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Using Social Cognitive Theory to Explain Cannabidiol Usage for Generalized Anxiety Disorder

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Walden University

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Walden University

College of Health Professions

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Margaret Wenzel

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Walden University
2021

Abstract

Using Social Cognitive Theory to Explain Cannabidiol Usage for Generalized Anxiety

Disorder

by

Margaret Wenzel

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

Walden University

November 2021

Abstract

In the United States, over 40 million adults suffer from a generalized anxiety disorder (GAD), with a 67% increase in overdose-related deaths. Research substantiates the efficacy and safety of cannabidiol (CBD) for GAD. Findings show that CBD, sourced from industrial hemp, may reduce anxiety symptoms. However, a problem exists for individuals deciding to subscribe to CBD's oral administration because of the inability to remain compliant with the regimen. The measured steps that occur when a medication is prescribed are lacking when an individual accesses CBD independently. This quantitative cross-sectional study was designed to examine whether social cognitive theory explained the self-reported likelihood of CBD usage for GAD patients. The five constructs of SCT were operationalized: knowledge, expectations, situational perception, self-efficacy, and goal setting. The instrument was validated for face, content, and construct validity, and internal consistency reliability was established using Cronbach's alpha. The data collected from the sample of 114 were analyzed using stepwise multiple regression. There was a significant association with the likelihood of CBD usage found between three SCT constructs, namely goal setting, self-efficacy, and situational perception ($p < 0.05$). The inclusion of SCT was shown to explain the likelihood of CBD use for GAD. The fortification that results from the inclusion of SCT can enhance educational programs used to promote using CBD for those individuals struggling with GAD, with the end goal of influencing positive social change in the arena of public health.

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Dedication

I dedicate my dissertation to our children, who, each in their various ways, have inspired me to do my most influential work. There is nothing quite like the love for a child to drive a parent to find the 'why.' First, my daughter Lindsey was responsible for the inspiration that prompted me to pursue this doctoral degree. Erik, Christine, Mark, and Lindsey: My love for each of you drove me never to stop researching and never take no for an answer. Some of my findings throughout my Ph.D. program led to discoveries that hopefully impact the field of public health. While researching the 'why' showed us the 'way' through various health dilemmas while gaining critical insights to understand better how to negotiate through the complex healthcare system. My goal is to continue to focus on tickborne diseases- an area that is desperately in need of positive social change.

I dedicate my dissertation to a person who inspired me to do my absolute best work. Throughout this doctoral program, my husband Jim was not only unwaveringly steadfast and supportive, but Jim also seemed to delight in... and even got a charge out of each step along the way- throughout the robust class schedule and writing this paramount assignment. From the occasional proofreading (how many pages???) to anxiously awaiting the grades to roll in, Jim never skipped a beat as he encouraged me to forge ahead and do my absolute best work. I love you dearly with my whole heart, 'James K!' Jim... you always knew that I would finish, even when I could not imagine that I could jump through all the necessary hoops to reach this lofty goal. This process epitomized the profound love and respect that we share. My heartfelt thanks to you all.

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First, I would like to thank my Committee Chairperson, Dr. Manoj Sharma. Dr. Sharma prompted me to develop high-level research skills that I will build upon throughout the rest of my life, and for this, I am deeply grateful. I would also like to extend my utmost gratitude to my Second Committee members Dr. Leslie Elliott and Dr. Schumaker, and the University Research Reviewer, Dr. Kuo, for their impeccable support, encouragement, and guidance from the inception of this study topic to the finished product. For all the volunteers who ever-so-kindly took the time to volunteer to become study participants, I sincerely thank you. I cannot speak highly enough about my husband James, whose unwavering support made this arduous journey a lot more fun. What was your grade? Only a 99? What happened???

Of course, our children Erik, Christine, Mark, and Lindsey were always in the forefront of my mind for the unique roles they played, hence, inspiring me to do my best work. Being a female born in the '60s, I would also like to acknowledge the fact that I felt that there was a benefit for our children and grandchildren to witness that we can continue to yearn and learn and contribute to positive social change through all the stages in our lives- and that we need not stop because we are committed to other endeavors. I am so grateful to have realized that I can continue to evolve and contribute my highest-level work while drawing from the various experiences that unfolded throughout my life. Most of all, from wherever this spark of passion ignited the fire inside of me to *do my best work*, I am entirely in awe of you. Thank you, God.

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Chapter 1: Introduction to the Study

This study's topic was focused on whether the constructs of social cognitive theory (SCT) influence participant's likelihood of using hemp-sourced cannabidiol (see Bitencourt & Takahashi, 2018) for generalized anxiety disorder (GAD). Some scientific research supports the safety and effectiveness of cannabidiol (Caraballo et al., 2020; Cooper et al., 2017; McGuire et al., 2018; Shannon and Opila-Lehman, 2016). However, it has become evident that complications exist regarding the various qualities of the raw materials and the complexity in dosing the substance (Larsen & Shahinas, 2020). McPartland and Guy (2017) concluded that individuals had a broad range of opinions and biases regarding the act of taking cannabidiol (CBD). Some were not certain if this was akin to using marijuana, while others were not clear if it is legal to transport CBD interstate (Mead, 2017).

Meanwhile, public health experts Trautmann et al. (2016) assert that anxiety and depression cost the global economy 1 trillion U.S. dollars annually. Finding a way to treat anxiety more effectively provides a four-fold return on each US\$ dollars invested (Trautmann et al., 2016). While a body of evidence shows how safe and effective CBD is in treating GAD, it has become abundantly evident that individuals struggle to find a dosing schedule that relieves the ailment (Elms et al., 2019). Therefore, it was warranted to examine these attitudes toward CBD through the framework of SCT. Such an investigation can provide the opportunity for researchers to gain a deeper understanding of the challenges that exist and the potential impediments that might minimize the likelihood of taking CBD for treating GAD, thus promoting positive social change.

Background of the Problem

In the United States, over 40 million adults suffer from GAD (Lydiard, 2000). Chollet et al. (2013) point to the risk of chemical dependency with chronic usage of commonly prescribed antianxiety medications such as Ativan and Xanax. Meanwhile, an assemblage of researchers showcased CBD's safety and effectiveness in treating GAD (Garcia-Gutierrez et al., 2020; Tambaro & Bartolato, 2012; Zuardi et al., 2017). However, many hesitate to subscribe to CBD's oral administration therapeutically because of quality concerns, costly out-of-pocket expenditures, and preconceived notions about the substance (Iannotti et al., 2020).

Simultaneously, practitioners in the field of holistic health encourage individuals to meet health challenges early in the disease progression as a means of minimizing suffering, becoming a master of one's health status, and decreasing the eventual need for more invasive, immoderate, and cost-prohibitive treatments (Zamanzadeh et al., 2015). Complementary and alternative health (CAM) experts conducted a study that examined the dovetailing of preventative therapies with conventional medicine to substantially decreasing the out-of-pocket expenditures and increasing the quality of life of the patient (Shi & Singh, 2017) while maximizing the populace's health. Farre and Rapley (2017) asserted that because the healthcare system is built upon the biomedical model, many individuals are hesitant to veer off in search of those prevention-arc'd therapies. Other researchers found that preventative medicine, when compared to the biomedical model, appears to be less regulated (Wade & Halligan, 2004).

Statement of the Problem

Anxiety has been determined to be a normal emotional response to danger or a potential threat (Belzung & Griebel, 2001). However, that healthy protective emotion can become pathological if it becomes uncontrollable, permanent, or maladaptive (Sartori & Singewald, 2019). Individuals with chronic anxiety disorders can react to situations or objects with dread and panic (Riskind, 1997). Wagner et al. (2005) asserted that the two centrifugal treatments for anxiety-related disorders are medications and psychotherapy. Stein (2004) revealed that GAD surpasses major depression as a strong predictor of various functional impairments and has become a public health issue. Engel (2012) opined that biomedicine is influenced by how society has come to conceptualize disease collectively. The current medical model is built around traditional health authorities and exemplifies a lack of confidence in nonmedical health-supportive models (Engel, 2012).

Su and Li (2011) ascertained an increased thrust in CAM's participation in the United States, most pronounced between 2002 and 2007. Serendipitously, the endocannabinoid system, responsible for creating biological harmony between the human body and its environment, was discovered in the 1990s (Di Marzo et al., 2004). Tambaro and Bartolatto (2012) assert that CBD has shown to be a highly effective and extremely desirable substance for treating anxiety disorders. However, these authors noted a gap in the academic literature that addresses a lack of operational strategies enabling individuals to utilize CBD effectively (Tambaro & Bartolatto, 2012). An estimated 40 million adults in America are afflicted with GAD, and only one-third of those individuals are in treatment for this rampant mental illness (Lydiard, 2000). Recognizing the magnitude of

this public health dilemma, I contended that there is prudence for this study to incorporate the theoretical framework of the SCT as a mechanism to explore theory-driven attitudes relating to the self-reported likelihood of CBD as an effective treatment for GAD.

Purpose of the Study

This quantitative study explored an individual's self-reported likelihood of using CBD for GAD. This exploration used SCT as a vehicle to probe into consumer's attitudes toward the use of CBD for GAD. The research's relevance and uniqueness stem from the lack of a theoretical approach coupled with the recent discovery of CBD's capacity to be highly therapeutic for GAD. I applied and measured five SCT constructs, a theoretical framework created by a developmental psychologist (Bandura, 2004). For this study, the five constructs include knowledge, expectations (including outcome expectations and outcome expectancies), situational perception, self-efficacy in using CBD, and goal setting. The rationale behind using the SCT is that it may help CBD users effectively apply a specific treatment protocol while discovering their effective CBD dosage. I sought to ascertain whether these variables will collectively contribute to a more comprehensive understanding of an individual's reluctance or inclination toward incorporating CBD as a holistic-oriented solution for GAD.

Research Questions and Hypotheses

Research Question 1: To what extent are knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the

application of an effective treatment protocol associated with the likelihood of CBD usage in generalized anxiety disorder?

H₀₁: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are not associated with the likelihood of CBD usage in generalized anxiety disorder.

H_{a1}: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are associated with the likelihood of CBD usage in generalized anxiety disorder.

Research Question 2: To what extent are knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol associated with the likelihood of CBD usage in generalized anxiety disorder, while controlling for age, gender, level of education, and generalized anxiety disorder scores?

H₀₂: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are not associated with the likelihood of CBD usage in generalized anxiety disorder while controlling for age, gender, level of education, and generalized anxiety disorder scores.

H_{a2}: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective

treatment protocol are associated with the likelihood of CBD usage in generalized anxiety disorder while controlling for age, gender, education level, and generalized anxiety disorder scores.

Variables in the Study

The independent variables are the five constructs of the SCT. These five constructs were measured as a mechanism to gain valuable data regarding the self-reported likelihood of using CBD for GAD. They are:

- knowledge,
- expectations (This construct examines both outcome expectations and expectancies),
- situational perception,
- self-efficacy in using CBD, and
- goal setting.

The likelihood of CBD usage is the dependent variable. The five constructs of the SCT are the independent variables while controlling for the following covariates, including age, gender, education level, and GAD level scores.

The Perspective of the Theoretical Framework

This study examines an individual's ability to use CBD effectively through the lens of the SCT. SCT posits that reciprocity transpires within a social context of the dynamic interactions between the individual's personal factors, behavioral and environmental factors (Bandura, 1989). Furthermore, personal factors consist of biological, affectual, and conceptual (Sharma, 2017). The resulting convergence can

prompt a new behavior (Turner et al., 2011). As the health field transforms into a health model rather than a model based on disease progression, health promotion needs to be built upon a well-constructed goal (Bandura, 2006). The creator of the SCT, Bandura (2018), opined that when the goal was to achieve a state of wellness, medical intervention alone is not the most conducive in attaining the end goal, which is the state of optimal health. Optimal health status is a loftier goal compared to merely minimizing the presenting physical or emotional symptomatology.

Using CBD for GAD differs from the experience of being prescribed a medication for the disorder. When one examines how a drug is prescribed and compares this ritual to starting a CBD protocol, one can likely begin to understand why a CBD user might become less compliant. A written prescription from one's medical doctor provides some built-in structuring that promotes the patient's compliance with the prescribed medication regimen. Firstly, a required initial visit with the physician to discuss presenting symptomatology precipitates the prescription. Next, a follow-up visit substantiates the need to engage in the prescribed treatment protocol. However, when a consumer considers using CBD to treat GAD, there is a less ritualistic formality to support the decision to take such an action (Larsen & Shahinas, 2020). Coupling the utility of SCT with CBD usage may help fortify compliance by examining the participants' unique ability to negotiate the necessary behavioral change so that the individual is supported to use CBD to manage GAD and address a meaningful gap in the current research literature.

For this research, I probed participants' self-reported likelihood of using CBD for GAD, beginning with applying the first construct of the SCT, which is knowledge. Here,

this construct intends to aid in discovering the individual's current level of understanding of the topic of CBD and GAD. The survey questionnaire probed the respondent's insights and facts on these topics of focus in this study. The participant's breadth and depth of understanding of the facts surrounding CBD and GAD are examined in Section 1 of the survey instrument.

Next, I examined expectations, including the outcome expectations and outcome expectancies of those considering using CBD for GAD. As an individual is poised to make a behavioral change, the person anticipates the outcome that might springboard from committing to the new behavior, hence, outcome expectations. Outcome expectancies is the value that the individual places upon the ability to perform that new behavior (Bandura, 2013). The same source posits that this modification can result from roleplaying, thinktanks, and discussing the advantages of the shift in behavior.

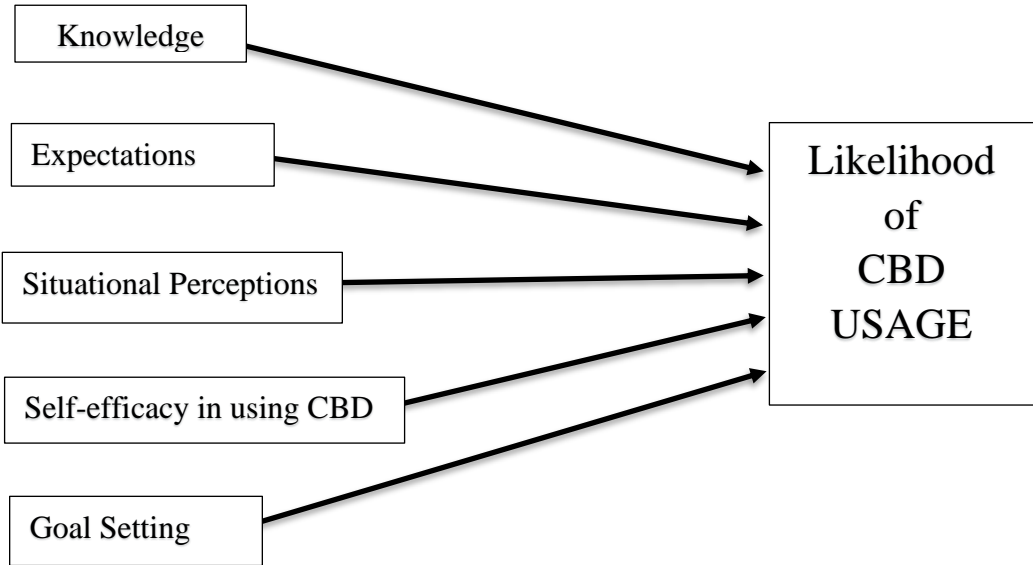
Sharma (2017) asserted the need to determine a level of understanding of the individual's situational perceptions. As the individual realizes that the old behavioral style and associated thinking are no longer suiting their needs, the person must shift the understanding of tired perceptions and interpretations of the environment and behavioral style. Had the old beliefs and perceptions been beneficial, the individual would likely not need this self-reflection and reassessment. The SCT construct of situational perception often requires rectification of an individual's distorted perceptions (Bandura, 2018)

Next in this inquiry is an examination of self-efficacy in using CBD for GAD. This study is with the potential of heightening awareness of the behavioral confidence that supports implementing a beneficial regimen. Bandura (2013) stated that self-efficacy

is the belief that an individual maintains regarding creating and executing an organized action to succeed with the desired outcome. It is noted that self-efficacy continues its evolution throughout an individual’s lifetime by acquiring new skillsets (Edinyang, 2010). The fifth construct examines goal setting to determine how likely the individual will experience a successful outcome when taking CBD to minimize GAD. In totality, the inclusion of this construct of the SCT will help analyze behavior initiation to fortify the ability to maintain a new behavior (Bandura, 2018). Following is a visual of the five SCT constructs as they are positioned to lead the individual into incorporating the new health-supportive habits.

Figure 1

Diagrammatic Model of SCT Constructs Leading to Desired Health Behavior



Nature of the Study

The nature of this study is quantitative research with a cross-sectional design. The study design provided the opportunity to acquire a snapshot of the characteristics of the attitudes related to CBD usage. Using a Likert scale, my goal was to determine the participants' ease of taking CBD and the potential impediments and challenges of doing so, through the SCT lens. My over-arching goal was to facilitate the elucidation of the participants' attitudes regarding the self-reported likelihood of CBD use while examining the subject's measurement of the SCT's five constructs on the Likert scale designation of 0-4. These independent variables are knowledge, expectations (including outcome expectation and outcome expectancies), situational perception, self-efficacy in using CBD, and goal setting toward applying an effective treatment protocol for the population seeking to treat GAD with CBD.

Operational and Constitutive Definitions

Knowledge: This first construct in SCT. *Knowledge* references one's ability to gain insight and the propensity to learn the factual elements (Bandura, 1998). This section assesses the individual's understanding of CBD as a potential remedy to relieve GAD. This construct is measured by Questions 1-10 in the survey instrument. The scoring for this construct, consisting of 10 true or false scale items, has a range of 0 through 10.

Expectations: This section assesses the individual's outcome expectations and outcome expectancies regarding the CBD taking for GAD. In this study, the two classifications of this construct: outcome expectations and outcome expectancies.

Outcome expectations refer to the likely outcome an individual will experience following through with taking CBD for GAD. In contrast, outcome expectancies are representative of the valuation placed on that expected outcome (Bandura, 2004). The construct titled outcome expectations is measured by Questions 11-15 in the survey instrument, with a scoring scale as follows: (0) *No*, (1) *Probably Not*, (2) *Maybe*, (3) *Probably*, and (4) *Highly Likely*. The construct termed outcome expectancies is measured by Questions 16-20 in the survey instrument with a scoring scale as follows: (0) *Not at all Important*, (1) *Not Very Important*, (2) *Somewhat Important*, (3) *Important*, (4) *Very Important*. Multiplication of items 11 and 16, items 12 and 17, items 13 and 18, items 14 and 19, and items 15 and 20 (Sharma and Petosa, 2014) enabled the summation of expectations of the likelihood of using CBD; the score range is from 0 to 80.

Situational perception: This construct describes how individuals perceive and interpret one's behavior and environment (Sharma, 2017). This section of the survey assessed how one's perception affects the ability to utilize CBD for effectively treating GAD. This construct was measured by Questions 21-24 in the survey instrument. The scoring scale for situational perception is with the following designations: (0) *No*, (1) *Probably Not*, (2) *Maybe*, (3) *Probably* (4) *Highly Likely*, and has a range of 0 to 16.

Self-efficacy: This construct is designated to examine the confidence that an individual must exercise (Bandura, 2006) to implement an effective protocol to take CBD for GAD. This construct is measured by Questions 25-28 in the survey instrument. The scoring scale for self-efficacy in using CBD has the following designations: (0) *No*, (1) *Probably Not*, (2) *Maybe*, (3) *Probably*, (4) *Highly Likely*, with a scoring range of 0-16.

Goal setting: The final construct of the SCT investigates the level of confidence in one's ability to pursue a new behavior (Sharma & Petosa, 2014). This construct, measured in Questions 29-33, examined the necessary strategy that needs to be implemented to set goals for taking CBD effectively for GAD and developing a plan on how to reach those objectives. The scoring scale for goal setting is with the following designations: (0) *No*, (1) *Probably Not*, (2) *Maybe*, (3) *Probably*, (4) *Highly Likely*, with the scoring range between 0 to 16.

Assumptions and Limitations

While cross-sectional design can serve multiple purposes, one potential barrier for this study is recruiting an adequate number of individuals willing to complete the survey questions. Also, as I assessed the limitations of self-reporting, there is the recognition that it is imperative to be keen to evaluate the level of accuracy and the potential of self-reporting bias of the data collection (Short et al., 2009). The cross-sectional analysis is with the possibility of introducing another limitation in this study. Specifically, while the cross-sectional design provides the opportunity to collect relevant data and make a one-time 'snapshot' measurement of the exposure and the outcome, a cross-sectional design can impair a researcher's ability to derive causality in the relationship between exposure and outcome (Setia, 2016).

Another potential limitation is that of generalizability. Although the publicly accessible pick-up and drop-off location that was used in recruiting participants for this study serves individuals from all SES sectors, a high percentage of participants hail from the northeast corner of Connecticut. This county is home to individuals in a relatively

high SES sector compared to other parts of the state and the country. Therefore, because this study can likely only be applicable to a narrow sector of the population, the results might have poor generalizability. The possibility of flawed generalizability was further analyzed in the final two chapters of this study.

Scope and Delimitations

Cross-sectional studies are inclined to biases, such as selection bias, information bias, nonresponse bias, recall bias, and confounding (Tilahun et al., 2020). The propensity to biases can limit a researcher's ability to prove noteworthy trends that may or may not be occurring. An overarching concern is the potential incomplete answers to items on the questionnaire, which would negatively influence this study's internal validity. Addressing the issue of generalizability, because this study is being conducted in a high SES location, there is a need to conduct further investigations into a cross-section of socioeconomic regions to examine the self-reported likelihood of using CBD in situations where the ability to make out-of-pocket expenditures assess individuals' varying degrees of abundance.

Significance of the Study

The study's outcome gives rise to vital insights into the self-reported likelihood of using CBD as a remedy for GAD. CBD can tone and balance the recently discovered endocannabinoid system (Garcia-Gutierrez et al., 2020). Hence, CBD can resolve the root cause of symptomatology rather than merely relieving the symptoms of such (Khan et al., 2020). Practical usage of CBD enables individuals to safely self-regulate and balance health issues that would otherwise be left in need of being treated with more potent

pharmaceuticals. In comparison, many of the medications commonly used to treat GAD have a plethora of side effects such as rebound, injury to the liver and kidneys, and the propensity of addiction (Park et al., 2015; Starcevic, 2014).

Lydiard (2000) reported that GAD has a characteristic of being remitting and relapsing for the over 40 million adults in the United States suffering from this most prevalent mental illness. Therefore, there is a need to find effective modalities to treat GAD other than the commonly prescribed benzodiazepines that, with long-term treatment, carry the risk of cognitive and psychomotor function impairment (Lydiard, 2000). Bridging the field of complementary and alternative health with biomedicine would aid in alleviating this public health burden (Mathiesen et al., 1999). Replacing a portion of the expected 3.8-billion-dollar market with CBD could positively influence societal change.

Moreover, in the spirit of promoting constructive social change, the overall beneficial impacts of applying SCT to CBD use may aid in relinquishing potential roadblocks and assist individuals in forming a more comfortable relationship with taking CBD for GAD. This study will apply the five theoretical constructs of the SCT to heighten awareness of the participants' theory-driven attitudes while examining the respondent's comfortability when deciding to use CBD for GAD. Furthermore, this study aims to determine if the self-reported likelihood of CBD usage is increased through the fortification of applying the SCT framework.

Summary

This chapter introduced an overview of this dissertation study, which is the probing into the participants' theory-driven attitudes toward CBD. Moreover, from the public health perspective, I sought to highlight the potential positive social change that may result from examining the study subjects' attitudes toward CBD usage for GAD. This chapter reviewed the rationale behind the probed hypotheses through the forty-five questions instrument presented to the recipients who chose to participate in this research. Chapter one also covered the reasoning behind selecting the cross-sectional study design using a quantitative methodology for the proposed data collection.

Consideration of potential assumptions and limitations was explored, including the scope and delimitation of this application. For this inquiry, I subscribed to the theoretical framework using SCT to explain an individual's self-reported likelihood of using CBD for GAD. The author will move forward to build the case incorporating the robust literature review. The overarching goal is that the findings will further clarify how individuals can use CBD most effectively to minimize or resolve GAD. Inevitably, the act of gaining a greater degree of understanding of the self-reported likelihood of effective CBD usage for GAD will contribute to positive social change.

Chapter 2: Literature Review

GAD affects 40 million adults in the United States (Lydiard, 2000). While treatable, only 36.9% of those afflicted are in treatment for this most common mental illness (Collins et al., 2004). Hoge et al. (2015) affirmed that there are concrete steps that one can take to decrease symptoms, but there is little support offered in prevention strategies (Christensen et al., 2010). Many health and law experts uphold that the influence of biomedicine has sanctioned a conceptualization of a sick-care system that lacks preventative care strategies (Cloatre, 2019; Engel, 2012; Sarris et al., 2013). As a result, the current medical model-oriented healthcare system upholds the traditionalist health authorities' stayed beliefs, which projects a lack of confidence to engage in a nonmedical healthcare model (Engel, 2012). CBD has been proven to effectively treat GAD (Garcia-Gutierrez et al., 2020). Still, there is a higher likelihood that patients learn about CBD from friends or the internet rather than from a healthcare professional (Corroon & Phillips, 2018).

Focusing on this dilemma might help minimize the divide between alternative and complementary healing mechanisms and public health strategies. Su and Li (2011) revealed a higher level of participation in these preventative-arc'd modalities between 2012 and 2017. And while Tambaro and Bartolato (2012) recognized CBD's high level of effectiveness for treating GAD, these authors also noted that a gap existed in the operational strategy to help individuals find their effective dosage. The following literature review points to the depth and breadth of the lack of education outside of the current medical model in alternative and complementary options, focusing on the theory-

driven application of SCT while examining the self-reported likelihood of CBD usage for GAD.

For this chapter, I subscribed to Ulrich's Periodicals directory and PRISMA for collecting the peer-reviewed, evidence-based items used to create a full literature review. My goal was to provide a more in-depth, evidence-based understanding of the issues surrounding the treatment of GAD and the potential impact of applying SCT. Of the total of 96 pieces of literature utilized for this research 94 of those were from 2000 to 2020; 79 of those were between 2010 and 2020, while 53 were from 2015 to 2020. Approximately 50 other journal articles were identified and incorporated into this study because of a crucial histrionic perspective the works offered.

This chapter provides a thorough explanation of the procedure for selecting the academic literature. There is a clarification of the reasoning behind the implementation of the chosen key search words. I also provide the basis of why I incorporated the five constructs of the SCT. I then present the argument as to why the SCT framework was appropriate and explained how this theoretical framework has the potential of simultaneously contributing to and filling a gap in the scientific literature.

Conducting the Strategic Literature Review Search

To create a robust and relevant literature review, I first researched the peer-reviewed academic journals to see if I would find an abundance of literature that showcased the safety and efficacy of CBD. Next, to understand how CBD is most effectively dosed, I explored how this substance modulates anxiety in the human body. An examination of how an individual comes to purchase CBD to treat GAD followed. I

became particularly interested in the complications that might unfold because of the freedom of choice and the lack of structure in CBD's dosing schedule. To meet this challenge, I incorporated the five constructs of the SCT as a systematic mechanism to explore CBD usage's likelihood and how this knowledge can enable an individual to find the most effective dosage of CBD for treating GAD. The relative newness of the topic and the recent discovery of the endocannabinoid system in the 1990s continuously revealed numerous gaps in even the most recent literature. To add a histrionic perspective, I infused into review some seminal works (Bandura, 1989; Bystritsky et al., 2012; Sarris et al., 2013; Sharma & Romas, 2012; Short et al., 2009; Smith & Hitt, 2006; Wade & Halligan, 2004).

The following is a description of pertinent academic article topics focusing on the safety and efficacy of CBD use. In this literature review, I place equal emphasis on GAD. The keywords searched include *CBD, cannabidiol, generalized anxiety, GAD, holistic health, biomedicine, complementary and alternative medicine, CAM, industrial hemp, anxiety-related disorders, generalized anxiety disorders, sleep disorders, and the endocannabinoid system*. I also focused on the pertinence of the application of the SCT. While searching for academic journal articles on SCT, key search words include *social learning theory, Albert Bandura, theoretical framework, theoretic foundations, self-regulation, cognitive formulation, Bobo doll experiment*.

The Walden University library was the primary source for the research conducted in the databases, including SAGE Journal, ERIC, and Thoreau multi-database search engine. Google Scholar, Research Direct, Research Gate, and MEDLINE were also

frequently searched to create the literature review. A catalog of just under 500 related peer-reviewed articles was generated while constructing this study's format. While 58 of the peer-reviewed academic journals were written between 2015-2020 (88%), 94 of the sources were written between 2000-2020. Seventy-nine of those sources fell between the years 2010 and 2020. The remainder of the journals were included because they introduced a vital and relevant historical perspective.

Because GAD is the focus of this study, I conducted a multi-faceted examination of this topic through various databases. From examining areas of specialization in pediatrics through geriatric medicine, I sought to gain greater awareness of the complexity of the issues that might arise from various stages of the lives of those suffering from GAD. Gaining a deeper understanding of the mediation and regulation in brain biochemistry from CBD and the commonly prescribed medications was a critical step in conducting a relevant literature collection upon which to draw. Looking at CBD's scientific development and attitudes toward CBD from as recent as 2000 to the present day is astounding. In total, these various perspectives lent an enriched understanding of the complexity of GAD and CBD. My curiosity was piqued as I combed the various modalities that remain the frontline treatments, although many questions persist regarding the safety of those commonly prescribed treatments.

Much research was done on the use and effectiveness of CBD for GAD to substantiate if there was prudence in conducting this study. Some of the studies revolved around a more in-depth look at the relationship between CBD use and medical protocols for GAD. As this study was being conducted, there was some new research surfacing

about COVID-19 and CBD usage. Some of the research was regarding the increase in GAD because there was a global pandemic unfolding in real-time. Serendipitously, scientists were examining CBD as a substance that modulated the stress response without creating the risk of lowering respiration, as is noted in some of the commonly prescribed antianxiety medications. Some of this research incorporated MRIs into the assessment of the brain anatomy to determine changes before and after CBD usage, as noted in the upcoming literature review table (Li et al., 2020).

To broaden my perspective, I also explored the research that was currently being conducted in countries other than the United States. The information of the various studies in the international locations as well as the United States has been included in the upcoming literature review table. In the assessment of the feasibility of using CBD for GAD, issues of brain biochemistry imbalances (De Gregorio et al., 2019), legal issues (Cloatre, 2019), and potential medication and herb interactions were assessed (Boparai et al., 2017). When I felt confident to move forward with examining the ‘likelihood of taking CBD for GAD,’ I had thus drawn the conclusion that CBD is safe and efficacious for the treatment of GAD. With the uniqueness that each user needs to find their unique, effective dosage, it felt prudent to examine the likelihood of taking CBD for GAD. The most current significant studies that were of pertinence to this study are listed in the literature review table in Table 1 below.

Table 1*Literature Review Table of Topics Pertaining to Generalized Anxiety Disorder*

<u>Author</u>	<u>Methods</u>	<u>Peer*review</u>	<u>Location</u>	<u>Focus Area</u>	<u>Source</u>	<u>Year</u>
1 Bauerle	Quant.	Yes	Germany	GAD/COVID	Journal	2020
2 Garcia	Quant.	Yes	Spain	Treatments	Journal	2020
3 Iannotti	Mixed	Yes	Italy	PPARy/Reg	Journal	2020
4 Li	Mixed	Yes	China	MRI/GAD	Journal	2020
5 Twenge	Quant.	Yes	USA	COVID/GAD	Journal	2020
6 Bolsani	Mixed	Yes	Brazil	CBD/Corti.	Journal	2019
7 Cloatre	Qual.	Yes	UK	Med/Law	Journal	2019
8 DeGregorio	Quant.	Yes	Canada	Serotonin	Journal	2019
9 Elms	Mixed	Yes	US	PTSD/CBD	Journal	2019
10 Linares	Mixed	Yes	Brazil	CBD/GAD	Journal	2019
11 Radoi	Mixed	Yes	Romania	Clinic/CBD	Journal	2019
12 Sartori	Quant.	Yes	Austria	Phar./CBD	Journal	2019
13 Shannon	Quant.	Yes	USA	Pediatrics	Journal	2019
14 Baric	Mixed	Yes	Croatia	CAM/CBD	Journal	2018
15Bitencourt	Quant.	Yes	Brazil	PTSD/CBD	Journal	2018
16 Hallion	Qual.	Yes	USA	Util./Worry	Journal	2018
17 Baldwin	Quant.	Yes	UK	CNS/Phar.	Journal	2017
18 Boparai	Qual.	Yes	India	Herb/Med.	Journal	2017
19 Kendall	Quant.	Yes	USA	Recept/CBD	Journal	2017
20 Lee	Quant.	Yes	UK	CBD/Regul.	Journal	2017
21 Reiman	Quant.	Yes	USA	CBD/Opioid	Journal	2017
22 Jurkus	Quant.	Yes	UK	CBD/Fear	Journal	2016
23 Shannon	Qual.	Yes	USA	CBD/Sleep	Journal	2016

Literature Review Overview

While all the entries in the literature review table were relevant, some are not self-explanatory. The first five entries were published the year this dissertation was written. With a focus on two of those entries, two of these studies (1, 5) examined CBD use for GAD through the unfolding of the COVID-19 pandemic. Some of the works in the literature review added fortification to the study by examining the fluctuation, positive

influence, and effectiveness of CBD on brain biochemistry- in entries 3, 4, 8, 12, 19, and 20. While the majority of the entries were quantitative, I carefully incorporated a balance of meta-analysis studies in entries 3, 4, 6, 9, 10, 11, and 14. To elucidate the perspective of the patient/respondent, several qualitative studies were integrated into the literature review, including entries 7, 16, 18, and 23. All entries were rechecked to ensure that each journal article accessed was peer-reviewed.

Social Cognitive Theoretical Framework

The SCT is utilized to support a person's ability to influence their actions and, therefore, increase the likelihood of producing a particular result (Bandura, 1999). The same source reveals that the SCT was developed in the 1960s by Albert Bandura. This theoretical framework was initially referred to as the social learning theory (Bandura & Walters, 1977). Bandura professed that SCT could enable subscribers to *contribute* positive attributes to one's life circumstances rather than merely being a product of such (Smith & Hitt, 2006). Bandura (2011) asserted that SCT was rooted in an agentic construct of a human's ability to develop, adapt, and change. The creator of SCT posits that behavioral change occurs within a social context as reciprocity occurs between the individual, the individual's behavior, and the individual's environment (Bandura, 2006).

In an analysis of how practical the application of SCT has been in similar studies, researchers utilized SCT as the theoretical framework for chronic health condition interventions (Tougas et al., 2015). Another study showcased the efficacy of applying the SCT in developing electronic health design platforms (Grace-Farfaglia, 2019). Domino et al. (2015) scrutinized ethical behavior, client narcissism, and fraud attitudes, also

determining SCT was highly beneficial in examining corporate accounting professionals' attitudes and behaviors. Lin et al. (2020) explored the mediation of hyper-competition and dysfunctional conflict in complex work environments by applying the SCT framework. The SCT was used in a study that probed the effect of CBD on the act of simulated public speaking and determined a high success rate (Bergamaschi et al., 2011). Knapp et al. (2020) also utilized the SCT to understand the complex multi-lateral composition of present-day work environments.

This study will explore the participants' self-reported likelihood of using CBD for GAD while subscribing to the SCT framework. The application of the first construct of the SCT is knowledge. Here, I examined the experience the participants currently maintain on CBD use for GAD. The second construct is pointed at gaining a deeper understanding of the subject's expectations, including outcome expectations and outcome expectancies by and for the participant. The third construct of SCT is referred to as situational perception. Here, the intention was to gain insight into the study participant's perception and interpretation of their behavior and environment (Sharma, 2017) that might inhibit one from successfully embarking upon a CBD regimen to treat GAD.

Self-efficacy in using CBD, the fourth construct, allows for an examination of CBD usage self-efficacy to be considered and assessed. This concept enables the assessor to gain insight into the subject's degree of behavioral confidence for implementing a beneficial CBD protocol (Bandura, 2004). The fifth construct of the SCT is that of goal setting. Bandura (2018) professed that the use of goal setting relates to an increase in self-monitoring behaviors. The rationale for conducting this examination through the lens of

the SCT is that doing so will facilitate a more in-depth understanding of the attitudes and the self-reported likelihood of CBD use by examining the respondent's confidence level in using CBD as an effective holistic health modality for GAD.

Prevalence of Generalized Anxiety Disorder

Belzung and Griebel (2001) contended that anxiety is considered a normal and healthy response to threats and dangerous circumstances. Yet this healthy emotion has become maladaptive, pathological, and even permanent (Sartori & Singewald, 2019) for upwards of 20% of individuals between 18-54 living in the United States (Bandelow & Michaelis, 2015). These statistics equate to approximately 40 million adults afflicted with GAD (Collins et al., 2004). The United States Census Bureau stressed that there was a tripling increase in GAD in adults in May of 2020 compared to the previous year (Twenge & Joiner, 2020).

Barlow (2000) demonstrated that certain circumstances or objects could trigger a person to have a panic attack or overwhelming and sometimes chronic feeling of dread, while noting that essential determinants in developmental learning and psychology aided in understanding anxiety and related disorders. The current medical-arc'd health care system proclaims that there are two primary treatments for GAD: psychotherapy and prescription medications (Wagner et al., 2005). Meanwhile, some alternative and complementary researchers expressed concern that treating anxiety disorders is highly influenced by the intervention-arc'd healthcare system rather than implementing a preventative care approach (Engel, 2012). This research points to limitations in treatment

protocols that could be beneficial with the inclusion of adaptogens such as CBD to treat GAD (Zamanzadeh et al., 2015).

Complementary and Alternative Medicine

In the United States, the medical-oriented healthcare system has become more accepting of complementary and alternative preventative-arced and health-building modalities (Perard et al., 2015). Zamanzadeh et al. (2015) stressed that merging a holistic health system of care with biomedicine could improve healthcare methodologies. The same researchers asserted that this act could prompt the creation of appropriate preventative public health education campaigns. Pelletier (1991) built an impressive case regarding cost-effectiveness resulting from prevention strategies with a greater focus on health promotion rather than mere intervention-styled medication modalities.

Meanwhile, Cloatre (2019) examined the convergence of traditional healing techniques as they abutted with biomedicine. Specifically, I explored how ancient health modalities have become the ‘pseudo’ treatments as biomedicine and law have become centrifugal to the current healthcare system. This health law expert (Cloatre, 2019) asserts that- while regulatory systems are recognizing various branches of ancient healing arts, these modalities are being operationalized on assumptions disqualifying the product because it does not resemble the medical model treatment strategies. Niemeyer et al. (2013) showcased those medical practitioners often consider CBD to be a feasible and effective treatment for the patient’s GAD yet remain uncomfortable recommending an herbal supplement. Throughout the peer-reviewed literature, there was a familiar storyline of many individuals discovering the ease of surrendering to a written

prescription for medication rather than embarking upon the process of experimenting with herbals remedies, such as CBD.

Epidemiology of Generalized Anxiety Disorder

The World Health Organization's perspective on the ramifications of anxiety disorders is showcased in a journal article that focuses on the gravity of anxiety disorders- revealing the cumbersome economic burden to which this nation is subjected because of the gross underdiagnosing and undertreatment of these mental illnesses (Costa e Silva, 1998). A group of researchers conducted a cross-sectional study of 15,704 residents to assess GAD from an epidemiological stance due to COVID-19, concluding a spike in the GAD prevalence (Bauerle et al., 2020). Meanwhile, there was an increase in the number of researchers resounding the safety and efficacy of CBD for inflammation, sleep disorders, and GAD (Caraballo et al., 2020; Cooper et al., 2017; McGuire et al., 2018; Shannon and Opila-Lehman, 2016). While examining how individuals can use CBD most effectively for an epidemic proportion of GAD, I revisited the challenge that exists when users are left to determine what dosage is most useful for this prevalent health threat. Moving toward a solution to de-escalate this health impediment would be a giant step toward alleviating considerable strain on the public health arena while positing social change.

Reiman et al. (2017) defended that not only is CBD poised to treat the root cause of GAD, but CBD is a safe and effective treatment that can support patients to move away from even those highly-scrutinized opioid medications so frequently prescribed for pain relief, sleep disorders, and GAD. Reiman et al. (2017) produced substantial evidence

revealing that 97% of those interviewed strongly agreed/agreed that cannabis use enabled a decrease in opiate usage, while 81% strongly agreed/agreed that cannabis provides more pain relief than opioids. Caraballo et al. (2020) highlighted the safety, effectiveness, and tolerability of CBD with children with a mean age of 10.5 years. Garcia-Gutierrez et al. (2020) conducted a review to determine the potential for using CBD to treat GAD through the lens of epidemiology. These scientists determined that CBD is a safe and effective treatment for GAD by assessing the preclinical, clinical, epidemiological, and human experimental studies.

Generalized Anxiety Disorder and the Standard Biomedical Treatment

Baldwin et al. (2017) confirmed that while pharmaceuticals remain the standard medical treatment for GAD, a high percentage of patients abandon the protocol because of the untoward side effects, including weight gain and sexual dysfunction. Bourin and Thibaut (2013) substantiated that the standard treatment methods include cognitive-behavioral therapy and psychopharmacological protocols. These researchers elaborate those benzodiazepines, albeit highly addictive, remain the frontline treatment for GAD. Li et al. (2020) determined that there is recognition of underdiagnosing and undertreating GAD, urging general practitioners to be vigilant to the possibility of such developments. Wagner et al. (2005) defended that partaking in a regular exercise program aids the brain in releasing endogenous cannabinoids that ease anxiousness, urging a holistic approach.

Taylor et al. (2012) identified evidence supporting the prudence in incorporating meditation, yoga, and other prevention-arc'd stress management techniques when seeking to understand links between the brain and physical symptomatology

manifestations, including GAD. A most recent study (Klotz et al., 2020) highlighted that self-initiated CBD usage is high; however, there is a considerable limitation on information regarding the potential of interaction with concomitant medications. These researchers determined that this lack of data causes many to fall back into taking the frequently prescribed benzodiazepines to manage the symptoms of GAD (Klotz et al., 2020).

GAD and Alternative & Complementary Medicine Treatment

In a national study examining the lack of ability to keenly assess and determine GAD and the common comorbidity of major depressive disorder, researchers are pointing to the need for a blending of biomedicine with complementary and alternative medicine practices (Blanco et al., 2014). Sarris et al. (2013) paved the way for further research of treating GAD safely and efficaciously with plant-based medications, including CBD. This team gleaned that CBD's regular use was effective in humans' clinical trials for a broad range of anxiety-related disorders. Scientists examining non-compliance issues, Bystritsky et al. (2012), demonstrated that those participants achieving a 50% reduction in GAD symptoms were more likely to discontinue alternative therapies after eighteen months. This common theme is reiterated in other studies, confirming that complementary and alternative medicine for GADs continues to showcase limitations (Baric et al., 2018; Radoi & Cicu, 2019). These researchers pointed to non-compliance with the CAM practice- usually falling off the protocol not long after the individual feels the relief of the symptom of GAD and begins to forget the level of discomfort previously associated with GAD.

Treating Generalized Anxiety Disorder with Cannabidiol

Kendall and Yudowski (2017) highlighted the brain biochemistry disorder that springboarded from imbalances in the endocannabinoid system and focused on the signaling pathways of the CB1 receptor- specifically the role of modulating homeostasis processing and synaptic plasticity. In a peer-reviewed case study, Shannon and Opila-Lehman (2016) determined that CBD oil can be a safe and effective treatment even in pediatrics- for reducing GAD and improving sleep disturbances commonly associated with post-traumatic stress disorder. Shannon et al. (2019) conducted a large retrospective case series examining CBD's efficacy on generalized anxiety and sleep disorders. These researchers discovered that the inclusion of CBD positively impacted the participants' anxiety scores as quickly as in a 30-day response in this clinical trial, with a notable decrease in anxiety level scores in 57 of the total 72 adult samples (79.2%). This study's scientists also determined that the sleep scores (66.7%) showed an immediate improvement in 48 participants.

Seeking to determine how CBD impacted other complex mental health diagnoses, McGuire et al. (2018) assessed CBD's safety and efficacy in various mental health areas, including schizophrenia. These researchers determined that CBD was well tolerated, had a clear impact on patients, and was a promising prospect as a new adjunctive therapy. Lee et al. (2017) demonstrated anti-anxiety effects through the regulation of emotional processing and emotional memory in response to the use of CBD. De Gregorio et al. (2019) substantiated that CBD reduces anxiety with repetitive treatment from the

activation of the 7-HT_{1A} receptor and aids in repairing faulty 5-HT transmissions in neuropathic-based pain status.

Jurkus et al. (2016) discovered that CBD caused a reduction in learned fear by relinquishing memory reconsolidation of the fear (Linares et al., 2019). In turn, CBD proved efficacious in enhancing extinction- the process through which “exposure therapy inhibits learned fear.” In this case study, Shannon and Opila-Lehman (2016) determined that CBD oil can be a safe and effective treatment for reducing GAD and improving sleep disturbances commonly associated with post-traumatic stress disorder. Zuardi et al. (2017) assembled a compilation of academic journal results, all of which supported CBD’s efficacy in treating GAD, including social anxiety, post-traumatic stress, obsessive-compulsive, social phobia, and panic disorders.

Applying Five Constructs of SCT to Explain the Likelihood of Using CBD for Generalized Anxiety Disorder

With the recognition of the obviousness that many individuals are without the behavioral fortitude to maintain consistency with a CAM remedy compared to taking a prescribed drug, I sought to fortify this research with the social cognitive theoretical structure. Recognizing that there is inadequate research regarding the challenge of discovering one’s effective dosage of CBD (Miller et al., 2019), this framework can serve to unfetter this typically complex process by applying the five constructs of the social cognitive theoretical framework. This study is designed to consider the participants’ current beliefs and behavioral styles of operating. Serendipitously, SCT can help fortify the participants to make health-supportive changes (Rowling, 2010).

In the 1960s, this theoretical framework was first named the social learning theory by the creator Albert Bandura (Smith & Hitt, 2006). In 1989 this learning theory was transformed into the SCT focused on the impact of social influence and emphasized internal and external reinforcements (Turner et al., 2011). As extracted from the SCT, those variables include knowledge, outcome expectations and expectancies, situational perception, self-efficacy in using CBD, and goal setting. Each construct of SCT aids in clarifying the participants' strengths and weaknesses regarding the modification of a specific behavior. The SCT has been proven to be a highly effective framework in critically examining participants' behavioral modification mechanisms (Bandura, 2018) by bringing clarity to the behavior that needs support through this process of transformation.

Potential Influence of Construct Knowledge on Likelihood of Using CBD for GAD

Each participant brings into the experience of taking CBD their unique biases, assumptions, and level of knowledge of the substance. Behavior change is accomplished by compiling facts on the topic in focus through informative sheets, talks, and lectures (Sharma & Petosa, 2014). A study conducted to assess the knowledge level of herbal medicines of undergraduate medical students determined a lack of awareness that the potential of herb/drug interactions exists (Boparai et al., 2017). In the process of enabling an individual to become an authority of one's health status, employing this construct positions a researcher to unequivocally understand if further training is necessary and precisely where to pinpoint an educational initiative. This process of gaining a clear understanding of the participants' knowledge of CBD could curtail the possibility of

omitting key details (Turner et al., 2011), which might disable the individual from finding the effective dosage of CBD for the treatment of GAD.

The Role of Outcome Expectations/Expectancies When Considering CBD for GAD

The purpose of this construct of the SCT was to aid the participant in examining the expected result of using CBD for GAD. While each contributor enters into the process of taking CBD with different preconceived outcomes, examining this construct alerts the researcher to the anticipated consequence, or *expectation*, that might result from engaging in the behavioral change process (Bandura, 2018). The outcome expectancy construct emphasizes the value that the human subject places on the likely outcome that springboards from the act of making the given behavioral change (Sharma, 2017). This information will help a researcher gain a deeper understanding of how driven the participant will likely be while considering CBD for GAD. In comparison, the modification of outcome expectations evolves by discussing the behavioral change benefits, while outcome expectancies develop by discussing the value placed upon the anticipated behavioral adaptations.

The Rationale for Situational Perception When Considering CBD for GAD

There is prudence in gaining knowledge from the survey respondent's current situational perceptions and interpretation of the level of awareness of the health-supportive attitude within the context of one's environment (Manjarres-Posada et al., 2020). The knowledge gained by understanding an individual's situational perceptions can rectify the dysfunctional behavior by recognizing those current and past misperceptions (Bandura, 2018). Through this assessment, the respondent can reposition

their perceptions and interpretations to aid in increasing the likelihood to attain the end goal of gaining the fortitude to follow through with a health-supportive behavioral change (Smith & Hitt, 2006). Thus, this newly developed skillset can increase the likelihood of acquiring a health-supportive habitual behavior.

Self-Efficacy in Likelihood of Using CBD for Generalized Anxiety Disorder

Having confidence in one's capacity to follow through with new behavior is an element that all change-makers need to contend with while making an essential health-supportive transition. Researchers Shamizadeh et al. (2019) tested behavioral confidence in a study focusing on prediabetes patients. These scientists concluded that there was indeed value derived from applying the SCT- as it assisted those in making lifestyle changes that guided the participants in modifying the individual's familial propensity to prediabetes. The role of the theoretical framework in this study was to gain a higher level of insight into the subject's belief in their ability to pursue the new behavior of taking CBD for minimizing or resolving their GAD.

Gaining a more in-depth understanding of what practical steps (Turner et al., 2011) need to be taken to turn the intention of taking CBD into a health-supportive behavior is the pinnacle goal. Bandura (1989), the creator of this theoretical framework, proclaimed that there is value in understanding how an individual can execute a course of action to enable a health-supportive change. Providing an individual with specific behavioral change techniques can aid in increasing confidence in implementing a holistic-arc'd treatment rather than a mainstream medical treatment protocol (Turner et al., 2011).

Examining Goal Setting as One Seeks to Treat GAD with Cannabidiol

Through the SCT application, one must notice the interaction within and between the five constructs. Also, Bandura (2011) educated that there is reciprocity between the individual, the person's environment, and the subject's response to stimuli through achieving goals. This over-arching theme of the act of goal setting aids the participant to glean a snapshot of precisely where to focus on those necessary shifts in awareness to enable the health-supportive behavioral change (Manjarres-Posada et al., 2020). Sharma (2017) defended that modification of self-control is constitutionalized by setting a goal, monitoring one's behavior, and the inclusion of an award system for the reinforcement of accomplishing the given health-supportive change. Because taking CBD for GAD necessitates that every individual discovers one's effective dosage, goal setting is a critical construct of the SCT when seeking to heighten compliance and increase the likelihood of using CBD successfully.

Summary

Through the lens of public health, it has become obvious that GAD is made even more complicated because of the lack of effective treatment strategies other than the commonly prescribed pharmaceuticals (Bolsoni et al., 2019; Bourin & Thibaut, 2013). A band of researchers has CBD clearly in focus as a safe and efficacious treatment for not only the management of GAD the is scientific evidence showcasing that CBD can even eliminate GAD (Caraballo et al., 2020; Cooper et al., 2017; McGuire et al., 2018; Shannon and Opila-Lehman, 2016). Hallion et al. (2018) professed that GAD is an

affliction characterized by agitation and worry- and can be debilitating without appropriate monitoring and applying suitable treatment strategies.

In this chapter, I critically examined the most current research, measurements, and published data that showcased this study's focus areas. These focal areas included the incidence and prevalence of GAD, the most common and easily accessible biomedicine treatments, and the potential benefits and risks of each. This literature review included an abundance of primary academic research exploring the feasibility and likelihood of using CBD to treat GAD. This chapter showcased how the SCT can help individuals find an effective dose of CBD for GAD while addressing a gap in the scientific literature. Finally, incorporating the SCT served as the theoretical framework to explore the participants' self-reported likelihood of using CBD for GAD. Moreover, I included a robust number of works articulated by key theorists into the section to expose' how this study benefited from SCT's inclusion. Incorporating the robust literature review provided the anchor to pivot to the research methodology- which served to elucidate how this research was operationalized in the upcoming segments of this study.

Chapter 3: Research Methods

Introduction

The purpose of this quantitative study was to explore the study respondent's self-reported likelihood of the inclusion of CBD to manage or resolve GAD. The rationale for the study design that was chosen for this study is outlined in the first section of this chapter. The stages of the study are thoroughly defined throughout this section.

Beginning with the fortification of the SCT, the goal was to gather information from the participants to understand the role that attitudes play in deciding to use CBD to manage or alleviate GAD symptoms. Accessing this data was enabled by my quantitative research questions:

Research Question 1: To what extent are knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol associated with the likelihood of CBD usage in generalized anxiety disorder?

H₀1: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are not associated with the likelihood of CBD usage in generalized anxiety disorder.

H_a1: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are associated with the likelihood of CBD usage in generalized anxiety disorder.

Research Question 2: To what extent are knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol associated with the likelihood of CBD usage in generalized anxiety disorder, while controlling for age, gender, level of education, and generalized anxiety disorder scores?

H₀2: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are not associated with the likelihood of CBD usage in generalized anxiety disorder while controlling for age, gender, level of education, and generalized anxiety disorder scores.

H_a2: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are associated with the likelihood of CBD usage in generalized anxiety disorder while controlling for age, gender, education level, and generalized anxiety disorder scores.

The uniqueness of this study stemmed from the prior absence of applying the SCT in CBD usage. Furthermore, SCT probed into the respondent's attitudes regarding finding the most effective CBD dosage to minimize GAD symptoms. The research's relevance stemmed from the innovative pairing of the under-researched issue of the complexity of finding one's effective dosage of CBD with the SCT's theoretical framework. I gauged the participants' likelihood of CBD usage by measuring the five constructs of SCT, including knowledge, expectations, situational perceptions, self-efficacy in using CBD,

and goal setting. The over-arching goal was to find a more concrete way to teach individuals how to adhere to a CBD regimen in a manner that is most specific and effective for GAD. Inclusively, the SCT constructs increased awareness of the participants' inclination or reluctance to take CBD as an effective nonmedical remedy to treat GAD.

To enrich the understanding of the basis of this study, I am seeking to inform the reader of each of the chosen methodology elements employed to enable in-depth research and data collection. As a mechanism of increasing awareness of individuals' attitudes toward CBD usage, I am covering the rationale for examining an individual's self-reported likelihood of using CBD while applying the SCT. I provide a thorough explanation of how I am operationalizing the variables as a mechanism to gain a more robust understanding of the participants' self-reported likelihood of using CBD to minimize acute or chronic anxiety. In this chapter, I cover the objective of the data analysis, as well as data management. I am thoroughly addressing the instrumentation and operationalization of constructs. I am presenting the steps taken to increase validity, reliability, and other potential breaches of trustworthiness.

The Rationale for Research Methodology and Study Design

The study was designed to probe the survey respondent's likelihood of using CBD to treat GAD. This cross-sectional study design was suitable for this study to answer the research questions while testing the hypotheses. A cross-sectional study design is apropos when a researcher seeks to gain data from the sample at a single point in time (Creswell & Creswell, 2013). The same source proclaims that the cross-sectional design aids in

deciphering the population's characteristics such as age, geographical location, and other demographical details. In this study, the independent variables were the five constructs of the SCT. With the consideration of time constraints, this study had neither prospective nor experimental study attributes. I surveyed the respondents over a predetermined timeframe, which also fulfilled one benchmark for the rationale of choosing a cross-sectional research study design. This observational study design allowed for investigating the one-time measurement of both the exposure and outcome simultaneously (Setia, 2016). In an observational study design, it is not a researcher's role to influence or alter participants' exposure (Barnett et al., 2012), as was the case in this research.

Independent Variables

In this study, the five constructs of the SCT were the independent variables. In establishing cause and effect through the research methodology, I sought to determine the independent variables that would showcase the impact of the respondent's self-reported likelihood of using CBD in this study. Gaskin and Happell (2014) stressed that the independent variables are centrifugal to analytical health research. These statistical experts defended that the independent variable is the cause; the independent variables have stability and are not affected by other variables (Dennis et al., 2000; Gaskin & Happell, 2014; Giuliano & Polanowicz, 2008). The independent variables reference the study's condition under examination (Creswell & Creswell, 2013). These researchers asserted that a theory is an interlinked group of constructs, otherwise known as quantitative research variables. Creswell and Creswell (2013) also proclaimed that these constructs are then composed into hypotheses to choreograph the relationship

encompassed by the variables. The concept of a theoretical rationale is an addendum to this definition, which explained the prediction or expectation of the discovered relationship (Labovitz & Hagedorn, 1971).

This study examined the participants' attitudes surrounding the decision and follow-through of taking CBD for GAD while maintaining focus on measuring SCT constructs employed in this study. These constructs consisted of knowledge, expectations (including outcome expectations, outcome expectancies), situational perception, self-efficacy in using CBD, and goal setting. These independent variables were analyzed by examining the study respondent's process of managing a CBD treatment protocol to minimize GAD. This study aimed to elucidate the data derived from the survey's answers, utilizing a numeric Likert measurement with designations on a scale of 0-4. This measurement helped gather data enabling a higher level of understanding of the participants' attitudes regarding the ease, challenges, and potential impediments of finding one's effective dosage of CBD to manage anxiety symptomatology.

The Dependent Variable in this Study

The dependent variable in this study was *the likelihood of using CBD for GAD*. The expectation is that the dependent variable would be influenced by the independent variable or variables (Aschengrau & Seage, 2014). The same source asserted that the 'presumed effect' of the research study is the dependent variable. In this study, I sought to determine the effect of the SCT's five constructs on the respondent's self-reported likelihood of CBD for GAD.

Methodology

Study Population

The population that comprised the sample for this study was inclusive of individuals living in a community in the northeast corner of the state in Connecticut, including, but not limited to, Cos Cob, Darien, Easton, Georgetown, Greenwich, New Canaan, Norwalk, Redding, Ridgefield, Rowayton, Springdale, Stamford, Weston, Westport, and Wilton. The New York communities were Armonk, Bedford Hills, Lewisboro, Mount Kisco, Pound Ridge, and South Salem. Individuals from the said communities frequent the publicly accessible holistic health center, which served as the survey distribution and drop-off location. Individuals frequent this nutrition center from throughout the state, as well as the abutting states of New York; Rhode Island to the east, and Massachusetts to the north.

Some of the towns that comprised this study population were within Fairfield County, Connecticut, with a population total of 943,332 (United States Census Bureau, 2019) and a median income of \$92,969 between 2014 through 2018. Of those living in Fairfield County, 89.9% had a high school diploma or higher, and 47.4% held a bachelor's degree. The same source revealed that those in the study population residing in New York hailed from Westchester County constituted a total population of 949,218, with a median income of \$92,758 (United States Census Bureau, 2019). Those living in Westchester County with a high school diploma or higher comprised 87.8%, while those holding a bachelor's degree or higher included 48.2% (United States Census Bureau, 2019).

Recruitment Procedure, Ease of Participation, and Data Collection

I collected the data from surveys distributed to approximately 120 individuals suffering from GAD through a publicly accessible holistic health center/natural food store. While some of this sample was self-referred, others were introduced through various practitioners, including psychiatrists, psychologists, psychotherapists, sleep-disorder clinics, immunologists, general practitioners, rheumatologists, oncologists, and advanced practical registered nurses. Additionally, a wide array of holistic-arced practitioners also referred individuals to this highly frequented public access complementary and alternative health center, including chiropractors, nutritionists, acupuncturists, reiki therapists, yoga instructors, public health experts, fitness trainers, and physical therapists. These practitioners' common goal was to help the patients treat a wide range of maladies, including anxiety-related disorders. Moreover, this complementary and alternative health center offers a wide array of health-supportive organic foods, nutraceuticals, homeopathic remedies, and herbal supplements, including CBD products.

I aimed to create a collaborative study involving scientific research with community members (Akamani & Hall, 2015). In this study, I sought to gain a more in-depth understanding of those community participants- gaining valuable data regarding the potential complexities of using CBD as a mechanism to treat GAD. To this end, email blasts announced the community members' opportunity to participate in this research. In addition, community announcement board postings in the northeast corner of CT, and announcements through social media, including Instagram and Facebook, also raised

awareness of the opportunity to participate in this study. Social media influencers broadened the reach of potential participants struggling with generalized anxiety to various mental health platforms, mother's groups, men's clubs, and Parent/Teacher Associations consisting of individuals residing in New Canaan and surrounding towns throughout Connecticut and New York.

The study survey packets were publicly accessible to potential participants in plain, unmarked envelopes. The designated pickup and drop-off hub, located in the center of a village, is easily and equally accessible by pedestrians and those driving. For ease of accessibility, a curbside pickup was available as a mechanism to mitigate any obstacles or barriers to participating in this study. The completed surveys were returned directly to me and then placed into a sealed collection box- to guarantee anonymity and relinquish potential privacy concerns.

I discussed the debriefing and exit strategy at the point of drop-off of the survey questionnaire to each participant in this study. One critical step in the process of participating in this study- the act of taking the survey in and of itself expressed informed consent on behalf of the participant (See Informed Consent Form in Appendix A). After the participant returned the completed packet, I placed the complete survey questionnaire directly into the lockbox owned solely by myself, Margaret Wenzel. Further de-identification: the participants' questionnaire packets were assigned a numeric referencing code to further maintain anonymity.

Ethics

To ensure adherence to the standards set forth by Walden University, I exercised a significant level of consideration and reflection to what seemed to be even the most insignificant of details. For collecting new data, the Walden University Research Ethics Approval Checklist was used as a primary guideline. The forty questions regarding the ethical standards employed for this study were thoroughly examined and answered. This proposal and research design were built so that each answer to those forty questions on the Research Ethics Approval Checklist was YES while being as self-critical and objective as could be. Simultaneously, these standards prepared me for the Institutional Review Board's pending review following this proposal's approval (Walden University, n.d.). One of the panel experts who aided in the instrument's creation and final approval has a health law background. Having an individual on the panel with expertise in this area offered a keen eye for ethical details throughout the medical disclaimer, informed consent, and the instrument's vocabulary.

Instrument

Since I was planning to collect data in my workplace, one of the panel experts recommended having a preemptive consultation with the Institutional Review Board (Walden University, Center for Research Quality, n.d.). As a result of this meeting and then reviewing the available guidelines regarding data collection at one's workplace, it was recommended that the recruitment, data collection, informed consent would be achieved in a manner that hinders a researcher from knowing which individuals participated and those who chose not to participate (Walden University, 2020). First, the

preferred recruitment methods through collecting data and gaining informed consent were thoroughly considered and addressed. Next, these methods were combed and validated by a panel of seven experts. All reviewers can access a copy of the Informed Consent de-identification process in Appendix A for complete details of this process.

Operationalization of the Five Constructs

This first construct in SCT, *knowledge*- referenced one's ability to gain insight and their propensity to learn the factual elements (Bandura, 1998). This section probed the study participant's prior understanding of CBD. The *knowledge* section also assessed the individual's understanding of CBD as a potential remedy to relieve GAD. The scoring for the construct knowledge consisted of 10 true or false scale items and had a scoring range of 0 through 9.

The second construct assessed the individual's *expectations* and *expectancies* regarding the taking of CBD for GAD. In this study, the two classifications of this construct: *Outcome expectations* referred to the likely outcome an individual will experience while following through with taking CBD for GAD. In contrast, *outcome expectancies* were representative of the valuation placed on that expected outcome (Bandura, 2004). The scoring scale for *outcome expectations* consisted of items 10-14 and was with a scoring range as follows: No (0), probably not (1), maybe (2), probably (3), highly likely (4).

The scoring scale for *outcome expectancies* consisted of items 15-19 and was with a scoring as follows: Not at all important (0), not very important (1), somewhat important (2), important (3), very important (4). The multiplication of items 10 and 15, items 11

and 16, items 12 and 17, items 13 and 18, and articles 14 and 19 (Sharma & Petosa, 2014) enabled the summation of expectations regarding the likelihood of CBD usage; the scoring range was from 0 to 80. The third construct described how individuals perceived and interpreted one's behavior and the environment (Sharma, 2017). This section assessed how one's situational perception affected the ability to effectively utilize CBD for treating GAD. The scoring scale for *situational perception* consisted of items 20-23 and was with the following designations: No (0), probably not (1), maybe (2), probably (2), highly likely (4), and had a range of 0 to 16.

The fourth construct was designated to examine the confidence an individual must exercise (Bandura, 2006) to implement an effective protocol for taking CBD for GAD. The scoring scale for *self-efficacy in using CBD* consisted of items 24-27 and was with the following designations: No (0), probably not (1), maybe (2), probably (3), highly likely (4), and was with a scoring range of 0 to 16. The fifth construct of the SCT investigated the level of confidence in one's ability to pursue a new behavior (Bandura, 2018). This construct examined the necessary steps that needed to be taken to set goals for taking CBD effectively for GAD and developing a plan on how to reach those objectives. The scoring scale for the construct of *goal setting* consisted of items 28-31 and was with the following designations: No (0), probably not (1), maybe (2), probably (3), highly likely (4), and was with a scoring range of 0 to 16. The scoring for the dependent variable- *Likelihood of CBD Usage* (Item 32) had the following designations: Not at all (0), probably not (1), maybe (2), probably (3), and highly likely (4), and was with a scoring range of 0 to 4.

Sample Size Calculation

As this study was poised to investigate the self-reported likelihood of taking CBD for GAD, there were five predictor variables: knowledge, outcome expectations and expectancies, situational perception, self-efficacy in using CBD, and goal setting. The effect size = 0.15 (medium), the alpha level = 0.05, the power = 0.80, and number of predictors 9 (five constructs of SCT and 4 covariates). Using these indices in G*Power, it was determined that a sample size of 114 participants would confer a medium effect size. I determined the sample size by creating a scenario whereby numerous observations were provided to replicate data opportunities in the statistical sample (Stamatopoulos, 2019), utilizing G*Power 3.1.9.7 statistical power analysis. However, because there was a relatively low number of respondents (114), this left some concern that an analysis of subgroupings would perhaps not have the power to be applied to a more extensive population. Further coverage of this potential issue will be conducted in chapter five.

Data Analysis Plan

For this data analysis, I sought to determine the independent variables' ability to predict the dependent variable- the likelihood of using CBD for GAD while controlling for age, gender, education level, and GAD scores. The primary objective of this cross-sectional study was to investigate the associations between the variables while seeking to determine the moderating effects of age, gender, level of education of the participants, and GAD scores. To gather this data for analysis, I had chosen the following sequence of data collection arrangements in my data analysis plan. In order of execution, Cronbach's

Alpha was run in SPSS 25 for the purpose of assuring internal consistency reliability of the purpose-built survey questionnaire instrument.

Included in the data analysis plan, the descriptive statistics of the independent variables, including knowledge, outcome expectations and expectancies, situational perception, self-efficacy, goal setting, and the dependent variable likelihood of CBD usage, enables the organization and summarization of the characteristics in the data set. As a clarifying visual aid, a boxplot of the five constructs allowed for viewers to quickly deduce if there was skewness, dispersion, and potential outliers in the data. There was prudence in including a Pearson correlation coefficient test as a mechanism to measure the strength of the association between the variables.

I used a stepwise regression analysis in SPSS Version 25 (IBM, 2019). The stepwise multiple regression statistical test is in the *F tests* family, a fixed model, specifically with the designation of *R*² deviation from zero. The utility of the Adjusted R-Squared statistical test enabled the adjustment of the statistics dependent upon the number of the independent variables in this study (Sharma & Petosa, 2014). As this study investigated the likelihood of taking CBD for GAD, there were five predictor variables: Knowledge, outcome expectations and expectancies, situational perception, self-efficacy in using CBD, and goal setting.

Management of Data

For this study, I collected and utilized primary data. I created the instrument precisely and purposefully for this research data collection. Much attention was paid to keeping the survey questionnaire simple, direct, precise, and unfettered (Presser et al.,

2004). Briggs (2015) urged that it is vitally important to take steps to avoid common survey issues such as leading questions or another potential bias-arc'd verbiage. I analyzed the independent predictor variables- the five constructs of SCT, including knowledge, expectations, situational perception, self-efficacy in using CBD, goal setting, and the dependent variable, likelihood of CBD usage. The demographics data was examined in the Pearson product-moment correlation statistical test, with the remaining baseline variables utilized to identify the potential influence of confounding components.

In Section 1 of the survey instrument: Knowledge of CBD and GAD, the choices for the respondents were 'true,' 'false,' and 'don't know.' As coded in SPSS, if the respondent chose the answer of 'true,' the individual received a "1." If the said respondent determined the solution of 'false,' or 'don't know,' they received a "0" as coded in SPSS. This measurement system prompted the respondent to make a definitive response, a technique that researchers discovered helps avoid ambiguity (Liedtka et al., 2008). In Sections 2, 3, 4, and 5, a Likert scale was utilized whereby these ordinal variables had inherent ordering. In the final section of the instrument, Demographics: While Question 34- What is your age was a continuous variable, Questions 35-39 were the nominal and ordinal variety of variables.

Validity and Reliability

Habig (2020) stressed that the utmost advantage of a cross-sectional study was to examine the absence or presence of outcome or exposure at a given time point. While all research is subject to internal and external threats to validity, great care was taken, and critical thinking was applied to minimize the potential of such threats. The population

was well represented by randomizing the wide variety (cross-section) of individuals who accessed this research survey. From the conception of this topic, I applied critical thinking to develop the research question. Its complexity provided limitations of the probability of an alternative explanation that might account for the findings (Ditterich, 2010). This same academic source opines that it is vital that researchers strategically utilize statistical controls to reduce threats to internal validity.

A seven-person panel of experts agreed upon the instrument's face and content validity with an end goal of minimizing threats to internal validity. This consultant board of experts was a thoughtfully comprised group of adept professionals. All panelists have areas of expertise in mental health, public health, linguistics, and pharmacology (See Appendix B). I tested the reliability by examining the standard deviation and the mean similarities between groups, a method that has been deliberated by other scientists (Nijjar & Khan, 2017).

Internal validity for each of the subscales was conducted to ensure the reliability of the instrument. Measuring the internal consistency was achieved through the application of Cronbach's alpha. This process provided clarity regarding whether the questions would produce a reliable measurement of the variables (Tavakol & Dennick, 2011). This testing procedure was accomplished through the SPSS statistical process platform. Cronbach's alpha provided a summary measuring internal consistency reliability by calculating the degree of intercorrelation among all the items that have been designed for measuring a construct in the study instrument (Santesson et al., 2020; Sharma & Petosa, 2014). Eigenvalue over 1.0 and factor loadings over 0.48 (after

doubling the critical value of 0.24 for a sample size of 114) for each item were the criteria used to confirm the factor structure (Sharma & Petosa, 2014; Stevens, 1996).

Summary

I conducted this research using the cross-sectional design methodology. This study targeted the population of those individuals living in or around the northeast corner of Connecticut. Specifically, I focused on those individuals in pursuit of exploring the use of CBD for GAD. For randomness, this research opportunity was accessible to all individuals, and there was no systematic sampling process. G*Power (Faul et al., 2007) aided in determining that 114 respondents were needed to participate in this study. Attention to any potential ethical issues was centrifugal to this chapter.

I created the questionnaire instrument explicitly for this study. The face and content validity process had been achieved through an examination by a panel of seven health and academic content experts. This chapter included information regarding the utilization of Cronbach's Alpha to test the survey instrument's psychometric soundness. This chapter also covered the statistical tests, including the Adjusted R-squared that I ran in SPSS Version 25, to analyze the survey data collection. Cronbach's alpha was conducted to measure the internal consistency reliability of the instrument.

Chapter 4: Results

For this study, I sought to investigate the ability of the five SCT constructs to predict the self-reported likelihood of effectively using CBD for GAD. Specifically, the purposefully devised survey questionnaire was with the aim to evaluate the constructs of SCT: knowledge, outcome expectations and expectancies, situational perception, self-efficacy, and goal setting. While this study intended to survey individuals with GAD, some participants were self-referred. Others were referred to New Canaan Healthcare LLC through a wide array of holistic-arced practitioners, including chiropractors, nutritionists, acupuncturists, reiki therapists, yoga instructors, public health experts, fitness trainers, and physical therapists. These practitioners' common goal was to help patients treat a wide range of maladies, including anxiety-related disorders.

The location where this study was conducted is a complementary and alternative health center that offers a wide array of health-supportive organic foods, nutraceuticals, homeopathic remedies, and herbal supplements, including CBD. In a community with a high percentage of individuals holding at least a bachelor's degree, many shoppers have a keen interest in the importance of preventative healthcare. Because of this community's high socioeconomic status, most shoppers have the disposable income to comfortably pay out-of-pocket for products that might be considered luxury items to those in a lower SES community.

This chapter covers the data collection process, the analysis of the data through IBM SPSS Version 25, and the study results. This results section includes charts and diagrammed visuals to aid in comprehending the outcome of this examination. The

results of this data analysis are organized into three sections. The first section describes how the variables were operationalized using the SCT constructs. Following, also in the first section, is an explanation of the data collection methods. The information in the second section describes the operationalization of the constructs in answering the research questions. As described in the third section, I implemented a stepwise regression analysis to evaluate the research questions.

Data Collection

The data collection began after receiving Walden University's IRB approval number for the proposal: 04-27-21-0742839, which expires on April 26, 2022. Strict adherence to the guidelines and recommendations of the IRB at Walden University was followed through recruitment and collecting the data. The respondents simultaneously filled out a GAD-7 self-administered seven-item instrument to measure the severity of anxiety symptoms as part of the questionnaire. The GAD-7 is a self-reporting survey questionnaire that takes under 10 minutes to complete. In 2006, the GAD-7 self-reporting assessment tool was developed by three colleagues: Dr. Kurt Kroenke, Dr. Robert Spitzer, and Dr. Janet Williams, which was backed by a grant through Pfizer. For this study, this assessment was administered in paper and pencil form. The GAD-7 is also available in online formatting. Permission is not required to incorporate the GAD-7 assessment into an academic study. In a peer-reviewed journal article, *A brief measure for assessing generalized anxiety disorder: the GAD-7*, the conclusion illuminated that good agreement existed between the interviewer-administered and the self-reported version of the GAD-7 assessment tool (Spitzer et al., 2006).

This data collection occurred between May 1, 2021, and June 15, 2021. To each participant, I explained that this study aimed to examine the likelihood of CBD use for GAD through the lens of SCT. The survey questionnaire included a section whereby I assured the participants that their anonymity would be maintained. I also clarified to each participant that their consent was implied by filling out the survey, leaving no reason to include any personally identifying information on the questionnaire. One hundred thirty participants showed interest in completing the survey, were eligible, and collected the questionnaire in person. Some participants filled out the survey in privacy in a quiet section of the approved facility from where the study took place. In contrast, others brought the questionnaire home to complete the survey. Of those hard copy surveys distributed, 114 surveys were executed and returned within a time frame of 6 weeks to a holistic health facility easily accessible in the heart of a high SES pedestrian-friendly community in Fairfield County, Connecticut. I then placed each anonymous survey into the pile of other completed surveys in a designated lockbox maintained solely by me.

This data collection process was explained to and witnessed by each participant. A small token of appreciation was then given directly to the study participant after the survey was returned- to highlight and substantiate the importance of effectuating the act of contributing to social change. In the spirit of minimizing any potential coercion or response bias, there was no mention of any form of reward offered before the point in time when the respondent's questionnaire was completed and returned. There were no discrepancies in the data collection from the plan presented in Chapter 3 of the proposal.

A total of 114 participants completed the survey questionnaire. All the surveys were complete, and there were no deletions.

Research Question 1: To what extent are knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol associated with the likelihood of CBD usage in generalized anxiety disorder?

H₀1: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are not associated with the likelihood of CBD usage in generalized anxiety disorder.

H_a1: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are associated with the likelihood of CBD usage in generalized anxiety disorder.

Research Question 2: To what extent are knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol associated with the likelihood of CBD usage in generalized anxiety disorder, while controlling for age, gender, level of education, and generalized anxiety disorder scores?

H₀2: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are not associated with the likelihood of CBD usage in

generalized anxiety disorder while controlling for age, gender, level of education, and generalized anxiety disorder scores.

H_{a2}: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are associated with the likelihood of CBD usage in generalized anxiety disorder while controlling for age, gender, education level, and generalized anxiety disorder scores.

Evaluation of Reliability of the SCT Constructs Using Cronbach's Alpha

Upon creating the instrument, a panel of seven experts assisted in assessing the face and content validity of the survey questions. The goal of this procedure was to minimize threats to internal validity. The individuals who comprised this panel were high-level experts steeped in various healthcare sectors, including pharmacology, mental health, health linguistics, public health, and health law (See Appendix B). Confirmatory factor analysis using maximum likelihood method was run in SPSS for each subscale to further assess construct validity of the instrument. The Eigenvalue over 1.0, and factor loadings over 0.48 (succeeding doubling the critical value of 0.24 for the sample size of 114) for each line item were the criteria utilized to confirm the factor structure (Sharma & Petosa, 2014; Stevens, 1996). All subscales were found to be construct valid.

To assure internal consistency reliability of the purpose-built study instrument, I conducted a coefficient alpha in SPSS (Tavakol & Dennick, 2011). The Cronbach's alpha assessment was used to evaluate each SCT construct operationalized in this study. This test created a summary of internal consistency and reliability by calculating the

intercorrelation of the items of the survey design (Santesson et al., 2020; Sharma & Petosa, 2014). The result of CA is a number between 0 and 1 (Bonett & Wright, 2014). Except for the construct situational perception, the Cronbach's alphas were over 0.70 and thus acceptable. See Table 2 below.

Table 2

CA for SCT Constructs

Construct	Number of Items	Cronbach's Alpha
Outcome Expectations	5	.863
Outcome Expectancies	5	.848
Situational Perception	4	.64
Self- Efficacy	4	.829
Goal Setting	4	.831

The descriptive statistics of the independent variables- the five constructs of SCT- knowledge, outcome expectations/expectancies, situational perception, self-efficacy, and goal setting, and the dependent variable- the likelihood of CBD usage for GAD are shown in Table 3 below.

Table 3*Descriptive Statistics of the Study Variables for RQ1*

	<i>N</i>	Mean	Std Deviation	Range
Likelihood of CBD Use	114	2.59	1.342	0-04
Knowledge	114	6.59	1.634	1-10
Expectations	114	45.95	20.250	0-80
Situational Perception	114	11.74	2.439	0-16
Self-efficacy	114	10.04	3.771	0-16
Goal Setting	114	9.22	4.378	0-16

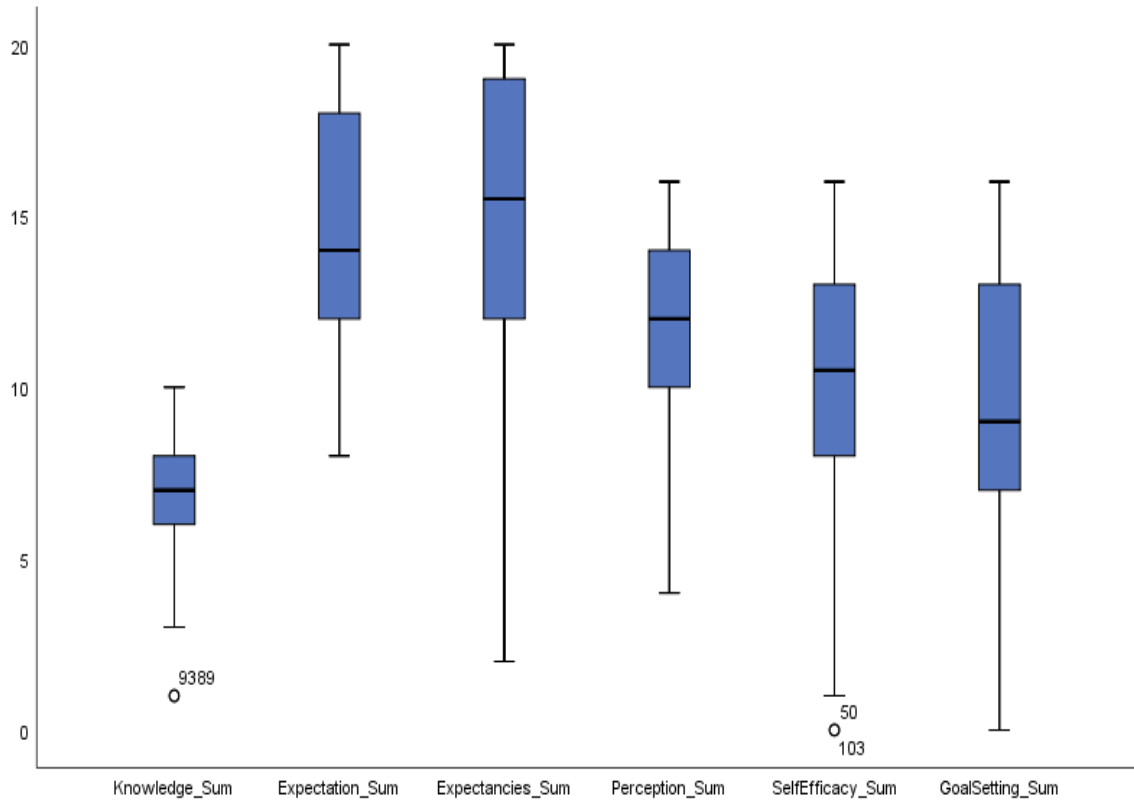
Note. Dependent Variable: Likelihood of CBD Use. Predictors: Knowledge, Expectations, Situational Perception, Self-efficacy, Goalsetting.

The Scoring Range, Mean, and Standard Deviation of the 5 SCT Constructs

The scores of the construct knowledge were determined on a scale of 1-10. Expectations and expectancies, when multiplied, raise the scoring range to 0-80. Perception, self-efficacy, and goal setting have a scoring range of 0-16. While the smallest percentage of participants chose *not at all* likely to use CBD to decrease generalized anxiety, the largest percentage of the participant pool revealed *highly likely* to use CBD as an aid in minimizing generalized anxiety. The standard deviation result ($SD = 1.342$) of the DV denotes a clustering around the mean, proving low variability. With a scoring range of 0-4, where 0 = *no*, 1 = *probably not*, 2 = *maybe*, 3 = *probably*, and 4 = *highly likely*. An assessment of the analysis assumption boxplot reveals slight skew and insignificant univariate outliers, as noted in the boxplot in Figure 2 below.

Figure 2

Boxplot of the Constructs of the Social Cognitive Theory



Pearson Correlation Statistical Test

I ran a Pearson correlation to evaluate the inclusion of the covariates, including the five constructs of the SCT- knowledge, outcome expectations, situational perception, self-efficacy, and goal setting, with the dependent variable- the likelihood of CBD use. From this dataset, one notes the strongest correlation between goal setting and the likelihood of CBD use ($r = .768, p = 0.00$). The next highest correlation exists between goal setting and expectations ($r = .658, p = 0.00$). A high correlation also exists between perception and expectations ($r = .594, p = .000$). Also highly correlated, the likelihood of CBD use and expectations ($r = .558, p = 0.00$), as shown below.

Table 4

Correlation Matrix Table of SCT Constructs with DV Likelihood of Using CBD for GAD

Pearson Correlation	Likelihood of CBD Usage	Knowledge	Expectations	Perception	Self-Efficacy	
	Knowledge	.241**				
	Expectations	.558**	.256*			
	Perception	.504**	.410**	.594**		
	Self-Efficacy	.072	.104	.352**	.207	
	Goal Setting	.768**	.290**	.658**	.531**	.207**

Correlation is significant at the .05 level (1 tailed)*

Correlation is significant at the .01 level (1 tailed)**

Assumptions for this Study

One of the assumptions is that the DV- Likelihood of CBD Usage is a continuous or interval/ratio variable. The same holds true for the five constructs of the SCT

constructs. These five constructs- the independent variables, are all measured on a Likert scale with the assumption that this provides the ability that one can derive from the instrument a summative score. This assumption on the dependent variable (ratio/interval) allows for using the multiple linear regression statistical test and is the basis for this choice of statistical test for this study.

The following summary showcases the amount of variance resulting in the three predictors- goal setting, self-efficacy, and perception. Statistical significance is seen in Model 3. Among the participants surveyed ($n = 114$), $R^2 = .643$, $F(3, 110) = 65.903$, $p \leq .0001$; adjusted $R^2 = .633$. Specifically, Model 3 reveals the statistical significance with an adjusted R-square result of .663, explaining the variation total in the dependent variable- the likelihood of CBD use. The adjusted R-squared result of .633 highlights that combined, these three variables explain 63% of the variance in the dependent variable. The R-squared represents the proportion of the variance in the dependent variable, while the adjusted R-squared creates an estimation in the total population under examination (Miles, 2014), as shown in Table 5 below.

Table 5*Step-wise Regression Table*

Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	SE of the Estimate
1	.768	.591	.587	.863
2	.792	.628	.621	.826
3	.802	.643	.633	.813

1. Predictors: (Constant), Goal Setting

2. Predictors: (Constant), Goal Setting, Self-Efficacy

3. Predictors: (Constant), Goal Setting, Self-Efficacy, Perception

Dependent variable: Likelihood of CBD Use

Next, the regression provided the results of the analysis of the difference in means. Analyzing the sum of squares, I sought to determine if a statistically significant difference existed between the means of the three predictor constructs in Model 3. It is essential to understand that alone, this test does not specify which of the means are different from each of the other means. However, with the established significance level of 0.05 ($p = .000$), we can conclude that there is a statistically significant difference between goal setting, self-efficacy, and perception. This analysis of the means provides the ability to examine if there are statistical differences among the means of two groups or more. This regression output enables the assessor to conclude that the likelihood of CBD use is significantly different for at least one of the SCT constructs utilized in the analysis of the difference of the means test. The dependent variable- the likelihood of CBD usage is significantly different for at least one of the SCT constructs utilized in the analysis of the difference in means.

The residual, also known as the errors of the sum of squares, resulted in a total of 72.792. This figure is achieved by determining the difference between the likelihood of CBD use by subtracting the actual scores from the estimated scores, or vice versa, and then squaring that sum. These analyses allow the scientist to examine if there are statistical differences among the means of two groups or more. The regression output enables the assessor to conclude that likelihood of CBD use is significantly different for at least one of the SCT constructs utilized to analyze the difference in the means test. The regression sum of squares and the residual sum of squares equate to the sum of squares.

The subsequent relevant data are an assessment of the analysis of the difference in means. Here, I determined the difference between the mean of the dependent variable likelihood of CBD use and the actual value, with a result of 203.623. In the analysis of the regression sum of squares, the result is 130.831. The analysis of the residual- the result is 72.792. The residual sum of squares and the regression sum of squares is equal to the total sum of squares. See Table 6 below.

Table 6

Model 3 ANOVA Summary

Model3	Sum of Squares	<i>df</i>	Mean Square	F	<i>p</i>
Regression	130.831	3	43.61	65.903	<.0001
Residual	72.792	110	.662		
Total	203.623	113	1.802		

Dependent Variable: Likelihood of CBD Use

Predictors: (Constant), Goal Setting, Self-Efficacy, Perception

In another statistical test, the coefficients table includes multiple values that enable analysts to glean a more thorough understanding of the stepwise regression. The stepwise regression was utilized because all the five predictors did not contribute uniquely to predicting the dependent variable- the likelihood of CBD use. For this stepwise regression, there was a removal of the predictors below a threshold of 0.05. Hence, there are no 'non-significant' predictors remaining in the model. In Model 3, we see the output using the predictors that have contributed most to the outcome variable.

Under the unstandardized coefficients column, the β column holds the regression equation, which follows: The Y-intercept is symbolized by \hat{y} = the likelihood of CBD use where the constant value of β_0 (.256) is added to the value of β_1 (.233) and is then multiplied by the participants' actual GoalSetting_Sum score. This equation reveals that those respondents scoring one point higher on goal setting will have an average score of 0.233 points higher on the dependent variable- the likelihood of CBD use. Next, adding the β_3 estimate value (.079) from the coefficients table then multiplying the participants' actual Perception_Sum score in the model will determine the participants' estimated likelihood of CBD use value. Assessing significance, goal setting ($p = .000$), which is less than the established significance level of 0.05, as well as the construct self-efficacy ($p = .001$), and situational perception ($p = .035$). In conclusion, all independent variables in Model 3 show statistical significance in predicting the likelihood of using CBD for GAD. This section of analysis enabled me to gain a deeper understanding by analyzing the size of the relation and the direction of the association between the predictor variable and response variables.

Research Question 2

Research Question 2: To what extent are knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol associated with the likelihood of CBD usage in generalized anxiety disorder, while controlling for age, gender, level of education, and generalized anxiety disorder scores?

H₀2: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are not associated with the likelihood of CBD usage in generalized anxiety disorder while controlling for age, gender, level of education, and generalized anxiety disorder scores.

H_a2: Knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy in using CBD, and goal setting for the application of an effective treatment protocol are associated with the likelihood of CBD usage in generalized anxiety disorder while controlling for age, gender, education level, and generalized anxiety disorder scores.

The descriptive statistics output for RQ2 includes the continuous age, revealing this measurement of central tendency ($M = 55.18$). The choices for gender included 1 = *female*, 2 = *male*, 3 = *LGBTQ*, 4 = *other*, and 5 = *prefer not to answer*. Here, ($M = 1.19$), thus revealing that the sample was predominantly female. In assessing the mean for education level, with choices including 1 = *less than high school*, 2 = *high school or equivalent*, 3 = *some college, but no degree*, 4 = *associate degree*, 5 = *bachelor's degree*,

6 = master's degree, 7 = Ph.D. or other doctoral degree, and 8 = prefer not to answer, one can gather from assessing the descriptive statistics table that most of the sample holds a bachelor's degree ($M = 5.10$).

In an assessment of GAD scores, with a potential scoring range of 0-21 ($M = 6.65$). The correlations output for RQ2 include the controlling variables- age, gender, level of education, and GAD-7 scores, showcased several of these inverse correlations, meaning that as there is an increase in the value of one of the variables, the value of the other variable decreases. See Table 7 below.

Table 7

Descriptive Statistics for the Study Variables for RQ2

Variable	Mean	SD	N
Likelihood of CBD Use	2.59	1.342	114
Knowledge	6.59	1.634	114
Expectations	45.95	20.250	114
Perceptions	11.74	2.439	114
Self-Efficacy	10.04	3.771	114
Goal Setting	9.22	4.378	114
Age	55.18	13.701	114
Gender	1.19	.418	114
Education	5.10	1.097	114
GAD Score	6.65	4.833	114

The model summary table highlights the amount of variance that exists in three of the predictors. The most relevant statistical significance is seen in Model 3, which

displays the result of .663 adjusted R-square. This test enabled me to conclude that .633 (or 63.3%) of likelihood CBD use results from three of the SCT constructs.

In Model 3, there are three predictors, including goal setting, self-efficacy, and perception. The adjusted R-squared result of .633 reveals that the combination of these three predictor variables explains 63% of the variance in the dependent variable. While the adjusted R-squared creates an estimation of the population total that is under examination, the R-Square is a representation of the proportion of the variance in the dependent variable (Miles, 2014). This statistic enabled me to conclude that .633 of the variance of the self-reported likelihood of using CBD for GAD was explained by three predictors, including goal setting, self-efficacy, and perception. The table displays information about the regression line and the ability of this statistical test to explain the total variation in the dependent variable- the likelihood of CBD use.

In the final statistical test, the coefficients table provided multiple values that enabled me to analyze the regression. The output highlights the constructs that have contributed most significantly to the outcome variable, the likelihood of CBD use. As noted in the unstandardized coefficients, those study participants who scored one point higher on the SCT construct- goal setting, will score, on average, 0.233 points higher on the dependent variable- the likelihood of CBD use. Repeating this process, one notes significance in goal setting ($p = .000$), below the established significance level of 0.05. Self-efficacy ($p = .001$), and perception ($p = .035$) both proving to be statistically significant. In conclusion, all three of the IVs, including goal setting, self-efficacy, and situational perception, revealed statistical significance and improved prediction of the

likelihood of using CBD for GAD. In an assessment of the size of the relationship and the direction of association between the predictor and response variables in Model 3, the results are in Table 8 below.

Table 8

Regression Coefficients of SCT Constructs on Likelihood of CBD Usage

Variable	B	95%CI	β	<i>t</i>	<i>p</i>
P (constant)	.256	-.548, 1.060		.632	.529
Goal Setting	.233	.191, .276	.761	10.911	.000
Self-Efficacy	-.075	-.117, -.032	-.209	-3.464	.001
Perception	.079	.006, .152	.144	2.133	.035

$R^2 = .643$, Adjusted $R^2 = .633$, $F(3, 110) = 65.903$, $p \leq .0001$

Summary

In this chapter, the items relevant to this study and incorporated into the analysis include descriptive statistics. For analyzing the extent to which each of the quantitatively measured variables exists in relationship to each other, there was an assessment of the correlations table for both research questions. To discover pertinent information regarding the regression line, the model summary provided the ability to glean a deeper understanding of the total variation of the dependent variable- the likelihood of CBD usage. The ANOVA summary was analyzed to determine if significant statistical differences exist between the means of three or more independent variables. The coefficient table was also included in the analysis- this assessment enabled a deeper

understanding of the relationship size and direction between predictor and response variables.

To this end, a summarization of the findings follows: The optimal model remains the representation found in RQ1. From this dataset, one notes the strongest correlation between goal setting and the likelihood of CBD use ($r = .768, p = 0.00$). A high correlation also exists between perception and expectations ($r = .594, p = .000$). There was initially no notable correlation between x and y . However, after using the stepwise regression method in SPSS, goal setting was selected as a key variable in the model. Model 3 consisted of goal setting, self-efficacy, and situational perception, as the optimal model in predicting the self-reported likelihood of using CBD for GAD. These results enable determining if the gap that brought this study to fruition has been met. A further examination of the potential limitations of this study and an exploration of potential further beneficial research follows.

Chapter 5: Discussion, Conclusions, and Recommendations

The intent of this cross-sectional study was to examine the ability of the five constructs of the SCT in predicting the self-reported likelihood of CBD usage for GAD. I also sought to determine if an association existed between the SCT constructs and the possibility of CBD use while examining if influence resulted from the mediating effects of age, gender, level of education, and GAD scores. The over-arching goal of this inquiry was to discover the associations between the SCT constructs and CBD usage and if the moderating variables impacted the relationship between the constructs and the likelihood of CBD usage.

In this study, the theoretical framework of SCT aided in discovering if there was reciprocity between the participant's environment and certain behavioral factors. The primary tenet of the SCT is that the subscriber embraces an agentic vantage point to the behavioral characteristics of self-reflection, proactivity, self-organization, and self-regulation (Bandura, 2005). This study illuminated three SCT constructs, namely goal setting, self-efficacy, and situational perception, that were significantly associated with the dependent variable: the likelihood of CBD usage.

Interpretation of the Findings

To my knowledge, there has been no study that has investigated the likelihood of using CBD for GAD while applying the SCT constructs as a mechanism to predict the likelihood of usage. However, comprehensive studies have been conducted that applied SCT to assessing and addressing those social-behavioral perceptions that aid in identifying nonadherence behaviors (Amico et al., 2018). The positive influence of goal

setting has also been influential and abundant in other medication protocol-compliance training (Miller & Bauman, 2014). In this study, goal setting was the construct that ranked the highest significance in influencing the mechanisms that underlie self-reported behavioral modulation, thus exhibiting significance in increasing the likelihood of using CBD for GAD.

The findings in this study showed self-efficacy also contributed to increasing the likelihood of CBD use for GAD. With a focus on self-efficacy, it is notable that this SCT construct commonly ranks most substantially in influencing behavioral change implementation (Bennett et al., 2018). With the recognition that adherence to a medication protocol remains one of the biggest challenges for healthcare workers and clinicians, academic studies have provided an understanding that there are three distinct and quantified stages, including the initiation phase, the act of implementation, and discontinuation of the protocol (Okuboyejo et al., 2018). Self-efficacy has been strongly correlated with the adherence to medication regimens in treating HIV and other complex treatment protocols (Johnson et al., 2007). Okuboyejo et al. (2018) asserted that through probing into a plethora of instructional innovations that have incorporated self-efficacy, it is notable that there is a greater likelihood to engage in compliance-building behaviors when the patient gains the ability to maintain the necessary self-confidence to do so.

Situation perception, an SCT construct that also proved to be significant in this study, has also been correlated with successful adherence to treatment protocols in various academic research. One study examined the study participant's illness perception as a mechanism to gain a greater understanding of medication protocol adherence,

utilizing a questionnaire that probed the patient's perception of the malady of which the individual has been plagued (Alluhayyan et al., 2020). Dehdari & Dehdari (2019) conducted a similar study with patients diagnosed with Type 2 diabetes. Their conclusion was with the recognition that gaining insight into one's perception of the unique internal and external situational positions needs consideration when seeking to increase medication adherence and wellness-supportive therapies (Dehdari & Dehdari, 2019). Specifically, these researchers pointed to three-pronged situational subthemes:

- Patient's comfort level with medication style including consideration of one's belief in complementary and alternative medicine versus the allopathic healthcare model.
- An examination of one's confidence in potential treatment effectiveness.
- Examining the patient on these core issues regarding disease perception aided in increasing health-supportive behaviors.

Although anyone 18 years of age or older struggling with generalized anxiety was invited to participate in this study, most respondents were females with a mean age of 55 years. Some research intimates that females are more likely than males to become aware of their uncontrollable and chronic level of worry (Hantsoo & Epperson 2017). This fact might aid in understanding why more middle-aged women were quicker to agree to assess the role that anxiety plays while exercising consideration to explore the likelihood of taking CBD for potentially diminishing the uncontrollable anxiety levels.

Some of the data collected from the survey questionnaire for the construct knowledge was particularly notable. The first true or false question: "The Farm Bill of

2018 determined that CBD was to be extracted from industrial hemp rather than the marijuana plant.” Eighty respondents (70%) answered: “*don’t know*.” Eighty-eight of the respondents (77%) answered *false* to Question 2: “CBD is not available in a variety of potencies.” Question 3 explored if “CBD is commonly used to treat generalized anxiety disorder,” with 90 respondents (78%) answering *true*.

Question 4 explored if those surveyed believed that “CBD cannot resolve the root cause of generalized anxiety disorder,” and sixty-nine participants (60%) answered true. Question 5 examined the sample knowledge of whether “In the United States, more than 40 million adults suffer from a generalized anxiety disorder,” with eighty-seven respondents (76%) answering true. It is noteworthy that only one respondent (0.008%) answered false to Question 5.

Ninety-six respondents (84%) recognized that “generalized anxiety is a public health problem,” as probed in Question 6. Question 7 examined if the “occasional anxiety is considered normal, while chronic stress is not.” Here, ninety individuals answered true (78%). Ninety-seven respondents (85%) answered false to Question 8, which examined the sample’s understanding of the effect of CBD while equating it to that of marijuana- “Taking CBD has the same effect as smoking marijuana.” Here, only two respondents (0.01%) answered true to Question 8. Question 9 probed if “all CBD is sourced from the same high-quality raw material,” and eighty-eight (77%) answered false. Question 10 was a query into if “CBD can be administered to children,” and 49 respondents (42%) replied: “*don’t know*.”

After handing in the completed questionnaire, some participants quickly explored the feasibility of taking CBD for generalized anxiety with staff members. It illuminated that having been enlightened regarding the efficacy of CBD for generalized anxiety, it was notable that some participants were spurred into action to try CBD even though many did not initially have prior knowledge of the substance. Some individuals raised the point of taking CBD while simultaneously applying the SCT behavioral constructs to increase compliance. This level of interest in CBD and SCT unquestionably resonated immediately after filling out the survey questionnaire with at least ten respondents, primarily female. It was particularly noteworthy that one of the respondents reported back approximately a month after starting a CBD regimen. This individual revealed having had lifelong struggles with anxiety. Tearfully, this participant thanked us for the study, admitting that this opportunity had made a life-changing impact. Although potentially anecdotal, there were several other compelling interactions with participants who felt the need to convey appreciation for their enlightenment that resulted from the participation in this study.

Assessing precisely how the findings of this study related to the study problem and research questions which drove this study, a recapitulation of the research questions, follows. RQ1 probed: To what extent are knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy, and goal setting for the application of an effective treatment protocol associated with the likelihood of CBD usage in generalized anxiety disorder? RQ2 probed: To what extent are knowledge, outcome expectations and expectancies, situational perceptions, self-efficacy, and goal setting for

the application of an effective treatment protocol associated with the likelihood of CBD usage in generalized anxiety disorder while controlling for age, gender, level of education, and GAD-7 scores?

A noted gap in the academic literature upon which this study was built addressed a lack of operational strategies enabling individuals to utilize CBD effectively. Moreover, another gap existed in the operational design of taking CBD- related explicitly to discovering solutions through which individuals could determine their effective dosage of CBD for GAD. I determined that knowledge and outcome expectations and expectancies were not significant predictors in increasing the likelihood of taking CBD effectively for GAD. However, in order of significance, goal setting, self-efficacy, and situational perception proved to be significant predictors of SCT when operationalized to potentially increase the likelihood of CBD usage.

I determined through this study that the influence of these three constructs- goal setting, self-efficacy, and situational perception increased an individual's likelihood of taking CBD effectively for GAD. Thus, the findings in this study have bridged a noticeable gap and notable lack in the academic research, which pointed to an absence of operational strategies in the scientific literature for the likelihood of taking CBD effectively for GAD. My findings supported that the SCT- the theoretical framework underlying this study, was instrumental in serving as a functional and effectual operational tool for this study. These findings can prompt positive social change on the individual level and the familial and community echelons. As noted in the implications for practice, these findings can also initiate a positive social change in the realm of

community public health. Specifically, positive social change is primed through the dovetailing of the social cognitive theoretical framework with CBD use for GAD.

Limitations of the Study

Self-reporting questionnaires that probe participant's subjective experience are not considered the gold standard and are often met with skepticism when compared to, for example, a face-to-face interview or a videoed interview (Erba et al., 2017). As this study sought to describe the sample within a population regarding an outcome- the likelihood of CBD use, a cross-sectional study design was suitable. This design is known to be beneficial at indicating associations (Levin, 2006). However, the same source points the potential limitation that stems from the fact that this type of probe occurs at only one point in time. Also, to minimize time and cost, this study utilized convenience sampling, which drew volunteers near the research's place of business. Convenience sampling was likely the cause that the sample was relatively homogeneous and is a potential limitation of this study.

Further assessment of potential limitations in this study, it is essential to consider the study location. This study was conducted in Fairfield County, Connecticut- an exceptionally high socioeconomic status community. Most of the individuals who responded to this study have the out-of-pocket expendable income to afford CBD, as it is a nutraceutical that is not covered by insurance. Therefore, through a lens of social stratification, if this study were conducted in low socioeconomic status locations throughout the United States, there would likely be a different outcome in the self-reported likelihood of using CBD for GAD. Likewise, this highly educated community is

more likely to gain awareness (Dickinson & Adelson, 2014) that anxiety has escalated to a level that needs treatment and can perhaps begin to manage the disorder before the need for medical intervention.

Another consideration regarding potential limitations in this study is how representative the sample is regarding the population of interest and its proportional representation to the larger population. Although there is a diverse population that shops and consults at the holistic health center from where the questionnaire was made available, this study sample was not representative of this fact. Because of the overrepresentation of White females and those holding at least a bachelor's degree, this narrow group creates the potential for issues of a lack of generalizability and external validity. Also, because shoppers in this SES sector are more likely to be agreeable with the cost of a high-level quality product, individuals can access quality-controlled CBD products. Other lower price point CBD formulations often do not yield the same potency of the active ingredient.

This community is also unique in that individuals have awareness and knowledge of various brands of CBD made from high-quality raw materials and can quickly and consistently access those high-quality CBD products. Being located even in nearby neighborhoods throughout the relatively small state of Connecticut can minimize accessing high-quality CBD products. These facts could potentially play a role in diminishing the likelihood of taking CBD for GAD if the participants are not residing in or around Fairfield County, CT, or another high socioeconomic locale. The data analysis revealed that the sample was predominately female with a mean age ($M = 55.18$). Most of

the sample holds a bachelor's degree ($M = 5.10$). This apparent lack of diversity in the sample introduced a potential threat to external validity.

This study investigated the self-reported likelihood of taking CBD for GAD. There were five predictor variables: knowledge, outcome expectations and expectancies, situational perception, self-efficacy in using CBD, and goal setting. The effect size = 0.15 (medium), the alpha level = 0.05, the power = 0.80, and number of predictors 9 (five constructs of SCT and 4 covariates). Using these indices in G*Power, I determined that a sample size of 114 participants would confer a medium effect size. However, because there was a relatively low number of respondents (114), an analysis of subgrouping will likely not have the power to apply to a broader demographic. This relatively low sample size could play a role in diminishing the application to a larger population- decreasing generalizability.

The overrepresentation of female participants increased the potential of introducing response bias. Assessing another form of response bias, social-desirability bias, can occur when respondents provide answers to survey questions that they feel would be favorably viewed by associates and friends (Krumpal, 2013). Although I conveyed to each participant before filling out the survey that it was of utmost importance to be blatantly honest with their answers, some might have felt that it was in their interest to frame CBD positively. Because some of the individuals who filled out the survey questionnaire are acquainted with me, social-desirability bias could have played a role in influencing the participants to answer in a manner that would have been deemed positive by the researcher.

Recommendations for Further Studies

Undoubtedly, GAD continues to be a growing public health concern, particularly through the COVID-19 pandemic (Bauerle et al., 2020) that unleashed serendipitously through the year-long time frame that this dissertation was written. The pandemic has brought cause for rapid adaptations as conventional medicine has experienced a sharp increase in prescriptions for benzodiazepines such as Xanax and Klonopin- while emerging evidence suggests that this class of medication is contraindicated for high-risk patients with respiratory issues (Ostuzzi et al., 2020). Learning further applications of CBD for sleep disorders, inflammatory conditions, and seizures disorders through the lens of SCT could aid this substance to be used safely and ultimately effectively while perhaps minimizing the common practice of recommending such highly addictive medications.

Several studies have showcased strong associations between all the SCT constructs, including knowledge, outcome expectations/expectancies, situational perception, self-efficacy, and goal setting. However, this study found the three constructs specifically- goal setting, self-efficacy, and situational perception to be strong predictors of the dependent variable- the self-reported likelihood of using CBD for GAD. Moreover, while the sample size was purposefully and precisely calculated for this study, it would require further academic research to determine if a larger participant pool would prompt a different outcome. Another consideration is the length of time of the data collection process. Although many individuals were gracious and committed to participating

quickly in this study, spreading the collection period over an extended time frame and to multiple diversified communities appears worthy of another probe.

Implications for Practice

Through the lens of public health, a problem exists in the United States, where 40 million adults are diagnosed with GAD. Still, many individuals are unwilling to take a prescription medication to treat the condition, and the GAD will go untreated. Some are hesitant to try CBD even though much research is emerging about its potential benefits for GAD. This section looks at practical methods to aid practitioners and health educators in devising effective teaching methods about CBD usage. A review of these findings can serve to draw implications from the results of this study. The over-arching goal was to utilize what has been implicated in prompting further inquiries. The following information will further operationalize the results obtained in this study, aiding experts in the field to apply a SCT-based teaching strategy to assist patients in increasing the likelihood of using CBD for GAD.

Goal Setting in Advising Individuals to Take CBD for GAD

As a potential strategy when taking a medication to aid in minimizing GAD, the act of goal setting can fortify one's ability to increase adherence to a CBD protocol. This study showed that there is a benefit in taking steps that can improve compliance. Behaviors such as clarifying the intention of taking CBD to decrease GAD and then committing to taking measures such as daily journaling about the protocol have shown the promise of significantly increasing the likelihood of taking CBD for GAD. For practical CBD usage, each person was to develop a plan to aid in finding one's effective

dosage. This effective dose depends upon the degree of imbalance of the newly discovered endocannabinoid system (Pertwee, 2006). Raising the patient's awareness of goal setting steps such as envisioning what life would be like when no longer paralyzed with anxiety showed significance in increasing the likelihood of taking CBD for GAD. Encouraging individuals to create a reward system is beneficial in the goal setting process when considering implications for practice (Sharma, 2017).

Self-efficacy in Advising Individuals to Take CBD for GAD

Self-efficacy also proved to be a consequential construct of the SCT. Raising awareness of the importance of increasing one's confidence in changing the unhealthy behavior increased the likelihood of taking CBD for GAD. Learning from an expert about ways to diffuse potential challenges can be liberating- thus minimizing the possible fear of failure and increasing self-assuredness of complying with a CBD protocol. Aligning with others in the spirit of a team-building peer support approach has also proven to be confidence bolstering when creating a new health-building behavior (Bussell, 2017). The same source asserts that behavioral confidence can be strengthened when hearing from an important role model such as an expert in the field or even a well-known celebrity touting a positive experience using CBD for GAD.

Situational Perception in Advising Individuals to Take CBD for GAD

Situational perception is one of the SCT constructs that serves to create a realistic sense of the circumstances the individual faces when embarking on a behavior. Some patients struggle and attempt to cope with highly destructive and uncontrollable anxiety levels, believing that everyone contends with the same dilemma. Having an expert

convey how life experiences can be when not paralyzed with anxiety can be sobering and perspective-changing. Exploring one's awareness, perception, and interpretation can be the start point to instituting practical steps to increase life skills, coping mechanisms, and diminishing out-of-control anxiety levels. For example, learning about the abundant research that has been done on CBD can be fortifying and reassuring. To aid in relinquishing dosing hesitancy, there is a benefit in guiding the patient to understand that CBD is a non-mind-altering substance. Modulating an individual's situational perception also increased the likelihood of using CBD for generalized anxiety in this study.

Implications for Social Change

This study showcased that disease burden and comorbidities associated with a GAD could be positively influenced as individuals learn to take CBD more effectively through the behavioral restructuring brought about by the application of goal setting, self-efficacy, and situational perception- three relevant constructs of SCT. This study highlighted that the SCT constructs could explain the likelihood of CBD usage for GAD. One of the values in determining these findings is that these outcomes can be harnessed to develop a training program that can facilitate taking CBD more effectively for GAD.

Through the lens of public health, this study focused on those who have been diagnosed with GAD. With further consideration of the numbers of those individuals who remain undiagnosed with GAD, this study has indicated that there is prudence in creating tools that enable health educators to teach individuals those metered steps that may increase the likelihood of taking CBD for GAD. Applying behavioral change techniques through using the social cognitive theoretical framework indeed showcased positive

results. Increasing the likelihood of CBD usage can induce positive social change on the individual level and potentially generate productive revisions in the family structure, the workplace, and eventually impacting societal transformations.

Conclusions

Generalized anxiety continues to be a public health threat as the number of individuals diagnosed and undiagnosed with generalized anxiety continues to spike upward. As a potential solution to this dilemma, this study sought to examine the SCT's ability to predict the likelihood of using CBD for GAD. This study highlights the additional challenges of taking CBD for GAD and the extra responsibility required by health practitioners to ease individuals into taking CBD for conditions of anxiousness. While some medical practitioners treating patients with GAD are taking the time to teach patients about CBD usage, most are not- as this process calls upon a new skill set and requires more time than is typically allotted. This study determined that three SCT constructs increased the likelihood of taking CBD for generalized anxiety, including goal setting, self-efficacy, and situational perception. Hence, the application of the SCT increased the likelihood of individuals taking CBD- a protocol that is with the possibility of becoming a viable solution for the treatment of GAD.

We are at a point in history where we are perpetually probing deeper into the scientific literature and discovering how to create more preventative, safer, efficacious, and cost-effective treatment protocols. The criterion for this progress was to find solutions with the most negligible adverse impacts on the human body while increasing the likelihood of achieving optimal health. Through conducting such inquiries, we are

learning to prevent the furthering of disease progression, reduce suffering- with an end goal of teaching patients to become a master of one's health status. Doing so increases the individual's ability to move toward the highest state of optimal health while minimizing risk and decreasing the level of need for sick-care treatments.

Dovetailing complementary and alternative health treatments within the medical model is occurring more frequently. As this study considered the increased implementation of CBD for GAD, there was a discovery that has the potential of contributing value to the preventative healthcare model. Standardizing these findings into a SCT-based teaching protocol can create interest for service providers of a practical implementation that has shown to increase the ease of taking CBD for GAD. On a grander scale, making inroads that can expose' the increased likelihood of using CBD for generalized anxiety in public health initiatives is with the ability to reduce comorbidities of GAD. Doing so can minimize the need for the eventual more invasive, immoderate, and cost-prohibitive modalities while aiding the patient to gain a position of authority over one's health status. In the spirit of social change in the public's health, as those stricken with GAD regain a position of power over one's health, those friends and family members who have been impacted will also benefit from the relinquishment of the disease burden.

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Appendix A: Instrument

Section 1: Knowledge of Cannabidiol (CBD) and Generalized Anxiety Disorder**PLEASE CIRCLE THE ONE ANSWER THAT YOU MOST AGREE WITH**

	True	False	Don't Know
1. The Farm Bill of 2018 determined that CBD is to be extracted from industrial hemp rather than the marijuana plant.	T	F	?
2. CBD is not available in a variety of potencies.	T	F	?
3. CBD is commonly used to treat generalized anxiety disorder.	T	F	?
4. CBD cannot resolve the root cause of generalized anxiety disorder.	T	F	?
5. In the United States, more than 40 million adults suffer from a generalized anxiety disorder.	T	F	?
6. Generalized anxiety disorder is a public health problem.	T	F	?
7. While occasional anxiety is considered normal, chronic stress is not.	T	F	?
8. Taking CBD has the same effect as smoking marijuana.	T	F	?
9. All CBD is sourced from high-quality material.	T	F	?
10. CBD can be administered to children.	T	F	?

Section 2a: Outcome Expectations**PLEASE CIRCLE THE ONE ANSWER WITH WHICH YOU MOST AGREE**

	No	Probably Not	Maybe	Probably	Highly Likely
11. Taking CBD can eliminate mild to severe levels of anxiety.	0	1	2	3	4
12. A benefit of regular CBD use is the relief of inflammation.	0	1	2	3	4
13. Many CBD users experience higher levels of focus and concentration as their anxiety subsides.	0	1	2	3	4
14. Some people no longer need anxiety medication, because of taking CBD.	0	1	2	3	4
15. Some CBD users report that close relations have noticed they seem less anxious.	0	1	2	3	4

Section 2b: Outcome Expectancies

PLEASE CIRCLE THE ONE ANSWER WITH WHICH YOU MOST AGREE

	Not at all Important	Not Very Important	Somewhat Important	Very Important	Very Important
16. It is important to you that you eliminate mild to severe levels of anxiety.	0	1	2	3	4
17. It is important to you that there are added benefits from taking CBD- such as relief of inflammation.	0	1	2	3	4
18. It is important to you that, as your anxiety lessens, you will have better focus and concentration.	0	1	2	3	4
19. It is important to you to stop taking prescription medication as a result of taking CBD.	0	1	2	3	4
20. It is important to you that close relations will witness you being less anxious.	0	1	2	3	4

Section 3: Situational Perceptions**PLEASE CIRCLE THE ONE ANSWER WITH WHICH YOU MOST AGREE**

	No	Probably Not	Maybe	Probably	Highly Likely
21. Abundant research supports that CBD is effective for generalized anxiety disorder (GAD).	0	1	2	3	4
22. There is adequate time in my daily schedule to maintain a CBD regimen.	0	1	2	3	4
23. Medical doctors recommend the use of CBD for GAD.	0	1	2	3	4
24. CBD is a “non-mind-altering” extract derived from industrial hemp.	0	1	2	3	4

Section 4: Self-efficacy in Using CBD

	No	Probably Not	Maybe	Probably	Highly Likely
25. I would be more compliant with a CBD dosing schedule if I journaled each dose.	0	1	2	3	4
26. Consulting with an expert on how to take CBD would aid in staying steady with the dosing.	0	1	2	3	4
27. Creating a support system would help me to stay motivated with dosing CBD.	0	1	2	3	4
28. To create a steady habit, I would find it easier taking CBD with meals.	0	1	2	3	4

Section 5: Goal setting**PLEASE CIRCLE ONE ANSWER WITH WHICH YOU MOST AGREE**

	No	Probably	Maybe	Probably	Highly
	0	1	2	3	4
	Not				Likely
29. I intend to either begin using or continue using CBD for my anxiety.	0	1	2	3	4
30. I am willing to commit to daily journaling so that I can notate how I feel as I adjust the dosage of CBD.	0	1	2	3	4
31. It is my goal to make my life more fulfilling by taking steps to relieve generalized anxiety disorder.	0	1	2	3	4
32. I am imagining what life will be like when I no longer experience GAD as a result of taking CBD.	0	1	2	3	4

	Not	Probably	Maybe	Probably	Highly
	0	1	2	3	4
	At All				Likely
33. How likely are you to use CBD to help decrease your generalized anxiety disorder?	0	1	2	3	4

DEMOGRAPHICAL INFORMATION

34. What is your age? _____

- Prefer Not to Answer

35. What is your race/ethnicity?

- White
- Black or African American
- American Indian or Alaskan Native
- Asian
- Native Hawaiian or another Pacific Islander
- From multiple races
- Some other race (Please specify) _____
- Prefer Not to Answer

36. What is your gender identity?

- Female
- Male
- LGBTQ
- Other (Please specify) _____
- Prefer Not to Answer

37. What is your marital status?

- Married
- Separated
- Divorced
- Widowed
- Never Married
- Prefer Not to Answer

38. What is the highest level of education you have completed?

- Less than high school
- High school or equivalent (e.g., GED)
- Some college, but no degree
- Associate degree
- Bachelor's degree
- Master's degree
- Ph.D. or other Doctoral degrees
- Prefer Not to Answer

39. How much total combined income did all members of your household earn in 2019?

- \$0 - \$9,999
 - \$10,000 - \$49,999
 - \$50,000 - \$79,999
 - \$80,000 - \$99,999
 - \$100,000 or more
 - Prefer Not to Answer
-

Generalized Anxiety Disorder Assessment (GAD-7)

Over the past two weeks, how often have you been bothered by the following:

(A) Feeling nervous, anxious, or on edge?

- Not at all (0)
- Several days (+1)
- More than half the days (+2)
- Nearly every day (+3)

(B) Not being able to stop or control worrying?

- Not at all (0)
- Several days (+1)
- More than half the days (+2)
- Nearly every day (+3)

(C) Worrying too much about different things?

- Not at all (0)
- Several days (+1)
- More than half the days (+2)
- Nearly every day (+3)

(D) Trouble relaxing?

- Not at all (0)
- Several days (+1)
- More than half the days (+2)
- Nearly every day (+3)

(E) Being so restless that it is hard to sit still?

- Not at all (0)
- Several days (+1)
- More than half the days (+2)
- Nearly every day (+3)

(F) Becoming easily annoyed or irritable?

- Not at all (0)
- Several days (+1)
- More than half the days (+2)
- Nearly every day (+3)

(G) Feeling afraid as if something awful might happen?

- Not at all (0)
- Several days (+1)
- More than half the days (+2)
- Nearly every day (+3)

Thank You
For Contributing to Positive Social Change!

Appendix B: Panel of Experts for Assessment of the Instrument Reliability, Content and
Face Validity

Practitioners with Expertise in the Area of Mental Health

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