodiazepines (Inglet et al., 2020), which is helpful considering the nation's opioid epidemic. CBD is also effective in alleviating spasticity, neuropathic pain, and sleep disturbances and is safer in comparison to many first-line synthetic pharmacological therapies (Jones & Vlachou, 2020).

MS is a chronic neurological condition affecting nearly 2.3 million people worldwide (Multiple Sclerosis Association of America, 2024). Common symptoms include spasticity, pain, and inflammation (Filippini et al., 2022). Treatments using THC and CBD have shown effectiveness in treating some of MS patients' most pressing and challenging complaints, such as pain, muscle spasms, and sleep issues (Fragoso et al., 2020) holistically. Researchers' findings and conclusions strongly support the therapeutic efficacy of cannabinoids, including THC and CBD, in alleviating MS symptoms. For instance, nabiximols, a CBD oromucosal spray, is a prominent treatment option for MS patients who are not responsive to traditional first-line therapies like baclofen and gabapentin used to treat spasticity (Filippini et al., 2022).

Also, Martinez-Paz et al. (2023) showed that nabiximols improved spasticity-related quality of life and daily functioning such that patients experienced a general 45% improvement in spasticity symptoms. Despite a discontinuation rate of 40% due to mild to moderate adverse events, nabiximols' safety and tolerability profiles are favorable compared to conventional antispastic drugs (Martinez-Paz et al., 2023). Researchers have also found that the efficacy of cannabis-derived treatments varies depending on the

administration method. For example, Filippini et al. (2022) reviewed 25 randomized controlled trials (RCTs) involving 3,763 participants and found moderate-certainty evidence that nabiximols increased spasticity relief compared to placebo.

Problem Statement

The problem is that there is a lack of consistent and equitable legal access to medical cannabis across states exists, particularly for patients seeking MS treatment. The result is that patients, such as those with MS, are denied access to treatments that are effective (Orenstein & Glantz, 2020). This results in MS patients who lack legal access being left to rely on pharmacological treatments such as opioids and have fewer alternative options (Orenstein & Glantz, 2020; Salter et al., 2021). Kansas, specifically, has shown a higher rate of opioid addiction than Colorado (Salter et al., 2021). The age-adjusted drug overdose death rate in Kansas was 26.5 per 100,000 residents (Centers for Disease Control and Prevention [CDC], 2020).

In contrast, data from the Colorado Health Institute indicated that Colorado's drug overdose death rate was 16.3 per 100,000 residents in 2014, which was higher than the national average of 14.7 per 100,000 at that time (CDC, 2020). This represents widened healthcare disparities and outcomes. Although opioids are frequently used to relieve pain and other drugs are employed to manage symptoms, many patients still experience significant discomfort (Jones & Vlachou, 2020).

The specific research problem I addressed was that public policymakers, such as those in Kansas, who are presented with evidence-based solutions to narrow healthcare equity outcome gaps using cannabis treatments, have yet to make medical cannabis more

accessible for treating MS patients in Kansas (Kansas Cannabis Information, 2024).

Tension exists between the medical uses and the illegal market, and the intersection of law enforcement, community, and court systems.

Purpose of the Study

The purpose of the qualitative systematic review was to examine what, if any, obstacles, physicians in Kansas and Colorado perceive concerning medical cannabis use for MS treatment, that interfered with equitable legal access to medical cannabis across states. The results of my study may allow for better understanding as to why these two states had similar evidence presented to them, yet they developed opposite public policies regarding that data.

The data were collected using a systematic review of the literature according to PRISMA guidelines (see Savin-Baden & Major, 2023) to identify themes concerning challenges, concerns, and influences that might shape medical cannabis policy decisions. The possible social benefit of the findings is that the themes uncovered may be used to inform possible policy measures that could contribute to more equitable access to medical cannabis for MS treatment across states. Gaining a clearer understanding of the intersection of medical evidence, regulatory constraints, and possible policy hesitations helped explain why disparities persist and what could be done to support more uniform access across states.

Research Questions

The following research questions guided the collection of data found through the systematic review, in alignment with the problem statement and to inform the purpose:

RQ1: What administrative and policy-related factors do physicians perceive contributed to substantially different legal treatment of cannabis for MS treatment between Colorado and Kansas?

RQ2: What measures do physicians perceive may promote more equitable healthcare access across states concerning the use of cannabis for MS treatment?

Theoretical Framework

Interest group theory (IGT) was chosen as the most appropriate theoretical framework for the study. IGT was introduced by Truman (1951) during the mid-20th century as a response to classical pluralist models of democratic governance. Truman posited that public policy outcomes are impacted by the activities of organized groups representing various societal interests. Truman also developed the theory to explain how political decisions are negotiated outcomes between competing social factions and are not neutral or solely evidence-based outcomes. The notion that groups form naturally around shared interests in response to changes in the social or political environment is a central tenant to the theory. Such groups seek to influence legislation and regulation through lobbying, public messaging, and alliances with decision-makers. Truman's work became groundwork for later developments in political science in which the non-linear, contested nature of policymaking is emphasized in domains characterized by controversy, such as healthcare policy or drug regulation. Thus, IGT provides an analytical foundation for understanding dynamic policy conflict.

More specifically, the IGT framework provides a cohesive model within which the legal approaches to and discrepancies between marijuana and cannabis legalization or

repression between states can be better understood based on sociopolitical factors. IGT is a theoretical lens that can be used to examine how organized social groups impact political and legislative processes that align with and are aimed at advancing the interests of respective groups. Interest groups are thought to be critical in shaping policy outcomes (Conrad, 1959; Kelley, 2009; Mortensen et al., 2019; Truman, 1951). Moreover, the IGT assumes that policymaking is not only driven by objective public interest or empirical evidence but is significantly impacted by competing interest groups that advocate for respective agendas (Conrad, 1959). Such groups may include medical organizations, pharmaceutical companies, law enforcement agencies, and patient advocacy coalitions, all of whom exert pressure on legislators to enact policies that align with their priorities.

In the context of the study, the IGT framework is relevant because it aided in explaining why Kansas policymakers and other key stakeholders may have been resistant to expanding medical cannabis access despite evidence of its benefits for MS patients. Thus, by exploring and thematically analyzing the possible perspectives, role, influences of different stakeholders, and factors identified throughout the literature reviewed, that may shape cannabis policy, I found data that can be used shed light on the political and economic motivations contributing to policy disparities between states like Kansas and Colorado. Thus, IGT has been applied throughout political and social science research to explain the intersection and influence of group agendas on economic and political outcomes (Kelley, 2009; Mortensen et al., 2019) and was applied in my study as a model through which I analyzed and understood how the legislative differences between states regarding cannabis policy took shape.

In summary, by applying the IGT to my study, a deeper understanding of how stakeholder advocacy, rather than scientific consensus, may shape state-level cannabis policy for MS treatment was gained. Through an analysis of peer-reviewed literature in which the perspectives from physicians, policymakers, and administrators, are documented, I identified how various interest groups promoted or obstructed policy reform. An application of the IGT allows for a consideration of potentially divergent motivations of stakeholders to be interpreted as deliberate efforts to influence legislation in ways that maintain or shift the policy status quo. In Kansas, resistance to legalization may reflect successful framing by opposition groups. Colorado's more permissive approach may indicate stronger coalitions in favor of reform. The framework can thus be applied to uncover which groups are active and how power, persuasion, and access to lawmakers vary across contexts and contribute to policy inequity.

Nature of the Study

A qualitative systematic review methodology was chosen as appropriate for my study. Qualitative systematic review methodologies are used when the researcher's goal is to explore and understand meanings, experiences, and perspectives, rather than to produce quantified measures, test statistically significant relationships, or rely on numerical data (Hammarberg et al., 2016; Pope & Mays, 1995). Thus, qualitative research methodologies are used to answer the how and why questions of research that require collecting rich, contextual, narrative, and explanatory data (Cardano, 2020). Because my study's research questions and purpose were designed to ask what factors contributed to states' uneven adoption of legislation concerning CBD access for medical

treatment and how measures can contribute to more equitable access and legislation, a qualitative systematic review method was most useful approach to obtain rich, contextual narrative to answer RQs and investigate the research problem.

A systematic review of the literature was chosen as a design that aligns with a qualitative methodological approach. Systematic review designs involve the collection of data from existing empirical research aligned with inclusion criteria (PRISMA, 2020). The data can then be analyzed according to PRISMA guidelines (PRISMA, 2020). In this way, the analysis of research is addressed across multiple contexts, rather than relying on data from a single location or organization (Yin, 2012). Hence, the strength of using a systematic review is that the nuanced and complex realities of organizational and policy environments can be better understood by synthesizing findings across diverse sources (Savin-Baden & Major, 2023). Researchers using systematic reviews may thus consider how organizational culture, norms, values, and informal practices are documented and interpreted within the literature (Yin, 2012).

As such, I conducted a systematic review of literature published between 2015 and 2025 (a time frame of 10 years), focused on factors influencing cannabis policy adoption, such as physician perspectives, administrative barriers, or policy barriers concerning medical cannabis use for MS treatment in Kansas and Colorado. Due to the time period of studies selected, published between 2015 and 2025, the research included in the systematic review was contextualized in a political context characterized by ongoing public health impacts resulting, in part, from the COVID-19 pandemic and heightened policy debates during the 2024–2025 U.S. election cycle. Such context-based

factors impact how physicians and policymakers may understand and view medical cannabis access in all states, and especially in states like Kansas in which conservative resistance remains.

The use of a systematic review approach allows for the collection of data from peer-reviewed articles and official reports (Mashuri, 2022) to better understand published findings on the efficacy of cannabis in MS treatment, legal challenges, and strategies proposed or implemented to address them. PRISMA guidelines were followed concerning the data collection and reporting. Clarke and Braun's (2014) six-step thematic analysis was used to synthesize and interpret themes concerning legislation, healthcare access, and regulatory influences found throughout the literature.

Definitions

Cannabis Policy: Cannabis policy is used to refer to the legal and administrative laws and rules that govern the growing, cultivation, distribution, and use of cannabis within a jurisdiction, both concerning recreational and medical use. Policies vary considerably between states and result from public health, legal, and economic considerations, as well as stakeholder interests, described through the lens of the interest group theory (Pacula et al., 2014).

Chaos Theory: Chaos theory is a theoretical framework through which researchers examine how small changes in initial conditions can lead to unpredictable and significant effects in complex systems, such as legislative processes (Battaglini, 2021). Though not used as the guiding theoretical framework in this study, chaos theory was mentioned by

several researchers describing the legal landscape of cannabis use and is thus defined herein (Battaglini, 2021; Salter et al., 2021).

Greater Good: The concept, or term, of the 'greater good,' is derived from utilitarianism. In the context of the utilitarian theory applied in the study, the concept of greater good is a principle often invoked in policymaking, but that emphasizes actions or decisions that maximize benefits for the most significant number of people, even at the expense of compromised individual interests. Hence, the greater good is a moral concept that justifies policies designed to protect social equity and the interests of the whole (Mill, 2009).

Legislative Dynamics: Legislative Dynamics refer to the processes and interactions among legislators, stakeholders, and other actors that influence laws' creation, amendment, and implementation (Krehbiel, 1991).

Medical Cannabis: Medical cannabis and its derivatives are used for therapeutic purposes, only under medical supervision, to treat the symptoms arising from conditions such as multiple sclerosis (MS), chronic pain, and epilepsy (National Academies of Sciences, Engineering, and Medicine, 2017).

Multiple Sclerosis (MS): MS is a chronic neurological condition characterized by central nervous system damage, which can lead to symptoms such as muscle weakness, fatigue, and impaired coordination (National MS Society, 2021).

Assumptions

Assumptions are aspects of the study that must be true for the results to be accurate, but that cannot be proven true (Kakar et al., 2020). Three methodological

assumptions apply herein. First, I assumed that the studies included in the systematic review were conducted with methodological soundness and that the findings therein accurately represent physician perspectives, factors and other policy-related influences on medical cannabis use for MS treatment. To support this assumption, I applied clear inclusion and exclusion criteria while screening each source carefully for relevance, quality, and methodological transparency, following PRISMA guidelines.

Second, I assumed that the thematic analysis technique used was appropriate for synthesizing findings across diverse sources. To enhance trustworthiness, I extracted data using a standard process and applied Braun and Clarke's (2006) six-step method to consistently identify themes. The data extraction process followed recommended practices in the qualitative synthesis of literature (see Mashuri, 2022). Finally, I assumed that the interest group theory is suitable for interpreting the data and understanding the legislative dynamics across states. Considering the theory's tenets and applicability to evaluate socio-political factors and its use in political and social science research, the framework was chosen as appropriate.

Scope and Delimitations

A study's scope refers to the context and population focused on, while delimitations refer to ways the scope has been intentionally narrowed (Adu & Miles, 2020). The context and population for my study have been narrowed by focusing on specific aspects of legislation, geography, and healthcare outcomes. For instance, cannabis laws vary across many U.S. states. Hence, to simplify the data collection and legislative comparison process, I focused on reviewing studies and reports published

between 2015 and 2025 that are specifically related to two states: Kansas and Colorado. Thus, the study's scope is limited to the geographic and legislative contexts of Colorado and Kansas.

Second, the population represented in the included literature was narrowed to MS physicians, administrators, and policymakers within Colorado and Kansas. Such a focus allowed me to analyze findings from professionals not only familiar with legislative frameworks and medical cannabis use, but also with direct experience treating MS, which qualifies them to give insights concerning the possible clinical and legal landscapes of cannabis use for MS treatment.

Finally, the focus was limited to the intersection of legislation and healthcare by concentrating on medical cannabis policies for MS treatment and excluded broader topics such as recreational use or unrelated conditions, thereby ensuring that the research remains aligned with the healthcare implications of cannabis legislation. By analyzing outcomes specific to MS, I remained focused on a medically significant and policy-relevant issue, thereby supporting the pursuit of evidence-based strategies to address healthcare disparities (see Braun & Clarke, 2006; Kakar et al., 2020; Mashuri, 2022).

Limitations

The study's methodological weaknesses could limit the findings' applicability, accuracy, or trustworthiness (Cardano, 2020). One of the primary limitations is that the data that was used in the study was taken from previously published sources. Thus, the research was limited in that it relied on the quality, accuracy, and transparency of self-reported data from the original studies. It is possible that physicians, administrators, and

policymakers participating in those studies may have presented responses in ways that reflected more socially or professionally desirable viewpoints. Thus, to minimize the potential weakness, I applied strict inclusion criteria to ensure that only peer-reviewed and methodologically sound research was included. Each source was evaluated based on methodological clarity, ethical considerations, and transparency.

Publication bias, which refers to the tendency of journals to include studies with significant or favorable results, may also influence the findings, which could limit access to data that represent more diverse or conflicting views. I addressed this possible weakness by searching multiple databases. Another limitation was the legislative and geographic scope of the review. Because I focused only on Colorado and Kansas, the findings did not represent the full range of legislative approaches or policy options across all U.S. states. However, this scope was chosen intentionally to simplify the review process and to highlight two states that represent contrasting perspectives on medical cannabis law. Hence, while the findings were not be generalizable to the entire United States, they provided insight concerning the lived policy realities of regions with divergent cannabis legislation, offering useful implications for policymakers and healthcare leaders working in comparatively restrictive contexts. Finally, researcher bias concerning the data analysis process may impact how themes are interpreted. Thus, bracketing was used, which is a process of reflexivity through which I journaled my biases, assumptions, and expectations to minimize their influence and maintain objectivity throughout the data analysis and synthesis process (see Mozersky, 2021).

Significance

The findings of my study may be significant for scholars and practitioners. Concerning scholarship, the findings can provide critical insight concerning the applicability and relevance of the interest group theory in the context of cannabis law in the United States. While the IGT framework has been applied extensively throughout political and social science research, it has not explicitly been used to guide data collection and interpretation concerning differences in cannabis laws across states.

Second, from a public policy standpoint, the findings can contribute to researchers' understanding of specific legislative factors that may have impacted states' uneven adoption of the cannabis-related legislation, as well as factors that could contribute to the adoption of more even cannabis legislation across states, in the interest of equitable healthcare access. From a practice standpoint, the findings may offer significant insight that petitioners and conservative states may use to incentivize or motivate legislatures to adopt more liberal cannabis laws, thereby improving equitable access to alternative health care and treatment for multiple sclerosis. Hence, the findings may inspire policy changes, legal and medical discussions, and social reforms that can contribute to more equitable access. Also, the findings may provide critical insight that physicians and other states can use to better understand the legal landscape and how to overcome barriers when addressing MS patient treatment using alternative therapies such as cannabis. Regarding social justice, the findings of my study may inspire important legislative changes that can contribute to creating a more just and equitable healthcare climate for individuals in the United States suffering from MS and seeking alternative,

non-pharmacological treatments; such contributions could make significant impacts toward improving health care access for underserved populations.

Summary

Chapter 1 included an overview and summary of the qualitative case study's background, problem, purpose, nature, theoretical framework, assumptions, limitations, and significance. The problem was that there is unequal access to cannabis for MS treatment in the United States due to varying legislatures across states, which results in a lack of consistent, equitable access to cannabis as an alternative, nonpharmacological treatment. Concerning this problem, I explored perspectives and factors contributing to the unequal adoption of cannabis-related legislation among states and factors that could contribute to more equitable access. I conducted a systematic review of the literature according to PRISMA guidelines and used Clarke and Braun's (2014) six-step thematic analysis to interpret the results. The interpretation of results and contextualization of the problem statement were guided by the IGT (see Truman, 1951). I used the IGT framework to explore themes characterizing MS physicians', policymakers' and administrator's perspectives and factors found throughout the literature that concern the possible legislative and administrative factors contributing to these disparities and recommended reforms to promote equitable healthcare access.

I narrowed the scope of the study to focus on literature published between 2015 and 2025 concerning Kansas and Colorado, two states with opposing cannabis policies. Delimitations of the study pertained to the exclusion of broader cannabis use or unrelated medical conditions to maintain a healthcare-centered focus (see Adu & Miles, 2020).

Bracketing was employed to minimize the potential impact of researcher bias on the interpretation of the findings (see Cardano, 2020). The study's findings may be significant in that they can contribute to research and practice by contributing to policymakers' understanding of legislative dynamics through the lens of the interest group theory. Advocates and policymakers may use such insights to improve equitable access to alternative MS treatments.

Chapter 2: Literature Review

Cannabis, specifically THC and CBD, have shown potential in treating symptoms of MS. These compounds have been shown to be useful in alleviating chronic pain, muscle spasticity, and sleep disturbances (Fragoso et al., 2020). Oral cannabinoids and oromucosal sprays such as Nabiximols contain THC and CBD and are shown to reduce these symptoms and thus may potentially minimize dependency on opioid analgesics (Chisari et al., 2020). However, the effectiveness of cannabis varies depending on individual factors. Some individuals experience significant relief, while others only experience minor benefits. Side effects are generally mild to moderate, such as dizziness, dry mouth, and fatigue (Jones & Vlachou, 2020). From a policy standpoint, the use of medical cannabis is regulated differently across states, regions, and countries, often requiring a prescription and adherence to specific legal guidelines. I focused on the dynamics between Colorado and Kansas. The literature review portion is divided into three subsections: (a) legislative approaches to cannabis in Colorado and Kansas, (b) theoretical and evidence influences on cannabis legislation, and (c) treatment uses of cannabis generally and concerning MS.

Literature Search Strategy

To identify literature for inclusion in my study, the following Boolean search phrases were input into Google Scholar, JSTOR, ProQuest, Policy File Index, Policy Commons, and the University database: *Interest group theory, Cannabis legislation, Colorado, Public policy theory, Colorado cannabis experience, medical marijuana, recreational cannabis, and cannabis legislation + Kansas.*

Literature was selected and prioritized for inclusion based on the publication date, with literature published during and after 2020 being prioritized. However, seminal work concerning the theoretical frameworks was included along with some historical literature informing the progression of marijuana legislation nationally and in Colorado and Kansas. Furthermore, only peer-reviewed literature was included, except for reliable government websites and publications.

Theoretical Foundation

One guiding theoretical framework, IGT (Truman, 1951), was chosen as appropriate and fitting for inclusion in my study. The framework described in this section provides a cohesive model within which the legal approaches to and discrepancies between marijuana and cannabis legalization or repression between Colorado and Kansas can be better understood based on various sociopolitical factors.

Interest Group Theory

IGT (Truman, 1951) is a theoretical lens that can be used to examine how organized social groups impact political and legislative processes that align with and are aimed at advancing the interests of respective groups (Mortensen et al., 2019). Hence, interest groups are thought to be critical in shaping policy outcomes (Conrad, 1959; Mortensen et al., 2019). This theory assumes that political systems operate through a pluralistic balance of power among competing groups. These groups use resources like lobbying, advocacy, and media campaigns to sway policymakers, reflecting their constituents' preferences and priorities (Kelley, 2009). The theory highlights that the legislative process is not guided solely by public interest but also shaped by the strategic

actions of interest groups with varying degrees of influence (Conard, 1959). Recent scholarship has expanded IGT to account for the increasingly institutionalized and professionalized nature of lobbying in the United States, where political access and financial resources have a strong bearing on a group's legislative success (Chamberlain et al, 2023; Strickland, 2021). This underscores how American policymaking, particularly at the state level, is deeply shaped by interest groups with the capacity to mobilize voters, influence media narratives, and strategically target lawmakers. This context reveals how societal narratives and political power converge to shape public policy.

The application of IGT is relevant in policy debates around contentious issues such as cannabis legalization. As observed in the media's framing of marijuana users, interest groups play a significant role in shaping public perceptions and influencing discourse surrounding legalization (Mortensen et al., 2019). For instance, interest groups advocating for medical cannabis speak to its therapeutic benefits (Mortensen et al., 2019). Opponents commonly cite stereotypes around criminality to resist policy changes (Smart, 2020). These narrative strategies, particularly when reinforced through lobbying and coalition-building, reflect a broader trend in U.S. legislative dynamics, where interest groups often act as gatekeepers to reform. Smart (2020) noted that policy change often depends less on shifts in public opinion and more on how effectively interest groups frame issues within the institutional structures of government. Such competing narratives can be amplified through media and lobbying and demonstrate how interest groups work to align public opinion with their policy goals, which impacts legislative outcomes.

IGT was used to help me analyze and understand how the legislative differences between Colorado and Kansas regarding cannabis policy took shape. The theory provided a lens to understanding how stakeholder groups, such as medical organizations, patient advocacy groups, and anti-drug coalitions, contributed to state-based legislative proceedings (Kelley, 2009). In Colorado, the alignment of interest groups with both political actors and economic incentives helped shape the legal infrastructure that enabled cannabis commercialization (Mortensen et al., 2019). As such, Colorado's cannabis legalization reflects the success of interest groups advocating for broader societal acceptance and economic benefits. In Kansas, by contrast, more traditionalist interest groups, including those aligned with law enforcement and religious organizations, maintained substantial influence over the legislative agenda, contributing to the state's continued prohibition (Roberts, 2019). Kansas's restrictive stance indicates the influence of groups prioritizing conservative values and public safety concerns. These state-level variations demonstrate how localized power dynamics mediate national trends in cannabis policy reform. I used the interest group theory to conceptualize how competing interest groups influence over-arching political systems to affect cannabis policy outcomes.

Literature Review Related to Key Concepts

The literature reviewed in the following three primary subsections aligns with the research question: What are MS physicians' perspectives concerning legislative, administrative, and policy measures that have contributed to unequal medical cannabis adoption for MS treatment, and what legislative, administrative theory, and legislative

practices might influence the passage of cannabis legalization in Kansas? The first subsection herein concerns legislative approaches to cannabis in Colorado and Kansas, while the second subsection concerns theoretical and evidence influences on cannabis legislation. Finally, the third section includes a synthesis of researchers' findings concerning treatment uses of cannabis.

The problem is that conservative laws concerning cannabis use adopted by Kansas restrict patients in Kansas from receiving cannabis treatment for MS. Despite the promise shown by cannabis, the legal landscape for cannabis to manage anxiety in MS varies significantly between Kansas and Colorado. A greater understanding of this challenge can contribute to more effective policies that would help those with MS receive effective treatment. The uneven legal landscape has contributed to unequal patient outcomes. In Colorado, for instance, both medical and recreational marijuana are legal. The legality of both provides patients with MS access to THC products that can alleviate a variety of typical MS symptoms (Salter et al., 2021). Colorado also has a comprehensive regulatory framework that includes a wide range of cannabis products, thereby enabling patients and healthcare providers to tailor treatments individually. Such accessibility helps patients benefit from the therapeutic effects of THC according to evidence-based practice, research, and development.

In contrast, the state of Kansas continues to maintain strict prohibitions against the use of cannabis for medical and recreational purposes (Orenstein & Glantz, 2020; Pathak et al., 2022). Cannabis has shown promise in treating MS (Haroutounian et al., 2021). Kansas was chosen, among other states such as Nebraska and Wyoming, as a state

contrasting Colorado's liberal cannabis laws, since Kansas is characterized by some of the most conservative cannabis laws (Orenstein & Glantz, 2020; Pathak et al., 2022). The legal position taken by Kansas is such that patients with MS do not have the opportunity to access potentially beneficial cannabis treatments for anxiety management legally. Consequently, MS patients in Kansas who desire cannabis treatment are left to rely on less effective or potentially more harmful pharmacological treatments. This can further exacerbate disparities in healthcare outcomes (Kansas Cannabis Information, 2024). A gap in research exists concerning understanding differences in applied theory, policy, and practices of Kansas versus Colorado state legislatures examining the same set of facts reaching diametrically opposed legislation (Orenstein & Glantz, 2020). While some would argue that the states' rights to determine the will of the people in that state are upheld by the Constitution Article IV and/or Amendment XI, the issue of conservative laws in Kansas concerning cannabis is still problematic, considering that such state-specific laws minimize access to cannabis medical treatment for MS patients. The dramatic difference in state laws points to a broader issue of healthcare inequality in which access to potentially beneficial treatments is contingent upon state residency. Such contingency leaves patients in restrictive states at a disadvantage.

Hence, the general issue or problem that prompted my search of literature concerning the topic was the lack of consistent legal access to cannabis for MS treatment across states, which results in MS patients being left to rely on less effective or more harmful alternatives, including opiates (Orenstein & Glantz, 2020; Salter et al., 2021). Researchers have shown that Kansas has a higher rate of opioid addiction than Colorado

(Salter et al., 2021). The social consequence of this problem is exacerbated healthcare disparities and outcomes. The specific research problem that I addressed through this study was that public policymakers presented with evidence-based solutions to narrow the gap in healthcare outcomes have processes that fail the public need to provide healthcare resources to underserved citizens, specifically concerning the legalization of cannabis use in treating MS patients in Kansas (see Kansas Cannabis Information, 2024). To address this problem and gap in research, I systematically examined the perceived obstacles to the legal and administrative policies that led to substantially differential legal treatment of cannabis for MS treatment between Colorado and Kansas.

Legislative Approaches to Cannabis

As described, Colorado and Kansas are characterized by two significantly contrasting legislative approaches to cannabis—such differences in legislation point to the complexities and consequences of cannabis policy in the United States. Colorado was an early adopter of recreational cannabis legalization, becoming (alongside Washington) one of the first U.S. states to legalize recreational marijuana through a voter-initiated ballot in 2012 (Payán et al., 2021). The state has embraced a commercial model that prioritizes economic growth and thus generates significant tax revenues and job creation while raising public health and safety challenges such as cannabis-induced psychosis and traffic fatalities (Gandilhon, 2019; Santaella-Tenorio et al., 2020). However, scholars cited considerations such as the percentage of cannabis-linked traffic accidents in comparison to alcohol-related incidents (Santaella-Tenorio et al., 2020). Unlike Colorado, the Kansas legislature maintains a prohibitionist stance. The state resists

reform for recreational or medical cannabis use, allegedly based on concerns over youth access, public health risks, and regulatory challenges (Kansas Cannabis Information, 2024; Pathak et al., 2022). While policymakers use Colorado's model to demonstrate the many possible benefits and drawbacks of legalization, Kansas's approach shows the possible economic and social costs of inaction. The different approaches exemplify how ideology, public health priorities, and economic considerations shape cannabis policy outcomes (Orenstein & Glantz, 2020; Roberts, 2019).

Legislative Approaches in Colorado

For many policymakers and organized stakeholders, Colorado's approach to recreational cannabis legalization is widely treated as a pioneering template—often described as a “model of legalization policy” and explicitly framed as a “Colorado Model” that can inform other states' regulatory choices (Hudak, 2014; Yates & Speer, 2018). Colorado legislature can be described as balancing public health concerns with the commercial potential of the cannabis market. Since the implementation of the state's regulated seed-to-sale market in 2014, Colorado legislature and development have primarily demonstrated how legalizing and managing cannabis for recreational use can be an incredibly complex process (Rotering & Apollonio, 2022). While the state's approach has been lauded for its innovation, it also includes tensions between public health priorities and commercial interests (Subritzky et al., 2020). As an example of these competing interests, the Retail Marijuana Code (RMC) initially sought to address public health risks through strict regulations. However, issues surrounding high-potency

products, unintentional overdoses, and cannabis-related psychosis are emerging, causing policies to be shifted (Wu et al., 2023).

Lobbying

Lobbying has also shaped Colorado's cannabis policies. Specifically, in-state and out-of-state stakeholders have impacted lobbying processes in Colorado. Between FY 2010 and 2021, the cannabis industry spent over \$7 million lobbying the legislature on 367 bills, with 11% of funding coming from out-of-state entities (Rotering & Apollonio, 2022). A large percentage of state-based lobbying efforts did not disclose cannabis affiliations, which made intentions less transparent and compromised the efficacy of these groups' interests (Obradovic, 2021). Furthermore, alliances between the cannabis, alcohol, and tobacco industries impacted regulation so that many regulatory measures became more aligned with commercial interests instead of public health, to the dismay of many citizens and interest groups (Rotering & Apollonio, 2022). Stakeholders' impact on legislative processes thus came at the expense of robust public health measures.

Colorado's legislative development mirrors broader trends in cannabis policymaking. The commercially oriented model instituted by Colorado yielded economic benefits but has also introduced challenges concerning public health, such as increased cannabis use among young adults and the proliferation of high-potency products (Obradovic, 2021). Such duality points to how it is necessary to incorporate public health best practices into cannabis regulation while simultaneously considering economic and social objectives. Altogether, Colorado policymakers have been highly successful when it comes to regulating the commercial cannabis market. However, the

legal framework adopted by state legislatures has been criticized for prioritizing business interests over reparative justice or public health (Wu et al., 2023). Unlike some Canadian provinces that sought to incorporate reparative measures into legalization frameworks, Colorado missed opportunities to address racial disparities and social inequalities otherwise exacerbated by historical cannabis prohibition (Valleriani et al., 2018). The practice gap concerning social equity thus illuminates a need for more inclusive and equitable cannabis policies designed to prioritize social justice.

Thus, public health implications remain a critical focus regarding existing gaps in policy and research and the context of the study. Colorado's legalization framework has demonstrated mixed and inconclusive outcomes concerning adolescent cannabis use. Use rates among adolescents have remained steady post-legalization (Wu et al., 2023). Use among young adults has risen, which some suggest is cause for concern regarding the possible long-term effects of high-potency products (Wu et al., 2023). Furthermore, some researchers have reported increased motor vehicle collisions, acute care visits, and cannabis use during pregnancy (Armstrong, 2024; Subritzky et al., 2020), but the validity of these findings has yet to be supported by extensive research in multiple contexts and/or systematic reviews. The economic gains achieved by Colorado's approach to cannabis have included increased tax revenues and job creation, but the legislative framework still includes flaws. Further emphasizing public health in cannabis policies could mitigate risks associated with high-potency products and target prevention efforts toward at-risk populations (Armstrong, 2024). Hence, adaptability, transparency, and stakeholder engagement remain critical to effective cannabis legislation.

While the Colorado legislature can be used to demonstrate and support the possibilities and pitfalls of a commercial model, Kansas's prohibitionist stance shows the limitations of a nonlegalized framework. When considered in tandem, the two cases show the need for legislative balance and alternative models or adaptations (Rotering & Apollonio, 2022; Subritzky et al., 2020). Hundreds of millions of dollars in annual tax revenue have been generated by cannabis legalization. Many of these dollars in Colorado have been allocated to education, healthcare, human services, and local affairs (Gandilhon, 2019). Nearly 40,000 jobs since 2012 have been created due to cannabis in Colorado, which is beneficial for reducing unemployment rates (Gandilhon, 2019).

However, such economic gains have not gone without increased state expenditures on law enforcement and public health agencies, the trade-off of which remains inconclusive (Rotering & Apollonio, 2022). As mentioned previously, public safety concerns, such as traffic fatalities, have come into focus post-legalization, though they are still far overshadowed by alcohol-related fatalities (Santaella-Tenorio et al., 2020). Weighing trade-offs between economic and public health treatment benefits of legalization with such consequences remains a difficult task since the interests of different groups often conflict, and data varies depending on context. Colorado experienced an increase of approximately 75 excess traffic fatalities annually after implementing recreational cannabis legislation (RCL) (Santaella-Tenorio et al., 2020). Factors contributing to this disparity include the density of cannabis retail stores, tourism, and local regulatory differences. Colorado faces cannabis regulatory challenges

concerning public safety while being presented with the opportunity to perpetuate the health and economic benefits of legalization.

Moreover, possible health and safety risks of cannabis use and increased use resulting from legalization extend beyond traffic incidents. Some researchers reported that healthcare center emergency departments have experienced a significant increase in cannabis-related visits since legalization (Mello, 2024; Potter & Unnithan, 2021; Roberts, 2019). Patients presenting issues have included, but are not limited to, cannabis-induced psychosis, accidental ingestions, and adverse reactions to high-potency products, especially among vulnerable populations (Roberts, 2019). Such trends suggested the need for improved patient and public education concerning use. Colorado's *Good-to-Know* campaign is an example of proactive communication designed to better educate citizens about safely consuming cannabis (Potterf & Unnithan, 2021). The campaign was generally effective but limited in reach and audience segmentation. Some suggested that it overemphasized knowledge dissemination rather than behavioral change (Potterf & Unnithan, 2021). Such findings were used to suggest that future campaigns should adopt more nuanced approaches to address diverse audience needs.

Colorado's efforts to sustain cannabis reform post-legalization were characterized by complexity. Maintaining public support while simultaneously adapting to evolving challenges proved challenging (Roberts, 2019). Advocacy groups and policymakers have worked to ensure that legalization is aligned with public interests so that regulatory oversight is balanced with economic growth (Mello, 2024). Such ongoing mobilization showed how cannabis policy is often dynamic and requires continual adjustment based on

social, economic, and health issues, including crime, market regulation, and health access disparities. Despite such challenges, Colorado's legislative approach and processes arguably included valuable lessons for other states considering legalization. Integrating public health best practices into cannabis policies in an economically viable way was critical (Santaella-Tenorio et al., 2020). However, gaps in addressing public safety, health risks, and equitable outcomes show significant room for improvement. In this way, Colorado was considered a case study, and other states can evaluate it when planning to navigate the potential cannabis legalization process. For states like Kansas that maintained prohibitions, Colorado's model shows potential opportunities and challenges of legalization.

Legislative Approaches in Kansas

The legislative approach to cannabis that Kansas adopted contrasts that of Colorado and is characterized by strict prohibition of recreational and medical cannabis. Kansas ultimately takes a more conservative stance toward cannabis (Wang & Wilson, 2022). The conservative stance reflected social resistance to cannabis reform in certain states that was likely derived from political, cultural, and economic ontological and cultural factors. Kansas has yet to pass comprehensive medical cannabis legislation, and the state is politically positioned as one of the few remaining states strictly prohibiting cannabis use in any form (Mallinson & Hannah, 2020). Kansas's approach reflected an approach that prioritized perceived public health and safety risks of cannabis over potential economic and emerging alternative therapeutic benefits (Baker, 2021). Moreover, Kansas's failure to legalize cannabis was also impacted by licensing and

regulatory complexity. Researchers have indicated that states with restrictive licensing frameworks for medical cannabis often cite concerns about misuse and regulatory challenges as barriers to reform (Mallinson & Hannah, 2020; Pawar et al., 2024). Such concerns represented rigid opposition to any legislative effort aimed at creating a feasible licensing structure for medical or adult-use cannabis. In contrast, states like Colorado were often considered early mover states because of adopting broad licensing categories with low entry barriers (Wang & Wilson, 2022).

Youth cannabis use was a concern that has arisen in legislative debates among Kansas officials. While medical cannabis legalization (MCL) has shown minimal effects on youth cannabis use (Stoa, 2023), RCL was associated with modest increases in past-month cannabis use among young adults (Pawar et al., 2024). Kansas legislators commonly cited these findings in justification of a conservative approach by suggesting that increased use among vulnerable populations contributed to healthcare expenditures and societal threats (Kansas Cannabis Information, 2024). However, such a conservative stance largely ignored evidence of the power effective regulation can have on mitigating risks while optimizing therapeutic health benefits as a non-traditional pharmacological approach.

A tension between state-level autonomy and federal regulations characterized Kansas's policy environment. The absence of legal cannabis in Kansas resulted from policymakers' and regulators' reluctance to engage in entrepreneurial regulatory strategies embraced by progressive states such as Colorado (Stoa, 2023). Baker (2021) suggested that Kansas officials have avoided creating more progressive state-specific frameworks

that could be used to manage cannabis cultivation, distribution, and use. Kansas officials have also expressed concerns regarding legalization's administrative and enforcement challenges, especially in a state with limited precedent for managing controlled substances outside traditional pharmaceutical frameworks (Fischer et al., 2020). Hence, a gap existed in Kansas's legislative discussions concerning the lack of attention to equity and social justice in cannabis policy reform.

Liberal states like Colorado have received criticism for inadequately addressing racial and economic disparities in cannabis enforcement and industry participation. However, Kansas legislators have failed to engage in such issues (Stoa, 2023) meaningfully. The omission of discussion concerning the intersection of cannabis and economic disparities pointed to the need for a more comprehensive approach to cannabis policy in Kansas that considers public health and safety as well as the social and economic impacts of prohibition (Egan & Miron, 2006). Kansas' legislative inertia on cannabis reform was used to show the challenges of policy adaptation and the learning required among all stakeholders to mobilize policy change and make it effective. Unlike states that have embraced cannabis legalization as an economic and public health opportunity, scholars have suggested that due to the legal stance taken by Kansas, the state remains resistant to inevitable political and cultural change (Mallinson & Hannah, 2020). Hence, whether the policy approaches taken by Kansas prove helpful, economically viable, or socially productive in the future remains in question.

The resistance to reform on behalf of Kansas policymakers also raised questions about the role of ideology, political will, and regulatory capacity in shaping cannabis

policy. Such questions pointed to possible lessons for other jurisdictions that may be navigating the complexities of cannabis legalization (Stoa, 2023; Wang & Wilson, 2022). Budgetary implications surrounding cannabis prohibition also existed. Economic costs accompanied marijuana enforcement regardless of whether potential revenue opportunities are capitalized upon (Pathak et al., 2022). Prohibition involves substantial expenditures on law enforcement, judicial processes, and incarceration for cannabis-related offenses. Egan and Miron (2006) estimated that U.S. states spend billions annually on marijuana prohibition, which diverts resources that could otherwise be put toward public health and safety concerns in more efficient ways (Orenstein & Glantz, 2020). In Kansas, these expenditures contribute to a more extensive debate about the fiscal sustainability and opportunity costs of restrictive cannabis laws.

Summary Regarding Colorado and Kansas

The findings and conclusions reviewed in this first section of the literature review concerning legislative approaches as found in the literature reveal stark differences between Colorado and Kansas. The divergent ways state legislators have approached the issue reflect ontological, political, and social debates concerning public health, economic benefits, and social values. Colorado's regulatory framework has driven economic growth and funded public services, albeit with challenges such as increased traffic fatalities and public health risks (Gandilhon, 2019; Santaella-Tenorio et al., 2020). Conversely, Kansas's prohibitionist stance has been used to demonstrate the costs of inaction, including but not limited to missed economic opportunities and persistent healthcare disparities. The stance taken by Kansas brought questions to the surface regarding the

potential impact of conservative ideologies or agendas (Kansas Cannabis Information, 2024; Pathak et al., 2022). The cases of Colorado and Kansas were used and evaluated to show the complex interplay of public policy, ideology, and socioeconomic considerations in cannabis legislation. The contrasting approaches also characterized the practical context within which theoretical and evidence-based influences on cannabis legislation can be explored.

Theoretical and Evidence Influences on Cannabis Legislation

The legislative approaches to cannabis in Colorado, Kansas, and other states were understood through various theoretical and evidence-based approaches. Researchers can use IGT to better understand how competing societal values, public health priorities, and economic considerations are considered or balanced when designing cannabis policy (Kelley, 2009; Nagin & Telep, 2020). The theory was designed to address governance structures and public needs differently. Evidence-based influences were also used to incorporate concrete data on the outcomes of cannabis legislation, including public health impacts, economic benefits, and social equity considerations when designing policy. Researchers have demonstrated how reforms affect cannabis availability, healthcare utilization, and criminal justice outcomes, informing regulatory strategies that address societal complexities (Benedetti et al., 2021; Bradford et al., 2024). Hence, theoretical and evidence-based insights composed a comprehensive foundation for creating compelling and equitable cannabis policies. However, the framework has been applied and interpreted differently by different players, which explains the varied conservative and liberal approaches to legislation.

Theoretical Influences

Theoretical influences also played a pivotal role in shaping cannabis legislation. One such influence stemmed from criminological theories exploring legalization's impact on crime and public safety. Post-legalization criminology can be used to show the need to reassess issues like illicit production, enforcement, and impaired driving, emphasizing the transition from prohibition to regulation (Fischer et al., 2020). By focusing on cannabis-related behaviors and their association with crime and justice, theories such as this can be used by policymakers to understand possible broader implications of legal reform (Hammond et al., 2020). Hence, more comprehensive strategies are often needed to effectively manage the unintended consequences of legalization (Hammond et al., 2020). The role of cultural and social factors in cannabis legislation is also complex. For instance, public acceptance of cannabis use is interrelated to and demonstrative of political ideologies, religious sentiments, and socioeconomic factors (Siddiqui et al., 2022). Conservative consumers are likely to reject legalization due to the stigma associated with cannabis despite growing awareness of potential medicinal benefits. Increasingly available education and scientific evidence regarding cannabis's therapeutic potential have contributed to more accepting favorable attitudes, however, especially in jurisdictions where legalization efforts are the result of lobbying and formal or informal public health campaigns (Siddiqui et al., 2022). Cultural and social dynamics shaped legislative outcomes by impacting public opinion and political decision-making.

Additional insights can be gleaned through the lens of the Theory of Planned Behavior (McTaggart-Cowan et al., 2020). Specifically, it can be suggested that

individuals' beliefs and societal norms concerning cannabis use are often more impactful on legislative decisions than many scholars and policymakers may acknowledge. A study involving cancer survivors included results indicating that marijuana legalization improved access to safer products for these patients and shifted perceptions about the acceptability of cannabis as a therapeutic option (McTaggart-Cowan et al., 2020). Nonetheless, barriers such as physician disapproval and a lack of robust scientific evidence deterred some individuals from using cannabis to manage their symptoms. I concluded that personal and institutional factors both impacted patients' behaviors. Building from the way that personal and institutional factors can impact both policy and behavior, the International Cannabis Policy Study (ICPS) offered a framework for understanding the varied impacts of cannabis legalization across jurisdictions and factors impacting legalization, broad and/or personal use (Siddiqui et al., 2022). A quasi-experimental design compared policy measures like product standards, retail policies, and public education (Hammond et al., 2020). The results showed that different regulatory frameworks influenced cannabis use and societal outcomes (Hammond et al., 2020). For example, jurisdictions with robust labeling and health warnings were positively correlated with better public health outcomes than those with less stringent regulations. Such findings support the case for using evidence in making policy decisions so that practice can be informed by both theory and evidence concerning public health and safety.

Furthermore, legal theories can provide a foundation for understanding how cannabis policies relate to overarching legal systems. In the United States, for instance,

cannabis legislation was often the byproduct of stakeholders navigating the frequent tension between federal prohibition and state-level legalization efforts (Nann & Cohen, 2018). It is not uncommon for civil and international law to converge in this way (Nann & Cohen, 2018). The dual legal framework created opportunities for innovative regulatory models and presents challenges in harmonizing often conflicting legal standards. Theoretical perspectives on legal pluralism and federalism thus played a crucial role in shaping cannabis legislation in states that adopt progressive policies within a federally restrictive environment. Incorporating theory into cannabis legislation is generally done to align societal values, public health priorities, and legal frameworks (Fischer et al., 2020; Siddiqui et al., 2022). Criminological theories addressed the shift from prohibition to regulation and showed a need to mitigate crime and promote safety concerning use (Fischer et al., 2020). Public perception and acceptance are also important in legislation, and both can be shaped by education and awareness campaigns (Siddiqui et al., 2022). The application of theoretical perspectives to an inquiry into cannabis legislation provided a multidimensional lens for evaluating and shaping cannabis legislation, incorporating evidence that is responsive to societal needs.

Procedural justice theory highlighted the importance of transparent legal processes concerning compliance and legitimacy (Siddiqui et al., 2022). Nagin and Telep (2020) showed that individuals are more likely to comply with laws when they perceive the legal system as equitable and procedurally fair. The finding is relevant in cannabis legislation, considering that disparities in enforcement and access, such as those observed between states like Colorado and Kansas, indicate the need for policies that promote

equity and public trust (Pearlman, 2021). A fair regulatory framework can minimize political resistance to legalization and help promote acceptance.

Cannabis legalization also encompassed dualism between regulation and criminalization within the regulatory–carceral state. Aaronson and Rothschild-Elyassi (2021) described how legalization exists alongside residual criminal enforcement and creates a hybrid system within which cannabis is a legal commodity and a controlled substance (Aaronson & Rothschild-Elyassi, 2021). The dualistic dynamic mirrored and manifested governance tensions characterized by corrupt regulatory efforts entrenched in carceral practices disproportionately impacting marginalized communities (Nagin & Telep, 2020). Persistent dual systems created a need for theoretical approaches driven by values and concepts inherent in interest group theory and procedural justice frameworks that are used to balance regulatory objectives with social equity.

Internationally, debates on cannabis policy reform reflect political and constitutional frameworks' role in forming legislation. In Germany, constitutional principles and public health considerations drove conservative approaches to cannabis reform in which legislature is driven by decriminalization and controlled access rather than commercialization (Kemme et al., 2021). In contrast, the market-driven approach in states like Colorado was driven by the prioritization of economic incentives. A comparison of the two showed the importance of contextualizing cannabis legislation within the specific political, legal, and cultural frameworks of jurisdiction, as suggested through the lens of frameworks like the optimistic pluralism theory. Healthcare entities also undoubtedly impact cannabis legislation and are affected by medical, legal, and

regulatory concerns. As an example, Pearlman (2021) discussed how state and federal discrepancies in cannabis policy create challenges for healthcare providers concerning the effective and ethical management of patient access to medical cannabis. For example, healthcare providers working on behalf of serving patients with alternative therapeutic options must navigate conflicting state and federal laws at the risk of federal noncompliance. Such a dynamic reflected a broader issue of legal pluralism, wherein overlapping jurisdictions complicate the implementation of such policies. However, applying theoretical perspectives on statutory interpretation and legislative intent (Kelley, 2009) helped address these conflicts by providing a framework for clarifying the roles and objectives of state versus federal governance.

Evidence-Based Influences

Researchers have demonstrated that cannabis policy reform significantly impacts cannabis use and access. Benedetti et al. (2021) examined the impacts of cannabis policy changes in Europe and found that reforms influenced the availability and consumption of cannabis. These findings suggest that policies created with a nuanced consideration of such factors can be used to more effectively regulate the availability of cannabis by balancing access for medical or recreational purposes while managing and minimizing possible misuse (Haroutounian et al., 2021). Such insights and suggestions are critical when designing evidence-based reforms to address public health concerns and promote equitable access. Furthermore, access to cannabis also influenced the use of traditional medications, especially mental health pharmacological treatments, which poses threats to existing pharmaceutical companies and may impact subsequent corporate lobbying

efforts against cannabis legalization (Kees et al., 2019). Bradford et al. (2024) investigated how cannabis laws influence prescription medication use, finding that increased access to cannabis reduced benzodiazepine dispensing among patients. Such a reduction showed that cannabis may be an alternative treatment for certain conditions and could lower patients' dependence on pharmaceutical interventions.

The criminal justice implications of cannabis legalization provided another compelling evidence-based influence. Gunadi and Shi (2022) explored the relationship between RCL and cannabis possession arrest rates in states that had previously decriminalized cannabis. They found possession-related arrests decreased by over 40 percent following RCL implementation. The authors concluded that the significant decline showed how effective legalization can be in alleviating the burden on law enforcement. Benedetti et al. (2021) provided a foundation for understanding how regulatory strategies influence use patterns and emphasized the importance of evidence-based approaches to create effective cannabis laws. Similarly, Bradford et al. (2024) described the possible healthcare implications concerning the role of cannabis in reducing reliance on conventional medications, while Gunadi and Shi (2022) discussed the societal benefits of legalization concerning reducing arrest rates and alleviating systemic inequalities in the criminal justice system.

The implications of these findings are especially relevant for jurisdictions navigating the complexities of cannabis policy. Policymakers might draw on Benedetti et al.'s (2021) research to design targeted reforms that balance accessibility with public health safeguards. Bradford et al.'s (2024) study provided a rationale for integrating

medical cannabis into broader healthcare strategies that could reduce prescription drug dependency and associated costs. Additionally, Gunadi and Shi's (2022) findings were used to support the societal benefits of legalization due to their evidence that counters arguments against reform that are otherwise rooted in concerns about law enforcement and public safety.

Evidence-based influences can also be used to show the importance of adapting cannabis policies to meet local community needs. For instance, Benedetti et al.'s (2021) demonstration of the variable way in which policy changes affect use patterns were used to suggest that reforms should be tailored to demographic, cultural, and societal factors. Likewise, Bradford et al. (2024) revealed the nuanced relationship between cannabis access and healthcare use. They showed that policies are more useful when they account for existing healthcare infrastructure and patient needs. A demonstration of how RCL can reduce arrest rates in states with prior decriminalization efforts in support of aligning new policies with existing legal frameworks was demonstrated by Gunadi and Shi (2022). These researchers' findings illustrated the diverse impacts of cannabis policies on public health, criminal justice, and societal well-being. Policymakers can craft reforms that address the complexities of cannabis legalization while promoting equity, health, and safety by integrating empirical findings into legislative frameworks (Kees et al., 2019).

Another critical contribution to evidence-based influences on cannabis legislation is the recognition of the complexities in regulating cannabis compared to other controlled substances like alcohol and tobacco. Kees et al. (2019) highlighted that cannabis differs significantly in its patterns of use, distribution methods, and physical and psychological

impacts and thus requires a regulatory approach distinct from that used to govern alcohol sales and consumption. The IGT framework implied that marketing and public policy researchers can guide cannabis legislation by looking at gaps in consumer behavior and understanding and applying evidence-based recommendations. Economic and industry dynamics also played a significant role. For instance, Adams et al. (2021) explored how the cannabis industry players use strategic lobbying, public-private partnerships, and research collaborations to create policies. In New Zealand, the medicinal cannabis industry was linked to regional economic development and employment in which NGOs are funded by and aligned with policymakers advocating for recreational legalization. Implementing such strategies demonstrated how industry influences often accelerate policy reform by framing cannabis as an economic and social opportunity (Camors et al., 2020). The lessons from New Zealand resonated globally, given that similar industry-driven approaches have shaped cannabis policies in U.S. jurisdictions.

Social equity considerations also informed evidence-based cannabis legislation that was aimed at addressing disparities otherwise exacerbated by prohibition. Camors et al. (2020) identified the role gender diversity plays in shaping cannabis policy and industry outcomes. They found that gender diversity in decision-making bodies positively and significantly correlated with increased adoption of adult-use cannabis policies and improved tax revenue levels. Furthermore, such legalization often reduced spending on enforcement, health costs, and drug-related violence, benefits that disproportionately impact communities burdened by the previous prohibition. Camors et al.'s (2020) insights supported the inclusion of equity-focused frameworks in cannabis legislation so

that broader societal benefits can be achieved and reforms to historical injustices can be approached. Cultural factors constituted another dimension of evidence-based cannabis policymaking. Wanke et al. (2024) emphasized the role of cannabis users' identities and the societal stigmas they navigated that are often distinguished from other drug users and mainstream culture. The cultural dynamics of cannabis use are not always aligned with oversimplified narratives about marijuana, which showed that legislation efforts ought to better consider and account for diverse user experiences and societal perceptions.

Global perspectives concerning cannabis legislation also reflected the variability in how evidence-based practices are implemented. For example, Kees et al. (2019) and Adams et al. (2021) demonstrated, in different ways, that local economic, social, and cultural contexts significantly influenced the success of cannabis policies. For example, regions with strong public-private collaborations and industry participation, such as New Zealand and some U.S. states, experienced smoother transitions to marijuana legalization. However, jurisdictions that overlooked such dynamics faced challenges when implementing and enforcing policy. Challenges concerning public acceptance were also encountered (Kees et al., 2019). The symbolic and cultural aspects of cannabis use, as discussed by Wanke et al. (2024), further showed how societal perceptions inform cannabis policy. Simplified generalizations about cannabis use often fail to account for the complexities of user identities and cultural influences on use. By integrating cultural considerations into evidence-based frameworks, policymakers can create more inclusive and effective cannabis regulations based on the needs of diverse populations.

Treatment Uses of Cannabis

The therapeutic use of cannabis has evolved into a significant focus in general medical applications and multiple sclerosis (MS) management. Cannabis-based treatments, especially those that incorporate THC and CBD, have shown promise in addressing chronic pain, inflammation, and neurological symptoms across diverse populations (Hollingsworth et al., 2022). Changes in medical cannabis laws have allowed for increased use for pain relief and symptom management. The expansion of medical marijuana use has also contributed to reductions in reliance on traditional pharmaceuticals, including opioids and benzodiazepines (Inglet et al., 2020). In the context of MS, cannabinoids like THC and CBD are effective in alleviating spasticity, neuropathic pain, and sleep disturbances, such that evidence indicates these compounds are a safer adjunct to first-line therapies (Jones & Vlachou, 2020). The research synthesized in the following two theme-based sections of this final subsection includes an exploration of the dual role cannabis plays in broad medical applications and MS-specific treatments.

General Treatments and Policy

Cannabis-based treatments have gained increased attention for their therapeutic potential, thus influencing both clinical practice and policy. For instance, Inglet et al. (2020) provided a comprehensive review of clinical data. They highlighted the efficacy of cannabis in managing chronic pain, multiple sclerosis (MS)-related spasticity, and nausea from chemotherapy. Although applications of cannabis such as these have shown significant relief for patients (Inglet et al., 2020), the variability in treatment outcomes

and the potential for adverse effects such as dizziness and cognitive impairment point to a need for potentially more precise dosing and monitoring (Bradford et al., 2024). Along these lines, Haroutounian et al. (2021) suggested standardized guidelines to maximize benefits and minimize risks in clinical settings. The societal and policy implications of cannabis-based treatments are equally critical. Haroutounian et al. (2021) also emphasized the role of cannabis in addressing chronic pain while simultaneously exacerbating conditions like anxiety and depression in vulnerable populations, thus showing the need for practitioners to weigh trade-offs from a patient-centric stance critically. Nonetheless, integrating cannabis more prominently into pain management regimens could reduce reliance on opioids, which would constitute a significant public health benefit amid the ongoing opioid epidemic.

Cannabis legalization has also influenced treatment landscapes in mental health. Bradford et al. (2024) examined how increased access to cannabis correlates with reduced dispensing of prescription medications like benzodiazepines that are commonly used to manage anxiety. Bradford et al.'s (2024) findings suggested that cannabis could serve as an alternative therapeutic option for alleviating the side effects and dependency risks associated with traditional medications. However, disparities in access, as highlighted by Harris and Kulesza (2023), showed that systemic inequities concerning referrals to treatment for cannabis use remain. It is essential to address inequities to ensure equitable access to cannabis-based treatments. The impact of cannabis policy changes on youth use further complicated treatment policy. Benedetti et al. (2021) also found that policy reforms in Europe influenced cannabis availability and consumption

patterns for adolescents. Medical cannabis policies are often designed to provide therapeutic benefits. However, they may have unintended consequences, such as increased youth exposure to cannabis, thus showing the importance of targeted public education campaigns.

The dynamic and unpredictable nature of cannabis policy reform is described by Battaglini (2021), which adds complexity to the consideration of regulatory and legislative approaches. Opportunities for expanding access to cannabis-based treatments are arising while challenges in standardizing care also intensify. Hence, policymakers must navigate these uncertainties to create frameworks that support consistent, equitable access to medical cannabis (Battaglini, 2021). Gunadi and Shi (2022) found that recreational cannabis legalization significantly reduced cannabis possession arrest rates and alleviated burdens on the criminal justice system. This shift has implications for treatment access, given that fewer legal barriers enable more individuals to seek cannabis-based therapies without fear of prosecution. However, systemic enforcement and access disparities necessitate reforms addressing such inequities. Research findings of Inglet et al. (2020) and others demonstrated the therapeutic potential of cannabis, while the findings included in studies like those by Haroutounian et al. (2021) and Benedetti et al. (2021) are focused on the challenges of balancing medical benefits with public health concerns.

Cannabis-based therapies have shown efficacy in managing chronic pain, reducing muscle spasticity, and alleviating chemotherapy-induced symptoms (Haroutounian et al., 2021). While these benefits can significantly improve the quality of

life for patients with chronic conditions such as multiple sclerosis (MS), the risks presented to those vulnerable to depression and anxiety mean that cannabis use, and distribution must be carefully monitored. Disparities in access to cannabis treatments illuminated socioeconomic and racial inequities. Salter et al. (2021) observed that cannabis use was more prevalent among non-white individuals, unemployed populations, and those with lower levels of education, which reflects systemic barriers to healthcare access. For instance, while MS patients may find relief through cannabis-based therapies, those in lower socioeconomic groups may not be able to afford or access such alternative therapies, which is a pattern that likely applies to other conditions faced by vulnerable populations.

Legal and policy frameworks thus impacted the adoption and effectiveness of cannabis in general treatments. Orenstein and Glantz (2020) argued that public health best practices, such as those developed for tobacco and alcohol control, must be considered when considering cannabis legalization. However, policy success is often determined by public acceptance and understanding (Marrie et al., 2023). When cannabis is perceived primarily as a recreational substance, its therapeutic applications may be overlooked, and thus, its potential for improving health outcomes is limited. Hollingsworth et al. (2022) showed that cannabis can be especially useful for treating conditions like chronic pain, epilepsy, and anxiety disorders but is underrecognized for this use due to culturally derived stigma concerning use.

The unintended consequences of broader legalization also impacted general treatment contexts. Hollingsworth et al. (2022) found that recreational cannabis laws tend

to increase usage rates within younger populations—a cause for concern regarding potential misuse. International perspectives on cannabis reform offered additional insights into general treatment applications. Kemme et al. (2021) analyzed Germany’s cautious approach to medical cannabis policy, which emphasizes controlled access and public health over-commercialization. The model adopted by Germany is a case showing how regulatory frameworks can support medical cannabis use without encouraging misuse. Similarly, the United States could adapt these practices to address the complexities of balancing cannabis’s therapeutic benefits with its societal implications (Harris & Kulesza, 2023).

Cannabis and Multiple Sclerosis Treatment

Cannabis-based therapies are increasingly recognized for their potential in managing symptoms associated with MS. MS is a chronic neurological condition that affects approximately 2.3 million people worldwide (Multiple Sclerosis Association of America, 2024). Common MS symptoms include but are not limited to spasticity, pain, and inflammation (Filippini et al., 2022). Treatments using THC and CBD have shown effectiveness in treating some of the primary symptoms of MS and most pressing patient complaints, such as pain, spasticity, and sleep disturbances (Fragoso et al., 2020) more holistically.

A synthesis of researchers’ findings and conclusions reviewed herein strongly support the therapeutic efficacy of cannabinoids, including tetrahydrocannabinol (THC) and cannabidiol (CBD), in alleviating MS symptoms. Nabiximols, a THC: CBD oromucosal spray, is a prominent treatment option for MS patients who are not

responsive to traditional first-line therapies like baclofen and gabapentin used to treat spasticity. Martinez-Paz et al. (2023) demonstrated that nabiximols significantly improved spasticity-related quality of life and daily functioning. Patients experienced a general 45% improvement in spasticity symptoms (Martinez-Paz, 2023). Despite a discontinuation rate of 40% due to mild to moderate adverse events, the treatment's safety and tolerability profiles are favorable compared to conventional antispastic drugs (Martinez-Paz et al., 2023). However, the efficacy of cannabis-derived treatments varied depending on how they are administered. Filippini et al. (2022) reviewed 25 randomized controlled trials (RCTs) involving 3,763 participants and found moderate-certainty evidence that nabiximols increased spasticity relief compared to placebo. The results concerning effects on chronic neuropathic pain were less conclusive, such that very low-certainty evidence suggested only limited effectiveness (Filippini et al., 2022). Treatment discontinuation due to adverse effects was slightly higher for cannabinoids than for placebos (Filippini et al., 2022).

In addition to reducing spasticity and pain, cannabis-derived therapies may exhibit anti-inflammatory properties. Maayah et al. (2020) explored the role of full-spectrum cannabis extracts that contain bioactive molecules including terpenes and flavonoids. These compounds' role in managing MS-related neuropathic pain was explored. Their researchers noted the importance of the "entourage effect," in which these compounds work synergistically to enhance therapeutic outcomes (Maayah et al., 2020). Purified THC or CBD demonstrated efficacy, but full-spectrum extracts offered broader

benefits regarding inflammation reduction and slowed disease progression (Maayah et al., 2020).

Studies involving both animals and humans include findings that showed nuanced effects of cannabinoid combinations. For example, Jones and Vlachou (2020) found that combinations of Δ^9 -THC and CBD were more effective in animal models of MS than single cannabinoids. In humans, these combinations are moderately effective in reducing spasticity but less so than in animal studies (Vlachou, 2020). Compared to conventional treatments like baclofen, cannabinoid-based therapies offer comparable efficacy with fewer severe side effects. A pressing concern, however, was cognitive dysfunction. Considering this, there was a need for long-term, placebo-controlled studies to clarify the role of cannabinoids in MS treatment. Patient-reported outcomes are cited as reinforcing the therapeutic potential of medical cannabis for MS symptoms. For instance, Gustavsen (2021) conducted a study on low-dose cannabis oils and reported significant reductions in pain intensity, spasticity, and sleep disturbances without impairments to ambulation, dexterity, or processing speed.

Despite the growing body of evidence supporting cannabis-based treatments for MS, access and regulatory barriers present significant obstacles to legalization in some contexts. Weinkle et al. (2019) noted that the introduction of nabiximols has provided legal access to cannabis-related therapies in many countries, but bureaucratic hurdles and high costs limit widespread adoption. To complicate matters, no scientific evidence exists in which the benefits of smoking marijuana for MS patients are validated, which reinforces that standardized, pharmaceutical-grade formulations may be necessary for MS

patients to reap evidence-based benefits. Haddad et al. (2022) highlighted the effectiveness of oromucosal sprays and oral cannabis formulations in reducing spasticity and pain, two of the most common symptoms of MS. Nabiximols are a combination of THC and CBD. Their use has shown significant improvements for patients in symptom management compared to traditional treatments. However, evidence for their use in treating other MS symptoms remained inconsistent (Haddad et al., 2022; Mecha et al., 2020; Weinkle et al., 2019). Researchers have also explored the biological mechanisms underlying cannabis-based therapies. Cannabinoids interact with CB1 and CB2 receptors in the central nervous system (CNS), affecting immune responses and neuroinflammation (Mecha et al., 2020). Mecha et al. (2020) showed that in animal models, cannabinoids demonstrated neuroprotective effects by reducing inflammation and promoting remyelination of damaged axons.

Supporting evidence can also be gleaned from published systematic reviews of the literature. Longoria et al.'s (2022) systematic review of cannabinoid effects in both clinical and experimental settings, focusing on the use of nabiximols and other cannabinoid formulations, showed that the use of these compounds generally resulted in significant spasticity, pain, and bladder dysfunction reductions through most in clinical trials evaluated. Additionally, the findings included in preclinical studies showed that cannabinoids may mitigate disease severity and promote remyelination. Longoria et al. (2022) emphasized the modest short-term benefits of these therapies and called for further research into their long-term effects on disease progression and disability accrual. Patient-reported outcomes provide further evidence of the utility of medical cannabis in

MS treatment. Guarnaccia et al. (2021) found that the severity of MS symptoms positively correlated with the reported benefits of medical marijuana, whereas patients with milder disabilities experienced greater symptom relief. Many reported reducing or discontinuing prescription medications, including controlled substances (Guarnaccia et al., 2021).

Furthermore, Salter et al. (2021) surveyed a large cohort of MS patients in the United States, and the findings were enormously supportive of widespread use of cannabis for symptom relief. Salter et al. (2021) identified disparities in cannabis use based on socioeconomic factors. Higher usage rates were found among non-white, unemployed, and less-educated individuals. These findings underscored the importance of equitable access to cannabis-based treatments and the need for policies that address these disparities to ensure all patients can benefit from such therapies (Salter et al., 2021). Similarly, Langston et al. (2021) emphasized the role of cannabis in comprehensive symptom management for MS. They outlined the efficacy of THC and CBD in reducing neuropathic pain, spasticity, and secondary symptoms such as sleep disturbances or bladder dysfunction. The authors cautioned against potential cognitive side effects, particularly in long-term use (Langston et al., 2021).

Existing research concerning cannabis treatments is promising and underscores challenges concerning medical applications and multiple sclerosis (MS) management. Researchers have consistently demonstrated the efficacy of cannabis, notably THC and CBD, in alleviating chronic pain, spasticity, and sleep disturbances. However, providers' conflicts regarding regulations, legalities, optimal dosing, long-term safety, and side

effects remain issues (Hollingsworth et al., 2022). Cannabis has the potential to reduce dependency on opioids, yet some practitioners and policymakers have harbored concerns about potential increased use among adolescents following legalization (Hollingsworth et al., 2022). For MS patients, nabiximols and similar cannabinoid-based therapies can be effective as adjunctive treatments. However, researchers such as Jones and Vlachou (2020) have identified concerning variability in patient response and potentially detrimental cognitive side effects. Moreover, disparities in access and regulatory inconsistencies have created barriers to equitable treatment. While cannabis-based treatments offer a valuable option for symptom management, there is a need for long-term studies and consistent policy frameworks to maximize the therapeutic potential.

The literature reviewed in this chapter pointed to complexities and disparities surrounding cannabis use, legislation, and treatment outcomes. My study addressed this gap through the lens of Optimistic Pluralism, Utilitarianism, Interest Group, and Chaos Theories, which together are used to examine the divergent legislative approaches to cannabis in Colorado and Kansas. Further qualitative research is warranted to explore the nuanced social phenomena surrounding the issue, leading to divergent regulatory approaches (Savin-Baden & Major, 2023). Furthermore, future qualitative case studies can be valuable for understanding divergent regulatory structures that are context- and state-specific (Stake, 2008 & Yin, 2017). The contrasting legislative environments between Colorado and Kansas and their implications for public health, equity, and policymaking remained underexplored. Thus, my study focused on exploring the issue through the lens of theory and evidence. Furthermore, the study contributed to addressing

the gap in comprehensive empirical understanding concerning how contrasting legislative frameworks, such as those in Colorado and Kansas, impacted healthcare access and patient outcomes for cannabis-based treatments, such as for conditions like multiple sclerosis.

Summary

The purpose of my study was to explore what administrative and policy-related factors physicians perceived contributed to substantially different legal treatment of cannabis for MS treatment between Colorado and Kansas, and what measures do physicians perceive may promote more equitable healthcare access across states concerning the use of cannabis for MS treatment. Chapter two, the literature review, included a synthesis and discussion of research relevant to the topic as a basis within which to contextualize the findings and problem space. A Boolean search of literature was used by inputting key phrases into PubMed, ProQuest, JSTOR, Google Scholar, and the University database. Only peer-reviewed literature, except for government publications, was included. The research reviewed included evidence supporting the use of cannabis in treating MS symptoms but also included indications of potential drawbacks concerning mental health. Also, researchers' findings indicated that divergent public perceptions and political ideologies largely shape the regulatory differences between Colorado and Kansas. The theoretical foundation was composed of the Interest Group Theory (Kelly, 2009), which offered a lens through which to analyze cannabis legislation's complexities. Furthermore, the research reviewed revealed that cannabis is generally effective for managing MS symptoms of spasticity, neuropathic pain, and sleep

disturbances through formulations like nabiximols and THC: CBD combinations (Filippini et al., 2022; Jones & Vlachou, 2020) but that evidence is inconclusive regarding long-term efficacy and safety. Socioeconomic and racial disparities in cannabis access and use were identified as predominant challenges (Salter et al., 2021). Moreover, the contrasting regulatory frameworks between Colorado and Kansas showed the need for harmonized, evidence-based policies prioritizing public health and equitable access.

The interest group theory (Kelly, 2009) can be used to emphasize the need to balance competing interests and promote equity in governance. However, conflicts arise when industry influence prioritizes economic goals at the expense of public health safeguards (Adams et al., 2021; Nagin & Telep, 2020). Evidence from research such as that conducted by Benedetti et al. (2021) demonstrated the impact of policy reforms on cannabis availability and provides contrasting evidence to findings that suggest public health risks, such as increased substance use among youth in states with recreational legalization (Gunadi & Shi, 2022; Pawar et al., 2024). Although considerable evidence exists that can be used to support the potential of cannabis legalization in reducing prescription medication reliance (Bradford et al., 2024), concerns remain regarding regulatory gaps that fail to address enforcement and access disparities. Chapter 3 presents the study's methodology, research design, instrumentation, data collection and analysis procedures, and how trustworthiness issues were addressed.

Chapter 3: Research Method

The problem I addressed was a lack of consistent legal access to cannabis across states. This lack of access affects patients seeking chronic illness treatment such as treatment for MS and exacerbates healthcare inequities, resulting in many chronic illness patients, including MS patients, having access to fewer alternative treatment options. Hence, such patients are often left to rely on pharmacological treatments such as opioids (Orenstein & Glantz, 2020; Salter et al., 2021). Such a reliance on opioids is problematic, considering the nationwide opioid epidemic. For instance, Kansas, a state with extremely conservative cannabis laws in which patients cannot access cannabis as an alternative treatment, has shown a higher rate of opioid addiction than Colorado, the latter of which is a state with more liberal cannabis laws (Salter et al., 2021). Such a discrepancy represents widened healthcare disparities and outcomes. Although opioids are frequently used to relieve pain and other drugs are employed to manage symptoms, many patients still experience significant discomfort, and opioids are highly addictive with potentially significant adverse side effects (Jones & Vlachou, 2020).

To address this problem, the purpose of this study was to investigate what administrative and policy-related factors physicians perceive contributed to substantially different legal treatment of cannabis for MS treatment between Colorado and Kansas, and what measures do physicians perceive may promote more equitable healthcare access across states concerning the use of cannabis for MS treatment. Peer-reviewed literature published during or after 2020, pertaining to Colorado and Kansas, and documenting the perspectives and factors concerning policymakers, administrators, and MS physicians

were included to inform the following research questions: RQ1: What administrative and policy-related factors do physicians perceive contributed to substantially different legal treatment of cannabis for MS treatment between Colorado and Kansas? RQ2: What measures do physicians perceive may promote more equitable healthcare access across states? This chapter includes a discussion of the study's research design and rationale, my role as the researcher, the study's methodology, instrumentation, data collection and analysis procedures, and how trustworthiness issues were addressed. I conclude the chapter by discussing how I handled ethical guidelines and considerations.

Research Design and Rationale

I used a qualitative systematic review methodology to guide the data collection and analysis process. Qualitative systematic review methodologies are used to explore and deepen understanding of a topic or phenomenon, rather than to test relationships statistically or rely on numerical measurement and statistical analysis (Creswell, 2009; Hammarberg et al., 2016). Hence, qualitative research methodologies are used to answer the how and why questions of research that require collecting contextual and explanatory data (Cardano, 2020). Because my research questions and study purpose were designed to ask what factors contributed to states' uneven adoption of legislation concerning CBD access for medical treatment and how measures can contribute to more equitable access and legislation, a systematic review is a sound approach to understanding the focus of the study.

A systematic review of the literature was chosen as a design that aligns with a qualitative methodological approach. Systematic review designs synthesize evidence by

comprehensively identifying and extracting data from existing empirical studies that meet pre-specified eligibility (inclusion/exclusion) criteria, and the study identification/selection process is typically documented and reported in accordance with PRISMA (McKenzie et al., 2024; Mancin et al., 2023; Page et al., 2021). PRISMA is a set of 27 evidence-based guidelines that ensure systematic reviews and meta-analyses are transparently reported by detailing key elements such as objectives, eligibility criteria, search strategy, study selection, data extraction, risk of bias, and synthesis of results (Savin-Baden & Major, 2023). Objectives are the specific research questions used to guide the review, which clarify the purpose and scope. Eligibility criteria are used to define what studies are included or excluded from the review. Furthermore, the search strategy was used to specify the databases searched, filters applied and keywords so that the literature search is reproducible. The study selection was a process of screening articles in multiple stages. Data extraction was carried out by pulling relevant findings from each study, systematically using the PRISMA framework. Finally, the synthesis of results was used to refer to how the data across studies are aggregated and interpreted (PRISMA, 2020).

In this way, the analysis of research is addressed across multiple contexts, rather than me relying on data from a single location or organization (Yin, 2012). Hence, a strength of using a systematic review is that the nuanced and complex realities of organizational and policy environments can be better understood by synthesizing findings across diverse sources (Savin-Baden & Major, 2023). Researchers using systematic

reviews may thus consider how organizational culture, norms, values, and informal practices are documented and interpreted within the literature (Yin, 2012).

As such, I conducted a systematic review of literature focused on factors influencing cannabis policy adoption, such as physician perspectives, administrative barriers, or policy barriers concerning medical cannabis use for MS treatment in Kansas and Colorado. Studies selected were published between 2015 and 2025. The use of a systematic review approach allows for the collection of data from peer-reviewed articles and official reports (Mashuri, 2022) to better understand published findings on the efficacy of cannabis in MS treatment, legal challenges, and strategies proposed or implemented to address them. PRISMA guidelines were followed concerning the data collection and reporting, and Clarke and Braun's (2014) six-step thematic analysis was used to synthesize and interpret themes concerning legislation, healthcare access, and regulatory influences found throughout the literature.

Role of the Researcher

I served as the primary data collection instrument and was responsible for selecting the literature and analyzing the data. Furthermore, I was responsible for the entire research process, from writing and revising the initial proposal, collecting and analyzing the data, and generating the final report. Hence, to minimize the possible impact of researcher bias, it was imperative for me to practice bracketing, which is a form of reflexivity through which I continually wrote and became aware of any preconceived notions or personal biases that could impact the interpretation of results, thereby minimizing their impact through awareness (see Cardano, 2020). I was also responsible

for ensuring ethical standards are followed and upheld throughout the study and following Kakar et al.'s (2020) recommendations.

Methodology

The data collection and analysis procedures followed in the study aligned with a qualitative methodology and a systematic review design. Seventeen peer-reviewed studies were purposefully selected (see Yin, 2012) that address MS physicians', administrators' and policymakers' perspectives, factors, and experiences concerning medical cannabis use in Colorado or Kansas. A preliminary search using the defined inclusion criteria resulted in approximately 60 peer-reviewed articles that were published between 2015 and 2025. From the original pool of 60, studies were filtered based on state-specific relevance, which resulted in a balanced and purposive sample of 17 articles total for Colorado and Kansas, which supports comparative thematic analysis. Research was selected that is published between 2015 and 2025, and no limit was set on the number selected to allow for the saturation of data collection. Although there was no direct interaction with participants due to the use of systematic review of the literature, only a structured data extraction tool based on the research question was used (PRISMA) to gather relevant information from each source. The lack of using interviews is a limitation and a benefit. Though firsthand narratives could provide deeper context, the reliance on published studies allows for broader thematic synthesis across multiple sources. The IGT framework guided the review process and ensure that the extracted data remains focused and aligned with the study's purpose. The following sections describe

the study's literature selection criteria, screening and review process, data extraction procedures, and thematic analysis approach.

Data Selection Logic

Purposive sampling is a selection strategy through which data sources are intentionally chosen based on the relevance to the research question (Yin, 2012). In this study, articles and secondary archival data took the place of participants, as there were no qualitative interviews in this study. Hence, articles were purposefully selected using PRISMA guidelines to ensure rigor and transparency, and that the selection process is replicable.

Seventeen articles and relevant legislative records were selected, that include data from MS physicians, policymakers, and administrators in Colorado and Kansas, with findings pertinent to the intersection of cannabis legislation, MS treatment, and healthcare delivery. Sources published between 2015 and 2025 were included, with no limit to allow for comprehensive data saturation and thematic depth. The two states of Colorado and Kansas represent opposing political and legal approaches to medical cannabis, and hence, represent a useful legislative contrast concerning how legislation impacts physician perspectives and access to care. The populations to be represented in the studies were qualified to provide insight into the overlapping spheres of policy, practice, and patient care in the context of cannabis-based treatments due to their professional roles and responsibilities (administrators, policymakers, and MS physicians).

In alignment with purposive sampling and PRISMA protocols, inclusion criteria was used to screen studies for relevance and for quality (see Cardano, 2020). The

inclusion criteria was as follows: (a) Research must be concerning participants who are licensed medical doctors or specialists practicing in Colorado or Kansas, medical administrators, or policymakers; (b) The research must include findings relevant to MS treatment; and (c) the research must address cannabis use or legislation related to healthcare delivery. If one or more of the inclusion criteria were not met, the literature source was excluded. Literature was selected from interdisciplinary journals. These journals have published peer-reviewed studies in which healthcare policy, cannabis legislation, MS treatment, and provider or policymaker perspectives are addressed. A total of 17 sources were selected, which is consistent with recommendations for qualitative systematic reviews that allow for in-depth data analysis (see Braun & Clarke, 2006). Saturation was determined to be met when no new themes or relevant insights emerged from additional studies (see Braun & Clarke, 2014). To pinpoint qualified sources, multiple academic databases were searched using keywords derived from the research questions and a documented screening process outlined in the PRISMA flow diagram.

Instrumentation

Following Mashuri's (2022) recommendations for structured qualitative data gathering, a systematic review was used to collect data from published studies that concern policymakers', administrators', and MS physicians' experiences, perspectives, and other factors related to cannabis use for MS treatment. Systematic reviews are a gold standard for including and synthesizing qualitative evidence in such a way that is trustworthy, documented and focused on the research question while allowing for a broad

understanding of the topic across varied contexts. Braun and Clarke's (2014) thematic analysis framework was used to guide the development of the data extraction tool, which was designed to capture relevant findings from selected studies that address legislative, clinical, and patient-related experiences in the context of medical cannabis for MS.

The data extraction tool was a structured form developed by PRISMA and was aligned with the research questions and theoretical framework. The tool was also designed to capture relevant narrative findings from each included study. NVivo is a computer-assisted qualitative data analysis (CAQDAS) tool that helps researchers organize and manage qualitative data—including unstructured text and other materials—and supports coding, querying/retrieval, and analytic visualization to identify patterns and develop themes in the dataset (Dhakal, 2022; QSR International, 2013; Wong, 2008). This provided a structured protocol to gather detailed findings related to the research question from each eligible source. See the appendix for the PRISMA guidelines. The extraction process involved identifying narrative data relevant to physician perspectives, administrative challenges, policy interpretations, and possible disparities in access. I followed PRISMA guidelines so that the selection, screening, and reporting of sources are systematic and transparent. Following the PRISMA guidelines includes documenting the identification, screening, eligibility, and inclusion stages of literature selection. A PRISMA flow diagram was created and used to visually represent the number of records identified, included, and excluded, along with reasons for exclusions at each stage. Additionally, I used PRISMA's checklist (See appendix) to report objectives, search strategies, selection criteria, data extraction methods, and

synthesis of findings (. Following Braun and Clarke's (2014) and Mashuri's (2022) recommendations, the systematic review themes and categories were reviewed by university committee members to make sure that the tool is valid and neutrally structured. This minimized potential bias in the data collection process. Finally, each study included in the review was examined for contextual information such as participant background, years of experience, and familiarity with cannabis policy, which was recorded during data extraction and used to contextualize the themes. The method was aligned with interest group theory because it allowed for the identification of how organized interests, such as medical professionals, administrative institutions, and policy advocates, form and are influenced by cannabis policy outcomes in each state. By thematically analyzing stakeholder perspectives and systemic barriers, I explored how competing interest groups influence legislative decisions and healthcare access in the context of MS treatment.

To guide the initial coding process, a preliminary framework was developed based on key tenets of interest group theory, which included evidence of stakeholder advocacy, political alignment, institutional influence, and regulatory resistance. The codes used were tied to the research questions by flagging narrative data that reflect physicians' perceived roles in policy change, administrative obstacles to cannabis access, and state-specific interest group dynamics. The six steps of Braun and Clarke's (2014) six-phase approach was used, which included familiarization with the data, generation of initial codes, reviewing and defining themes in alignment with IGT concepts, and synthesizing the findings to reveal how organized interests have shaped MS cannabis treatment policy in Colorado and Kansas. First, I became immersed in the data to gain a

deep understanding of the content. Next, initial codes were generated, in which meaningful aspects of the data relevant to the research questions and theoretical framework were systematically identified and labeled. Next, I searched for themes by grouping codes into broader patterns, reviewed themes for coherence and consistency, defined and named the themes to clearly articulate their significance, and finally, created the report. The writing of the final report involved linking the themes back to the research questions, IGT, and the literature.

Procedures for Data Collection

Article Selection Procedures

Through purposive sampling, I identified sources that are deemed eligible for inclusion based on predefined criteria, so that each study included was relevant to the research questions and purpose (Etikan et al., 2016). Following the PRISMA guidelines, I conducted structured searches across multiple academic databases and applied clear inclusion and exclusion criteria to screen sources. PRISMA is a standardized framework used to ensure transparency and completeness in reporting systematic review methods and findings (see PRISMA, 2020). Key words directly relating to the research questions were used. The selection process was reported in a transparent manner using a PRISMA flow diagram (see Figure 1). The flow diagram was used to record the number of records identified, screened, excluded, and included at each stage. Also, in support of the selection process, a data extraction form was used that outlined the study's purpose, target population, research focus, and relevance to cannabis legislation and MS treatment.

Figure 1*PRISMA Flow Diagram*

Identification	Records identified through database searching (e.g., PubMed, PsycINFO, CINAHL, Scopus): $n = 485$ Keywords: 'Multiple Sclerosis', 'medical cannabis', 'policy', 'Kansas', 'Colorado' Filters: English, Peer-reviewed, 2015–2025
Screening	Records after duplicates removed: $n = 410$ Records screened by title and abstract: $n = 410$
Eligibility	Full-text articles assessed for eligibility: $n = 105$ Inclusion Criteria: - Physician, policymaker, or admin in KS/CO - MS treatment focus - Cannabis-related policy or care Excluded: Not specific to MS or cannabis policy, irrelevant population
Included	Studies included in qualitative synthesis: $n = 22$
Additional Sources	Legislative records from Kansas and Colorado included: $n = 12$
Final Sample	Total sources in final analysis: $n = 34$

Each research article that is included was evaluated for fit using a checklist according to the research criteria, such as geographic focus on Colorado or Kansas, data derived from MS physicians, administrators, or policymakers, and thematic relevance to the intersection of legislation and healthcare. Seventeen sources were selected, based on qualitative researchers' recommendations for achieving sufficient variation in findings while maintaining a manageable dataset for in-depth thematic analysis (Braun & Clarke, 2006). Selection was continued and performed by expanding search terms or databases, if needed, until 17 qualifying sources (Clarke & Braun, 2014; Mashuri, 2020; Peoples, 2020) are found to analyze. To ensure transparency and access to full study details, I maintained written documentation of publication information.

The PRISMA diagram was used in this study to transparently outline the process of identifying, screening, and selecting literature related to physician perspectives on medical cannabis access for MS treatment in Kansas and Colorado. It aligned with the study's central problem by ensuring a rigorous synthesis of evidence concerning legal and healthcare disparities. While PRISMA is widely used for systematic reviews, its application in policy-focused, theory-informed research remains underexplored, a gap this study addressed. By integrating PRISMA with a social justice framework, the study extended its utility beyond methodology to inform policy analysis. This approach enhanced both transparency and theoretical alignment in examining healthcare access across differing state legal contexts. The integration was grounded in the purpose of the study, which was to explore how policy and administrative barriers affect access to medical cannabis for MS treatment, framed through the lens of the Interest Group Theory.

Data Collection Procedures

Following PRISMA 2020 guidelines, the data collection process began after the initial screening checks were completed and after the institutional review board (IRB) approved the study design. The Walden IRB approval for this study was granted on August 26, 2025 (IRB approval number 08-26-25-0174660).

During the stage of full-text review, I examined each article to extract all the relevant data that was deemed to be aligned with the research question. Each study was thus systematically reviewed, and a structured data extraction form was used to ensure consistency during the process (Mashuri, 2022). I looked for patterns in the data that

revealed how administrative and policy-related factors influenced physician perspectives and access to medical cannabis for MS treatment in Kansas and Colorado. The form included predefined categories related to the research aims, such as: a) physician experiences with MS treatment and cannabis use, b) the role of state-level legislation in shaping patient access, c) perceived challenges in advocating for cannabis-based treatment among administrators, and d) differences in cannabis policy between Kansas and Colorado. These categories were applied to the IGT framework by interpreting each element of the data extraction and reflecting how various interest groups influence policy, perceptions, and access to cannabis treatment. The data extracted reflected physician, administrator, and policymaker perspectives on cannabis access for MS treatment, which aligned directly with the research questions that are focused on administrative and policy-related factors. The findings were interpreted through the lens of Interest Group Theory to understand how organized interests influence legislative decisions, so that there is a connection between the data, theory, and research questions. Interest Group Theory is based on the assumption that public policy outcomes are shaped by competing organized groups seeking to influence legislation and regulation in their favor.

Furthermore, data was extracted that relates to proposed solutions or policy recommendations discussed in the included literature. As the data extraction progressed, I revisited initially reviewed studies to maintain consistency in how findings were interpreted and categorized. The iterative process continued until all included studies had been thoroughly examined and no new themes emerged. To protect the integrity and traceability of the review, each study was assigned an identification number, and all

extracted data was organized by each source. The final dataset was uploaded into NVivo for coding and thematic synthesis following Braun and Clarke's (2014) six-step analysis.

Data Analysis Plan

The data analysis plan followed Clarke and Braun's (2014) six-step thematic analysis for qualitative researchers. The goal of the analysis was to identify key themes and patterns in the literature regarding the legal and administrative policies that shape cannabis access for MS treatment in Kansas and Colorado, which I interpreted and used to answer the research questions. Clark and Braun's (2014) thematic analysis approach is a qualitative analytic method that focuses on identifying, analyzing, and reporting patterns, or themes, within data that specifically relate to and inform the research question. The data was interpreted through the lens of the IGT framework. Such a method helped understand the complexities of the legal, medical, and personal experiences of MS physicians in the context of cannabis treatment.

The first of the six steps involved becoming familiar with the data. To accomplish this, I reviewed the notes taken during the extraction of data during this stage. I began to make initial notes concerning each study's findings, which were coded and eventually inform potential themes (Clarke & Braun, 2014). Through this process, I identified themes and possible areas where findings converge or overlap.

The second step involved code generation and was critical for organizing the data into meaningful categories for further analysis, following Clarke and Braun's (2014) process. I assigned code words, in which segments of the transcript are assigned labels or codes that summarize the content, to pertinent phrases of data that can stand alone in their

essential meaning (Braun & Clarke, 2006). For example, a code was assigned to a passage in which barriers to accessing cannabis for MS treatment were described in findings, or in which views on the differences between cannabis laws in Kansas and Colorado were described. Codes were listed in the second column from the right, while verbatim phrases of interview data were listed in the first.

To ensure the process carried out was in alignment with IGT, the process of coding was guided by core concepts, which included the evidence of stakeholder influence, advocacy behavior, institutional power dynamics, and regulatory pushback. Codes were created by identifying key phrases or concepts in the data that reflect stakeholder influence, such as 'regulatory delay,' 'legislative lobbying,' or 'physician advocacy for reform.' The codes were used to connect to and show evidence of Interest Group Theory by revealing how organized groups shape policy through resistance, support, or strategic alignment with lawmakers. Initial codes included phrases such as *organized physician advocacy*, *administrative constraints*, *political resistance*, or references to specific lobbying efforts or legislative actors. Using Clarke and Braun's six-step process allowed the theory-based elements to be systematically identified while also allowing for possible inductive themes that were grounded in the literature. The thematic analysis was useful for connecting patterns across data sources that showed how different interest groups inform cannabis policy differently in Kansas versus Colorado. By applying IGT as an interpretive lens, I, through analysis, identified what themes exist and explained how the themes reflect the interactions and tensions between competing policy influencers.

Next, I searched for themes by reviewing codes and similarities within the data. Possible themes were listed as category words in the third column. These potential themes expressed as categories represented patterns that describe a significant aspect of the data about the research questions. In the context of the study, categories resembling possible themes were identified by grouping similar codes into overarching themes that reflect the research questions and the key factors influencing cannabis access for MS treatment.

I then reviewed and refined themes in the fourth column. This stage involved checking whether the identified themes accurately reflected the data and the research questions. I reviewed the data extracts within each category or potential theme to ensure coherence and that the data supported the theme rather than being a fabrication based on my bias. During this stage, the use of reflexivity was essential. Additionally, I chose to revisit the data and identify possible new themes that may have been overlooked in the initial stages.

The fifth step involved defining and naming the themes in the fifth column. Each theme was carefully defined through the writing of a narrative description, including supporting interview data evidence and quotes, to capture the theme's essence and significance within the context of the research. Hence, I developed and wrote clear definitions of each theme and how the theme answers the research questions and contributes to understanding the legislative differences between Kansas and Colorado regarding cannabis use for MS treatment. These narratives were used in the writing of the final report.

The final step involved writing the final report. The identified themes were compiled to construct a coherent narrative that answered the research questions. Chapter four, the results chapter, includes a description of the process used to collect and analyze the data and a presentation of the data and themes found. Chapter five of the report includes a discussion of themes as they informed the research question and can be understood or contextualized within existing empirical research, as well as regarding the significance of the findings.

Issues of Trustworthiness

Trustworthiness in qualitative research refers to the credibility, reliability, transferability, confirmability, and dependability of research (Cardano, 2020; Yin, 2012). Credibility is used to describe how accurate and believable the findings are. The use of PRISMA guidelines and the structured approach therein enhanced credibility (Yin, 2012). Transferability refers to the extent to which the findings can be applied to other research settings. Because I focused on MS physicians, policymakers, and administrators in Kansas and Colorado, as described through the literature sources selected, states with polarized cannabis policies, the findings are not generalizable to other states. However, they do represent findings possibly similar to those applicable to other states with similar polarized legal landscapes and thus may inspire legal considerations and future research concerning policy contributors and solutions. Dependability describes the stability of the data over time and under similar conditions. To improve dependability, I kept a clear audit trail of steps used that other researchers in similar contexts can replicate (Cardano, 2020; Yin, 2012). Finally, confirmability, which refers to the degree to which the

findings are shaped by the data rather than researcher bias, was improved by using bracketing, a process of journaling personal biases and preconceived notions to minimize their influence on data interpretation (Savin-Baden & Major, 2023).

Ethical Procedures

Ethical standards concerning the use of published literature was followed, which included accurate citations, respect for intellectual property, and adherence to standards of transparency, integrity, and accuracy in the collection, reporting, and interpretation of findings (U.S. Department of Health and Human Resources, 2022). I followed copyright and licensing guidelines when accessing and referencing articles and did not alter, misrepresent, or misinterpret any findings from the included studies.

Data is securely stored in my two-step authenticated NVivo account and will continue to be for the next five years following my study's publication and will be deleted thereafter. No confidential information was used, and any content requiring special permissions were excluded. Since recruitment of humans was not involved, nor was informed consent or personal identifiers used, there was no anticipated risk of harm to individuals. However, I remained committed to upholding ethical scholarship and ensured that the findings were used responsibly to inform more equitable and evidence-based healthcare practices.

Summary

Chapter three, the methodology chapter, included a description of the study's method, design, data collection, and analysis procedures for exploring factors affecting unequal medical cannabis access and legislation across states by examining Kansas and

Colorado through a systematic review of the literature. I used a qualitative approach based on a systematic review of the literature design to examine the factors influencing cannabis legislation in these two states, specifically focusing on cannabis use in treating MS patients. The use of this approach allowed me to gain in-depth information concerning the "how" and "why" aspects of the legislative process, which cannot be effectively captured through quantitative methods (Cardano, 2020).

The research question was framed to explore factors concerning the differential legal treatment of cannabis for MS treatment and to identify measures that can promote more equitable access across states. I used a systematic literature review following PRISMA guidelines for data collection and analysis. Moreover, Clarke and Braun's (2014) six-step thematic analysis, which was used to identify themes across the collected interview data, was used to understand the policies, practices, and perspectives that have shaped the legislative differences between states such as Kansas and Colorado, and possible solutions that could be used to contribute to a more equitable healthcare landscape concerning cannabis access for MS treatment. The chapter concluded with ethical considerations and measures to enhance trustworthiness.

Chapter 4: Results

The purpose of the qualitative study was to examine what, if any, obstacles physicians in Kansas and Colorado perceived concerning medical cannabis use for MS treatment, that interfered with equitable legal access to medical cannabis across states. The problem is that there is a lack of consistent and equitable legal access to medical cannabis across states, particularly for patients seeking MS treatment. To address this purpose, the following research questions were addressed:

RQ1: What administrative and policy-related factors do physicians perceive contributed to substantially different legal treatment of cannabis for MS treatment between Colorado and Kansas?

RQ2: What measures do physicians perceive may promote more equitable healthcare access across states concerning the use of cannabis for MS treatment?

Setting

Kansas and Colorado have contrasting legal and political environments; the two states have markedly different approaches to medical cannabis policy. Kansas has maintained one of the most prohibitive cannabis stances in the country, enforcing laws such as the Kansas Two-Step, which disproportionately targets individuals traveling from cannabis-friendly states and reflects broader resistance to reform (Kansas Cannabis Information, 2024; Orenstein & Glantz, 2020). Colorado, in contrast, has adopted a commercially driven legalization model, shaped in part by significant lobbying activity from both in-state and out-of-state stakeholders (Rotering & Apollonio, 2022). These settings are also influenced by broader contextual factors, including the ongoing opioid

crisis and recent federal court rulings affirming patients' rights to access cannabis for medical treatment (Chisari et al., 2020a; Martinez-Paz et al., 2023). Political polarization during the 2024–2025 election cycle and post-pandemic public health priorities likely shaped physician and policymaker perspectives documented in the literature (Savin-Baden & Major, 2023).

Demographics

Despite an extensive literature search, only a limited number of peer-reviewed studies were found that address provider perspectives on medical marijuana in Kansas and Colorado. Searches were conducted between August 27, 2025 and December 8, 2025 in the Walden University Library database, Liberty University Library Database, and Google Scholar. The search strategy used combinations of keywords including:

- *“medical marijuana” AND “Kansas”*
- *“medical marijuana” AND “Colorado”*
- *“provider attitudes” OR “physician perceptions” OR “healthcare provider views” AND “medical cannabis”*
- *“physician knowledge gaps” AND “medical cannabis”*
- *“medical marijuana policy implementation” AND (“Kansas” OR “Colorado”)*
- *“provider perspectives” AND “cannabis” AND (“Midwest” OR “Western states”)*

Search limits were applied to years 2015–2025 to reflect modern legislative and healthcare contexts. Although these searches yielded numerous studies on provider

attitudes in broadly legalized states (particularly Colorado), 17 articles met inclusion criteria relevant to provider perspectives, knowledge gaps, or policy implementation in Kansas, Colorado, or another U.S. state whose findings were theoretically applicable to other states. Among these, just a few focused specifically on Colorado physicians (e.g. Kondrad et al.), and none addressed provider perspectives uniquely within Kansas. The relative scarcity of Kansas-specific literature likely stems from the fact that Kansas did not adopt a medical marijuana program during much of this period, thereby limiting clinical exposure, provider engagement, and opportunities for empirical investigation.

The 17 studies published between 2015 and 2025 focused on Colorado, Kansas, and multistate or national samples. Six studies were conducted in Colorado, a state with early and comprehensive legalization of both medical and recreational cannabis, making it a valuable setting for examining provider attitudes and patient behaviors (Brooks et al., 2017; Ghosh et al., 2016; Hinckley & Hopfer, 2021; Kondrad & Reed, 2022; Richmond et al., 2015; Knapp & Jindal, 2020). These studies surveyed family physicians, internal medicine residents, and patients in safety-net health systems, providing insight into clinical decision-making in a permissive legal environment. Four studies focused specifically on Kansas, outlining physician concerns in a region where cannabis laws are more restrictive and politically contentious (see Kansas Medical Society, 2025) developing a health impact assessment of legalizing marijuana in Kansas (see Kansas Health Institute, 2015), and providing a review of medical marijuana to the Kansas Legislature (see Kansas Legislative Research Department, 2024; Kumberg, 2024). Several studies drew from national or multistate samples, including an extensive scoping

review of physician perspectives across specialties and legal environments (see Yusupov et al., 2024) and a cross-sectional study of primary care patients in Washington State (see Lapham et al., 2022). While the focus of this study is on Kansas and Colorado, additional studies from other states were included when they met the study criteria and were relevant to the research questions. No additional studies could be found from Kansas and Colorado. Demographic information about these studies is presented in Table 1 below.

Table 1*Articles Included in the Systematic Review*

Authors, Date	Population	Location	Methodology	Findings
Brooks et al., 2017	114 healthcare providers	Colorado	Cross-sectional survey using Venue-Day-Time sampling	Providers assessed marijuana use inconsistently; lacked confidence and requested training.
Ghosh et al., 2016	Regulatory policy documents in Colorado	Colorado	Literature review (non-systematic)	The study concluded that a structured public health framework—centered on assessment, policy development, and assurance—is essential for effectively regulating legalized marijuana in Colorado and protecting population health amid data gaps and emerging risks.
Groce, 2015	Not applicable (regulatory perspective)	Colorado	Regulatory commentary	Explored enforcement policy and emphasized need for physician conduct regulation.
Hinckley & Hopfer, 2021	Data related to adolescents, young adults, and pregnant women	Colorado	Literature review (non-systematic)	Colorado’s marijuana legalization has led to measurable public health impacts, including increased THC potency, expanded dispensary access, and a rise in unintentional pediatric exposures and emergency department visits.
Kansas Health Institute, 2015	General Kansas population	Kansas	Health impact assessment	The Kansas HIA concludes that medical marijuana legalization could have mixed or uncertain public health effects, with many outcomes depending on how regulations are structured.

Authors, Date	Population	Location	Methodology	Findings
Kansas Legislative Research Department, 2024	Not applicable (regulatory perspective)	Kansas	Regulatory commentary	Many stakeholders emphasized that, were Kansas to adopt medical marijuana, it would require a robust regulatory framework including licensing, clear statutory definitions (e.g. qualifying conditions, license caps, product labeling/packaging, testing), and oversight of production and distribution.
Kansas Medical Society, 2025	Physician stakeholders	Kansas	Policy brief	Outlined physician concerns regarding safety, youth exposure, and lack of standardization.
Knapp & Jindal, 2020	41 internal medicine residents	South Carolina	Cross-sectional survey	Most residents support medical marijuana use but lack training and confidence.
Kondrad & Reed, 2022	235 family physicians	Colorado	Survey (follow-up to 2011 study)	Support for recreational use grew; recommendation practices remained unchanged.
Kumberg, 2024	Kansas policymakers, public health officials, and healthcare stakeholders	Kansas	Testimony provided to Special Committee convened as an interim legislative body	Concluded that while public support for medical cannabis is strong, lawmakers and healthcare professionals remain divided, citing the need for a robust regulatory framework, clearer provider roles, and further evidence to address safety, legal, and implementation concerns before advancing legislation.
Lapham et al., 2022	1,688 primary care patients	Washington State	Survey with EHR comparison	Medical cannabis use underreported in EHRs; patients used more than records showed.
Richmond et al., 2015	2,030 SBIRT-screened patients	Colorado	Secondary data analysis using SBIRT tools	Medical cannabis users reported higher marijuana use but lower use of other substances.

Authors, Date	Population	Location	Methodology	Findings
Yusupov et al., 2024	Data from 41 U.S. studies involving physicians and trainees	United States (national)	Scoping review	Widespread provider knowledge gaps and varying comfort with medical cannabis, including in Kansas and Colorado.
Mallinson & Hannah, 2020	State medical marijuana laws	United States (multi-state)	Policy analysis of medical marijuana laws	Identified policy and political learning shaping cannabis regulation across states, including Colorado.
Philpot et al., 2019	62 primary care providers	Minnesota	Electronic survey	Providers generally supported cannabis but were hesitant and desired further education.
Ronne et al., 2021	Physicians from 21 international studies	Global (U.S., Canada, Israel, EU)	Systematic literature review	Physicians cited patient demand, lack of confidence, and gaps in knowledge as barriers.
Voth, 2024	Expert testimony representing Kansas physicians	Kansas	Legislative testimony	Argued against legalization; cited weak evidence base and safety concerns.

Data Collection

I collected data from a total of 10 peer-reviewed articles, three policy reports, and four legislative testimonies that addressed physician attitudes, knowledge, policy perspectives, and regulatory conditions surrounding the use of medical cannabis for conditions such as MS and chronic pain (see Table 1). Data were collected through the National University Library website and Google Scholar using keywords like *Kansas*, *Colorado*, *medical marijuana*, *provider attitudes*, and *physician attitudes*. The articles identified provided data through three primary modes: (a) provider surveys ($n = 8$ studies), (b) patient surveys ($n = 2$ studies), and (c) policy analyses or expert testimony ($n = 7$ studies). Across the eight provider-focused studies, data were drawn from over 700 individual providers, including family physicians, internal medicine residents, and general practitioners, primarily located in Colorado, Kansas, Minnesota, Missouri, South Carolina, and national samples across the United States. Two patient-focused studies included survey data from over 3,700 patients in Colorado and Washington State. The seven policy sources provided narrative and legislative testimony reflecting broader political and regulatory perspectives rather than individual-level data.

All data collected represented the time span between 2015 and 2025, with each study typically conducting cross-sectional surveys ranging from two weeks to several months, depending on sample size and methodology. For instance, Philpot et al. (2019) conducted their provider survey over a two-week window using electronic methods, while Richmond et al. (2015) relied on secondary analysis of Screening, Brief Intervention, and Referral to Treatment (SBIRT) data collected across clinical sites. They

collected data through standardized survey instruments, structured questionnaires, electronic health record (EHR) comparison tools, and thematic coding for policy analysis and reviews. Rønne et al. (2021) and Yusupov et al. (2024) used systematic and scoping review methodologies aligned with PRISMA guidelines, extracting and synthesizing data from dozens of primary sources.

There were no deviations from the data collection plan presented in Chapter 3, as the literature review followed a structured and systematic search and coding strategy. However, there was some difficulty in identifying articles specific to Colorado and Kansas. This meant relevant articles using data from other states were included in the review, and 17 articles were included rather than 20. Google scholar with Boolean phrases were used as a supplemental literature identification tool to enhance the precision and comprehensiveness of the article search process to increase the number of included articles. The platform's search capability enabled the identification of three additional peer-reviewed studies related to medical cannabis policy, provider perspectives, and health system implementation in Colorado and Kansas between 2015 and 2025. A review of the online Library of Congress found two documents reviewing legislative testimony in Colorado and two in Kansas.

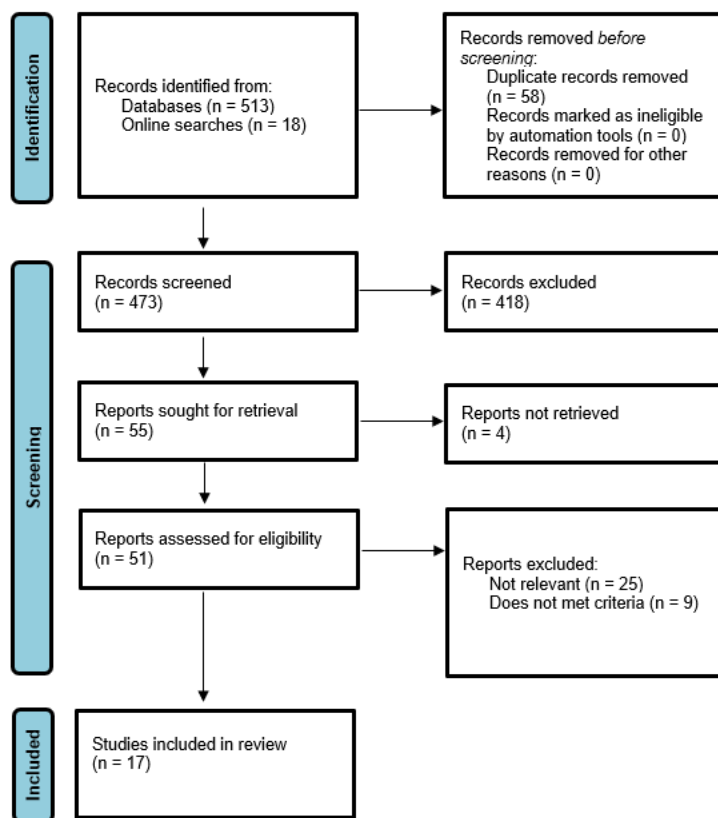
An additional minor variation was the inclusion of expert testimony, which was not anticipated in the original plan as a primary source type, provided insights into physician concerns and legal discourse in Kansas and Colorado—thus enriching the administrative and policy-related dimensions of RQ1. It was particularly difficult to locate empirical studies or provider-level data specific to Kansas, likely due to the state's

restrictive cannabis laws and limited implementation infrastructure. As a result, the pieces of testimony served as valuable data points reflecting Kansas-specific perspectives. No other unusual circumstances were encountered during data collection.

Figure 2 shows a PRISMA diagram of the data collection process.

Figure 2

PRISMA 2020 Flow Diagram



Data Analysis

An inductive thematic analysis was conducted manually, using NVivo software to systematically organize the data from the 17 included articles. The analytic process began with repeated close readings of each article to become familiar with the content and context. Relevant data excerpts related to the research questions were imported into NVivo and open-coded line by line. Initial codes captured descriptive information such as "provider confusion," "state-level restriction," "training interest," and "documentation gap," and were applied directly to the text segments. NVivo's AI coding feature was initially used to create open codes throughout the documents included in the review. I then reviewed the articles, added additional codes, removed coded passages that had been misinterpreted by the AI feature, and tailored the codes NVivo identified to be more aligned with their own thinking.

As coding progressed, the codebook evolved through an iterative process. Codes were continually refined—some merged, others split—as additional patterns and relationships became evident across articles. For example, the Policy Learning and National Standards themes were initially two separate themes that were combined when it became clear they were interrelated. This phase involved constant comparison, where each new coded segment was assessed against existing codes to maintain conceptual clarity and reduce redundancy. See Table 2 for more information about the coding scheme.

Next, related codes were grouped into broader categories that reflected conceptual linkages, such as administrative barriers, clinical decision-making influences, and

systemic policy environments. NVivo's node structure and memo features were used to document decisions about grouping and reorganizing codes. From these categories, higher-level themes emerged that synthesized meaning across sources and aligned with the study's research questions. For example, the category of administrative barriers included codes such as “policy inconsistency,” “liability concerns,” and “lack of federal guidance.” The category of clinical decision-making influences drew from codes like “provider uncertainty,” “training needs,” and “specialty-based skepticism.” Table 2 below describes the codes, categories, and themes. These themes are presented in the Results section below.

Table 2*Codes, Categories, and Themes*

Codes	Category	Theme
Policy inconsistency; Liability concerns; Lack of federal guidance	Administrative Barriers	Legal Environment and Provider Confidence (RQ1)
Fear of sanction; Malpractice liability; Legal consequences	Professional Risk	Legal Environment and Provider Confidence (RQ1)
State-level variation; Political opposition; Medical board oversight	Institutional Climate	Legal Environment and Provider Confidence (RQ1)
Lack of formal training; No CME opportunities; Limited clinical guidelines	Educational Deficits	Policy-Driven Knowledge Gaps (RQ1)
Primary care uncertainty; Psychiatry skepticism; Oncology openness	Specialty-Based Perspectives	Policy-Driven Knowledge Gaps (RQ1)
Limited research; Conflicting studies; Need for randomized trials	Evidence Base Concerns	Policy-Driven Knowledge Gaps (RQ1)
Skepticism of efficacy; Concerns over recreational spillover; Ethical reservations	Philosophical Beliefs	Discrepant Views and Professional Division (RQ1)
Documentation gaps; State-by-state variation; Equity of access	Systemic Policy Environments	Discrepant Views and Professional Division (RQ1)
Provider uncertainty; Training needs; Specialty-based skepticism	Educational Needs	Standardized Education as a Foundation for Access (RQ2)
Knowledge of drug interactions; Ability to counsel patients; Comfort with dosing	Clinical Preparedness	Standardized Education as a Foundation for Access (RQ2)
Missing patient-reported cannabis use; Lack of standardized fields; Under-documentation	EHR Limitations	Documentation and Communication Gaps (RQ2)
Fear of stigma; Selective disclosure; Normalization of use	Patient Disclosure	Documentation and Communication Gaps (RQ2)

Codes	Category	Theme
Gaps in interdisciplinary communication; Lack of referral pathways; Inconsistent follow-up	Care Coordination	Documentation and Communication Gaps (RQ2)
Learning from other states; Adaptation of successful models; Political learning	Policy Diffusion	Policy Learning and National Standards (RQ2)
Need for federal standards; CME requirements; Baseline provider preparedness	National Guidelines	Policy Learning and National Standards (RQ2)
Unequal access across states; Vulnerable patient populations; Rural vs. urban disparities	Equity Concerns	Policy Learning and National Standards (RQ2)

Discrepant or contradictory data—such as outlier cases in which provider perspectives conflicted with regional policy norms—were deliberately examined and coded as part of the same analytic framework. Rather than being excluded, these cases challenged preliminary interpretations and ensured that final themes reflected the diversity and complexity of perspectives across geographic and professional contexts. The analysis continued until thematic saturation was reached, with no new codes or categories emerging from the final reviewed articles. This ensured that the themes reported in the findings chapter were grounded in a thorough and consistent coding process supported within NVivo.

Data were collected until saturation was reached. Data were determined to be saturated as no new codes were produced when coding the last two documents, as described in Creswell and Poth (2023). Using a constant comparison approach, each new data segment was evaluated against previously coded material, and no additional concepts emerged during the review of these final sources. All identified codes and themes were consistently represented across the data set, indicating that saturation had been achieved (Creswell & Poth, 2023).

Evidence of Trustworthiness

The strategies described in Chapter 3 to ensure trustworthiness were implemented throughout data analysis and interpretation, following Lincoln and Guba's (1985) criteria, outlining that trustworthiness in qualitative studies is made up of credibility, transferability, dependability, and confirmability. No significant deviations occurred, though minor adaptations were made to enhance the process as noted below.

Credibility

Credibility was supported through triangulation of data sources and iterative coding procedures, as described in Chapter 3. Peer-reviewed studies, policy reports, and expert testimony were analyzed using NVivo to identify themes across diverse perspectives and jurisdictions systematically. Each source was reviewed multiple times to ensure accurate representation of meaning, and analytic memos were used to document reflections and decisions during coding. As planned, discrepant perspectives—such as provider skepticism in restrictive policy environments—were retained to challenge emerging patterns and strengthen internal validity (Lincoln & Guba, 1985). This commitment to methodological rigor supported the authenticity and plausibility of the findings.

Transferability

Transferability was addressed by including detailed contextual information about each of the 17 articles in a structured table outlining participants, location, methodology, and key findings (see Table 1). This enables readers to assess the applicability of results to other settings. A thick description was used throughout the reporting process, consistent with Lincoln and Guba's (1985) recommendation that researchers provide sufficient detail for others to determine transferability. No changes were made to the strategy outlined initially.

Dependability

To ensure dependability, the coding and analysis process was systematically documented in NVivo, providing a clear audit trail as described in Chapter 3. Updates to

the codebook were tracked to reflect evolving interpretations. While the original plan included descriptive frequency counts for codes, this approach was refined to prioritize conceptual coherence over quantification. The rest of the dependability strategy was followed as proposed, ensuring the study process could be replicated and evaluated for consistency (Lincoln & Guba, 1985).

Confirmability

Confirmability was addressed by maintaining neutrality and transparency throughout the analysis. As outlined in Chapter 3, findings were grounded in the data and supported by detailed coding summaries and exported NVivo outputs, constituting an audit trail. Researcher reflexivity was practiced throughout the analytic process by memoing biases, questions, and interpretive decisions. By integrating negative or contradictory cases and systematically organizing all evidence, the study upheld Lincoln and Guba's (1985) standard for confirmability, ensuring that the data, rather than researcher preconceptions, shaped interpretations.

Results

This section presents the findings from the thematic analysis of 17 documents, including peer-reviewed research articles, policy briefs, and legislative testimony. Two research questions guided the analysis. Findings are organized by research question and theme, with unedited quotes from source materials presented as evidence. Discrepant perspectives are addressed within each section. Six major themes emerged from the data analysis. Those themes are discussed in the sections below.

Research Question 1

What administrative and policy-related factors do physicians perceive contributed to substantially different legal treatment of cannabis for MS treatment between Colorado and Kansas? Themes related to Research Question 1 include legal environment and provider confidence, policy-driven knowledge gaps, and discrepant views and professional divisions.

Legal Environment and Provider Confidence

A common theme found in all the data was that the legal and regulatory environment appeared to be strongly linked to physician behavior and comfort in discussing cannabis. In Colorado, where medical and recreational marijuana are legalized, physicians were seen as likely to engage in discussions with patients. However, confidence remained a concern. Brooks et al. (2017) noted, “Few providers felt completely knowledgeable about marijuana health risks and lacked confidence talking to patients about this issue” (p. 6)

In contrast, physicians practicing in Kansas were embedded in a restrictive legal environment that discouraged participation and endorsement of cannabis as a treatment option. Dr. Eric Voth (2024), representing the Kansas Medical Society, voiced explicit opposition: “The net effect of this legislation is to take advantage of sick and suffering Kansans with the false hope of marijuana as a near miracle medicine. Every state that has ultimately legalized marijuana has approved medicinal marijuana” (p. 1). His testimony characterized the legalization proposal as deceptive and medically unfounded, illustrating

how state-level policy shapes clinical practice, physician advocacy, and public testimony. This characterized the contentiousness of the medical marijuana debate.

The provider confidence and engagement variation between states like Colorado and Kansas reflected broader administrative differences. Legal protection and structured regulation in Colorado provided a framework in which physicians could discuss cannabis use more freely, even if hesitantly. In Kansas, the absence of a regulatory infrastructure and strong institutional resistance contributed to physician disengagement and fear of liability.

Across the data, this pattern was corroborated by multiple sources in permissive and restrictive contexts. Agreement came from Colorado- and Minnesota-based studies linking policy latitude with greater provider engagement but lingering hesitancy (Brooks et al., 2017; Philpot et al., 2019; Kondrad & Reed, 2022), while policy briefs and testimony from Missouri and Kansas reflected how restrictive or contested environments depress clinical dialogue (Kansas Medical Society, 2025; Voth, 2024). A partial counterpoint is that legalization alone did not uniformly translate into recommendations (Kondrad & Reed, 2022), and regulatory commentary suggested that strong oversight—not permissiveness per se—can also shape physician behavior (Groce, 2015).

Policy-Driven Knowledge Gaps

Physician knowledge gaps were evident across all environments but were particularly pronounced in restrictive policy contexts. These gaps were often attributed to both inadequate training and ambiguous legal guidance. In a nationwide synthesis, Rønne et al. (2021) reported, “Physicians specialized in addiction treatment may mainly

experience the adverse health effects from recreational use of cannabis, which possibly gives rise to their scepticism” (p. 20). In both Colorado and Kansas, this finding by Rønne et al. (2021) reflects broader provider attitudes shaped by local policy environments.

In Colorado, where medical and recreational marijuana have been legalized for over a decade, providers working in addiction medicine and psychiatry have reported concerns about increased cannabis-related hospitalizations, youth use, and comorbid mental health conditions (Ghosh et al., 2017). This aligned with Rønne et al.’s observation that clinical exposure to negative outcomes can heighten physician skepticism even in legal states. Conversely, in Kansas, where medical marijuana remains illegal, many providers’ perspectives were influenced not by clinical exposure but by policy uncertainty and lack of standardized education, which reinforced caution and hesitancy toward legalization (Kansas Legislative Research Department, 2025; Voth, 2024). Therefore, across both states, differing levels of legalization have produced distinct yet parallel patterns of provider skepticism. In Colorado this is demonstrated through observed health effects and in Kansas through policy-driven apprehension and limited clinical experience.

The Kansas Legislative Research Department (2024) also reported that “as a nurse, [the president of the Kansas Cannabis Coalition] stated she educates professionals and patients on how to use cannabis safely and discussed some common misunderstandings regarding the therapeutic benefits of cannabis and the types of relief it may provide” indicating that there are remaining misconceptions that need to be

assuaged. The October 28, 2024 testimony to the Kansas Special Committee on Medical Marijuana also discussed how policy uncertainty perpetuates knowledge gaps among both policymakers and healthcare professionals. The testimony highlighted that much of the evidence used in Kansas policy discussions is “very dated (para. 4)” and that modern, prospective clinical trials are needed to evaluate medical cannabis as a therapeutic option. This lack of updated research, combined with Kansas’s prohibitionist legal framework, has created an environment in which policy advances outpace empirical understanding and providers remain without evidence-based guidance. As the testimony points out, the absence of accessible, contemporary data leaves stakeholders reliant on outdated studies or anecdotal evidence, reinforcing misconceptions and limiting informed legislative debate.

Even in Colorado, where cannabis is legal and integrated into some clinical workflows, knowledge gaps persisted. Brooks et al. (2017) indicated that “providers assessed marijuana use inconsistently” (p. 6), which may result from a lack of standardized education or clinical protocols. This suggested that policy change alone is insufficient without accompanying investments in provider education and support.

The findings across these sources indicated that administrative policies can either reinforce or alleviate provider uncertainty, depending on how well those policies are accompanied by educational infrastructure and institutional clarity. Convergent evidence for widespread knowledge gaps and uncertainty appears in provider and trainee samples as well as reviews (Knapp & Jindal, 2020; Philpot et al., 2019; Brooks et al., 2017; Yusupov et al., 2024; Rønne et al., 2021). Agreement spans specialties and

jurisdictions—studies consistently note limited guidance on dosing, interactions, and indications, which interacts with policy ambiguity to dampen provider confidence (Philpot et al., 2019; Rønne et al., 2021; Yusupov et al., 2024). A qualifying perspective was that regulatory emphasis on standard-of-care obligations can mitigate uncertainty via professional norms (Groce, 2015), whereas restrictive policy stances may amplify it (Voth, 2024), indicating the gap is policy-sensitive rather than purely educational.

Discrepant Views and Professional Division

Not all physicians in permissive states viewed legalization as sufficient justification for recommending cannabis. Kondrad and Reed (2022), in a follow-up study of Colorado physicians, found that:

This study affirms that, even as the regulatory landscape shifted from 2011 to 2020, the increasing number of permitted medical uses of medical marijuana and permission of recreational marijuana use has not led to decreased perception of the risks of marijuana use or increased formal recommendation of marijuana to patients by family physicians. It does seem to have led to greater support for the legalization of recreational marijuana and the deregulation of marijuana.” (p. 109).

However, not all practitioners in restrictive states like Kansas voiced opposition to medical marijuana. The Kansas Legislative Research Department (2025) reported that “the Executive Director of the Kansas Medical Society (KMS) spoke to the Committee, stating KMS continues to be in opposition to the legalization of medical marijuana. She stated KMS believes more evidence of medical efficacy is needed” (p. 7). In the same

brief, however, it was reported that “The President of the Kansas Cannabis Coalition, a registered nurse, provided testimony to the Committee in support of medical marijuana” (p. 7).

Multiple sources documented substantive professional divergence, including within permissive (Kondrad & Reed, 2022) and restrictive (Kansas Legislative Research Department, 2025) states and across specialties (Rønne et al., 2021; Yusupov et al., 2024). Agreement with the “division” pattern was evident where primary care/oncology tend to be more open while addiction/psychiatry express greater skepticism (Rønne et al., 2021; Yusupov et al., 2024). Hinckley & Hopfer (2023) also reported that policy liberalization in Colorado has outpaced scientific evidence, leaving “clinicians and researchers...to develop scientifically based responses and provide evidence to guide future policy and regulation.” This framing indicated that the rapid expansion of marijuana access has occurred without clear, evidence-based clinical guidance, contributing to hesitation among providers to discuss or recommend cannabis. The authors noted that this lack of evidentiary support “likely contributes to many parents’ and providers’ discomfort in talking to adolescents about the consequences and health effects of marijuana use” (para. 8).

Countervailing perspectives from policy and testimony (Kansas Medical Society, 2025; Voth, 2024) highlighted principled opposition despite legalization trends, while regulatory commentary (Groce, 2015) emphasized conduct standards rather than attitudinal change—together demonstrating that professional division persists beyond legal status. This finding demonstrated that legalization may shift attitudes but does not

necessarily translate into clinical practice changes. In Kansas, the opposite pattern emerged: even in the face of growing national support for medical cannabis, professional associations maintained formal opposition. Dr. Voth (2024) warned of “toxic forms of cannabis that are proposed in this legislation” and stated that high-potency cannabis was “frankly toxic,” reinforcing the strength of resistance in nonlegal states (p. 2). These discrepant views highlighted the role of deeply held beliefs, specialty norms, and political context in shaping how physicians engaged with cannabis policy, regardless of the legal status in their state.

Influence of Organized Stakeholder Groups on Policy Outcomes

The Interest Group Theory (IGT) was used to understand the influence of organized stakeholder groups on policy outcomes. The IGT provided an analytical framework for examining how organized stakeholder groups shaped policy development through advocacy, negotiation, and agenda setting. According to IGT, policymaking is influenced by a range of organized interests that compete to ensure their preferences are reflected in legislation and regulatory structures (Truman, 1951; Mortensen et al., 2019). In the context of medical cannabis policy, these stakeholder groups include professional medical associations, law enforcement organizations, patient advocacy coalitions, and emerging industry representatives. Each group contributed to the policy process by framing issues, mobilizing support, and influencing legislative priorities.

In Colorado, the alignment of public health advocates, policymakers, and regulated industry groups supported the implementation of a framework that expanded access to medical cannabis while establishing systems for oversight and safety. This

collaboration reflected how coordinated stakeholder engagement can facilitate policy outcomes that integrate both clinical and economic considerations (Ghosh et al., 2017). In Kansas, by contrast, legislative deliberations have been shaped by sustained opposition from professional medical societies and law enforcement associations, which have emphasized public safety concerns and insufficient evidence regarding efficacy and regulation (Kansas Legislative Research Department, 2025; Voth, 2024). These dynamics illustrated how variations in stakeholder alignment, institutional access, and agenda framing can contribute to differing policy outcomes across states with similar public interest pressures.

Through the lens of IGT, the influence of these organized groups was observed in how evidence, risk, and need are defined within policymaking discourse. Interest groups not only informed legislative agendas but also shaped perceptions of legitimacy regarding medical cannabis research and practice. In this context, both Colorado and Kansas demonstrate the importance of stakeholder coalitions in determining how evidence was operationalized in law. While Colorado's established coalitions facilitated a structured regulatory framework, Kansas's fragmented stakeholder environment has maintained a more cautious legislative posture. Together, these cases underscore that policy formation is a negotiated process shaped as much by organized influence as by scientific consensus.

Research Question 2

What measures do physicians perceive may promote more equitable healthcare access across states concerning the use of cannabis for MS treatment? Themes related to

Research Question 2 include standardized education as a foundation for access, documentation and communication gaps, and policy learning and national standards.

Standardized Education as a Foundation for Access

Physicians and policymakers consistently emphasized the need for structured, evidence-based education to support informed decision-making and equitable access to cannabis treatments. This included the collection and sharing of data to inform decisions. Knapp & Jindal (2020) found that among internal medicine residents, “approximately 80% of the participants in our survey wanted more education on marijuana use to inform them further” (p. 3). Similar educational gaps have been reported among Colorado physicians, where legalization occurred ahead of formal provider training or clinical guidelines, leaving many uncertain about dosage, interactions, and qualifying conditions (Ghosh et al., 2017). In Kansas, where medical marijuana remains prohibited, this absence of structured education perpetuates uncertainty and limits readiness to engage in clinical conversations should legalization occur (Kansas Legislative Research Department, 2025; Voth, 2024).

This desire was not limited to trainees. Philpot et al. (2019) similarly reported that a majority of practicing providers "wanted to learn more about [medical cannabis]" and that "one-half of providers were not ready or did not want to answer patient questions about medical cannabis" (p. 5). This parallels provider hesitancy in Kansas, where clinicians have expressed discomfort in addressing patient inquiries without clear statutory or medical board guidance (Voth, 2024), and in Colorado, where providers continue to report variable comfort levels despite years of legalization due to evolving

product formulations and patient-driven use (Ghosh et al., 2017). The lack of confidence in clinical dialogue suggests that training is an equity issue regarding geographic access and ensuring informed care across all providers.

Findings from broader reviews reinforced this theme. Rønne et al. (2021) noted that "most physicians experience a lack of knowledge of beneficial effects, adverse effects, and of how to advise patients" (p. 1). In Colorado, these gaps have translated into inconsistent patient education and variation in how providers integrate cannabis discussions into care (Ghosh et al., 2017), while in Kansas, they underscored the structural inequities of a system where clinical knowledge cannot develop in the absence of a regulated medical framework (Kansas Legislative Research Department, 2025; Voth, 2024). Collectively, these findings demonstrated that while provider knowledge deficits are widespread, their consequences differ by policy context—manifesting as clinical inconsistency in Colorado and informational exclusion in Kansas.

Building on this, Ghosh et al. (2016) emphasized the need for data-driven policy development as a cornerstone of effective marijuana regulation, rather than relying on opinions – even those of experts. The authors said, “Particularly important lessons learned include the thoughtful collection of baseline marijuana use data through population-based surveys before legalization and the timely development of public health campaigns for youth prevention and responsible use for adults” (para. 42).

The Kansas Health Institute also highlighted the need for data-driven decisions. The impact report indicated that Kansas Department of Health and Environment could consider identifying evidence-based practices that keep health care providers accountable

to the types of prescriptions/recommendations they make for medical marijuana such as Kansas Tracking and Reporting of Controlled Substances (K-TRACS)” (p. 4). This recommendation focused on the need to collect and share high-quality data.

Support for formal training, functional data, and clear guidance is broad, spanning trainees, practicing clinicians, and review syntheses (Brooks et al., 2017; Ghosh et al., 2016; Kansas Health Institute, 2015; Knapp & Jindal, 2020; Philpot et al., 2019; Yusupov et al., 2024; Rønne et al., 2021). Agreement centered on the need for CME, dosing/interaction guidance, and counseling skills as prerequisites for equitable, consistent care (Knapp & Jindal, 2020; Philpot et al., 2019; Yusupov et al., 2024). A dissenting policy view argued that safety concerns outweigh the benefits of expanding training absent stronger evidence (Voth, 2024), highlighting that education alone may be insufficient without parallel evidence standards and safeguards. Due to an overall lack of information on the effects of medical marijuana, Ghosh et al. (2016) indicated that data should be used to inform policy decisions, rather than relying on perspective.

Documentation and Communication Gaps

Another significant barrier to equitable access was the inconsistency between patient self-reported cannabis use and formal documentation in medical records. In a study conducted in Washington State, Lapham et al. (2022) found, "This study demonstrated that most medical cannabis use is not documented in the medical record—EHR documentation missed 90% of patient self-reported cannabis use for health reasons (10.0% sensitivity equates to 90.0% of patient-reported medical use not documented)” (p. 8). This gap between self-reported and documented use is particularly relevant to

Colorado, where legalization has led to diverse forms of cannabis use, often without consistent disclosure to providers or integration into the electronic health record (Ghosh et al., 2017). Such inconsistencies complicate continuity of care and risk assessment, especially when patients use cannabis alongside prescribed medications. In Kansas, where medical marijuana remains illegal, documentation gaps present an additional barrier: patients may underreport use out of concern for legal or professional repercussions, while providers lack standardized screening tools or guidance to record cannabis-related discussions (Kansas Legislative Research Department, 2025; Voth, 2024).

This documentation gap not only impaired continuity of care but also limits the ability of health systems to track outcomes and safety related to cannabis use. The authors suggested, “Asking patients about use of cannabis to manage health conditions alongside routine cannabis screening may improve recognition and documentation of medical cannabis use” (p. 9). The Kansas Medical Society (2025) went on to say:

Before being introduced to the public, new medications and treatments in the United States undergo vigorous research and testing under recognized standards. Commonly prescribed medications, as well as treatment procedures for diseases and conditions, all have a strong evidence base in which the appropriate conditions and administration of the medication or procedure are well documented. By comparison, little is known about the effects of marijuana and how to administer it for medicinal purposes (p. 3).

Such communication failures are particularly harmful for patients with chronic conditions like MS, where treatment coordination and informed care are essential. Without improved documentation systems, even legal and clinical acceptance of cannabis cannot ensure equitable access. Evidence of under-recognition in clinical systems was strongest where survey–EHR mismatches were quantified (Lapham et al., 2022), with complementary indications that inconsistent assessment practices also constrained communication (Brooks et al., 2017). Agreement among these sources supported the need for structured intake prompts and EHR fields to normalize and capture medically directed cannabis use (Lapham et al., 2022). A qualification is that most direct empirical documentation evidence comes from a smaller subset of studies; nevertheless, its alignment with provider-reported assessment inconsistencies suggested a system-level barrier rather than an isolated anomaly (Brooks et al., 2017; Lapham et al., 2022).

Policy Learning and National Standards

Several sources emphasized that state-level disparities could be reduced by sharing policy models or data, and establishing national clinical standards. Mallinson and Hannah (2020) wrote that states “engage in political and policy learning from each other,” allowing innovations in one jurisdiction to inform progress in others (p. 346). This offered a potential pathway for restrictive states like Kansas to follow regulatory models developed in Colorado, Washington, or Minnesota. However, ideological resistance remained a significant barrier. In his opposition testimony, Voth (2024) warned the Kansas legislature that “the net effect of this legislation is to take advantage of sick and

suffering Kansans with the false hope of marijuana” (p. 1). His view illustrated the persistence of moral framing even in the face of emerging clinical consensus.

Ghosh et al. (2016) also discussed the importance of sharing data from multiple agencies in Colorado. In their discussion of the assessment function within the public health framework, the authors emphasized that effective marijuana regulation depends on collecting, integrating, and sharing surveillance data across agencies. They note that Colorado’s experience showed the need for collaboration among public health, law enforcement, and other state partners to monitor health impacts, use patterns, and emerging risks. The authors indicated, “the breadth of public health issues associated with marijuana requires close collaboration among state agencies responsible for marijuana (and often liquor) enforcement, public safety, agriculture, and behavioral health” (para. 43).

Multiple sources converged on cross-state learning and standardized guidance as levers to reduce geographic inequities (Mallinson & Hannah, 2020; Yusupov et al., 2024). Agreement is visible where professional groups call for dosing standards and clearer clinical pathways (Kansas Medical Society, 2025) and where syntheses recommended national-level guidance to harmonize practice (Yusupov et al., 2024). Opposing testimony (Voth, 2024) illustrated ongoing ideological and safety objections, reinforcing the need for consensus-building mechanisms (e.g., federal guidance, specialty society statements) to translate policy learning into durable standards.

Summary

This chapter presented findings from a thematic analysis of 17 articles, policy briefs, and legislative testimony examining physician perspectives on the legal treatment of cannabis for MS and measures to improve equitable access across states. In response to Research Question 1, the findings demonstrated that physicians perceived substantial differences in legal treatment of cannabis for MS between Colorado and Kansas as stemming primarily from state-level policy environments, administrative clarity, and professional autonomy. Despite lingering uncertainty, Colorado's permissive legal framework fostered greater provider engagement and open patient communication. In contrast, Kansas's restrictive legal stance and institutional opposition contributed to a climate of fear, liability concerns, and policy-driven disengagement. Physician knowledge gaps were further shaped by the policy environment, with access to training and clear clinical guidance more common in states with established cannabis programs.

Regarding Research Question 2, findings highlighted several physician-endorsed strategies to promote more equitable access to cannabis-based treatments. Across jurisdictions, providers emphasized the urgent need for formal education and standardized training on medical cannabis. Additionally, system-level improvements in documentation—such as integrating cannabis use into electronic health records—were identified as critical to supporting coordinated care. Finally, policy diffusion, national clinical guidelines, and federal leadership were cited as key levers to reduce geographic disparities and support provider participation, especially in restrictive states like Kansas.

Chapter 5 interpreted these findings in the context of existing literature, exploring their implications for policy and practice, and offers recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of the qualitative study was to examine what, if any, obstacles physicians in Kansas and Colorado perceived regarding medical cannabis use for MS treatment, which interfered with equitable legal access to medical cannabis across states. The importance of this study was to better understand and explore how these two states had similar evidence presented to them, yet they developed opposite public policies regarding that data. The data were collected using a systematic review of the literature according to PRISMA guidelines (see Savin-Baden & Major, 2023) to identify themes concerning challenges, concerns, and influences that might shape medical cannabis policy decisions.

The findings demonstrated that physicians perceived substantial differences in legal treatment of cannabis for MS between Colorado and Kansas as stemming primarily from state-level policy environments, administrative clarity, and professional autonomy. The results also showed that despite lingering uncertainty, Colorado's permissive legal framework fostered greater provider engagement and open patient communication. In contrast, Kansas's restrictive legal stance and institutional opposition contributed to a climate of fear, liability concerns, and policy-driven disengagement. Physician knowledge gaps were further shaped by the policy environment, with access to training and clear clinical guidance more common in states with established cannabis programs.

Based on data reviewed, the findings highlighted several physician-endorsed strategies to promote more equitable access to cannabis-based treatments. Across jurisdictions, providers emphasized the urgent need for formal education and

standardized training on medical cannabis. Additionally, system-level improvements in documentation, including integrating cannabis use into electronic health records, were identified as critical to supporting coordinated care. Lastly, policy diffusion, national clinical guidelines, and federal leadership were cited as key levers to reduce geographic disparities and support provider participation, especially in restrictive states like Kansas. In Chapter 5, I presented the interpretation of findings, limitations of the study, recommendations, implications, and conclusion.

Interpretation of Findings

In this section, I present the discussion of findings and their interpretations regarding obstacles that physicians in Kansas and Colorado perceive concerning medical cannabis use for MS treatment, that interfered with equitable legal access to medical cannabis across states. The findings are discussed, addressing two research questions. The discussions are based on themes under each research question, addressing the problem and purpose of this study.

Research Question 1

What administrative and policy-related factors do physicians perceive contributed to substantially different legal treatment of cannabis for MS treatment between Colorado and Kansas?

This study's results indicated that the legal environment and provider confidence was associated with differences in the legal treatment of cannabis for MS treatment between Colorado and Kansas. Although in Colorado, where medical and recreational marijuana are legalized, physicians were more likely to engage in discussions with

patients; however, confidence remained a concern. On the other hand, physicians practicing in Kansas were embedded in a restrictive legal environment that discouraged participation and endorsement of cannabis as a treatment option. These differences affected the legal treatment of cannabis for MS treatment between Colorado and Kansas. However, according to Voth (2024), the net effect of this legislation is to take advantage of sick and suffering Kansans with the false hope of marijuana as a near-miracle medicine.

The findings indicated that the provider confidence and engagement varied between states like Colorado and Kansas, reflecting broader administrative differences. While legal protection and structured regulation in Colorado provided a framework in which physicians could discuss cannabis use more freely, even if hesitantly, the absence of a regulatory infrastructure and strong institutional resistance in Kansas contributed to physician disengagement and fear of liability. Yet, agreement came from Colorado- and Minnesota-based studies linking policy latitude with greater provider engagement but lingering hesitancy (Brooks et al., 2017; Philpot et al., 2019; Kondrad & Reed, 2022), while policy briefs and testimony from Missouri and Kansas reflected how restrictive or contested environments depress clinical dialogue (Kansas Medical Society, 2025; Voth, 2024).

These findings are similar to previous research, which indicated that the legal landscape for alternative therapies such as cannabis to manage MS symptoms varies significantly between these two states. The uneven legal landscape between Colorado and Kansas has contributed to unequal patient outcomes (Salter et al., 2021). Unlike Kansas,

Colorado has policies making both medical and recreational marijuana legal. The legality of both provides patients with MS access to THC products that can alleviate a variety of typical MS symptoms (Salter et al., 2021). Colorado also has a comprehensive regulatory framework that includes a wide range of cannabis products, thereby enabling patients and healthcare providers to tailor treatments individually. Such accessibility helps patients benefit from the therapeutic effects of THC according to evidence-based practice, research, and development. This suggests the need to balance policies on marijuana regarding its use for treatment across the United States.

The review showed that policy-driven knowledge gaps were evident across all environments but were particularly pronounced in restrictive policy contexts. Rønne et al. (2021) stated that physicians specialized in addiction treatment may mainly experience the adverse health effects from recreational use of cannabis, which possibly gives rise to their skepticism. This finding by Rønne et al. reflects broader provider attitudes shaped by local policy environments in both Colorado and Kansas. In Colorado, where medical and recreational marijuana have been legalized for over a decade, providers working in addiction medicine and psychiatry have reported concerns about increased cannabis-related hospitalizations, youth use, and comorbid mental health conditions (Ghosh et al., 2017). However, in Kansas, where medical marijuana remains illegal, many providers' perspectives were influenced not by clinical exposure but by policy uncertainty and lack of standardized education, which reinforced caution and hesitancy toward legalization (Kansas Legislative Research Department, 2025; Voth, 2024).

The findings across these sources indicated that administrative policies could either reinforce or alleviate provider uncertainty, depending on how well those policies are accompanied by educational infrastructure and institutional clarity. Convergent evidence for widespread knowledge gaps and uncertainty appears in provider and trainee samples as well as reviews (Knapp & Jindal, 2020; Philpot et al., 2019). The results from the reviewed articles align with other research indicating that Colorado's legalization framework has demonstrated mixed and inconclusive outcomes concerning adolescent cannabis use and treatment (Wu et al., 2023). However, gaps in addressing public safety, health risks, and equitable outcomes show significant room for improvement. For states like Kansas that are maintaining prohibitions, Colorado's model shows potential opportunities and challenges of legalization (Santaella-Tenorio et al., 2020). This suggests that policy change alone is insufficient without accompanying investments in provider education and support.

Discrepant views and professional division have been regarded as administrative and policy-related factors contributing to substantially different legal treatment of cannabis for MS treatment between Colorado and Kansas. Not all physicians in permissive states viewed legalization as sufficient justification for recommending cannabis, as Kondrad and Reed (2022) noted that the increasing number of permitted medical uses of medical marijuana and permission of recreational marijuana use has not led to decreased perception of the risks of marijuana use or increased formal recommendation of marijuana to patients by family physicians in Colorado. Still, not all practitioners in restrictive states like Kansas voiced opposition to medical marijuana.

These discrepant views highlight the role of deeply held beliefs, specialty norms, and political context in shaping how physicians engage with cannabis policy, regardless of the legal status in their state.

Other studies also indicated that there are discrepant views and professional divisions regarding administrative and policy-related factors contributing to substantially different legal treatment of cannabis for MS treatment between Colorado and Kansas (Gandilhon, 2019; Santaella-Tenorio et al., 2020). Previous research also revealed that Kansas's approach reflects an approach that prioritizes perceived public health and safety risks of cannabis over potential economic and emerging alternative therapeutic benefits (Baker, 2021). Colorado's efforts to sustain cannabis reform postlegalization are characterized by complexity. The findings and conclusions reveal stark differences between Colorado and Kansas. The divergent ways state legislators have approached the issue reflect ontological, political, and social debates concerning public health, economic benefits, and social values. Colorado's regulatory framework has driven economic growth and funded public services, albeit with challenges such as increased traffic fatalities and public health risks (Gandilhon, 2019; Santaella-Tenorio et al., 2020). Conversely, Kansas's prohibitionist stance has been used to demonstrate the costs of inaction, including but not limited to missed economic opportunities and persistent healthcare disparities.

The influence of organized stakeholder groups on policy outcomes is also a factor contributing to substantially different legal treatment of cannabis for MS treatment between Colorado and Kansas. This finding aligns with the IGT used to understand the

influence of organized stakeholder groups on policy outcomes. According to IGT, policymaking is influenced by a range of organized interests that compete to ensure their preferences are reflected in legislation and regulatory structures (Truman, 1951; Mortensen et al., 2019). In the context of medical cannabis policy, these stakeholder groups include professional medical associations, law enforcement organizations, patient advocacy coalitions, and emerging industry representatives. Each group contributed to the policy process by framing issues, mobilizing support, and influencing legislative priorities.

On the alignment of public health advocates in Colorado, policymakers, and regulated industry groups supported the implementation of a framework that expanded access to medical cannabis while establishing systems for oversight and safety. This collaboration reflects how coordinated stakeholder engagement can facilitate policy outcomes that integrate both clinical and economic considerations (Ghosh et al., 2017). By contrast, in Kansas, legislative deliberations have been shaped by sustained opposition from professional medical societies and law enforcement associations, which have emphasized public safety concerns and insufficient evidence regarding efficacy and regulation (Kansas Legislative Research Department, 2025; Voth, 2024).

These dynamics illustrate how variations in stakeholder alignment, institutional access, and agenda framing can contribute to differing policy outcomes across states with similar public interest pressures. In this context, both Colorado and Kansas demonstrate the importance of stakeholder coalitions in determining how evidence is operationalized in law. While Colorado's established coalitions facilitated a structured regulatory

framework, Kansas's fragmented stakeholder environment has maintained a more cautious legislative posture. These findings align with previous research indicating that while policymakers use Colorado's model to demonstrate the many possible benefits and drawbacks of legalizing marijuana, Kansas's approach shows the possible economic and social costs of inaction. The different approaches exemplify how ideology, public health priorities, and economic considerations shape cannabis policy outcomes in two states (Orenstein & Glantz, 2020; Roberts, 2019).

Research Question 2

What measures do physicians perceive may promote more equitable healthcare access across states concerning the use of cannabis for MS treatment?

Based on the articles analyzed, standardized education as a foundation for access was identified as a strategy to promote more equitable healthcare access across states concerning the use of cannabis for MS treatment. Physicians and policymakers consistently emphasized the need for structured, evidence-based education to support informed decision-making and equitable access to cannabis treatments. The findings revealed that educational gaps have been reported among Colorado physicians, where legalization occurred ahead of formal provider training or clinical guidelines, leaving many uncertain about dosage, interactions, and qualifying conditions (Ghosh et al., 2017). In Kansas, where medical marijuana remains prohibited, this absence of structured education perpetuates uncertainty and limits readiness to engage in clinical conversations in the event of legalization (Voth, 2024; Kansas Legislative Research Department, 2025).

This study's findings provide insights demonstrating that while provider knowledge deficits are widespread, their consequences differ by policy context, manifesting as clinical inconsistency in Colorado and informational exclusion in Kansas. These findings align with previous research findings of Haroutounian et al. (2021), who suggested standardized guidelines to maximize benefits and minimize risks in clinical settings. Consistent with the current study's findings, other studies also revealed the need for standardized education and pharmaceutical-grade formulations necessary for MS patients to reap evidence-based benefits across states (Haddad et al., 2022; Mecha et al., 2020; Weinkle et al., 2019). Therefore, emphasizing standardized education can enhance equitable access equitable healthcare access across states concerning the use of cannabis for MS treatment.

Another significant barrier to equitable access was the inconsistency between patient self-reported cannabis use and formal documentation in medical records. This gap between self-reported and documented use is particularly relevant to Colorado, where legalization has led to diverse forms of cannabis use, often without consistent disclosure to providers or integration into the electronic health record (Ghosh et al., 2017). Such inconsistencies complicate continuity of care and risk assessment, especially when patients use cannabis alongside prescribed medications. In Kansas, where medical marijuana remains illegal, documentation gaps present an additional barrier: patients may underreport use out of concern for legal or professional repercussions, while providers lack standardized screening tools or guidance to record cannabis-related discussions (Voth, 2024; Kansas Legislative Research Department, 2025).

The complementary inconsistent assessment practices also constrain communication across states (Brooks et al., 2017). This documentation gap and communication gap not only impair continuity of care but also limit the ability of health systems to track outcomes and safety related to cannabis use. This aligns with other studies indicating that Colorado's and Kansas' proactive communication may be designed to better educate citizens about safely consuming cannabis (see Potterf & Unnithan, 2021). Some suggested that it overemphasized knowledge dissemination rather than behavioral change (see Potterf & Unnithan, 2021). Such findings can be used to suggest that public health campaigns should adopt more nuanced approaches to address diverse audience needs.

Several sources emphasized that state-level disparities could be reduced by sharing policy models or data and establishing national clinical standards. The literature indicated that states engage in policy learning from each other, allowing innovations in one jurisdiction to inform progress in others. This offered a potential pathway for restrictive states like Kansas to follow regulatory models developed in Colorado, Washington, or Minnesota. Thus, multiple sources converge on cross-state learning and standardized guidance as levers to reduce geographic inequities (see Mallinson & Hannah, 2020; Yusupov et al., 2024). This is consistent with previous research indicating that a tension between state-level autonomy and federal regulations characterizes Kansas's and Colorado's policy environment. The absence of legal cannabis in Kansas may result from policymakers' and regulators' reluctance to engage in entrepreneurial regulatory strategies embraced by progressive states such as Colorado

(Stoa, 2023). Baker (2021) suggested the need for both Colorado and Kansas officials to create more progressive state-specific frameworks that could be used to manage cannabis cultivation, distribution, and usage across the states.

Limitations of the Study

One of the main limitations of this study was that the data used in the study were taken from previously published sources. Thus, the research was limited in that I relied on the quality, accuracy, and transparency of self-reported data from the original studies. Physicians, administrators, and policymakers participating in those studies may have presented responses in ways that reflected more socially or professionally desirable viewpoints. Thus, to minimize the potential weakness, I applied strict inclusion criteria to ensure that only peer-reviewed and methodologically sound research was included. Each source was evaluated based on methodological clarity, ethical considerations, and transparency.

Publication bias, which refers to the tendency of journals to include studies with significant or favorable results that may also influence the findings, which could limit access to data that represent more diverse or conflicting views. I addressed this possible weakness by searching multiple databases. Another limitation was the legislative and geographic scope of the review. Because the study focused only on Colorado and Kansas, the findings may not represent the full range of legislative approaches or policy options across all U.S. states. However, this scope was chosen intentionally to simplify the review process and to highlight two states that represent contrasting perspectives on medical cannabis law. Hence, while the findings may not be generalizable to the entire

United States as a whole, they may provide insight concerning the lived policy realities of regions with divergent cannabis legislation, offering useful implications for policymakers and healthcare leaders working in comparatively restrictive contexts.

Finally, researcher bias concerning the data analysis process may impact how themes are interpreted. Thus, bracketing was used, which is a process of reflexivity through which I journal my biases, assumptions, and expectations to minimize their influence and maintain objectivity throughout the data analysis and synthesis process (Mozersky, 2021).

Recommendations

Recommendations for further research were grounded in the strengths and limitations of the current study as well as the literature reviewed in Chapter 2. The research was limited in that it relied on the quality, accuracy, and transparency of self-reported data from the original studies. Physicians, administrators, and policymakers participating in those studies may have presented responses in ways that reflected more socially or professionally desirable viewpoints. As a result, future research should be conducted by collecting primary data from policymakers and physicians to limit overdependence on published articles. Collecting direct primary data from participants permits a researcher to verify the authenticity of responses, thus leading to reduced desirability bias and gaining more information from the perspective of participants, including administrators, regarding policies on medicinal cannabis.

Because the study focused only on Colorado and Kansas, the findings may not represent the full range of legislative approaches or policy options across all U.S. states.

Although this scope was chosen intentionally to simplify the review process and to highlight two states that represent contrasting perspectives on medical cannabis law, there is need for further research, as findings may not be generalizable to the entire U.S. Therefore, this study should be expanded in terms of geographic scope beyond Kansas and Colorado to help in enhancing the generalization of findings across different states and legislative frameworks. Future studies may be conducted to include other states with restrictive and permissive cannabis policies to explore the effect of diverse regulations on healthcare outcomes.

Longitudinal studies could be conducted to examine changes in the implementation of policies over time. This would help in understanding the attitude of physicians and administrators and patient health outcomes. This strategy may help in addressing study limitations related to cross-sectional data and offer a deeper comprehension of how shifts in cannabis legislation may impact the practices in a real-world setting and perspectives of stakeholders.

Implications

Positive Social Change

From a public policy standpoint, the findings have contributed to researchers' understanding of specific legislative factors that may have impacted states' uneven adoption of cannabis-related legislation, as well as factors that could contribute to the adoption of more even cannabis legislation across states, in the interest of equitable healthcare access. Policymakers may be informed in making effective medicinal cannabis policy decisions. This may foster the understanding of policymakers and practitioners

regarding contradicting legislative policies and frameworks that shape healthcare access and clinical practice for positive patient outcomes. Enhanced understanding of such policies and frameworks may promote access to healthcare and reduce disparities.

The findings have offered insights that petitioners and conservative states may use to incentivize or motivate legislatures to adopt more liberal cannabis laws, thereby improving equitable access to alternative health care and treatment for multiple sclerosis. Hence, the findings may inspire policy changes, legal and medical discussions, and social reforms that can contribute to more equitable access. Also, the findings have provided critical insight that physicians and other stakeholders can use to better understand the legal landscape and how to overcome barriers when addressing MS patient treatment using alternative therapies such as cannabis.

Regarding social justice, the findings of this study may inspire important legislative changes that can contribute to creating a more just and equitable healthcare climate for individuals in the United States suffering from MS and seeking alternative, non-pharmacological treatments; such contributions could make significant impacts toward improving healthcare access for underserved populations. Thus, the findings of this study may promote the development of transparent, ethical, and inclusive healthcare policies and frameworks that can be beneficial to communities across different regulatory jurisdictions and settings.

Theoretical Implications

IGT was applied in this study to help in understanding how the legislative differences between Colorado and Kansas regarding cannabis policy took shape. The

theory provided a lens to understand how stakeholder groups, such as medical organizations, patient advocacy groups, and anti-drug coalitions, contributed to state-based legislative proceedings (Kelley, 2009). The findings indicated that Colorado had policies that shaped the use of medicinal cannabis. In Colorado, the alignment of interest groups with both political actors and economic incentives helped shape the legal infrastructure that enabled cannabis commercialization (Mortensen et al., 2019). As such, Colorado's cannabis legalization reflects the success of interest groups advocating for broader societal acceptance and economic benefits.

However, the findings indicated that there was no legislation allowing the use of medicinal cannabis in Kansas. In Kansas, more traditionalist interest groups, including those aligned with law enforcement and religious organizations, maintained substantial influence over the legislative agenda, contributing to the state's continued prohibition (Roberts, 2019). Kansas's restrictive stance indicates the influence of groups prioritizing conservative values and public safety concerns. These state-level variations demonstrate how localized power dynamics mediate national trends in cannabis policy reform. Thus, the findings support this theory, which highlights that the legislative process is not guided solely by public interest but also shaped by the strategic actions of interest groups with varying degrees of influence (Conard, 1959). This has provided a more nuanced understanding of the difference in policies about the use of medicinal cannabis in both Colorado and Kansas.

Conclusion

This study has provided insights into the obstacles that physicians in Kansas and Colorado face concerning medical cannabis use for multiple sclerosis (MS) treatment, affecting equitable legal access to medical cannabis across states. This has provided a better understanding of how the two states of Colorado and Kansas had similar evidence presented to them, yet they developed polar opposite public policies on the use of medicinal cannabis. The study has provided a clearer understanding of the intersection of medical evidence, regulatory constraints, and possible policy hesitations helped explain why disparities persist and what may be done to support more uniform access across states. The results showed that despite lingering uncertainty, Colorado's permissive legal framework fostered greater provider engagement and open patient communication, while Kansas's restrictive legal stance and institutional opposition contributed to a climate of fear, liability concerns, and policy-driven disengagement. Physician-endorsed strategies to promote more equitable access to cannabis-based treatments, including an urgent need for formal education and standardized training on medical cannabis, and system-level improvements in documentation were investigated. Thus, this study's findings can inform policy makers and healthcare leaders seeking to reduce geographic disparities and support provider participation.

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Appendix: PRISMA Checklist

PRISMA 2020 expanded checklist

Note: This expanded checklist details elements recommended for reporting for each PRISMA 2020 item. Non-italicized elements are considered ‘essential’ and should be reported in the main report or as supplementary material for all systematic reviews (except for those preceded by “If...”, which should only be reported where applicable). Elements written in italics are ‘additional’, and while not essential, provide supplementary information that may enhance the completeness and usability of systematic review reports. Note that elements presented here are an abridged version of those presented in the explanation and elaboration paper, with references and some examples removed. Consulting the explanation and elaboration paper is recommended if further clarity or information is required (doi:10.1136/bmj.n160).

Section and Topic	Item #	Elements recommended for reporting
TITLE		
TITLE	1	<ul style="list-style-type: none"> Identify the report as a systematic review in the title. Report an informative title that provides key information about the main objective or question the review addresses (e.g. the population(s) and intervention(s) the review addresses). Consider providing additional information in the title, such as the method of analysis used, the designs of included studies, or an indication that the review is an update of an existing review, or a continually updated (“living”) systematic review.
ABSTRACT		
ABSTRACT	2	<ul style="list-style-type: none"> Report an abstract addressing each item in the PRISMA 2020 for Abstracts checklist.
INTRODUCTION		
RATIONALE	3	<ul style="list-style-type: none"> Describe the current state of knowledge and its uncertainties. Articulate why it is important to do the review. If other systematic reviews addressing the same (or a largely similar) question are available, explain why the current review was considered necessary. If the review is an update or replication of a particular systematic review, indicate this and cite the previous review. If the review examines the effects of interventions, also briefly describe how the intervention(s) examined might work.

		<ul style="list-style-type: none"> • If there is complexity in the intervention or context of its delivery (or both) (e.g. multi-component interventions, equity considerations), consider presenting a logic model to visually display the hypothesized relationship between intervention components and outcomes.
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OBJECTIVES	4	<ul style="list-style-type: none"> • Provide an explicit statement of all objective(s) or question(s) the review addresses, expressed in terms of a relevant question formulation framework. • If the purpose is to evaluate the effects of interventions, use the Population, Intervention, Comparator, Outcome (PICO) framework or one of its variants, to state the comparisons that will be made.
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METHODS		
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ELIGIBILITY CRITERIA	5	<ul style="list-style-type: none"> • Specify all study characteristics used to decide whether a study was eligible for inclusion in the review, that is, components described in the PICO framework or one of its variants, and other characteristics, such as eligible study design(s) and setting(s), and minimum duration of follow-up. • Specify eligibility criteria with regard to report characteristics, such as year of dissemination, language, and report status (e.g. whether reports, such as unpublished manuscripts and conference abstracts, were eligible for inclusion). • Clearly indicate if studies were ineligible because the outcomes of interest were not measured, or ineligible because the results for the outcome of interest were not reported. • Specify any groups used in the synthesis (e.g. intervention, outcome and population groups) and link these to the comparisons specified in the objectives (item #4). • Consider providing rationales for any notable restrictions to study eligibility.
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INFORMATION SOURCES	6	<ul style="list-style-type: none"> • Specify the date when each source (e.g. database, register, website, organisation) was last searched or consulted. • If bibliographic databases were searched, specify for each database its name (e.g. MEDLINE, CINAHL), the interface or platform through which the database was searched (e.g. Ovid, EBSCOhost), and the dates of coverage (where this information is provided).
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- If study registers, regulatory databases and other online repositories were searched, specify the name of each source and any date restrictions that were applied.
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Section and Topic	Item #	Elements recommended for reporting
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| | | <ul style="list-style-type: none"> • If websites, search engines or other online sources were browsed or searched, specify the name and URL of each source. • If organisations or manufacturers were contacted to identify studies, specify the name of each source. • If individuals were contacted to identify studies, specify the types of individuals contacted (e.g. authors of studies included in the review or researchers with expertise in the area). • If reference lists were examined, specify the types of references examined (e.g. references cited in study reports included in the systematic review, or references cited in systematic review reports on the same or similar topic). • If cited or citing reference searches (also called backward and forward citation searching) were conducted, specify the bibliographic details of the reports to which citation searching was applied, the citation index or platform used (e.g. Web of Science), and the date the citation searching was done. • If journals or conference proceedings were consulted, specify of the names of each source, the dates covered and how they were searched (e.g. handsearching or browsing online). |
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SEARCH STRATEGY	7	<ul style="list-style-type: none">• Provide the full line by line search strategy as run in each database with a sophisticated interface (such as Ovid), or the sequence of terms that were used to search simpler interfaces, such as search engines or websites.• Describe any limits applied to the search strategy (e.g. date or language) and justify these by linking back to the review's eligibility criteria.• If published approaches, including search filters designed to retrieve specific types of records or search strategies from other systematic reviews, were used, cite them. If published approaches were adapted, for example if search filters are amended, note the changes made.• If natural language processing or text frequency analysis tools were used to identify or refine keywords, synonyms or subject indexing terms to use in the search strategy, specify the tool(s) used.• If a tool was used to automatically translate search strings for one database to another, specify the tool used.• If the search strategy was validated, for example by evaluating whether it could identify a set of clearly eligible studies, report the validation process used and specify which studies were included in the validation set.• If the search strategy was peer reviewed, report the peer review process used and specify any tool used such as the Peer Review of Electronic Search Strategies (PRESS) checklist.• If the search strategy structure adopted was not based on a PICO-style approach, describe the final conceptual structure and any explorations that were undertaken to achieve it.
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SELECTION PROCESS	8	<p>Recommendations for reporting regardless of the selection processes used:</p> <ul style="list-style-type: none"> • Report how many reviewers screened each record (title/abstract) and each report retrieved, whether multiple reviewers worked independently at each stage of screening or not, and any processes used to resolve disagreements between screeners. • Report any processes used to obtain or confirm relevant information from study investigators. • If abstracts or articles required translation into another language to determine their eligibility, report how these were translated. <p>Recommendations for reporting in systematic reviews using automation tools in the selection process:</p> <ul style="list-style-type: none"> • Report how automation tools were integrated within the overall study selection process. • If an externally derived machine learning classifier was applied (e.g. Cochrane RCT Classifier), either to eliminate records or to replace a single screener, include a reference or URL to the version used. If the classifier was used to eliminate records before screening, report the number eliminated in the PRISMA flow diagram as ‘Records marked as ineligible by automation tools’. • If an internally derived machine learning classifier was used to assist with the screening process, identify the software/classifier and version, describe how it was used (e.g. to remove records or replace a single screener) and trained (if relevant), and what internal or external validation was done to understand the risk of missed studies or incorrect classifications. • If machine learning algorithms were used to prioritise screening (whereby unscreened records are continually re-ordered based on screening decisions), state the software used and provide details of any screening rules applied. <p>Recommendations for reporting in systematic reviews using crowdsourcing or previous ‘known’ assessments in the selection process:</p>
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		<ul style="list-style-type: none"> • If crowdsourcing was used to screen records, provide details of the platform used and specify how it was integrated within the overall study selection process. • If datasets of already-screened records were used to eliminate records retrieved by the search from further consideration, briefly describe the derivation of these datasets.
DATA COLLECTION PROCESS	9	<ul style="list-style-type: none"> • Report how many reviewers collected data from each report, whether multiple reviewers worked independently or not, and any processes used to resolve disagreements between data collectors. • Report any processes used to obtain or confirm relevant data from study investigators. • If any automation tools were used to collect data, report how the tool was used, how the tool was trained, and what internal or external validation was done to understand the risk of incorrect extractions. • If articles required translation into another language to enable data collection, report how these articles were translated. • If any software was used to extract data from figures, specify the software used. • If any decision rules were used to select data from multiple reports corresponding to a study, and any steps were taken to resolve inconsistencies across reports, report the rules and steps used.
DATA ITEMS (outcomes)	10a	<ul style="list-style-type: none"> • List and define the outcome domains and time frame of measurement for which data were sought. • Specify whether all results that were compatible with each outcome domain in each study were sought, and if not, what process was used to select results within eligible domains. • If any changes were made to the inclusion or definition of the outcome domains, or to the importance given to them in the review, specify the changes, along with a rationale. • If any changes were made to the processes used to select results within eligible outcome domains, specify the changes, along with a rationale. • Consider specifying which outcome domains were considered the most important for interpreting the review's conclusions and provide rationale for the

labelling (e.g. “a recent core outcome set identified the outcomes labelled ‘critical’ as being the most important to patients”).

DATA ITEMS (other variables)	10b	<ul style="list-style-type: none"> • List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). • Describe any assumptions made about any missing or unclear information from the studies. • If a tool was used to inform which data items to collect, cite the tool used.
STUDY RISK OF BIAS ASSESSMENT	11	<ul style="list-style-type: none"> • Specify the tool(s) (and version) used to assess risk of bias in the included studies. • Specify the methodological domains/components/items of the risk of bias tool(s) used. • Report whether an overall risk of bias judgement that summarised across domains/components/items was made, and if so, what rules were used to reach an overall judgement. • If any adaptations to an existing tool to assess risk of bias in studies were made, specify the adaptations. • If a new risk of bias tool was developed for use in the review, describe the content of the tool and make it publicly accessible. • Report how many reviewers assessed risk of bias in each study, whether multiple reviewers worked independently, and any processes used to resolve disagreements between assessors. • Report any processes used to obtain or confirm relevant information from study investigators. • If an automation tool was used to assess risk of bias, report how the automation tool was used, how the tool was trained, and details on the tool’s performance and internal validation.
EFFECT MEASURES	12	<ul style="list-style-type: none"> • Specify for each outcome (or type of outcome [e.g. binary, continuous]), the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.

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- State any thresholds (or ranges) used to interpret the size of effect (e.g. minimally important difference; ranges for no/trivial, small, moderate and large effects) and the rationale for these thresholds.
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Section and Topic	Item #	Elements recommended for reporting
		<ul style="list-style-type: none"> • If synthesized results were re-expressed to a different effect measure, report the method used to re-express results (e.g. meta-analysing risk ratios and computing an absolute risk reduction based on an assumed comparator risk). • Consider providing justification for the choice of effect measure.
SYNTHESIS METHODS (eligibility for synthesis)	13a	<ul style="list-style-type: none"> • Describe the processes used to decide which studies were eligible for each synthesis.
SYNTHESIS METHODS (preparing for synthesis)	13b	<ul style="list-style-type: none"> • Report any methods required to prepare the data collected from studies for presentation or synthesis, such as handling of missing summary statistics, or data conversions.
SYNTHESIS METHODS (tabulation and graphical methods)	13c	<ul style="list-style-type: none"> • Report chosen tabular structure(s) used to display results of individual studies and syntheses, along with details of the data presented. • Report chosen graphical methods used to visually display results of individual studies and syntheses. • If studies are ordered or grouped within tables or graphs based on study characteristics (e.g. by size of the study effect, year of publication), consider reporting the basis for the chosen ordering/grouping. • If non-standard graphs were used, consider reporting the rationale for selecting the chosen graph.

SYNTHESIS
METHODS
(statistical
synthesis
methods)

- 13d
- If statistical synthesis methods were used, reference the software, packages and version numbers used to implement synthesis methods.
 - If it was not possible to conduct a meta-analysis, describe and justify the synthesis methods or summary approach used.
 - If meta-analysis was done, specify:
 - the meta-analysis model (fixed-effect, fixed-effects or random-effects) and provide rationale for the selected model.
 - the method used (e.g. Mantel-Haenszel, inverse-variance).
 - any methods used to identify or quantify statistical heterogeneity (e.g. visual inspection of results, a formal statistical test for heterogeneity, heterogeneity variance (τ), inconsistency (e.g. I^2), and prediction intervals).
 - If a random-effects meta-analysis model was used: specify the between-study (heterogeneity) variance estimator used (e.g. DerSimonian and Laird, restricted maximum likelihood (REML)).
 - specify the method used to calculate the confidence interval for the summary effect (e.g. Wald-type confidence interval, Hartung-Knapp-SidikJonkman).
 - consider specifying other details about the methods used, such as the method for calculating confidence limits for the heterogeneity variance.
 - If a Bayesian approach to meta-analysis was used, describe the prior distributions about quantities of interest (e.g. intervention effect being analysed, amount of heterogeneity in results across studies).
 - If multiple effect estimates from a study were included in a meta-analysis, describe the method(s) used to model or account for the statistical dependency (e.g. multivariate meta-analysis, multilevel models or robust variance estimation).
 - If a planned synthesis was not considered possible or appropriate, report this and the reason for that decision.
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SYNTHESIS METHODS (methods to explore heterogeneity)	13e	<ul style="list-style-type: none"> • If methods were used to explore possible causes of statistical heterogeneity, specify the method used (e.g. subgroup analysis, meta-regression). • If subgroup analysis or meta-regression was performed, specify for each: <ul style="list-style-type: none"> ◦ which factors were explored, levels of those factors, and which direction of effect modification was expected and why (where possible). ◦ whether analyses were conducted using study-level variables (i.e. where each study is included in one subgroup only), within-study contrasts (i.e. where data on subsets of participants within a study are available, allowing the study to be included in more than one subgroup), or some combination of the above. ◦ how subgroup effects were compared (e.g. statistical test for interaction for subgroup analyses). • If other methods were used to explore heterogeneity because data were not amenable to meta-analysis of effect estimates (e.g. structuring tables to examine variation in results across studies based on subpopulation), describe the methods used, along with the factors and levels. • If any analyses used to explore heterogeneity were not pre-specified, identify them as such.
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Section and Topic	Item #	Elements recommended for reporting
SYNTHESIS METHODS (sensitivity analyses)	13f	<ul style="list-style-type: none"> • If sensitivity analyses were performed, provide details of each analysis (e.g. removal of studies at high risk of bias, use of an alternative meta-analysis model). • If any sensitivity analyses were not pre-specified, identify them as such.

REPORTING BIAS ASSESSMENT	14	<ul style="list-style-type: none">• Specify the methods (tool, graphical, statistical or other) used to assess the risk of bias due to missing results in a synthesis (arising from reporting biases).• If risk of bias due to missing results was assessed using an existing tool, specify the methodological components/domains/items of the tool, and the process used to reach a judgement of overall risk of bias.• If any adaptations to an existing tool to assess risk of bias due to missing results were made, specify the adaptations.• If a new tool to assess risk of bias due to missing results was developed for use in the review, describe the content of the tool and make it publicly accessible.• Report how many reviewers assessed risk of bias due to missing results in a synthesis, whether multiple reviewers worked independently, and any processes used to resolve disagreements between assessors.• Report any processes used to obtain or confirm relevant information from study investigators.• If an automation tool was used to assess risk of bias due to missing results, report how the automation tool was used, how the tool was trained, and details on the tool's performance and internal validation.
CERTAINTY ASSESSMENT	15	<ul style="list-style-type: none">• Specify the tool or system (and version) used to assess certainty (or confidence) in the body of evidence.• Report the factors considered (e.g. precision of the effect estimate, consistency of findings across studies) and the criteria used to assess each factor when assessing certainty in the body of evidence.• Describe the decision rules used to arrive at an overall judgement of the level of certainty, together with the intended interpretation (or definition) of each level of certainty.• If applicable, report any review-specific considerations for assessing certainty, such as thresholds used to assess imprecision and ranges of magnitude of effect that might be considered trivial, moderate or large, and the rationale for these thresholds and ranges (item #12).• If any adaptations to an existing tool or system to assess certainty were made, specify the adaptations.• Report how many reviewers assessed certainty in the body of evidence for an outcome, whether multiple

reviewers worked independently, and any processes used to resolve disagreements between assessors.

- Report any processes used to obtain or confirm relevant information from investigators.
- If an automation tool was used to support the assessment of certainty, report how the automation tool was used, how the tool was trained, and details on the tool's performance and internal validation.
- Describe methods for reporting the results of assessments of certainty, such as the use of Summary of Findings tables.
- If standard phrases that incorporate the certainty of evidence were used (e.g. "hip protectors probably reduce the risk of hip fracture slightly"), report the intended interpretation of each phrase and the reference for the source guidance.

RESULTS

STUDY SELECTION (flow of studies)	16a	<ul style="list-style-type: none"> • Report, ideally using a flow diagram, the number of: records identified; records excluded before screening; records screened; records excluded after screening titles or titles and abstracts; reports retrieved for detailed evaluation; potentially eligible reports that were not retrievable; retrieved reports that did not meet inclusion criteria and the primary reasons for exclusion; and the number of studies and reports included in the review. If applicable, also report the number of ongoing studies and associated reports identified. • If the review is an update of a previous review, report results of the search and selection process for the current review and specify the number of studies included in the previous review. • If applicable, indicate in the PRISMA flow diagram how many records were excluded by a human and how many by automation tools.
STUDY SELECTION (excluded studies)	16b	<ul style="list-style-type: none"> • Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.

Section and Topic

Item Elements recommended for reporting
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STUDY CHARACTERISTICS	17	<ul style="list-style-type: none"> • Cite each included study. • Present the key characteristics of each study in a table or figure (considering a format that will facilitate comparison of characteristics across the studies). • If the review examines the effects of interventions, consider presenting an additional table that summarises the intervention details for each study.
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RISK OF BIAS IN STUDIES	18	<ul style="list-style-type: none"> • Present tables or figures indicating for each study the risk of bias in each domain/component/item assessed (e.g. blinding of outcome assessors, missing outcome data) and overall study-level risk of bias. • Present justification for each risk of bias judgement, for example in the form of relevant quotations from reports of included studies. • If assessments of risk of bias were done for specific outcomes or results in each study, consider displaying risk of bias judgements on a forest plot, next to the study results.
<hr/>		
RESULTS OF INDIVIDUAL STUDIES	19	<ul style="list-style-type: none"> • For all outcomes, irrespective of whether statistical synthesis was undertaken, present for each study summary statistics for each group (where appropriate). For dichotomous outcomes, report the number of participants with and without the events for each group; or the number with the event and the total for each group (e.g. 12/45). For continuous outcomes, report the mean, standard deviation and sample size of each group. • For all outcomes, irrespective of whether statistical synthesis was undertaken, present for each study an effect estimate and its precision (e.g. standard error or 95% confidence/credible interval). For example, for time-to-event outcomes, present a hazard ratio and its confidence interval. • If study-level data is presented visually or reported in the text (or both), also present a tabular display of the results. • If results were obtained from multiple data sources (e.g. journal article, study register entry, clinical study report, correspondence with authors), report the source of the data.

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- If applicable, indicate which results were not reported directly and had to be computed or estimated from other information.

RESULTS OF SYNTHESSES (characteristics of contributing studies)	20a	<ul style="list-style-type: none"> • Provide a brief summary of the characteristics and risk of bias among studies contributing to each synthesis (meta-analysis or other). The summary should focus only on study characteristics that help in interpreting the results (especially those that suggest the evidence addresses only a restricted part of the review question, or indirectly addresses the question). • Indicate which studies were included in each synthesis (e.g. by listing each study in a forest plot or table or citing studies in the text).
RESULTS OF SYNTHESSES (results of statistical syntheses)	20b	<ul style="list-style-type: none"> • Report results of all statistical syntheses described in the protocol and all syntheses conducted that were not pre-specified. • If meta-analysis was conducted, report for each: <ul style="list-style-type: none"> o the summary estimate and its precision (e.g. standard error or 95% confidence/credible interval) o measures of statistical heterogeneity (e.g. τ, I^2, prediction interval) • If other statistical synthesis methods were used (e.g. summarising effect estimates, combining P values), report the synthesized result and a measure of precision (or equivalent information, for example, the number of studies and total sample size). • If the statistical synthesis method does not yield an estimate of effect (e.g. as is the case when P values are combined), report the relevant statistics (e.g. P value from the statistical test), along with an interpretation of the result that is consistent with the question addressed by the synthesis method. • If comparing groups, describe the direction of effect (e.g. fewer events in the intervention group, or higher pain in the comparator group).

	<ul style="list-style-type: none"> • If synthesising mean differences, specify for each synthesis, where applicable, the unit of measurement (e.g. kilograms or pounds for weight), the upper and lower limits of the measurement scale (e.g. anchors range from 0 to 10), direction of benefit (e.g. higher scores denote higher severity of pain), and the minimally important difference, if known. If synthesising standardised mean differences, and the effect estimate is being re-expressed to a particular instrument, specify details of the instrument, as per the mean difference.
<p>RESULTS OF SYNTHESSES (results of investigations of heterogeneity)</p>	<p>20c</p> <ul style="list-style-type: none"> • If investigations of possible causes of heterogeneity were conducted: <ul style="list-style-type: none"> o present results regardless of the statistical significance, magnitude, or direction of effect modification. o identify the studies contributing to each subgroup. o report results with due consideration to the observational nature of the analysis and risk of confounding due to other factors. • If subgroup analysis was conducted:

Section and Topic	Item Elements recommended for reporting #
	<ul style="list-style-type: none"> o report for each analysis the exact P value for a test for interaction, as well as, within each subgroup, the summary estimates, their precision (e.g. standard error or 95% confidence/credible interval) and measures of heterogeneity. o consider presenting the estimate for the difference between subgroups and its precision. • If meta-regression was conducted: <ul style="list-style-type: none"> o report for each analysis the exact P value for the regression coefficient and its precision.

o consider presenting a meta-regression scatterplot with the study effect estimates plotted against the potential effect modifier.

- If informal methods (i.e. those that do not involve a formal statistical test) were used to investigate heterogeneity, describe the results observed.
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RESULTS OF
SYNTHESES
(results of
sensitivity
analyses)

20d •

If any sensitivity analyses were conducted: o report the results for each sensitivity analysis. o comment on how robust the main analysis was given the results of all corresponding sensitivity analyses.

- o consider presenting results in tables that indicate: (i) the summary effect estimate, a measure of precision (and potentially other relevant statistics, for example, I^2 statistic) and contributing studies for the original meta-analysis; (ii) the same information for the sensitivity analysis; and (iii) details of the original and sensitivity analysis assumptions.
 - o consider presenting results of sensitivity analyses visually using forest plots.
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REPORTING BIASES	21	<ul style="list-style-type: none">• Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.• If a tool was used to assess risk of bias due to missing results in a synthesis, present responses to questions in the tool, judgements about risk of bias and any information used to support such judgements.• If a funnel plot was generated to evaluate small-study effects (one cause of which is reporting biases), present the plot and specify the effect estimate and measure of precision used in the plot. If a contour-enhanced funnel plot was generated, specify the ‘milestones’ of statistical significance that the plotted contour lines represent ($P = 0.01, 0.05, 0.1, \text{etc.}$)• If a test for funnel plot asymmetry was used, report the exact P value observed for the test, and potentially other relevant statistics, for example the standardised normal deviate, from which the P value is derived.• If any sensitivity analyses seeking to explore the potential impact of missing results on the synthesis were conducted, present results of each analysis (see item #20d), compare them with results of the primary analysis, and report results with due consideration of the limitations of the statistical method.• If studies were assessed for selective non-reporting of results by comparing outcomes and analyses pre-specified in study registers, protocols, and statistical analysis plans with results that were available in study reports, consider presenting a matrix (with rows as studies and columns as syntheses) to present the availability of study results.• If an assessment of selective non-reporting of results reveals that some studies are missing from the synthesis, consider displaying the studies with missing results underneath a forest plot or including a table with the available study results.
CERTAINTY OF EVIDENCE	22	<ul style="list-style-type: none">• Report the overall level of certainty (or confidence) in the body of evidence for each important outcome.• Provide an explanation of reasons for rating down (or rating up) the certainty of evidence (e.g. in footnotes to an evidence summary table).• Communicate certainty in the evidence wherever results are reported (i.e. abstract, evidence summary tables, results,

conclusions), using a format appropriate for the section of the review.

- Consider including evidence summary tables, such as GRADE Summary of Findings tables.

DISCUSSION

DISCUSSION (interpretation) 23a • Provide a general interpretation of the results in the context of other evidence.

DISCUSSION (limitations of evidence) 23b • Discuss any limitations of the evidence included in the review.

Section and Topic	Item #	Elements recommended for reporting
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DISCUSSION (limitations of review processes)	23c	• Discuss any limitations of the review processes used, and comment on the potential impact of each limitation.
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DISCUSSION (implications)	23d	• Discuss implications of the results for practice and policy. • Make explicit recommendations for future research.
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OTHER INFORMATION

REGISTRATION AND PROTOCOL (registration)	24a	• Provide registration information for the review, including register name and registration number, or state that the review was not registered.
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REGISTRATION AND PROTOCOL (protocol)	24b	• Indicate where the review protocol can be accessed (e.g. by providing a citation, DOI or link), or state that a protocol was not prepared.
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REGISTRATION AND PROTOCOL (amendments)	24c	• Report details of any amendments to information provided at registration or in the protocol, noting: (a) the amendment itself; (b) the reason for the amendment; and (c) the stage of the review process at which the amendment was implemented.
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SUPPORT	25	• Describe sources of financial or non-financial support for the review, specifying relevant grant ID numbers for each funder. If no specific financial or nonfinancial support was received, this should be stated. • Describe the role of the funders or sponsors (or both) in the review. If funders or sponsors had no role in the review, this should be declared.
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COMPETING INTERESTS	26	<ul style="list-style-type: none">• Disclose any of the authors' relationships or activities that readers could consider pertinent or to have influenced the review.• If any authors had competing interests, report how they were managed for particular review processes.
AVAILABILITY OF DATA, CODE, AND OTHER MATERIALS	27	<ul style="list-style-type: none">• Report which of the following are publicly available: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.• If any of the above materials are publicly available, report where they can be found (e.g. provide a link to files deposited in a public repository).• If data, analytic code, or other materials will be made available upon request, provide the contact details of the author responsible for sharing the materials and describe the circumstances under which such materials will be shared.
