VIRTUAL MET/CBT FOR TEEN PARENT WITH DUAL DIAGNOSIS: A CLINICAL CASE STUDY

A Doctoral Dissertation

presented to

The Graduate Department of Clinical Psychology,

University of Indianapolis

In partial fulfillment of the requirements for the degree

Doctor of Psychology

Samantha Ruxer, M.A.

March 2024

VIRTUAL MET/CBT FOR TEEN PARENT WITH DUAL DIAGNOSIS:

A CLINICAL CASE STUDY

The signatures below certify that the Doctoral Dissertation of

Samantha Ruxer

has been approved by the Graduate Department of
Clinical Psychology of the University of Indianapolis in
partial fulfillment of the requirements for the degree
Doctor of Psychology

Approved:	Accepted:
Debbie Warman, Ph.D. Dissertation Advisor	John Kuykendall, Ph.D. Dean, College of Education and Behavioral Sciences
Katie Kivisto, Ph.D. Committee Member	Date
Zachary Adams, Ph.D. Committee Member	
Date	

ABSTRACT

Clinical case studies provide a unique opportunity to bridge the gap between research and clinical practice by examining psychotherapy effectiveness on the individual level. Findings can be used to enrich clinicians' knowledge of therapy and improve client care. The following case study evaluated the use of virtual cognitive-behavioral therapy (CBT) with motivational enhancement therapy (MET) and contingency management (CM) in the treatment of a teenage father with comorbid diagnoses of cannabis use disorder (CUD) and generalized anxiety disorder (GAD). Treatment included frequent assessment of symptoms, utilizing the GAD-7 to measure anxiety and the timeline follow-back (TLFB) method to measure substance use. The data was analyzed for clinical and statistical significance using the reliable change index (RCI) and percentage of nonoverlapping data (PND). Results from the RCI suggest the client demonstrated a clinically significant reduction in anxiety symptoms from pre- to post-treatment. PND analysis indicates that treatment was very effective at reducing cannabis use. The author explores the functional impact of clinically meaningful change for the client. Treatment implications and directions for future research are discussed.

Table of Contents

VIRTUAL MET/CBT FOR TEEN PARENT WITH DUAL DIAGNOSIS: A CLINICAL CASE STUDY

Rationale for the Clinical Case Study

Single-subject research is a methodological approach that evaluates the impact of an intervention on a specific subject (Kazdin, 2021). The in-depth study of an individual has been around since the birth of psychology and has led to several valuable findings throughout the years. Some early and widely cited case studies include Freud's famous case of Anna O and John Watson and Rosalie Rayner's study on Little Albert. What differentiates these case studies from current single-subject research is the inclusion of carefully designed and controlled data collection to increase reliability. Single-subject research has continued to grow and develop in the field, expanding from behavioral interventions to exploring a range of evidence-based treatments. This approach has been applied to areas outside of mental health treatment, including sports psychology, education, and business settings (Kazdin, 2019).

There has been some debate about the use and applicability of single-subject research and its comparison to group research. Both methods have distinct advantages and disadvantages and are suitable for answering different research questions. While group-level designs have dominated psychotherapy research, the single-case methodology offers a unique approach to understanding and improving the treatment of individual patients. Group research, typically randomized control trials (RCTs), includes large numbers of participants divided into control and treatment groups. Performance is compared between the two groups and produces results pertaining to statistical significance. On the other hand, single-subject research involves a small number of

participants, typically one to ten, focusing on clinically significant changes (Maric & van der Werff, 2020).

The concept of clinical significance has been discussed extensively in psychotherapy research. Jacobson and researchers designate two criteria for clinically significant change; the individual must move into the functioning range following treatment, and the magnitude has to be statistically reliable (Jacobson et al., 1999). In comparison, statistical significance can tell us that a treatment effect exists; however, it fails to explain its importance and how much of an effect exists (Jacobson & Truax, 1991). Statistical significance "may not reflect a detectable or real difference in everyday life of any individual patient or even of the group" (Kazdin, 2008, p. 148). It is difficult to know if and to what extent data translates to meaningful change or improvement in a person's life (Kazdin, 2021).

Controlled trials do not always emulate complex conditions that exist in the real world (Kazdin, 2008). There are often restrictive inclusion criteria in group experiments (Borckardt & Nash, 2002). For instance, participants in controlled trials usually fit the criteria for a specific disorder; however, many patients carry multiple diagnoses that can impact the course of treatment (Borckardt et al., 2008). Single-case studies represent natural variability in people's lives, including both patients and therapists. Therapists' clinical decision-making, judgment, and expertise are just a few variances that could influence therapy outcomes (Kazdin, 2019). Large research studies cannot typically infer this level of practical detail regarding the influence of individual differences.

Furthermore, group research often shows a causal relationship but does not explain the process of change. Single-case studies increase our understanding of the

structure and mechanism of therapeutic change by isolating critical factors and using ongoing systematic evaluation to rule out external causes for change (Borckardt et al., 2008). Insight into this process deepens our understanding of what works and what does not in therapy, allowing clinicians to improve and validate clinical practices (Kazdin, 2019). Single-subject research offers an opportunity to bridge the gap between clinical practice and research by providing an in-depth look into the magnitude of psychotherapy effectiveness on the individual level (Maric & van der Werff, 2020). Increasing single-case studies will create positive and lasting contributions to the field, allowing clinicians to adapt interventions to maximize therapeutic change and improve daily functioning for patients (Borckardt & Nash, 2002).

Clinical Case Study Methods

To examine patient change on an empirical basis, single-subject research generally relies on one of three approaches: time series analysis, reliable change index (RCI), and percentage of nonoverlapping data (PND). These approaches are used to test whether or not the change in treatment is clinically significant. Jacobson et al. (1984) proposed a method to calculate clinical significance through a reliable change index (RCI). The RCI provides a relatively simple procedure for evaluating how much change has occurred during treatment (Blampied, 2022). In order to have standard criteria for clinically significant change, norms are needed for both the functional (non-clinical) and dysfunctional (clinical) populations to be comparable across studies. As seen in previous research studies, when functional and dysfunctional distributions overlap, it is possible for scores to fall outside of the cutoff point but still not have any statistical reliability

(Jacobson & Truax, 1991). The following RCI equation was proposed to account for this possibility:

$$RC = \frac{X_2 - X_1}{S_{diff}}$$

In the equation, X_1 stands for the subject's score before the intervention, X_2 stands for the same subject's score after the intervention, and S_{diff} is the standard error (SE) of difference between the two test scores. S_{diff} requires its own calculation, where s_1 stands for the standard deviation of the nonclinical population at intake and r_{xx} is the test-retest reliability of the measure in a non-clinical population:

$$S_{diff} = \sqrt{2}(SE)^2$$

$$SE = s_1\sqrt{1-r_{xx}}$$

The standard error of difference accounts for variation in the measure's reliability, in other words, if the treatment change is reflective of more than changes in an "imprecise measuring instrument" (Bischof et al., 2020; Jacobson & Truax, 1991). The cutoff score for the RCI equation is 1.96. If the RCI value is greater than 1.96, the difference is considered statistically reliable and thus likely reflects clinically meaningful change (Jacobson et al., 1999). The RCI provides valuable information: how much change has occurred, in what direction the change occurs, and whether the change is reliable and clinically significant (Jacobson et al., 1984). The RCI is widely applicable to different disorders and types of treatment and is a relatively straightforward method (Blampied, 2022). However, there are some disadvantages of the approach to consider. Because the equation uses pretest and post-test scores only, it is assumed there is a linear relationship between the two points and does not capture any variability that may occur (Jacobson et

al., 1999). In addition, the RCI assumes that clinical significance is equal to a return to normal functioning when that is not necessarily true for every disorder (e.g., autism) (Zahra & Hedge, 2010). For the present case study, I will be measuring anxiety symptoms and substance use, and therefore this specific disadvantage is not too concerning. Another potentially problematic feature is that norms and psychometric properties are needed for clinical and non-clinical populations, and many standard measures do not have both sets of norms. One assessment of anxiety that includes clinical and non-clinical norms is the GAD-7 (Bischoff et al., 2020), which will be used for the present investigation.

The percentage of nonoverlapping data (PND) approach is defined as a meaningful index of treatment effectiveness (Scruggs & Mastropieri, 2013). This approach compares a patient's functioning at the baseline and treatment phases. More specifically, the PND is calculated by identifying the percentage of data points in the treatment phase that surpass the outlier value in the baseline phase (Scruggs & Mastropieri, 2021). The extreme value may be high or low, depending on what is measured. For instance, one study might measure the decrease in anxiety symptoms as a function of treatment. Therefore, the extreme value would be the lowest datum point in the baseline phase (i.e., lowest anxiety rating), and the intended change is a decrease in scores. Alternatively, if the intended change is an increase in scores, such as an increase in goal-related behavior, the extreme value would be the highest datum point in the baseline phase. To calculate the PND, the number of non-overlapping points is divided by the total number of data points (Carlin & Costello, 2022). The less overlap there is, the more effective the treatment is considered. According to Scruggs and Mastropieri (2021),

PND scores greater than 90% are considered highly effective, 70 to 90% are moderately effective, 50 to 70% are questionable or minimally effective, and less than 50% is deemed to be ineffective. However, this is subjective, and interpretations of PND scores may vary.

The PND is a straightforward approach that is easy to calculate and immediately meaningful to researchers through visual inspection (Carlin & Costello, 2022). A meta-analysis from 2013 assessed 45 research synthesis reports that implemented PND and concluded that reliable results were produced across different coders (Scruggs & Mastropieri, 2013). A common criticism of the approach is that these scores are not sensitive to crucial treatment differences and do not offer information about the magnitude of treatment effects (Schlosser et al., 2008). However, Scruggs and Mastropieri (2013) argue that there is a relationship between effect size and the proportion of overlapping data, though some caution should be taken when considering this interpretation. The number of data points may bias PND scores; the more baseline data points collected, the more reliable the results (Scruggs & Mastropieri, 2021). In addition, it is required for researchers to know what data is going to be collected upfront to get baseline measurements. I have selected the PND to examine the response to treatment related to cannabis use for the present case study.

Although the RCI and PND are selected for the present study, other approaches are valuable to review. Time series analysis is another common approach for evaluating the outcomes of single-subject research and is recognized by the American Psychological Association (APA) as a valuable method for testing treatment efficacy (Borckardt et al., 2008). Similar to the PND approach, time series analysis tracks a specific symptom or

variable across the baseline and treatment phases. However, time series can assess both patient change and process change (Jones et al., 1993). To address patient change, the symptom scores are compared between the baseline and treatment phases. The magnitude of change is then determined statistically. Process change addresses how the change occurred across the course of treatment and what circumstances were present (Borckardt et al., 2008). Process change may track one or more variables, which influences the type of research question that can be asked. Univariate process change looks at how one variable changes over time, while multivariate process change looks at how two variables change over time and the interaction between the two (Borckardt & Nash, 2002).

Findings from time series analysis may provide future direction about how a treatment approach can be tailored to be as effective as possible in the shortest amount of time (Borckardt et al., 2008). This method accounts for bidirectional changes and can identify the relationship of variables over a period of time, unlike the RCI (Jones et al., 1993). An advantage of time series analysis and the percentage of nonoverlapping data (PND) approaches compared to the RCI approach is that you do not need a standardized measure with clinical and non-clinical norms, which allows for more flexibility (Borckardt, 2002).

Patient Descriptive Material

The subject of the present case study, James (pseudonym), is a cisgender Caucasian male in his late teens. James was referred to the therapy team by a GI doctor treating him for functional abdominal pain after he reported increased anxiety and cannabis use. He admitted a desire to cut down his cannabis use and was agreeable to the therapy referral. James and his father attended the intake appointment together. James

described a longstanding history of anxiety, stating he has been anxious his entire life. James endorsed many symptoms, including the inability to stop or control worrying, restlessness, feeling easily fatigued, difficulty concentrating, sleep disturbances, and muscle tension. He reported worry in various domains of his life, including school, family, future, and social situations.

When asked about substance use, James reported cannabis as his primary substance of abuse. He has been using cannabis since he was 14 years old. His tolerance and frequency of use have increased over time, leading to daily use for the past several months. James reported difficulty reducing use and acknowledged social, family, and school impairment related to his cannabis use. James also reported a history of nicotine and alcohol use. He estimated smoking a few puffs of his vape pen per day and has been doing so for about two years. James first drank alcohol at age 15 and endorses drinking a total of four times in his life. At the time of the intake appointment, it had been a year since James last drank alcohol. He reported disliking the taste of alcohol and how it made him feel. James denied the use of all other substances. James' father agreed with James' account and supported his goal of reducing cannabis use.

Using the K-SADS-PL 2013 (Kiddie Schedule for Affective Disorders and Schizophrenia, Present and Lifetime Version), James met criteria for cannabis use disorder (CUD), severe, tobacco use disorder (TUD), mild, generalized anxiety disorder (GAD), and attention deficit hyperactivity disorder (ADHD). The KSADS is a semi-structured interview that measures current and past symptomatology of mental health and substance use disorders using DSM-5 criteria in children and adolescents (Kaufman et al., 2013). James has a diagnosis of attention deficit hyperactivity disorder (ADHD) by

history, which is currently being treated through medication management by his primary care provider. His history is also significant for past diagnoses of anxiety and functional abdominal pain. James denied any history of hospitalizations, suicidal ideation, or self-injurious behavior. James was previously prescribed sertraline and trazodone to treat anxiety but stated the medications were ineffective.

James began working with a therapist at his school in 7th grade. He initially sought out therapy to work on anger management, but eventually, the focus shifted to anxiety as well. James has continued to see a school therapist on an ongoing but somewhat inconsistent basis. While James reported that he enjoys talking with the therapist, he has not noticed decreased anxiety symptoms. At the time James began treatment with the therapist of this case study, his treatment with the school therapist had not included any focus on substance use. James typically sees the therapist when he needs a break from schoolwork and being in the classroom. James denied receiving any other mental health treatment outside of the school therapist.

James currently lives with his mom, dad, younger brother, and three foster kids who have been with the family for about two years. James also has two half-siblings that live outside of the family home. When James was in 8th grade, he had a baby with an ex-girlfriend, Abby. James stated that he and Abby started off as friends, then dated for about a year. After spending significant time with James' baby nephew, the two decided they wanted a baby of their own. The couple tried unsuccessfully for a few months, leading to increased stress in the relationship, and they ultimately broke up. After the breakup, James learned Abby was pregnant and eventually was confirmed to be the father through DNA testing. James describes this as an incredibly stressful time as he navigated

trying to become a father at a young age and co-parent with his ex-girlfriend. In the last year, James feels he has been able to bond more with his son, Landon, and enjoys being with him. James typically has Landon for three days a week and Abby has him for the other four days. James' parents have been helpful with finances and other responsibilities, which James is thankful for. James reported that he remains on friendly terms with his ex-girlfriend and is not currently in any romantic relationships.

Regarding family mental health history, James' sister has been diagnosed with bipolar disorder, his nephew is diagnosed with ADHD, and his half-sister and cousin both struggle with substance use disorders. James denied any family history of depression or anxiety. James was in speech therapy from kindergarten until fifth grade to help with stuttering. He has a history of failing classes in school and repeated kindergarten and third grade. He is currently in 10th grade. He has not been diagnosed with any learning or intellectual disabilities but has an IEP for special accommodations at school. James reported school as being particularly anxiety-provoking for him because of the amount of work and social interactions. James' legal history includes an arrest at 15 for stealing and wrecking a car with friends. James reported he and his friends had smoked marijuana before stealing the car. At the time of the intake, James had completed house arrest, probation, and all court dates related to his arrest.

Based on the intake and history information, James was found to be an appropriate fit for the clinic and was referred for 15 sessions of individual therapy with the author. James reported being nervous yet motivated for treatment, and his treatment goals include reducing marijuana use, decreasing anxiety symptoms, and improving

grades at school. Of note, the author received consent from James' father and assent from James to use deidentified treatment materials for the purpose of this study.

Review of Psychological Literature

Etiology and Treatment of Generalized Anxiety Disorder

James meets criteria for generalized anxiety disorder (GAD), characterized by excessive and uncontrollable worry about various topics in a person's life and often leading to impairments in social, occupational, and other areas of functioning (American Psychiatric Association, 2013). Everyday worries tend to be accompanied by symptoms such as difficulty concentrating, irritability, muscle tension, sleep disturbances, and restlessness. The DSM-5 states the 12-month prevalence of GAD in the United States as 2% for adults and 0.9% for adolescents (American Psychiatric Association, 2013). A more recent statistic from the National Comorbidity Study-Adolescent Supplement (NCS-A) found the lifetime prevalence of anxiety disorders was 31.9% for adolescents, making it one of the most commonly diagnosed mental health conditions for this age group (Cabral & Patel, 2020). A diagnosis of GAD early in life is associated with more comorbidity and higher levels of impairment (American Psychiatric Association, 2013). While there is no known singular cause of GAD, various risk factors are associated with the disorder, including stress, genetics, substance abuse, and environmental factors such as child abuse and parental overprotection (Cabral & Patel, 2020).

Many approaches have been utilized in the treatment of GAD, the most common of which is cognitive-behavioral therapy (CBT). CBT appears to be the "gold standard" of treatment for individuals with generalized anxiety disorder (Hirsch et al., 2019). A meta-analysis conducted by Chambless and Ollendick found that CBT is the most

successful empirically supported treatment for anxiety disorders, emphasizing a reduction in anxiety symptoms maintained for up to two years following treatment (2001). Many studies have since echoed the finding that CBT is the first treatment of choice for GAD in both adults and adolescents (Wang et al., 2017; Odongo & Rutagengwa, 2019). CBT for GAD is based on the notion that anxiety is maintained by learned patterns of faulty thinking and maladaptive behavior. Therefore, changing how people think and behave can help treat anxiety (Hirsch et al., 2019).

There are assorted cognitive-behavioral treatment modalities for GAD, but all contain the same essential elements: psychoeducation, self-monitoring, challenging negative thoughts, relaxation skills, worry exposure, and problem-solving (Huppert & Sanderson, 2010). CBT emphasizes automatic thoughts, defined as "learned responses to cues that can occur so quickly that they may be outside of one's awareness" (Huppert & Sanderson, 2010, p. 264). Becoming aware of the thoughts and distortions that contribute to the cycle of anxiety allows patients to challenge these negative thoughts, leading to more realistic and logical thinking (Stefan et al., 2019). The behavioral component of CBT helps anxious individuals build skills to engage instead of avoid, leading to increased self-control and decreased anxiety symptoms (Newman et al., 2020).

As previously mentioned, CBT is an empirically supported approach for adolescents with GAD, with remission rates of about 67% post-treatment (Podina et al., 2016). Katz and colleagues (2009) suggest that developmental differences should be considered for treatment adaptions to increase success with this population. For instance, adolescents have not fully developed abstract thinking skills and the ability to process emotions, so it is helpful to include role-playing, stories, and metaphors when teaching

abstract CBT concepts. Additionally, growing research supports the inclusion of parents or caregivers in the treatment process. Parents can encourage environmental changes during treatment and following termination, including a behavioral rewards system in the home. Clinicians may also want to incorporate a meaningful reward system in sessions to increase homework compliance with teens. Building a strong therapeutic alliance is emphasized in CBT with all ages but may be particularly challenging with teenagers due to their desire for autonomy. Clinicians should emphasize confidentiality and promote active participation without being too forceful (Katz et al., 2009).

Seligman and colleagues (2012) examined over 40 studies on anxiety treatments for adolescents and found empirical support to designate CBT as the only evidence-based treatment for this population. CBT was effective at reducing anxiety symptoms compared to waitlist conditions, even for adolescents with comorbid diagnoses (Ollendick et al., 2008). In one study, treatment gains were maintained up to nine years following treatment (Nevo & Manassis, 2009). CBT demonstrated efficacy across individual, group, and family settings (Seligman et al., 2012). The Coping Cat is a manualized CBT approach for children that focuses on coping skills to deal with anxiety-provoking situations and includes parent involvement. One study found that 64% of the children in the Coping Cat CBT group did not meet diagnostic criteria for an anxiety disorder following treatment, compared to 5% of children on the waitlist (Kendall, 1994).

Despite the large amount of evidence establishing CBT as the most empirically supported treatment for GAD, many studies show promising results for alternative approaches. Another widely used treatment for anxiety is psychodynamic psychotherapy, which associates GAD with object relations and interpersonal relationships (Borkovec et

al., 1998). One study showed that after 16 weeks of psychodynamic therapy, 79% of adult patients no longer met criteria for GAD and had significant improvements in anxiety, worry, depression, and interpersonal functioning (Crits-Christoph et al., 1996). Various studies comparing psychodynamic to other treatment modalities for anxiety indicate that cognitive and behavioral therapies lead to more immediate improvement, but psychodynamic treatment may have greater change following termination (Durham et al., 2003; Klein et al., 1983).

Another study comparing CBT and psychodynamic psychotherapy for individuals with GAD found that both treatments produced significant improvements in anxiety and depression symptoms; however, CBT was more effective at reducing worry and trait anxiety (Leichsenring et al., 2009). This result is likely due to the stronger focus on the cognitive aspect of worrying in CBT. The emphasis on self-awareness of interpersonal patterns in psychodynamic psychotherapy appears to be an essential mechanism of change related to anxiety symptoms (Slavin-Mulford &Hilsenroth, 2012). Other psychodynamic techniques that are meaningfully related to anxiety outcomes include focusing on wishes, dreams, and early memories, linking current feelings to the past, highlighting patients' typical patterns, and helping patients understand their experiences in new ways (Crits-Christoph et al., 1995). The literature on psychodynamic therapy for adolescents with anxiety disorders is minimal but provides preliminary support for the approach. One RCT with teens found that CBT and psychodynamic therapy resulted in greater improvement in anxiety symptoms than the control condition, and these effects persisted at 12-months post-treatment (Midgley et al., 2021).

Applied relaxation (AR) therapy centers on the physiological response of reducing tension and somatic symptoms associated with GAD (Hayes-Skelton et al., 2013). Relaxation techniques may improve present moment awareness and self-monitoring. Instead of avoiding anxious thoughts, patients learn to notice and accept the thoughts. Progressive muscle relaxation is one of the common techniques used in AR and involves alternating tension and relaxation in muscle groups one at a time when anxiety arises (Huppert & Sanderson, 2010). Dugas and colleagues (2010) compared applied relaxation with CBT for GAD and found that both treatments significantly improve GAD severity. However, CBT was the only treatment to significantly improve worry and other specific symptoms associated with GAD.

Acceptance and commitment therapy (ACT) is considered a "third wave," or extension of cognitive-behavioral therapy that emphasizes psychological flexibility rather than the elimination of symptoms (Swain et al., 2013). ACT for anxiety disorders increases acceptance to cope with negative thoughts and feelings, while encouraging behavior change consistent with the patient's values (Landy et al., 2015). The efficacy of ACT has been demonstrated in several studies with adults. For instance, one study found that ACT was significantly more effective at reducing GAD symptoms than a waitlist condition, with 75% of participants showing clinically significant change after treatment (Roemer et al., 2008). Another study comparing ACT with CBT revealed that ACT participants had more significant decreases in worry, while CBT participants had more significant decreases in anxious symptoms (Wetherell et al., 2011). To date, there is a lack of RCTs exploring the effectiveness of ACT among adolescents with GAD (Swain et al., 2013).

Etiology and Treatment of Cannabis Use Disorder

In addition to generalized anxiety disorder, James meets criteria for cannabis use disorder (CUD). CUD is characterized by "a continued problematic pattern of use despite negative consequences, which causes significant distress or impairment in functioning" (Sherman & McRae-Clark, 2016, p. 1). Similar to GAD, cannabis use disorder has a multifactor etiology, including biological, psychological, social, and environmental factors. Some specific risk factors for CUD include academic failure, an unstable family situation, family history of substance use disorders, and behavioral disinhibition. Many individuals with CUD have comorbid diagnoses and report using cannabis to cope with psychological or physiological problems (American Psychiatric Association, 2013). According to the DSM-5, the 12-month prevalence of cannabis use disorder is around 3.4% for adolescents and 1.5% for adults (American Psychiatric Association, 2013). Cannabis use may be particularly harmful during adolescence due to its effects on brain development (Patrick et al., 2024). Use is often associated with impaired memory, learning, judgment, concentration, and increased risk of psychosis. Adolescents with CUD typically experience fluctuations in mood stability, energy levels, eating habits, and problems in school (American Psychiatric Association, 2013). Moreover, those who start using cannabis before adulthood are four to seven times more likely to develop a cannabis use disorder and have an increased risk of developing other substance use and mental health disorders (NIDA, 2018).

The majority of clinical trials for the treatment of CUD have centered around cognitive-behavioral therapy (CBT), motivational enhancement therapy (MET), and contingency management (CM), with results indicating the best outcomes when using a

combination of the three methods (Sherman & McRae-Clark, 2016). CBT for substance use disorders involves identifying patterns of using behavior, increasing alternative prosocial behaviors, and developing skills to reduce substance use. Some highly emphasized skills that increase self-efficacy include cognitive restructuring, refusal skills, negative mood regulation, and coping with cravings or high-risk situations (Waldron & Kaminer, 2004). Identifying the role that core beliefs play in a patient's substance use disorder is crucial to supporting change (Beck et al., 1993).

Several studies have demonstrated the efficacy of CBT with adolescent substance abuse, including two RCTs that resulted in significant reductions in cannabis use, with treatment gains maintained at 6 and 12-month follow-ups (Liddle et al., 2008; Hendricks et al., 2011). However, other results suggest CBT effectively reduced substance use in the short term, but treatment effects were not maintained at the year follow-up (Burleson, 1999). The efficacy of CBT increases when combined with motivational enhancement therapy (MET) (Babor, 2004). MET is based on motivational interviewing (MI) techniques to increase patient motivation for change through collaboration, nonjudgmental feedback, and exploring ambivalence (Sherman & McRae-Clark, 2016). The Marijuana Treatment Project (MTP) demonstrated the unique strengths and efficacy of MET/CBT, with participants with CUD showing significant reductions in days of use, dependence symptoms, and abuse symptoms (Babor, 2004).

Many studies have looked at the effect of adding contingency management (CM) to MET/CBT for substance use (Sherman & McRae-Clark, 2016). Contingency management is based on operant conditioning, which states that learned behavior is strengthened through reinforcement (Higgins et al., 2007). Thus, substance use is

maintained by the effects of the substance, and the goal is to change the reward structure in a patient's life in order to decrease their use (Bigelow et al., 1984). Using CM, patients receive rewards for meeting treatment goals, such as having a negative urinalysis or attending sessions (Sherman & McRae-Clark, 2016). Research has consistently shown that contingency management effectively reduces substance use and increases engagement during treatment (Winters et al., 2021). However, the effects seem to dissipate when the patient no longer receives incentives (Stanger et al., 2009). Treatment that includes all three components, CBT, MET, and CM, results in the strongest and longest-lasting effects (Sherman & McRae-Clark, 2016).

In addition, there is considerable evidence supporting family-based interventions in substance use treatment for adolescents (Sherman & McRae-Clark, 2016). Multidimensional family therapy (MDFT) is a flexible and integrative approach based on the idea that many factors contribute to substance abuse. Therefore, treatment focuses on four domains to improve developmental trajectory: adolescent, parent, family interaction, and extrafamilial social systems. Changes in one domain are used to foster change in others (Liddle, 2010). Liddle and colleagues (2008) compared MDFT and individual CBT with 224 adolescents with substance use disorders. While both groups showed decreased cannabis use, there was no significant difference between the two interventions. However, MDFT showed longer-lasting effects. Another study by Liddle and colleagues (2001) found that MDFT was more successful in reducing substance use and improving functional impairments in teens compared to peer group therapy and multifamily psychoeducation group intervention. MDFT was also associated with

improvements in prosocial behavior, school performance, and family functioning (Liddle et al., 2001).

Multisystemic therapy (MST) is a family-based intervention that is often used to treat adolescents with substance use disorders and delinquent or criminal behavior (Henggeler, et al., 2002). MST implements rewards and punishments for positive and negative behaviors and focuses on protective and risk factors related to substance use (Randall et al., 2001). Henggeler et al. (2002) looked at MST versus usual community services in a group of juvenile offenders with substance use disorders. There were significant treatment effects for cannabis use following the intervention, though the effects were not maintained at the 6-month mark. At the 4-year mark, MST was associated with significantly higher rates of cannabis abstinence and long-term reductions in aggressive criminal behavior (Henggeler et al., 2002).

Another popular family-based intervention is brief strategic family therapy (BSFT). BSFT aims to improve family relationships and restructure negative interaction patterns to reduce substance use and related problematic behavior (Horigian et al., 2016). In a RCT comparing BSFT to treatment as usual, BSFT was more effective at engaging teens in treatment and improving family functioning, but no difference was observed related to substance use (Robbins et al., 2011). Another RCT compared BSFT with group counseling and found that the adolescents in the BSFT condition had significantly stronger improvements in family functioning, conduct problems, and cannabis use (Szapocznik et al., 2012).

Technology-Based Interventions

An emerging area of interest is technology-delivered therapeutic interventions, which have become popular due to increased access to treatment, reduced treatment costs, and improved treatment fidelity (Cuijpers et al., 2009). Notably, digital interventions appeal to adolescents because of the prevalence and exposure to technology in their daily lives, with 95% reporting access to a smartphone (Anderson & Jiang, 2018). CBT is particularly fitting for online administration due to its highly structured and sequential format (Podina et al., 2016). Studies have shown promising results for technology-delivered CBT in the treatment of anxiety disorders across ages (Mewton et al., 2012; Pennant et al., 2015).

A meta-analysis looking at CBT via electronic/technological application (eCBT) for anxious adolescents showed eCBT was significantly more effective at reducing anxiety compared to the waitlist condition. In addition, eCBT demonstrated similar efficacy as standard face-to-face CBT (Podina et al., 2016), with comparable results reported on eCBT for adult anxiety (Cuijpers et al., 2009). A computerized CBT program called BRAVE for Teenagers–ONLINE led to significantly greater reductions in anxiety and improvements in overall functioning compared to the control condition, and no difference was found compared to clinic-based CBT (Berry & Lai, 2014).

In addition, technology-delivered interventions resulted in decreased cannabis use across multiple studies (Winters et al., 2021). In two RCTs, adults with CUD that received computer-delivered MET/CBT had similar reductions in cannabis use compared with those who received standard MET/CBT, with results maintained at 12-month follow-up (Budney et al., 2011; Budney et al., 2015). QTS (“quit the shit”), an online program that implements solution-focused therapy for young adult users, showed a

significantly greater reduction in cannabis use than the control condition. In addition, QTS users reported increased self-efficacy, higher life satisfaction, and decreased anxiety and depression (Tossmann et al., 2011). Contingency management has also shown promise as a digital intervention for substance use. An application called DynamiCare that implements CM principles has demonstrated higher participation and abstinence rates than treatment as usual in substance-abusing adults (Hammond et al., 2021).

However, there is limited research on technological interventions for adolescents with CUD and other substance use disorders (Winters et al., 2021). Walton et al. (2013) compared outcomes for adolescents with CUD assigned to either a single session of technology-delivered intervention (TDI), a single session of in-person MI, or a control condition. Compared to the control group, the TDI group had significantly fewer cannabis consequences at 3 and 6-month follow-ups. The TDI and MI groups had similar outcomes, but the in-person MI condition had larger reductions in cannabis consequences at 12-months posttreatment (Walton et al., 2013). Further research is needed on the implementation of technology-delivered interventions for adolescent substance use disorders.

Teen Fathers with Mental Health Concerns: Impacts and Potential Treatments

Studies have examined factors associated with an increased risk of becoming a father at a young age, including academic difficulties, delinquent behavior, substance abuse, low-income family, history of sexual or physical abuse, or mental health disorders (Kiselica & Kiselica, 2014). Specifically, anxiety, depression, and conduct disorders have significant associations with teenage parenthood (Kessler et al., 1997). Much less is known about effective psychotherapy approaches for teen parents, particularly teen

fathers. In fact, there is a gap in the treatment literature for adolescent fathers compared to adolescent mothers, as most services for teen parents were designed for and tested with mothers (Bellamy & Banman, 2014). Preliminary research suggests adaptions for treatment with teen fathers, such as focusing on a strengths perspective to encourage self-disclosure and self-efficacy and teaching prosocial skills like coping with frustration and job interview skills (Weinman et al., 2005). Motivational interviewing techniques can also result in more positive outcomes by increasing young men's motivation and engagement (Bellamy & Banman, 2014).

Case Formulation

The case conceptualization was developed based on the cognitive-behavioral model of generalized anxiety and substance use disorders. Following this model, psychopathology stems from the "activation of negative schemas by stressful life events" (Pearsons, 2012, p. 5). Negative schemas include dysfunctional thought patterns about the self, others, and the future, and often lead to maladaptive coping strategies.

Various factors and events have contributed to James' current presentation. While James describes a loving relationship with his parents, he notes that his quality time with them is limited due to their busy work schedules. James's parents exhibit a permissive parenting style, often giving James what he wants and rarely saying no to avoid conflict. James lacks emotional closeness with his parents and, subsequently, the development of healthy emotional expression. This is consistent with the findings that caregivers play an essential role in their child's emotional development through their level of attachment and support (Paley & Hajal, 2022). James discussed hiding his emotions since a young age to avoid looking weak, based on messages in the home that men don't cry. James's

parents have a lot on their plates with five other children in the house, which has led to James fighting to earn their attention. Consistent with the idea that early childhood experiences contribute to the formation of schemas (Songco et al., 2020), James developed the belief that he was not good enough based on his family relationships.

Academic stress has played a major role in James's presentation. James struggled in school since kindergarten due to ADHD symptoms and quickly fell behind his same-aged peers. James felt shameful about his poor grades, and school soon became a primary source of anxiety. Increased anxiety and worry at school further impaired James's ability to concentrate and problem-solve. Soon, James's negative core belief, "I am not good enough," was becoming stronger. His negative self-thoughts caused him to feel nervous around others and unsure of himself in social situations.

A significant event in James' life was the birth of his son, Landon (pseudonym), at age 14. James entered his first romantic relationship with Abby, which came with intense and confusing feelings he had not experienced before. This was coupled with the freedom James's parents provided, including allowing Abby to live in the family home temporarily. When James and Abby could not get pregnant as they had hoped to start their own family, the couple broke up due to the added stress on their relationship. James struggled with the loss of his first relationship and viewed himself as incompetent. Things became even more confusing for him after learning Abby was pregnant with his child following their breakup. James was now facing raising a child at a very young age and trying to co-parent with an ex-partner. James's negative views shifted beyond himself, and he began seeing the world as unpredictable and out of his control. Songco and colleagues (2020) reported that unpredictability often contributes to anxiety and the

intolerance of uncertainty (Songco et al., 2020). James's anxiety increased, especially around the uncertainties of becoming a father. James viewed himself negatively in the context of relationships and, relatedly, feared he would not be good enough as a father.

Ultimately, James developed dysfunctional coping mechanisms to manage his anxiety symptoms and dysfunctional beliefs. James's primary coping strategy became smoking cannabis, which provided a temporary escape from his thoughts and feelings, thus serving to negatively reinforce (removal of the aversive experience of distress) the behavior. This pattern is consistent with previous research on cannabis use as a learned behavior (Guven et al., 2017). However, James's substance use impacted his ability to carry out his responsibilities, in turn worsening his maladaptive schema. Using substances to cope impacts individuals' ability to develop healthy coping mechanisms and emotion regulation skills (Patrick et al., 2024). Despite the fleeting emotional relief cannabis provided, James's use created a cycle that maintained his anxiety symptoms.

Treatment Plan

James's treatment plan was created based on his diagnoses and goals determined at his initial evaluation. The plan followed the Encompass treatment manual, which is a 15-session manualized treatment approach that implements techniques from cognitive-behavioral therapy, motivational enhancement therapy, and contingency management to treat individuals with dual diagnoses (Riggs et al., 2017). The client's goals identified at the initial evaluation included decreasing cannabis use, reducing anxiety symptoms, improving academic performance, and maintaining medication compliance. The plan was to evaluate James and determine if he was a good candidate for virtual treatment. The therapist planned to assess the client's level of motivation to attend virtual sessions,

access to a confidential space, a reliable internet connection, and a computer or laptop with video and audio capabilities. Clients best suited for virtual CBT present with mild to moderate severity of anxiety or depression and can establish treatment goals (Newby et al., 2021). If the client was not a good candidate for virtual treatment, he would be referred to a therapist closer to his home so he could meet with a therapist in person.

The combination of CBT and MET has demonstrated efficacy in the treatment of dual diagnoses and is suitable for the cognitive and developmental needs of teens and adolescents (Sampl & Kadden, 2001). The plan was to focus on MET strategies more heavily at the beginning of treatment to encourage buy-in and acceptability of a longer CBT intervention (Riggs et al., 2017). Following a Motivational Enhancement Therapy (MET) approach, the therapist planned to identify and support behavior change by setting goals and making action plans for change (Guydish et al., 2010). The therapist planned to focus on the client's goals to help build a discrepancy between values and current behaviors. Based on MET, the therapist planned to complete a functional analysis with the client to help identify the antecedents and consequences that could be maintaining substance use. The information from the functional analysis would be used to assist in building insight and setting up behavioral experiments to test his negative predictions. The therapist planned to incorporate a motivational interviewing stance throughout to encourage collaboration and engagement in treatment, as well as support self-efficacy (Berman et al., 2020).

Individuals who have maladaptive coping mechanisms, such as substance use, that negatively affect their mental health are good candidates for Cognitive Behavioral Therapy (CBT) (Waldron & Kaminer, 2004). Following a CBT approach, the plan was to

include psychoeducation, cognitive restructuring, and skills training to build insight and healthy coping strategies and decrease risky behaviors (Riggs et al., 2017). The therapist planned to include exposure/response prevention, activity scheduling, role-playing, and social skills training. The plan involved tracking mental health symptoms and substance use on a weekly basis to monitor progress toward goals and increase client insight. The therapist planned to use this information to help the client develop an understanding of the connection between his anxiety symptoms, cannabis use, and academic performance. Also in line with CBT, the therapist planned to emphasize the therapeutic relationship through empathy, collaboration, and Socratic dialogue (Wilmots et al., 2020).

The treatment plan included contingency management to reinforce abstinence or reduced substance use and increase engagement in sober, structured, social activities, known as prosocials (Riggs et al., 2017). Prosocials are a helpful method to enhance social connection and support, which is a significant component of substance use recovery (NIDA, 2018). The plan was to measure substance use weekly with urine drug screens and the Timeline Follow Back (TLFB) measure. Based on the results, the client would participate in a weekly prize draw with the opportunity to win Amazon gift cards. Because the client's goal was to improve academic performance, the therapist planned to use the prize draw to reinforce academic gains as well.

Treatment goals also included medication compliance and maintaining good health while on stimulant medication for ADHD. The therapist planned to ensure the client was completing monthly medication management appointments and vital checks. The therapist planned to regularly consult with James's psychiatrist to receive updates on his treatment. Lastly, the plan was to include family therapy and parent strategy sessions

to address communication skills, limit-setting, and supporting behavior change at home, following a CBT framework (Curry et al., 2001). Curry and colleagues (2001) discuss the importance of including family in CBT for adolescent dual diagnoses.

Clinical Research Question

James's course of treatment had a number of features that provide notable opportunities for unique exploration. James is a teen and single parent, and our treatment was entirely virtual due to his distance from the office. With that in mind, for the present study, I pose the question: Can CBT with motivational interviewing and contingency management be helpful for a teen father with cannabis use disorder and generalized anxiety disorder when delivered virtually? See directly below for how this question will be tackled quantitatively.

Research Design

In order to answer the research question stated above, the therapist saw the patient, James, for 15 weekly individual virtual therapy sessions using a combination of cognitive-behavioral therapy, motivational interviewing, and contingency management. Two major variables, anxiety symptoms and cannabis use, were assessed to determine if treatment was effective for the patient. Anxiety was measured with the GAD-7, a questionnaire commonly used to screen for symptom severity related to generalized anxiety disorder. The GAD-7 has psychometric properties that permit examination using the RCI (Bischoff et al., 2020), including excellent internal consistency ($\alpha = 0.92$) and good test-retest reliability ($r = 0.83$) (Spitzer et al., 2006). Research shows GAD-7 scores are highly correlated with other measures of anxiety, and the questionnaire has been validated for use with various patient demographics (Bischoff et al., 2020). Mossman and

colleagues (2017) found the GAD-7 to be efficient in assessing anxiety symptoms in adolescents. Accordingly, a reliable change index (RCI) will be conducted to determine James' response to treatment in terms of his anxiety symptoms.

The second variable that was assessed was cannabis use. Cannabis use was measured using the timeline follow-back (TLFB) method, which consists of a visual calendar to gather self-reported quantitative estimates of weekly substance use. The TLFB is a valid and reliable method of measuring drug use in individuals with substance use disorders, including adolescents (Lewis-Esquerre et al., 2005). Psychometric properties of the TLFB have been reported for adolescent cannabis use ($\alpha = 0.99$; $r = 0.87$) (Barrett et al., 2001; Levy et al., 2004). The percentage of nonoverlapping data (PND) approach will be used to examine the response to treatment related to substance use. The amount of substances the patient reports on the TLFB at the first session, which assesses cannabis use in the 28 days before starting treatment, was used as the baseline measurement for the PND. Following the initial session, the patient reported cannabis use for the past seven days at each weekly session, which was examined as the treatment phase. The RCI and PND approaches allow the investigator to conclude if clinically meaningful change occurred in treatment.

Course of Treatment

The following section will review James' course of treatment through each of his 15 sessions. The therapist and client planned to meet once a week for 45 minutes. All therapy sessions were conducted virtually to accommodate James, given his distance from the office and lack of transportation. Although a couple of sessions were cut short (described further in this section), James was generally consistent and committed to the

treatment process. James became increasingly more engaged in sessions as therapeutic rapport was built. At each session, the therapist administered the GAD-7, TLFB, and prize draw, all via screen share. The TLFB allowed James to monitor his progress towards change goals (Berman et al., 2020). Due to the virtual setup of James' treatment, the therapist mailed urine drug screens to James' parents to have the screens completed at home each week, on the day of the session, if possible. The therapist followed up about the drug screen results at each session and confirmed with parents via email. James's parents were noncompliant with parent and family sessions due to their busy work schedules. Instead, the therapist used role-play in sessions with James to practice healthy communication with his parents.

Sessions integrated interventions from cognitive behavioral therapy, motivational enhancement therapy, and contingency management. Motivational enhancement therapy (MET) and motivational interviewing (MI) are both therapeutic methods that encourage motivation to change, and both are prevalent in James's treatment. However, there are a few distinct differences between MET and MI that should be defined. Motivational interviewing refers to a set of principles to approach clients in a non-directive way to elicit motivation to change (Berman et al., 2020; Miller & Rollnick, 2013). MET is a more structured and manualized approach based on MI principles (Guydish et al., 2010). The first three sessions of James's treatment were focused on MET interventions, while MI was incorporated throughout treatment with open-ended questions, affirmations, reflective listening, and summarization (Berman et al., 2020).

Session 1

The focus of the first session was rapport-building and assessing the client's motivation. The therapist asked open-ended questions to learn more about the client, including his family dynamics, school, interests, and other important areas of his life. Assessing a client's readiness to change is an important component of MET (Sampl & Kadden, 2001). The therapist used the "personal ruler questions" to assess three dimensions of James' motivation to change his substance use: the importance of change, confidence to change, and readiness to change. James identified changing cannabis use as very important to him, though he felt only somewhat confident and somewhat ready to make the change. The therapist helped James explore his ambivalence. The activity indicated that building self-efficacy should be an important part of James' treatment.

The therapist and client discussed goal setting to help build motivation (Sampl & Kadden, 2001). James related the importance of behavior change to his long-term goals of joining the army after graduating high school and setting a good example for his son. James described his schedule for seeing his son, which entails having his son three days each week, typically on the weekends. The therapist also used the first session to provide psychoeducation on CBT and the therapy process, emphasizing the collaborative nature of treatment. When introducing prosocial activities, it was evident these were lacking in James' life, and he struggled to think of potential activities on his own. The therapist hypothesized that the absence of pleasurable activities was, in part, maintaining James' anxiety and collaborated with James to brainstorm ideas.

Session 2

The second session focused on exploring James' goals in detail and creating a change plan, or specific steps to take towards achieving the goals (Berman et al., 2020).

The client and therapist started by breaking the goals down into manageable, realistic steps, James' anxiety symptoms appeared to be triggered by his poor school performance, so the therapist focused on his goal of improving his grades. James identified increased anxiety at school due to feeling incompetent and being around too many people, and therefore developed a habit of smoking before school to manage the anxiety. The therapist helped James recognize the impact of smoking before school on his academic performance, level of motivation, and ability to concentrate. The therapist and James collaboratively came up with a plan for James to choose two out of five days of the school week to refrain from smoking before school.

James discussed his habit of playing video games for hours after school and how it negatively impacts him. James planned to reduce video game use by 30 minutes per day and incorporate two prosocial activities each week to encourage getting out of the house. James identified the therapist, his Dad, and his favorite teacher as people who can help keep him on track with his goals. Throughout the session, the therapist began developing discrepancies between the client's goals and current behaviors (Sampl & Kadden, 2001).

Session 3

James was disappointed in telling the therapist he did not follow through with this week's homework related to smoking before school. The therapist provided encouragement and explored what got in the way of completing homework. James and the therapist worked on the functional analysis, a MET intervention, to develop a better understanding of his cannabis-using behavior. The sections of the functional analysis include external triggers, internal triggers, substance use behavior, short-term positive

consequences, and long-term negative consequences. James identified two friends he is usually with when he uses cannabis. They typically smoke together before and after school, either in his friend's car or at the friend's house. James had a more difficult time identifying the internal triggers for his use other than feeling anxious before he smokes. The therapist helped guide James by using gentle questioning and providing examples. James began to develop insight into the specific thoughts, feelings, and behaviors associated with his anxiety and how these are connected to his substance use. The therapist reframed client's sustain talk into change talk (Berman et al., 2020).

Session 4

James completed this week's homework of not using cannabis before school two days. He noticed he was more present and concentrated at school, though he did feel more anxious. The therapist helped James explore the source of anxiety at school and potential strategies to cope with the discomfort, including deep breathing. James recognized he feels calmer when his hands are occupied and planned to buy a fidget toy with his prize draw gift card. James felt proud of his reduced cannabis use.

Session four also involved finishing the functional analysis, including the exploration of the positive and negative consequences of James's use. James appreciated the acknowledgment of the positive consequences, and he appeared to become more comfortable talking about substance use thereafter. The therapist further encouraged the client by using a nonjudgmental and curious approach. James identified the positive consequences of his use as decreased anxiety, less body tension, increased creativity, and feeling more comfortable talking to friends. James noted he often doesn't know what to say to others, but he worries about this less when high. The primary negative

consequences of James's use are disappointing Dad, being less involved with his son, brain fog, decreased concentration, lower grades at school, and having less money. The functional analysis helped amplify discrepancies for client, and he set a new goal to refrain from smoking on the days he had his son.

Session 5

At this point in treatment, the groundwork was laid for client motivation and therapeutic rapport. Treatment now shifted toward building skills to manage high-risk situations and reduce symptoms. The therapist allowed James to assist in choosing skills to encourage self-efficacy, an important component of behavior change in MET (Sampl & Kadden, 2001). Selecting from various modules included in the Encompass treatment manual, James chose to start with "coping with cravings." The therapist began by normalizing the experience of cravings and providing psychoeducation using imagery and concrete examples. James talked through what a craving feels like for him. The therapist discussed how reducing exposure to triggers helps control cravings.

James and the therapist referred to the functional analysis to identify his triggers, high-risk situations, and ways to reduce exposure. For instance, James and the therapist created a plan for James to leave his cannabis pen at home during the week to reduce access to cannabis at school, where he often feels triggered to use. The client was introduced to specific skills to help manage cravings when avoiding triggers is not feasible. The primary skills discussed were distracting activities, relying on one's support system, improving self-talk, and urge surfing. The therapist reflected change talk throughout the session (Berman et al., 2020).

Session 6

James and the therapist continued to explore “coping with cravings,” focusing attention on self-talk and urge surfing. James appeared to have difficulty grasping more abstract therapy concepts, such as identifying thought processes and emotions but responded well to concrete examples. This aligns with James’s feeling that he doesn’t know the right thing to say, which is related to low self-confidence and self-efficacy. To help solidify the concepts, the therapist walked through the steps of urge surfing to have James practice live in session. The therapist provided examples of self-talk and questions for James to ask himself to increase his understanding of automatic thoughts. After collaborative exploration, James identified negative thoughts that contributed to his use, such as “I don’t know how to talk to people unless I’m high.” James’s homework was to generate new self-statements by considering the benefits of not using and the negative consequences of using. The therapist provided affirmation and empathic support throughout the session.

Session 7

The therapist and James spent a few minutes discussing the barriers to completing last week’s homework assignment and worked on completing the activity together in session. The skill focus for this week was enhancing social support. James identified what a supportive friend is to him and considered the role of various relationships in his life. James identified a good friend as being nonjudgmental. The therapist inquired about the connection to substance use, specifically whether James worried about his friends judging him for cutting down or saying no to using cannabis. James acknowledged that this was a concern for him and explored the topic with the therapist. James discussed one friendship in particular that he recognized revolved around weed.

When discussing relationships, James also opened up about his relationship with his son's mother, Abby, and his "one-sided romantic feelings" for her. James disclosed his fear of being vulnerable with others following his break up with Abby. The therapist provided empathic support and helped James explore ways to navigate this relationship while co-parenting. James discussed his relationship with his son and his desire to set a good example for him. The therapist helped James expand on what a good example of a role model means to him. James and the therapist ended session by exploring James's strengths. James noted he has been using distracting activities when he finds himself craving cannabis, which has led to significantly less cannabis use over the past week.

Session 8

This week's session was cut short due to distractions at home. James was caring for his son, who was sick and crying in the background of the video session. The therapist acknowledged that it may be difficult for James to complete a session and provided validation for managing his responsibilities. After completing the weekly nodal measurements, the therapist and client planned to meet at the usual time next week.

Session 9

The focus of session nine was negative mood regulation. The therapist used pictures to introduce the cognitive model and reviewed examples of automatic thoughts with James. To help build awareness of emotions, the therapist presented the feelings wheel. James could start to identify his feelings but had difficulty identifying thought patterns. The therapist assigned homework for James to watch for changes in his mood and write down what thoughts and self-talk accompany the mood shift ("thought record"). The therapist gently explored the connection between negative moods and

substance use. James discussed how he often feels overwhelmed, insecure, or bored before he smokes cannabis. While cannabis temporarily reduces these feelings, it often leads to feeling guilty or ashamed afterward. The therapist emphasized James's change talk and encouraged him to explore these feelings further on his thought record.

Session 10

The therapist and James continued their discussion around negative moods and self-talk, starting by reviewing James's thought record from the past week. James found this activity helpful in better understanding his thoughts in the moment. The therapist provided encouragement and reinforcement for completing the therapy homework assignment. The therapist familiarized James with different types of cognitive errors, and he identified most with "catastrophizing" and "mindreading" errors. James provided the following example: failing a school assignment or test signifies he will not pass high school and, therefore, is a failure in life. He then uses weed to escape these feelings, which in turn makes him feel like a bigger failure. James provided similar examples of catastrophizing and mindreading errors leading to not feeling good enough in the various relationships in his life. James noted that this was an eye-opening revelation for him.

The second half of the session was spent discussing ways to challenge James's negative thoughts, such as evidence for/against the thought and worst-case scenarios. The therapist discussed how increasing involvement in positive activities can also help improve negative moods and self-talk. James made a goal of doing more outdoor activities with his son. The therapist incorporated the spirit of MI through reflective listening and summarizing.

Session 11

James began the session by reflecting on his new goal. In trying to spend more time outdoors, he recognized how much time he spent playing video games. James decided to tell his friends he was taking a break from the game and asked them to hold him accountable. The therapist affirmed the client's progress in setting boundaries with friends and his ability to problem-solve. James also felt his relationship strengthening with his son due to increased quality time together. James reflected on the pattern that the more time he spends with his son, the less time he spends smoking cannabis.

The remainder of the session focused on substance refusal skills. While James understands it is ok to say no to substances, he worries about how to do so. He explained this worry stems from feeling he never knows the right thing to say. The therapist helped challenge James's belief that there is always a right and wrong way to say things. The therapist reviewed refusal training skills, including assertive communication and body language, suggesting alternative activities, and changing the subject. The therapist and James then used role-play to practice saying no to substances. James was assigned homework to create a "coping card" that includes his reasons for reducing cannabis use to keep in his pocket at all times, to which James was agreeable. James created a paper card and took a picture of the card on his phone.

Session 12

Session twelve focused on skill building related to job seeking and education to encourage autonomy and a sense of purpose. James discussed his goal of joining the army and a newer consideration of becoming a police officer. When asked what makes him interested in these careers, James stated that, most importantly, he wants to set a good example for his son. He also wants to be in a field where he can help others and one

that doesn't require a college degree. James discussed his admiration for his uncle, who is a police officer. The therapist helped James identify his values and explored how substance use aligns with his values. James acknowledged he would be drug tested for the army and police force and would need to stop smoking completely.

Time was spent exploring practical steps James can take to reach his goals, for instance, resumé building and connecting with others in the field. The conversation shifted to creating educational goals in order to graduate this year. Because James responds favorably to concrete plans and strategies, the therapist used MI techniques to help develop a routine to complete school assignments and hold himself accountable over the rest of the semester. James noted a decrease in anxiety over the past week, which he related to spending less time playing video games. He also reported feeling more comfortable with his son, which he related to decreased anxiety and increased self-confidence.

Session 13

This week's session was again cut short. As the session started, there were multiple interruptions due to James's siblings coming into his room. James is often responsible for watching his siblings when his parents aren't home, and the children were particularly disruptive on this day. The therapist acknowledged the disruptions, to which James expressed his frustration for the responsibilities his parents place on him and their overall lack of emotional support. The therapist provided empathic support and encouraged the client to validate his emotions. The therapist and client spent a few minutes discussing James's family dynamic and the impact on his mental health. James acknowledged he would struggle to engage in today's session with the repeated

interruptions from his siblings, and it was agreed upon to resume at next week's session. His homework was to use the feelings wheel to journal about his feelings one day this week.

Session 14

James did not complete his homework due to feeling unmotivated after getting in an argument with his parents over the weekend. The therapist and client identified the root cause of the fight and James's current distress was feeling unheard by his parents, a pattern that is familiar in his other relationships as well. The therapist made a connection between James feeling unheard and his core belief that he is not good enough for others. The two discussed ways to reduce self-blame and consider alternative explanations. The therapist used open-ended questions to encourage James's engagement throughout the session.

The second half of the session was focused on communication skills, and specifically how James can improve communication with his family. As the oldest male sibling in the family, James often received messages that showing emotions was weak, and therefore he never learned to communicate his feelings in a healthy way. The therapist challenged James's belief that showing emotions is weak and explored ways to effectively communicate his feelings to others in order to feel heard. Techniques discussed include "I statements" and reflective listening. The therapist encouraged James to consider what he has learned throughout treatment before the termination session next week.

Session 15

Session fifteen was focused on processing the termination of the therapeutic relationship, with the goal of promoting an example of a healthy goodbye for the client. James discussed what he found helpful about therapy: having a safe, consistent, supportive relationship, gaining coping skills, and creating a better understanding of himself and his substance use behaviors. James reported he felt proud of himself for reducing his cannabis use and subsequently developing a closer relationship with his son. The therapist referred back to James's initial treatment goals and discussed his progress throughout treatment to encourage confidence and self-efficacy. The therapist initiated a conversation regarding how James might know if therapy is needed again. The therapist and James said their goodbyes.

Empirical Findings

The GAD-7 was administered to assess James's anxiety pre- to post-treatment (i.e., first compared to last appointment). The data from the first and last sessions were used to calculate the RCI in order to conclude if clinically meaningful change occurred during treatment. The RCI was calculated using the following equation, introduced by Jacobson and Truax (1991):

$$RC = \frac{X_2 - X_1}{S_{diff}}$$

In the equation, X_1 represents the subject's pre-treatment score, X_2 represents the post-treatment score, and S_{diff} is the standard error (SE) of difference between the two test scores. S_{diff} requires its own calculation (shown below), where s_1 stands for the standard deviation of the nonclinical population at intake, and r_{xx} is the test-retest reliability of the measure. If the RCI score is greater than or equal to an absolute value of 1.96, reliable change has occurred (Jacobson & Truax, 1991).

$S_{diff} = \sqrt{2}(SE)^2$

$SE = s_1\sqrt{1-r_{xx}}$

Tables 1-3 summarize James's RCI score results. Using normative data from Spitzer and colleagues (2006) for the GAD-7, the RCI for James's pre- to post-treatment scores was calculated to be -2.86 (Table 1). This value indicates that reliable change occurred during treatment. Cutoff scores were then computed to determine if the change was clinically significant. Jacobson and Truax introduced the following equation to determine cutoff scores, where s_1 stands for the standard deviation of the nonclinical population, s_2 is the standard deviation of the clinical population, X_1 is the mean of the nonclinical population, and X_2 is the mean of the clinical population.

$Cutoff = (s_1 \ X_2) + (s_2 \ X_1) \ / (s_1 + s_2)$

Table 2 shows the cut-off score determination using norms from Spitzer and colleagues (2006) for the GAD-7. James's score met the cut-off point, therefore, there was a clinically significant reduction in James's anxiety symptoms over the course of treatment. Considering both the RCI and cut-off point, a client can be classified as one of the following: recovered, improved but not recovered, deteriorated, no change, and cannot be classified. Because James passed the RCI criteria and the cut-off score, he is considered recovered (Table 3).

Table 1

Reliable Change Index Determination of GAD-7 (Spitzer et al., 2006)

Measure	Pre-test score	Post-test score	Standard deviation of non-clinical population	Test-retest reliability	S_E	S_{diff}	Reliable Change Index (RCI)	Reliable change? ($\geq$1.96)

GAD-7	14	6	4.8	0.83	1.98	2.80	-2.86	Yes (improved)

Table 2

Cut-Off Point Determination for Client at End of Treatment Using Means and Standard Deviations of Clinical and Nonclinical Populations From Spitzer et al. (2006)

Measure	Mean of non-clinical population	Mean of clinical population	Standard deviation of non-clinical population	Standard deviation of clinical population	Cut-off score	Client's post-test score	Cut-off score achieved?
GAD-7	4.9	14.4	4.8	4.7	9.7	6	Yes

Table 3

Summary Table of Client's RCI Classification and Cut-Off Score to Determine Change Classification

Measure	RCI classification	Cut-off met or not	Change classification
GAD-7	Improved	Cut-off met	Recovered

In addition to anxiety symptoms, cannabis use was also measured to determine James's response to treatment. The TLFB was administered to estimate how many days per week James used cannabis. At the first session, James reported his cannabis use for the four weeks prior to starting treatment (baseline phase). At the following 15 sessions, James reported his cannabis use for the seven days prior to each session (treatment

phase). Table 4 presents the number of days per week James used cannabis for the baseline and treatment phases. Figure 1 displays the changes in James's cannabis use throughout treatment. PND analysis was completed to examine treatment effects related to cannabis use. James's PND score (Table 5) indicates that treatment was very effective at reducing cannabis use (Scruggs & Mastropieri, 2013). The *p*-value was less than 0.05, therefore, the results are statistically significant (Tarlow & Penland, 2016).

Table 4

TLFB Scores for the Baseline and Treatment Phases

Observation week number	Baseline (=0) or treatment (=1) phase	Number of days used cannabis
1	0	7
2	0	7
3	0	7
4	0	7
5	1	7
6	1	5
7	1	5
8	1	6
9	1	3
10	1	5
11	1	4
12	1	4
13	1	5
14	1	5
15	1	3

16	1	3
17	1	4
18	1	2

Figure 1

Cannabis Use Treatment Effects

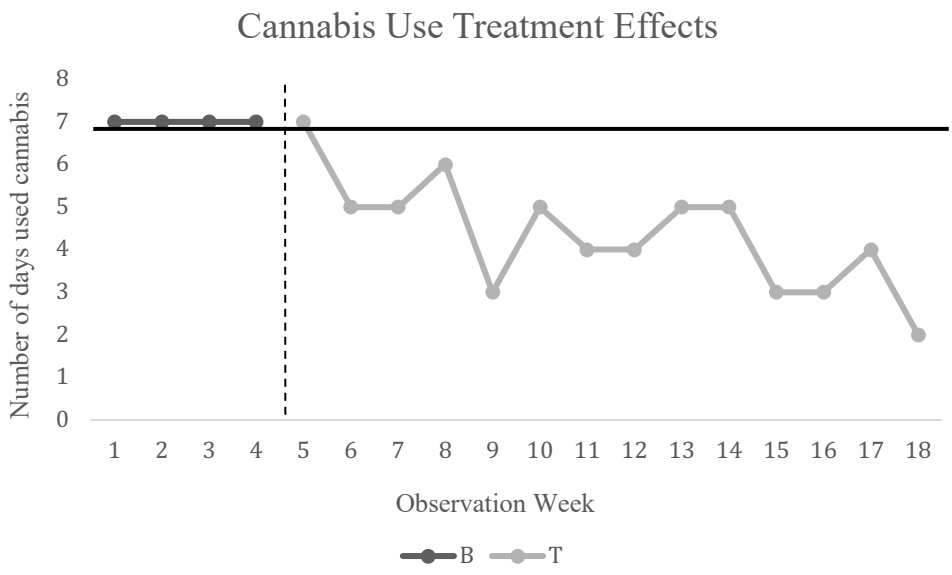

Table 5

PND Interpretation

PND	***p***	**PND Interpretation**
92.86%	0.0011	Very Effective

Discussion

The subject of the present case study, James, is a cisgender Caucasian male in his late teens referred to treatment for increased anxiety and cannabis use. James attended 15 sessions of virtual individual therapy, which implemented a combination of cognitive behavioral therapy, motivational interviewing, and contingency management. The present study assessed whether this modality of virtual treatment can be helpful for a teen father with comorbid diagnoses of cannabis use disorder and generalized anxiety disorder. To answer the research question, two major variables were measured during treatment. Anxiety symptoms were measured using the GAD-7 to determine pre- to post-treatment change, and cannabis use was measured weekly using the timeline follow-back method.

Overall, treatment was effective at reducing James's anxiety symptoms. Furthermore, the treatment was very effective at reducing James's cannabis use. It should be noted that while cannabis use never stopped completely, the client's use significantly decreased over the course of treatment, which was his goal for treatment. These findings demonstrate that treatment resulted in clinically meaningful change in both James's anxiety and cannabis use. According to the DSM criteria, James no longer met the criteria for GAD. At the start of treatment, James met the criteria for cannabis use disorder, severe, but post-treatment, he meets the criteria for cannabis use disorder, mild (APA, 2013). These findings support the many studies demonstrating the efficacy of CBT modalities in the treatment of both GAD and substance use disorders (Hendricks et al., 2011; Hirsch et al., 2019; Liddle et al., 2008).

The current study highlights the importance of targeting both substance use and mental health symptoms in dual-diagnosis clients (Riggs et al., 2017). Using substances

to cope with mental health symptoms is linked to riskier behavior and long-term consequences of substance use (Patrick et al., 2024). There was, undoubtedly, a connection between James's cannabis use and anxiety, and helping him to understand the connection was fundamental to his recovery. James used cannabis as a way to cope with anxiety and avoid negative thought spirals. As James learned more adaptive coping skills and emotion regulation strategies, he felt more in control of his anxiety, and symptoms began to decrease. Subsequently, he was less reliant on cannabis when his anxiety was more manageable, which aligns with previous research (Spencer et al., 2021).

One of the benefits of clinical case studies is the ability to achieve a more comprehensive understanding of the impacts on the individual client (Kazdin, 2021). The results of the present study indicate that clinically meaningful change occurred during treatment, but it is useful to consider the implications for the client's functioning (Blampied 2022). James's decrease in anxiety was related to improved attendance and performance at school. He felt more comfortable asking questions when he didn't understand. James felt more motivated and capable of pursuing his dream of joining the army or police force, which fostered a sense of purpose.

Decreasing cannabis use before school also had a major impact on James's concentration level and academic performance. Because James felt less anxious at school, he didn't feel as powerful a desire to smoke with his friend after school to relieve stress. He was able to implement more adaptive coping mechanisms instead, as well as practice his refusal skills. Guven and colleagues (2017) report the importance of social support to reduce or abstain from cannabis use. For the present case, a focus on positive social support was a component of treatment and may have played a role in James's recovery.

James leaned into his supportive relationships and set boundaries with friends who influenced his substance use. James's relationship with his son was a functional domain of importance and a strong inspiration in his life. Throughout treatment, James discussed improvements in his relationship with his son.

The therapeutic relationship is an essential element of treatment effectiveness (Berman et al., 2020; Stubbe, 2018). In this case, significant time was spent developing and strengthening the therapeutic relationship. The therapist used empathy, validation, and reflective listening to help establish rapport. In addition, the therapist emphasized collaboration throughout treatment to encourage the client's autonomy (Guydish et al., 2010). James felt a general lack of control over many areas of his life, and reminding him of his autonomy provided empowerment. Based on conversations throughout treatment, James did not feel heard in many of the relationships in his life. The therapeutic relationship helped him to feel valued and, in turn, improved his self-esteem.

The therapeutic alliance did not appear to be negatively impacted by the virtual modality. However, virtual treatment did have its downsides, including increased disruptions due to James's responsibilities of caring for his son and younger siblings, though these responsibilities likely would have impacted attendance for in-person treatment. Another downside to virtual treatment was the loss of internet connection on two occasions, which briefly disrupted the session progress. The use of urine analysis with virtual treatment poses the risk of not knowing for certain if the client is interfering with the results. It is ideal if parents or caregivers are willing to help in this scenario. Though James's parents did not engage in parent sessions, they were involved in administering the drug screens. Overall, the present findings support past research that

indicates virtual therapy can be effective (Mewton et al., 2012; Pennant et al., 2015; Winters et al., 2021).

While contingency management did not appear to have a strong impact on the client, he did appear to benefit greatly from the use of motivational interviewing techniques. With all the authority figures in his life (parents, teachers), James feels distant and unheard. It was key for the therapist to portray an MI spirit throughout each session, emphasizing collaboration and compassion (Berman et al., 2020). James responded well to creating change plans and reinforcing change talk to build self-motivation. Empowering the client to see his part in change allowed him to feel a sense of control over areas of his life that he previously did not. Research suggests that an increase in one's internal locus of control is associated with a decrease in mental health symptoms (Senan et al., 2019), an association that appears useful in understanding James's response to treatment.

Individuals with substance use concerns tend to exhibit lower levels of medication adherence, and poor compliance is associated with an increase in symptoms, substance use relapse, and lower quality of life (Magura et al., 2011). Therefore, the therapist ensured that medications were monitored throughout treatment. James was compliant with his ADHD medication, as reported by his psychiatrist and confirmed by James and his father. James worked with the psychiatrist on ways to manage nausea with the medication, and once this was under control, James reliably took his medication each day before school. He noted an improvement in focus and time management when both taking the meds consistently and refraining from smoking cannabis in the morning.

It is important to consider the current study's limitations when interpreting findings. Bias and dishonesty can exist in self-report measures (Paulhus & Vazire, 2007). Because both anxiety symptoms and cannabis use information were gathered through self-report, this is a valuable consideration. Although a weekly urine drug screen analysis was conducted in addition to the TLFB, the analysis results provided only a binary value of positive or negative and, therefore, did not verify whether the level of substance increased or decreased (Sampl & Kadden, 2001). Considering any external motivators for lying on a self-report measure is important (Paulhus & Vazire, 2007). In James's case, he was not at risk of getting in trouble with his parents for his cannabis use, and he was not particularly motivated by the prize draw incentives. Therefore, it seems unlikely James was deceitful on the measures. The urinalysis results also allowed the therapist to confirm the client was taking his ADHD medications, as he consistently tested positive for stimulants.

Another limitation is the low generalizability of the present case study. The treatment modality proved effective at reducing cannabis use and anxiety symptoms for the client, but one cannot assume the same results would apply to all individuals with the same diagnoses. Further data should be gathered to support this theory. It may be advantageous for future studies to compare treatment outcomes between in-person and virtual deliveries of MET/CBT therapy for adolescents with dual diagnoses. In addition, future studies should assess the results of this treatment modality with other types of dual diagnoses, including other substances of choice.

In sum, the present study was a case study of a teenage father who presented with Generalized Anxiety Disorder and Cannabis Use Disorder. Treatment focused on

motivational interviewing and CBT and was delivered virtually. The client demonstrated significant gains, as assessed on the GAD-7 and the timeline follow-back method. Quantitative analyses (RCI and PND) indicated significant improvement in terms of his GAD, such that he was classified as "recovered" by the end of treatment as determined by RCI analyses (Spitzer et al., 2006), and that treatment was "very effective" for his cannabis use as determined by PND analyses (Scruggs & Mastropieri, 2013).

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.).

Anderson, M., & Jiang, J. (2018). Teens, social media & technology 2018. *Pew Research Center*, *31*(2018), 1673-1689.

Babor, T. F. (2004). Brief treatments for cannabis dependence: findings from a randomized multisite trial. *Journal of Consulting and Clinical psychology*, *72*(3), 455-466.

Barrett, H., Slesnick, N., Brody, J. L., Turner, C. W., & Peterson, T. R. (2001). Treatment outcomes for adolescent substance abuse at 4-and 7-month assessments. *Journal of consulting and clinical psychology*, *69*(5), 802.

Beck, A. T., Wright, F. D., Newman, C. F., & Liese, B. S. (1993). Cognitive therapy of substance abuse: theoretical rationale. *NIDA research monograph*, *137*, 123-146.

Bellamy, J. L., & Banman, A. (2014). Advancing research on services for adolescent fathers: A commentary on Kiselica and Kiselica. *Psychology of Men & Masculinities*, *15*(3).

Berman, A. H., Beckman, M., & Lindqvist, H. (2020). Motivational interviewing interventions.

Berry, R. R., & Lai, B. (2014). The emerging role of technology in cognitive–behavioral therapy for anxious youth: A review. *Journal of rational-emotive & cognitive-behavior therapy*, *32*(1), 57-66.

Bigelow, G. E., Stitzer, M. L., & Liebson, I. A. (1984). The role of behavioral contingency management in drug abuse treatment. *Behavioral intervention techniques in drug abuse treatment*, *46*, 36-54.

Bischoff, T., Anderson, S. R., Heafner, J., & Tambling, R. (2020). Establishment of a reliable change index for the GAD-7.

Blampied, N. M. (2022). Reliable change and the reliable change index: still useful after all these years?. *The Cognitive Behaviour Therapist*, *15*, e50.

Borckardt, J. J. (2002). Case study examining efficacy of a multi-modal psychotherapeutic intervention for hypertension, *International Journal of Clinical and Experimental Hypnosis*, *50*, 189-201.

Borckardt, J. J., Nash, M. R., Murphy, M. D., Moore, M., Shaw, D., &O'Neill, P. (2008). Clinical practice as natural laboratory for psychotherapy research - A guide to case-based time-series analysis. *American Psychologist, 63*, 77-95.

Borckardt, J. J., & Nash (2002). How practitioners (and others) can make scientifically viable contributions to clinical outcome research using the single-case time-series design. *International Journal of Clinical and Experimental Hypnosis*, *50*, 114-148.

Borkovec, T. D., Ray, W. J., & Stober, J. (1998). Worry: A cognitive phenomenon intimately linked to affective, physiological, and interpersonal behavioral processes. *Cognitive Therapy and Research*, *22*(6), 561-576.

Budney, A. J., Fearer, S., Walker, D. D., Stanger, C., Thostenson, J., Grabinski, M., & Bickel, W. K. (2011). An initial trial of a computerized behavioral intervention for cannabis use disorder. *Drug and alcohol dependence*, *115*(1-2), 74-79.

Budney, A. J., Stanger, C., Tilford, J. M., Scherer, E. B., Brown, P. C., Li, Z., ... & Walker, D. D. (2015). Computer-assisted behavioral therapy and contingency management for cannabis use disorder. *Psychology of addictive behaviors: journal of the Society of Psychologists in Addictive Behaviors*, *29*(3), 501-511.

Burleson, Y. K. J. A. (1999). Psychotherapies for adolescent substance abusers: 15-month follow-up of a pilot study. *American Journal on Addictions*, *8*(2), 114-119.

Cabral, M. D., & Patel, D. R. (2020). Risk factors and prevention strategies for anxiety disorders in childhood and adolescence. *Anxiety Disorders*, 543-559.

Carlin, M. T., & Costello, M. S. (2022). Statistical decision-making accuracies for some overlap-and distance-based measures for single-case experimental designs. *Perspectives on Behavior Science*, *45*(1), 187-207.

Chambless, D. L., & Ollendick, T. H. (2001). Empirically supported psychological interventions: Controversies and evidence. *Annual review of psychology*, *52*(1), 685-716.

Christensen, L., & Mendoza, J. L. (1986). A method of assessing change in a single subject: An alteration of the RC index. *Behavior Therapy*, *17*, 305-308.

Crits-Christoph, P., Connolly, M. B., Azarian, K., Crits-Christoph, K., & Shappell, S. (1996). An open trial of brief supportive-expressive psychotherapy in the treatment of generalized anxiety disorder. *Psychotherapy: Theory, Research, Practice, Training*, *33*(3), 418.

Cuijpers, P., Marks, I. M., van Straten, A., Cavanagh, K., Gega, L., & Andersson, G. (2009). Computer-aided psychotherapy for anxiety disorders: A meta-analytic review. *Cognitive behaviour therapy*, *38*(2), 66-82.

Curry, J. F., Wells, K. C., Lochman, J. E., Craighead, W. E., & Nagy, P. D. (2001). Group and family cognitive behavior therapy for adolescent depression and substance abuse: A case study. *Cognitive and Behavioral Practice*, *8*(4), 367-376.

Dugas, M. J., Brillon, P., Savard, P., Turcotte, J., Gaudet, A., Ladouceur, R., ... & Gervais, N. J. (2010). A randomized clinical trial of cognitive-behavioral therapy and applied relaxation for adults with generalized anxiety disorder. *Behavior therapy*, *41*(1), 46-58.

Durham, R. C., Chambers, J. A., Macdonald, R. R., Power, K. G., & Major, K. (2003). Does cognitive-behavioral therapy influence the long-term outcome of generalized anxiety disorder? An 8–14 year follow-up of two clinical trials. *Psychological Medicine*, *33*(3), 499-509.

Guven, F. M., Camsari, U. M., Senormanci, O., & Oguz, G. (2017). Cognitive behavioral therapy in cannabis use disorder. In *Handbook of Cannabis and Related Pathologies* (pp. 1056-1065). Academic Press.

Guydish, J., Jessup, M., Tajima, B., & Manser, S. T. (2010). Adoption of motivational interviewing and motivational enhancement therapy following clinical trials. *Journal of Psychoactive drugs*, *42*(sup6), 215-226.

Hammond, A. S., Sweeney, M. M., Chikosi, T. U., & Stitzer, M. L. (2021). Digital delivery of a contingency management intervention for substance use disorder: A feasibility study with DynamiCare Health. *Journal of Substance Abuse Treatment*, *126*, 108425.

Hayes-Skelton, S. A., Roemer, L., Orsillo, S. M., & Borkovec, T. D. (2013). A contemporary view of applied relaxation for generalized anxiety disorder. *Cognitive behaviour therapy*, *42*(4), 292-302.

Hendriks, V., van der Schee, E., & Blanken, P. (2011). Treatment of adolescents with a cannabis use disorder: Main findings of a randomized controlled trial comparing multidimensional family therapy and cognitive behavioral therapy in The Netherlands. *Drug and alcohol dependence*, *119*(1-2), 64-71.

Henggeler, S. W., Clingempeel, W. G., Brondino, M. J., & Pickrel, S. G. (2002). Four-year follow-up of multisystemic therapy with substance-abusing and substance-dependent juvenile offenders. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*(7), 868-874.

Higgins, S. T., Silverman, K., & Heil, S. H. (Eds.). (2007). *Contingency management in substance abuse treatment*. Guilford Press.

Hirsch, C. R., Beale, S., Grey, N., & Liness, S. (2019). Approaching cognitive behavior therapy for generalized anxiety disorder from a cognitive process perspective. *Frontiers in psychiatry*, *10*, 796.

Horigian, V. E., Anderson, A. R., & Szapocznik, J. (2016). Family-based treatments for adolescent substance use. *Child and Adolescent Psychiatric Clinics*, *25*(4), 603-628.

Huppert, J. D., & Sanderson, W. C. (2010). Psychotherapy for generalized anxiety disorder. In D. J. Stein, E. Hollander, & B. O. Rothbaum (Eds.), *Textbook of anxiety disorders* (pp. 219-238). American Psychiatric Publishing, Inc.

Jacobson, N. S., Follette, W. C., & Revenstorf, D. (1984). Psychotherapy outcome research: Methods for reporting variability and evaluating clinical significance. *Behavior therapy*, *15*(4), 336-352.

Jacobson, N. S., Roberts, L. J., & Berns, S. B. (1999). Methods for defining and determining the clinical significance of treatment effects: description, application, and alternatives. *Journal of Consulting and Clinical Psychology*, *67*(3), 300-307.

Jacobson, N. S., & Truax, P. A. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59,* 12-19.

Jones, E. E., Ghannam, J., Nigg, J. T., & Dyer, J. P. (1993). A paradigm for single-case research: The time series study of a long-term psychotherapy for depression. *Journal of Consulting and Clinical Psychology, 61,* 381–394.

Katz, L. Y., Fotti, S. A., & Postl, L. (2009). Cognitive-behavioral therapy and dialectical behavior therapy; adaptations required to treat adolescents. *Psychiatric Clinics of North America*, *32*(1), 95-109.

Kaufman, J., Birmaher, B., Axelson, D., Perepletchikova, F., Brent, D., & Ryan, N. (2013). Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version (K-SADS-PL 2013, DSM-5). *Western Psychiatric Institute and Yale University*.

Kazdin, A. E. (2008). Evidence-based treatment and practice: New opportunities to bridge clinical research and practice, enhance the knowledge base, and improve patient care. *American Psychologist, 63*(3), 146–159.

Kazdin, A. E. (2021). Single-case experimental designs: Characteristics, changes, and challenges. *Journal of the Experimental Analysis of Behavior*, *115*(1), 56-85.

Kazdin, A. E. (2019). Single-case experimental designs. Evaluating interventions in research and clinical practice. *Behaviour research and therapy*, *117*, 3-17.

Kendall, P. C. (1994). Treating anxiety disorders in children: results of a randomized clinical trial. *Journal of consulting and clinical psychology*, *62*(1), 100.

Kessler, R. C., Berglund, P. A., Foster, C. L., Saunders, W. B., Stang, P. E., & Walters, E. E. (1997). Social consequences of psychiatric disorders, II: Teenage parenthood. *American Journal of Psychiatry*, *154*(10), 1405-1411.

Kiselica, M. S., & Kiselica, A. M. (2014). The complicated worlds of adolescent fathers: Implications for clinical practice, public policy, and research. *Psychology of Men & Masculinity*, *15*(3), 260.

Klein, D. F., Zitrin, C. M., Woerner, M. G., & Ross, D. C. (1983). Treatment of phobias: II. Behavior therapy and supportive psychotherapy: Are there any specific ingredients?. *Archives of General Psychiatry*, *40*(2), 139-145.

Koerner, N., & Dugas, M. J. (2006). A cognitive model of generalized anxiety disorder: The role of intolerance of uncertainty. *Worry and its psychological disorders: Theory, assessment and treatment*, 201-216.

Landy, L. N., Schneider, R. L., & Arch, J. J. (2015). Acceptance and commitment therapy for the treatment of anxiety disorders: a concise review. *Current Opinion in Psychology*, *2*, 70-74.

Leichsenring D Sc, F., Salzer, S., Jaeger, U., Kächele, H., Kreische, R., Leweke, F., ... & Leibing D Sc, E. (2009). Short-term psychodynamic psychotherapy and

cognitive-behavioral therapy in generalized anxiety disorder: a randomized, controlled trial. *American Journal of Psychiatry*, *166*(8), 875-881.

Levy, S., Sherritt, L., Harris, S. K., Gates, E. C., Holder, D. W., Kulig, J. W., & Knight, J. R. (2004). Test-retest reliability of adolescents' self-report of substance use. *Alcoholism: Clinical and Experimental Research*, *28*(8), 1236-1241.

Lewis-Esquerre, J. M., Colby, S. M., Tevyaw, T. O. L., Eaton, C. A., Kahler, C. W., & Monti, P. M. (2005). Validation of the timeline follow-back in the assessment of adolescent smoking. *Drug and alcohol dependence*, *79*(1), 33-43.

Liddle, H. A. (2010). Multidimensional family therapy: A science-based treatment system for adolescent drug abuse. *Sucht*, *56*(1), 43-50.

Liddle, H. A., Dakof, G. A., Parker, K., Diamond, G. S., Barrett, K., & Tejeda, M. (2001). Multidimensional family therapy for adolescent drug abuse: Results of a randomized clinical trial. *The American journal of drug and alcohol abuse*, *27*(4), 651-688.

Liddle, H. A., Dakof, G. A., Turner, R. M., Henderson, C. E., & Greenbaum, P. E. (2008). Treating adolescent drug abuse: A randomized trial comparing multidimensional family therapy and cognitive behavior therapy. *Addiction*, *103*(10), 1660-1670.

Maric, M., & van der Werff, V. (2020). Single-case experimental designs in clinical intervention research. In *Small Sample Size Solutions* (pp. 102-111). Routledge.

Magura, S., Rosenblum, A., & Fong, C. (2011). Factors associated with medication adherence among psychiatric outpatients at substance abuse risk. *The open addiction journal*, *4*, 58.

Mewton, L., Wong, N., & Andrews, G. (2012). The effectiveness of internet cognitive behavioural therapy for generalized anxiety disorder in clinical practice. *Depression and Anxiety*, *29*(10), 843-849.

Midgley, N., Mortimer, R., Cirasola, A., Batra, P., & Kennedy, E. (2021). The evidence-base for psychodynamic psychotherapy with children and adolescents: A narrative synthesis. *Frontiers in psychology*, *12*, 1188.

Miller, W. R., & Rollnick, S. (2013). *Motivational interviewing: Helping people change* (3rd ed.). Guilford Press.

Mossman, S. A., Luft, M. J., Schroeder, H. K., Varney, S. T., Fleck, D. E., Barzman, D. H., ... & Strawn, J. R. (2017). The Generalized Anxiety Disorder 7-item (GAD-7) scale in adolescents with generalized anxiety disorder: signal detection and validation. *Annals of clinical psychiatry: official journal of the American Academy of Clinical Psychiatrists*, *29*(4), 227.

Nevo, G. A., & Manassis, K. (2009). Outcomes for treated anxious children: a critical review of Long-Term-Follow-Up studies. *Depression and Anxiety*, *26*(7), 650-660.

Newby, J., Mason, E., Kladnistki, N., Murphy, M., Millard, M., Haskelberg, H., ... & Mahoney, A. (2021). Integrating internet CBT into clinical practice: a practical guide for clinicians. *Clinical Psychologist*, *25*(2), 164-178.

Newman, M. G., Zainal, N. H., & Hoyer, J. (2020). Cognitive-Behavioral Therapy (CBT) for Generalized Anxiety Disorder (GAD). *Generalized anxiety disorder and worrying: A comprehensive handbook for clinicians and researchers*, 203-230.

NIDA. (2018, July 2). Media Guide. Retrieved from https://archives.drugabuse.gov/publications/media-guide

Odongo, P., & Rutagengwa, S. (2019). Generalized Anxiety Disorder in Adolescents: Which Treatments are More Effective?. *IUSB Graduate Research Journal*, *6*, 89-103.

Ollendick, T. H., Jarrett, M. A., Grills-Taquechel, A. E., Hovey, L. D., & Wolff, J. C. (2008). Comorbidity as a predictor and moderator of treatment outcome in youth with anxiety, affective, attention deficit/hyperactivity disorder, and oppositional/conduct disorders. *Clinical Psychology Review*, *28*(8), 1447-1471.

Paley, B., & Hajal, N. J. (2022). Conceptualizing emotion regulation and coregulation as family-level phenomena. *Clinical Child and Family Psychology Review*, *25*(1), 19-43.

Patrick, M. E., Peterson, S. J., Terry-McElrath, Y. M., Rogan, S. E. B., & Solberg, M. A. (2024). Trends in coping reasons for marijuana use among US adolescents from 2016 to 2022. *Addictive Behaviors*, *148*, 107845.

Paulhus, D. L., & Vazire, S. (2007). The self-report method. *Handbook of research methods in personality psychology*, 224-239.

Pennant, M. E., Loucas, C. E., Whittington, C., Creswell, C., Fonagy, P., Fuggle, P., ... & Group, E. A. (2015). Computerised therapies for anxiety and depression in children and young people: a systematic review and meta-analysis. *Behaviour research and therapy*, *67*, 1-18.

Persons, J. B. (2012). *The case formulation approach to cognitive-behavior therapy*. Guilford Press.

Podina, I. R., Mogoase, C., David, D., Szentagotai, A., & Dobrean, A. (2016). A Meta-Analysis on the Efficacy of Technology Mediated CBT for Anxious Children and Adolescents. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, *34*(1), 31.

Randall, J., Henggeler, S. W., Cunningham, P. B., Rowland, M. D., & Swenson, C. C. (2001). Adapting multisystemic therapy to treat adolescent substance abuse more effectively. *Cognitive and Behavioral Practice*, *8*(4), 359-366.

Riggs, P., Wyatt, J., Klein, C., & Macdonald, M. (2017). *Encompass: Integrated Treatment for Adolescents and Young Adults*. University of Colorado School of Medicine.

Robbins, M. S., Feaster, D. J., Horigian, V. E., Rohrbaugh, M., Shoham, V., Bachrach, K., ... & Szapocznik, J. (2011). Brief strategic family therapy versus treatment as usual: results of a multisite randomized trial for substance using adolescents. *Journal of consulting and clinical psychology*, *79*(6), 713.

Roemer, L., Orsillo, S. M., & Salters-Pedneault, K. (2008). Efficacy of an Acceptance-Based Behavior Therapy for Generalized Anxiety Disorder: Evaluation in a Randomized Controlled Trial. *Journal of Consulting and Clinical Psychology*, *76*(6), 1083-1089.

Sampl, Susan & Kadden, Ronald. (2001). Motivational Enhancement Therapy and Cognitive Behavioral Therapy for Adolescent Cannabis Users: 5 Sessions. Cannabis Youth Treatment (CYT) Series, Volume 1.

Schlosser, R. W., Lee, D. L., & Wendt, O. (2008). Application of the percentage of non-overlapping data (PND) in systematic reviews and meta-analyses: A systematic

review of reporting characteristics. *Evidence-Based Communication Assessment and Intervention*, *2*(3), 163-187.

Scruggs, T. E., & Mastropieri, M. A. (2021). How to summarize single-participant research: Ideas and applications. *The Meta-Analysis Research in Special Education*, 227–244.

Scruggs, T. E., & Mastropieri, M. A. (2013). PND at 25: Past, present, and future trends in summarizing single-subject research. Remedial and Special Education, 34, 9-19.

Senan, S., Msetfi, R. M., El Keshky, M., & Halbrook, Y. (2019). The relationship between perception of control and mood: The intervening effect of cultural values in a Saudi Arabian sample. *Plos one*, *14*(8), e0220509.

Sherman, B. J., & McRae-Clark, A. L. (2016). Treatment of cannabis use disorder: current science and future outlook. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*, *36*(5), 511-535.

Slavin-Mulford, J., & Hilsenroth, M. J. (2012). Evidence-based psychodynamic treatments for anxiety disorders: A review. *Psychodynamic psychotherapy research*, 117-137.

Songco, A., Hudson, J. L., & Fox, E. (2020). A cognitive model of pathological worry in children and adolescents: A systematic review. *Clinical Child and Family Psychology Review*, *23*(2), 229-249.

Spencer, A. E., Valentine, S. E., Sikov, J., Yule, A. M., Hsu, H., Hallett, E., Xuan, Z., Silverstein, M., & Fortuna, L. (2021). Principles of Care for Young Adults With

Co-Occurring Psychiatric and Substance Use Disorders. *Pediatrics*, *147*(Suppl 2), 229–239. https://doi.org/10.1542/peds.2020-023523F

Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*, *166*(10), 1092-1097.

Stanger, C., Budney, A. J., Kamon, J. L., & Thostensen, J. (2009). A randomized trial of contingency management for adolescent marijuana abuse and dependence. *Drug and alcohol dependence*, *105*(3), 240-247.

Stefan, S., Cristea, I. A., Szentagotai Tatar, A., & David, D. (2019). Cognitive-behavioral therapy (CBT) for generalized anxiety disorder: Contrasting various CBT approaches in a randomized clinical trial. *Journal of Clinical Psychology*, *75*(7), 1188-1202.

Stubbe D. E. (2018). The Therapeutic Alliance: The Fundamental Element of Psychotherapy. *Focus (American Psychiatric Publishing)*, *16*(4), 402–403. https://doi.org/10.1176/appi.focus.20180022

Swain, J., Hancock, K., Hainsworth, C., & Bowman, J. (2013). Acceptance and commitment therapy in the treatment of anxiety: a systematic review. *Clinical psychology review*, *33*(8), 965-978.

Szapocznik, J., Schwartz, S. J., Muir, J. A., & Brown, C. H. (2012). Brief strategic family therapy: An intervention to reduce adolescent risk behavior. *Couple and Family Psychology: Research and Practice*, *1*(2), 134.

Tarlow, K. R., & Penland, A. (2016). *Percentage of Nonoverlapping Data (PND) Calculator*. http://www.ktarlow.com/stats/pnd

Waldron, H. B., & Kaminer, Y. (2004). On the learning curve: the emerging evidence supporting cognitive–behavioral therapies for adolescent substance abuse. *Addiction*, *99*, 93-105.

Walton, M. A., Bohnert, K., Resko, S., Barry, K. L., Chermack, S. T., Zucker, R. A., ... & Blow, F. C. (2013). Computer and therapist based brief interventions among cannabis-using adolescents presenting to primary care: one year outcomes. *Drug and alcohol dependence*, *132*(3), 646-653.

Wang, Z., Whiteside, S. P., Sim, L., Farah, W., Morrow, A. S., Alsawas, M., ... & Murad, M. H. (2017). Comparative effectiveness and safety of cognitive-behavioral therapy and pharmacotherapy for childhood anxiety disorders: a systematic review and meta-analysis. *JAMA pediatrics*, *171*(11), 1049-1056.

Weinman, M. L., Buzi, R. S., & Smith, P. B. (2005). Addressing risk behaviors, service needs, and mental health issues in programs for young fathers. *Families in Society*, *86*(2), 261-266.

Wetherell, J. L., Liu, L., Patterson, T. L., Afari, N., Ayers, C. R., Thorp, S. R., ... & Petkus, A. J. (2011). Acceptance and commitment therapy for generalized anxiety disorder in older adults: A preliminary report. *Behavior therapy*, *42*(1), 127-134.

Wilmots, E., Midgley, N., Thackeray, L., Reynolds, S., & Loades, M. (2020). The therapeutic relationship in Cognitive Behaviour Therapy with depressed adolescents: A qualitative study of good-outcome cases. *Psychology and psychotherapy*, *93*(2), 276–291. https://doi.org/10.1111/papt.12232

Winters, K. C., Mader, J., Budney, A. J., Stanger, C., Knapp, A. A., & Walker, D. D. (2021). Interventions for cannabis use disorder. *Current opinion in psychology*, *38*, 67-74.

Zahra, D., & Hedge, C. (2010). The reliable change index: Why isn't it more popular in academic psychology. *Psychology Postgraduate Affairs Group Quarterly*, *76*(76), 14-19.