

Mindfulness-based mode deactivation therapy for adolescents with behavioral problems and complex comorbidity: concepts in a nutshell and cost-benefit analysis

Abstract

Mindfulness-based Mode Deactivation Therapy (MDT) was conceptualized on the principles of cognitive theory for adolescents with behavioral problems and complex comorbid disorders. The theory and methodology addresses many of the shortcomings that were experienced in treating this population with available therapy approaches. As a systematic, manualized, and contextual treatment, MDT incorporates selected elements from approaches such as Cognitive Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT), and Dialectical Behavior Therapy (DBT), together with the unique Validation-Clarification-Redirection (VCR) change technique. Numerous empirical research studies have established MDT as an effective treatment for adolescents that consistently outperform alternative interventions. A cost-benefit analysis illustrates that MDT is also a cost-effective treatment, potentially saving between four and nine dollars in consequential behavioral costs for every dollar spent on the residential treatment of an adolescent. Therefore, there is ample evidence that Mode Deactivation Therapy (MDT) is a third wave therapy with potential to become the preferred intervention for this population. The objective of this article is to present a condensed summary of this evidence, together with a brief overview of the concepts and principles that constitute the MDT theory and methodology.

Keywords: mode deactivation, schema, cognitive behavioral therapy, conduct disorder, adolescent behavioral problems, mindfulness, acceptance, defusion, adolescent suicide

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Abbreviations: MDT, mode deactivation therapy; CBT, cognitive behavioral therapy; ACT, acceptance and commitment therapy; DBT, dialectical behavior therapy; VCR, validation-clarification-redirection; PTSD, posttraumatic stress disorder; COBB, conglomerate of beliefs and behavior; VCR, validation-clarification-redirection; CCBQ-SV, compound core beliefs questionnaire-short version; CBCL, child behavior checklist; STAXI, state-trait anger expression inventory; TFAB, triggers, fears, avoids, and beliefs; FABs, functional alternative beliefs; FAP, Functional Analytic psychotherapy; MST, multisystemic therapy; CPI, consumer price index

Introduction

Although adolescent behavioral problems inarguably have serious cost and value of life consequences for the societies and nations that are affected, there is a continuing shortage of effective evidence-based interventions, qualified practitioners, and other resources, including funding, to address the issue.¹ There is a paucity of well-designed research studies available to establish the effectiveness of treating adolescents with behavioral problems, especially externalized types in the presence of multiple comorbid conditions. Of the hundreds of treatment studies and interventions that are available, very few outperform control benchmarks with statistical significance and consistency, there are great variability between studies, and even fewer conducted follow-up studies that illustrated the durability of positive treatment change effects.² Dysfunctional adolescent behavior includes potentially lethal conduct such as homicide and violent crime, suicidality, and serious risk-taking behavior, to non-lethal conduct

such as delinquency, substance abuse, sexual promiscuity, truancy, and gang involvement. Either way, the outcomes of such behaviors are costly, disruptive, harmful, and affect the lives of many more than just the adolescent, for many years into the future and potentially generations. Just to illustrate the scope of the most serious outcomes of aberrant adolescent behavior: According to FBI arrest statistics of 2012, a total of 1.82million adolescents under the age of 20-years were arrested in the U.S. Of those, 77,866 committed violent offenses, including homicide, rape, aggravated assault, and robbery. In the same age group, homicide was the second leading cause of death in the U.S. with 2,949 victims in 2011, and suicide the third leading cause of death with 2,660 victims. The ratio of completed to attempted suicides for the age group 15- to 24-year olds is estimated at between 100 and 200 to one.³ Although there remain different opinions on the definition and criteria of an attempted suicide, there is broad consensus that these statistics are highly troubling.

Adolescents with serious emotional and behavioral problems typically present with a multitude of co-existing conditions, of which depressive disorders, anxiety, Posttraumatic Stress Disorder (PTSD), multiple personality disorders (in particular antisocial, borderline, dependent, avoidant, and narcissistic features), and substance abuse are the most common. Usually such psychological and behavioral dysfunction is associated with early childhood abuse and neglect in the context of other proximal (e.g. violence, substance abuse, and psychiatric problems in the family, poor/absent parenting, antisocial peer associations, and poor school/vocational performance) and distal risk factors (e.g. impulsive, aggressive, and intense temperament, socio-economic issues, and poor and unstable living conditions).

Beck et al.,⁴ have also associated developmental psychological and behavioral problems, including personality disorders, with dysfunctional attitudes, values, and beliefs.

Due to the current scope, only a brief introduction is offered here to emphasize the trajectory that most presentations of adolescents with behavioral problems usually take. The basic concept is derived from the developmental heterotopia of trauma model by Schmid et al.,⁵ Its construction is similar to the developmental view in Figure 1, where early childhood issues are most often related to emotional, attachment, and regulation problems initiated by cumulative trauma.⁶ At school age and early adolescence these disturbances typically develop into behavioral disorders (e.g. Conduct Disorder, Oppositional Defiant Disorder), affective spectrum disorders (e.g. depression, anxiety, bipolar disorders, obsessive-compulsive disorders, eating disorders, and ADHD), stress and trauma-related disorders (e.g. PTSD), and substance abuse. Affective spectrum disorders are often viewed as a broad group of disorders that commonly occur together in individuals and seem to share common causal factors.⁷ This level of symptom complexity that is linked to childhood cumulative trauma and expressed as self-regulatory disturbances is commonly viewed as difficult-to-treat.^{5,8} The MDT process is geared towards capturing and addressing the role of trauma and avoidance in the full range of the youth’s emotional and behavioral symptoms. These internal and external expressions are actively explored and managed in MDT by identifying, validating, and accepting the core beliefs that underlie and are reinforced by continued distress.

Before birth and at a very young age, predisposing inherited factors exist, which interact with environmental conditions to influence the likelihood that a positive or negative trajectory for the child will be set in motion. With continued negative experiences the child develops internal emotional damage that adversely affects their ability to learn and grow in order to interpret and find meaning in their self and surroundings. They also typically have increasing problems in forming and sustaining healthy attachments. Into adolescence, emotional and developmental difficulties are manifested in a widening range of disturbances and behaviors, which again depend on the presence and interaction of internal and external risk and protective factors. Childhood and adolescent stages are important periods as a lack of effective interventions lead to even more serious and chronic problems into adulthood that usually also affects the person’s own partner, children, family, and community later on. Problems become increasingly difficult to resolve and require escalating levels of resources that are aimed at containing the poor outcomes rather than recovery. Although the developmental model does not propose that someone with deprivation in early life will always mature to mental health and behavioral problems, the probability increases significantly if an effective intervention at the appropriate time does not change the trajectory. Evidence is presented that Mode Deactivation Therapy (MDT) is such an effective intervention for adolescents with behavior problems and other complex, co-existing conditions that achieves sustainable, positive emotional, cognitive, and behavioral changes.

MDT in a nutshell

The theoretical conceptualization of Mode Deactivation Therapy (MDT) is essentially framed on the concepts of cognitive theory that were developed by Aaron T. Beck in the 1960s when he first linked automatic negative thinking patterns, or cognitive distortions, to depression, and argued that such an understanding can be applied in practice to counter the negative conceptions and idiosyncratic schemas that some individuals manifest in impaired functioning and dysfunctional behavior.^{9,10} He continued to refine this conceptual

cognitive model by introducing the notion of modes, which he described as a “network of cognitive, affective, motivational, and behavioral components” as “integrated sectors or suborganizations of personality”¹¹ that are designed to deal with specific demands or problems, often as instinctive responses in the subconscious realm. Since then, the common broad theory of cognitive beliefs has been further enriched to derive specific formulations for individual problems with psychological overlays.¹² Even so, Apsche¹³ recognized shortcomings in the clinical application of cognitive theory as traditional cognitive behavioral therapy methodology, in particular in the treatment of adolescents with reactive conduct disorders and personality disorders, traits, or beliefs. As a result, the broad concepts of cognitive theory were operationalized differently to suit those adolescents who are typically deemed as difficult-to-treat. As such, Mode Deactivation Therapy (MDT) was developed to treat complex adolescents in the context of the sum of their experiences that manifests in their thinking and beliefs. Next, the most salient concepts and treatment steps are briefly summarized, starting with the overarching principles of MDT.

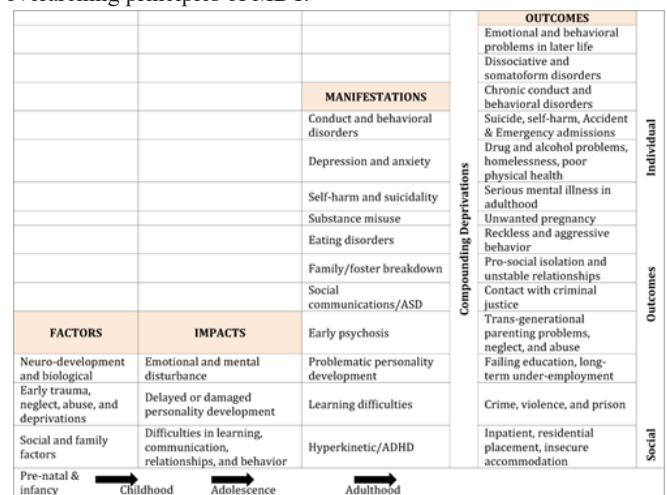


Figure 1 A developmental view of psychopathology in youth.

MDT philosophy and theory

The mode deactivation theory was developed by Dr. Jack Apsche in the early 2000s when he recognized some of the shortcomings of the prevailing cognitive behavioral approaches at the time, especially as it pertains to the treatment of adolescents with behavioral and complex comorbid conditions. In particular, the construct of MDT is based on Aaron’s Beck’s concept of modes driving psychological functioning. Beck¹¹ highlighted shortcomings of cognitive theory and suggested that a more adaptive and robust methodology is required to address the multiplicity of symptoms in the cognitive, affective, motivational, and behavioral domains. Many of psychological responses, even seemingly dysfunctional ones, are “normal” responses to real or perceived life events. Beck also believed that cognitive theory did not adequately address the relation of content, structure, and function in personality, and its apparent continuity with many psychological phenomena, as well as the relationship between conscious and unconscious processing of information that impact on behavior and cognitive/emotional processes. To overcome these issues, during the conceptualization of mode deactivation theory, several orientations and philosophies were used, some integrated from existing therapies such as Cognitive Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT), and Dialectical Behavior Therapy (DBT).

Contextual

The approach of MDT is nondirective and creates a mutual understanding that disturbances in the adolescent and family are a consequence of situational imbalances and needs that can be corrected by a sense of mutual responsibility within the family unit. Fairness in relationships are associated with a decrease in problems and symptoms, and is based on true understanding of the other's side, being responsible and accountable for one's own behaviors and to act accordingly. As such, MDT tries to do justice to the external facts, as well as the psychology of the individuals, and their patterns and integrity of interpersonal relationships, especially as they exist in the family unit.

Family system

The MDT philosophy recognizes the importance of the family environment in the development and maintenance of psychological phenomena, especially youths in their developmental stages. As MDT aims to focus beyond symptom reduction, the attainment of improved social and educational functioning is an essential goal. Various emotional, cognitive, and transactional techniques are applied to achieve this objective, while facilitating self-management after program completion. When feasible, the family is involved in MDT treatment and approached as a collective "client".

Acceptance

Whereas most cognitive behavioral approaches label and dispute problematic cognitions and beliefs, the MDT therapist creates an atmosphere of acceptance and validation with the help of techniques such as mindfulness. While the most basic goal of therapy is to produce change, the concept of acceptance in the process may be seen as an antithesis. However, MDT proposes that change is most possible and sustainable through a gradual process of acceptance. That, which is not accepted, causes distress and avoidance, a common cause of psychological disturbances. Acceptance of life and experiences as they truly are, is a necessary condition for change.

Insight

A person's thoughts, feelings, and behavior become disturbed as a result of a lack of insight into the underlying and unresolved conflicts and beliefs. Instead of solely focusing on attaining behavioral outcomes, MDT proposes that a person can only break free from undesirable patterns and habits by examining and understanding their past foundations. This psychoanalytic component of MDT is considered invaluable as a vehicle of change through a new understanding of dynamic cognitive and emotional processes and their roots.

Core beliefs and cognitive-emotional processes

The sum or range of what a person has perceived, discovered, or learnt develops over time into core beliefs, which are persistent views of the self, others, and the world. These beliefs are organized into a structure of schemas that facilitate expedient (mostly subconscious) responses to environmental triggers. Modes are patterns of emotional and cognitive states that are activated as a result, and provide the impetus for instinctive action through thoughts and feelings.

No-self

Mode deactivation theory acknowledges the traditional Buddhist concept of suffering as an inherent human condition that is related to our innate need to desire and cling to objects—including the self—as

if it were solid, permanent, and unchangeable. However, all things are interconnected and part of a process that changes all the time. All other views are illusions that are designed to construct our sense of reality from a perspective of survival. The self, as a part of this process, is not substantial and lasting. In trying to cling to that concept, we construct beliefs that are inaccurate, elusive, judgmental, biased, and based on unreasonable and unrealistic expectations—not only about ourselves, but also others, and the world in general. The approach of MDT is that, while these views may be valid and reasonable, they spawn most of our distress, and what we fear and avoid, and therefore have to be faced with realism.

The broad constructs and philosophies of the individual and family-based MDT theory are focused on promoting and motivating change through insight and acceptance in a relational family systems and interpersonal context, thereby stimulating behavior that are aligned with positive goals. These ideas were articulated and reframed in terms of specific concepts and techniques that could be utilized to achieve desirable outcomes effectively and sustainably.

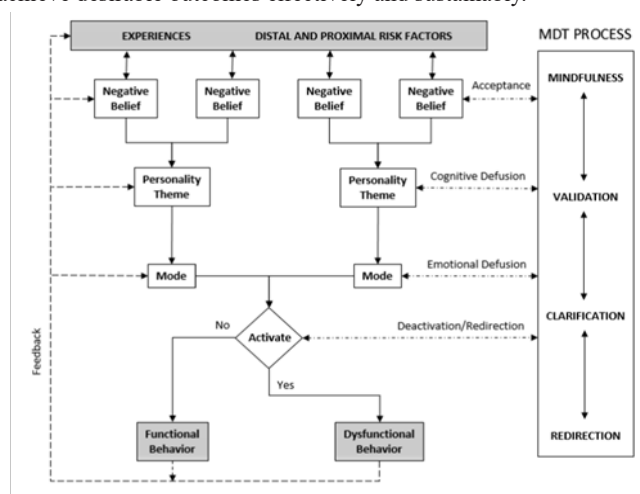


Figure 2 MDT process interaction with cognitive behavioral domains.

MDT concepts

The central concepts and techniques of MDT are all designed to facilitate the process of change and lead to the development and implementation of a systematic methodology that is in no way eclectic, but specifically targeted at problematic thinking processes that underlie dysfunctional behavior and distressing inner experiences. In Figure 2, the basic MDT process steps and how they target the dysfunctional cognitive domain are illustrated. Here, it is evident that core beliefs are rooted in cumulative life experiences, influenced by proximal and distal risk factors specific to the individual, and organized in personality-oriented themes or schemas for expedient and instinctive classification of new information and retrieval/activation of familiar response patterns, or modes.

Although the protocol is largely sequential, adequate room and discretion is left to the MDT therapist to build a personalized case conceptualization and treatment plan for the client. Techniques are employed throughout the process to enable adaptation in order to optimize effectiveness—all within a structured protocol.

Mindfulness

The concept of mindfulness is best described as the "intentional, accepting and non-judgmental focus of one's attention on the

emotions, thoughts and sensations occurring in the present moment”¹⁴ which epitomizes the philosophy of Buddhist thought as “the first step toward emerging from suffering is to accept the reality of it, not as a philosophical concept or an article of faith, but as a fact of existence”¹⁵. To be mindful involves being fully present and aware in the moment without judgment of oneself, one’s experiences and connectedness with others and the environment. As an MDT technique, mindfulness is complementary to the processes of acceptance, insight, and defusion. In MDT, mindfulness exercises were selected and adapted for adolescents, involve guided meditation, breathing, and imagery, and are practiced together with the adolescent and family. Feedback is solicited to test and monitor the experience.

Validation

As a way to communicate and experience acceptance, validation does not imply agreement or approval. It is a valuable technique to demonstrate support for the client, thereby strengthening the therapist-client relationship and trust. The six levels of validation as formulated by Linehan¹⁶ are applied throughout the MDT process: Being present for yourself and others, accurate reflection, attunement to thoughts and feelings, understanding behavior in the context of past experiences and biology, recognizing and normalizing emotional reactions, and radical genuineness, i.e. recognizing the person “as he or she is, seeing and responding to the strengths and capacities of the individual while keeping a firm emphatic understanding of the client’s actual difficulties and incapacities.” (p. 377). Validation is empowerment of the client, and creates the impetus for engagement and commitment in a change process.

Cognitive defusion

Defusion is defined as a reversal of the fusion between instincts and behavior that are integral to humankind. The process of cognitive defusion allows the thoughts that imprisoned the adolescent and his family to occur without resistance, but with an awareness and insight that is required to loosen its hold on self-identity and experiential avoidance. Thoughts are simply observed, labeled, and experienced as they come and go, without judgment or attachment.

Emotional defusion

By identifying and describing the exact area in the body and feeling of pain, numbness, or nothingness that an emotion is associated with, emotions lose their intense meaning and power. As a result, negative thoughts and feelings dissipate, while not actively avoided. It is a form of experiential acceptance that is correlated with psychological wellbeing.

Cognitive redirection

In MDT, problematic beliefs are identified and validated, but gently shifted away from a dichotomous thinking process to the acceptance that alternative beliefs are possible. Awareness is created of instinctive mental fixations, thereby shifting focus to more positive, realistic alternatives, or into a state of mindful awareness.

The core MDT techniques of mindfulness, validation, emotional and cognitive defusion, and cognitive redirection are incorporated into the methodology, practiced with the adolescent individually, or with his family, and taught to enable self-management away from the therapy environment. Although no strict rules or formulae are instructed, in general the techniques are applied in a natural sequence that best benefit the client, usually: awareness → acceptance → clarification → redirection → reinforcement.

MDT concepts

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MDT methodology

As is evident from the Gantt chart in Figure 3 that illustrates the typical course of an MDT program, stages are generally sequentially completed, with mindfulness exercises that are conducted in parallel from relatively early on until treatment completion. The MDT individual and family assessments, including the client typology survey—essentially a series of clinical and case interviews—are conducted first, followed by the individual or family case conceptualization.

After identifying all the focus areas in the case conceptualization, mindfulness training is introduced with attention and concentration on sensitive and development aspects. With completion of the Conglomerate of Beliefs and Behavior (COBB), the active treatment phase that is unique to MDT begins. After the Validation-Clarification-Redirection (VCR) process step, final reinforcement and wrap-up is done with the client.

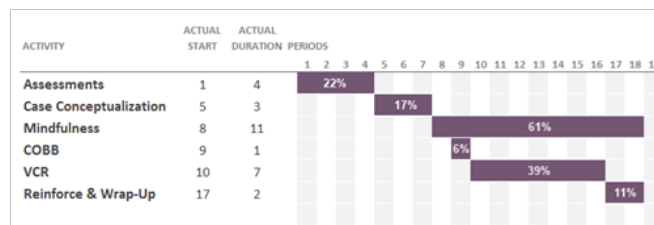


Figure 3 Mode deactivation therapy schedule.

MDT Assessments

The main MDT assessments that are conducted to obtain data for application in the case conceptualization are the client typology survey, Fear Assessment, and Compound Core Beliefs Questionnaire-Short Version (CCBQ-SV). The family typology survey entails clinical and case interviews with the adolescent and participating family members individually and collectively. Background, history, and behavioral and emotional data is collected to inform the process further. The Fear Assessment is a 60-item 4-point Likert scale questionnaire that identifies highly endorsed items with critical fears and avoidance situations. The CCBQ-SV is a 96-item 4-point Likert scale questionnaire that identifies important negative core beliefs. The Fear Assessment and CCBQ are computer-scored and analyzed to identify individual beliefs, but also shared, conflicting, and dyadic beliefs patterns in the family system. Sometimes, especially for research purposes where comparisons and psychometric validation is important, supplementary instruments such as the Child Behavior Checklist (CBCL) and State-Trait Anger Expression Inventory (STAXI) are also used.

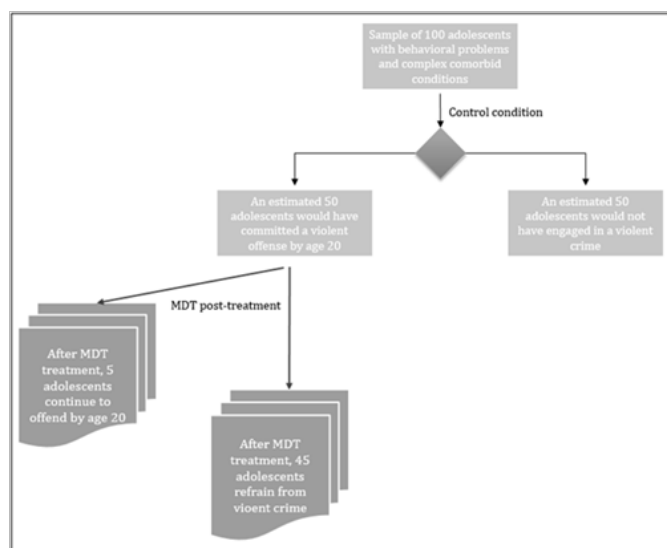


Figure 4 Assumed behavioral effect of MDT treatment.

Case conceptualization

In the case conceptualization process the endorsed beliefs, fears, and substantiating information are first-order validated and clarified, linked with behaviors, avoids, triggers, physiological responses, and intra-family sequelae to form a blueprint for the treatment plan.

Mindfulness training

Mindfulness exercises that were selected and adapted for adolescent and family use are incorporated in the MDT process—conducted in parallel with the main treatment activities. The MDT therapist participates with the family and guides them with meditation, breathing, and imagery to facilitate a state of mindful awareness, openness, and non-judgment.

Conglomerate of Beliefs and Behaviors (COBB)

The COBB, in the form of a waterfall or process flow diagram, is constructed by linking the adolescent and family members’ beliefs and behaviors in a sequential, cause-and-effect, neural network format—or combination thereof. The family COBB becomes the working plan of action to enable everyone to make a concerted effort to prevent or redirect undesirable behavior. Together with the Triggers, Fears, Avoids, and Beliefs (TFAB) worksheet, the COBB is a product of case conceptualization for application and refinement in the active treatment phase.

Validation-Clarification-Redirection (VCR)

VCR is the core active treatment phase that is unique to the MDT methodology. The adolescent and family beliefs as identified in the assessments and associated with triggers, fears, avoids, and behavior in the case conceptualization, are first validated to create an atmosphere of awareness, trust, and acceptance with the family. All aspects thereof are validated as reasonable and logical within the adolescent and family’s realm of circumstances and experiences by searching for the “grain of truth” in their beliefs and behaviors. Then, functional alternative beliefs (FABs) are developed and implemented with the commitment that was cultivated in the process with the adolescent and/or family.

Reinforce and self-management

Many interventions fail because of eventual relapse. Before completion, the VCR process is reinforced with the adolescent and family and ensured that they now possess the skills necessary to apply the techniques themselves. Mindfulness and VCR becomes a way of life that is possible to sustain over time.

The MDT process is designed to cultivate commitment and motivation to change. The tools and techniques are taught to self-management in times of distress and maintain improvements made in treatment. Although there are similarities with other approaches, we argue that individual and family-based Mode Deactivation Therapy (MDT) is sufficiently distinct in theory and procedure with strong supporting evidence to warrant recognition as an evidence-based, empirically supported psychotherapy program and practice.

MDT distinctiveness

Individual and family-based Mode Deactivation Therapy (MDT) borrowed concepts and elements from other cognitive behavioral therapies such as “classical” Cognitive Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT), Dialectical Behavior Therapy (DBT), Functional Analytic Psychotherapy (FAP), and, to a lesser extent, Multisystemic Therapy (MST). These elements were overlaid on the theoretical framework of mode deactivation that was inspired by the apparent lack of effective interventions for adolescents with serious behavioral problems and complex co-existing conditions.

Mode Deactivation Therapy (MDT) is thought of as part of the so-called third wave and other derivative therapies of cognitive behavioral principles, which can be considered as a family of interventions that are based on the notion that “modifying maladaptive behaviors can lead to a decrease in emotional distress and problematic behaviors”.¹⁷ However, there are at least ten important differences between MDT and other approaches to consider that make MDT very distinct and embody its achievements and effectiveness in a relatively short span of time.¹⁸

Theoretical roots

Mode Deactivation Therapy has its roots in the cognitive theory of Beck and Ellis by acknowledging the importance of beliefs on instinctive cognitive and emotional processes to provide impetus for behavior. However, MDT also recognizes the value of exploring and understanding the roots of psychological disturbances in order to resolve them in a sustainable way. MDT teaches clients to develop and utilize their conscious control system to deactivate modes by reinterpreting events in a manner inconsistent with the mode. The conceptual focus is on the processing of the mode instead of its contents.

Resistance to treatment, dropout, and attrition

An important reason why MDT was developed, is the apparent failure of other approaches, including cognitive-behavioral therapies, with complex psychopathology, in particular adolescents with behavior problems and multiple comorbid conditions. The premise is that other methods were not effective in addressing resistance to treatment, thereby resulting in unacceptably high dropout and attrition rates. Reported rates vary greatly, and are mostly not controlled for researchers with an interest in the outcome. Attrition for traditional CBT seems to be in a range varying between 11% and 19%.¹⁹⁻²¹ Admittedly, most MDT adolescent clients, as reflected in the available research studies, were mandated by court or other referring agencies

to receive treatment and did not have the option to terminate treatment prematurely. Nevertheless, of those who could drop out, less than 5% chose to do so. This is remarkable as most adolescents were ordered to undergo the MDT program, and a sizeable proportion was ejected from other treatments and facilities, usually for aggressive and non-compliant behavior. The non-confrontational and non-judgmental nature of the MDT approach is argued to optimize collaboration and compliance, which is supported by measuring and managing the adolescent and family commitment to treatment with the use of a daily record, and encouraging regular engagement and feedback.

Durability and relapse

Somewhat similar to drop-out and attrition, there is a general lack of follow-up studies—especially for children and adolescents—to establish the durability of treatment effects and relapse rates, but it seems to be between 35% and 75% for cognitive-behavioral therapies one year after treating adult depression,²² adolescent depression,²³ adolescent bipolar symptoms,²⁴ and adolescent substance abuse.²⁵ In comparison, during 18 months after MDT treatment, incidents of physical and sexual aggression reduced by more than 90%.^{26,27} Although it is perhaps not a comparison of high equivalency, evidence is provided of sustainable behavioral improvements with MDT. This is more remarkable when considering that relapse becomes much more probable when high comorbidity and behavioral disorders are present.

Evidence base

Although the evidence base of the effectiveness of MDT is growing rapidly, it is still relatively small compared to other “mainstream” psychotherapy approaches that have already achieved listings by major clearinghouses. The establishment and recognition of MDT will certainly benefit and be hastened by independent, and larger, multi-center research studies, and proliferation of practice. However, we argue that the existing evidence base is strong and firmly establishes MDT as an effective and superior treatment of adolescents with behavioral problems and complex comorbidity.²⁸

Past orientation

In contrast with most other cognitive-behavioral approaches, family-based MDT does not solely focus on changing present behavior, but also endeavors to understand the past roots of problems and how and why they manifest in the present time. It is believed that a psychoanalytic component increases the effectiveness and durability of the MDT change mechanisms.

Disputation and acceptance

Typical CBT and schema-based therapies view problems as products of distorted cognitions that are labeled and disputed, MDT (as does a few other “third wave” therapies such as ACT and DBT) employs “radical acceptance” of the client’s problems and views. The client’s beliefs are actively validated by communication that they are reasonable and logical given the client’s own experiences and context. The “grain of truth” in each is discovered and explored together with the objective to find an alternative and more functional truth to develop and implement. A balance between acceptance and motivation to change is always navigated.

Mindfulness

Many newer therapies have started to employ mindfulness practices in the past ten years, but few are adapted for use with adolescents and their families. Concepts, narratives, and metaphors are used that the adolescent can understand and relate to. The therapist is mindful

of the adolescent’s age and level of maturity, the family’s situation and context, their culture and values, and particular sensitivities. Mindfulness activities are guided, brief and basic, and post-activity feedback is encouraged to monitor progress and problems.

Procedural

MDT is a manualized, systematic protocol, which duration and number of sessions are not fixed, but generally last for 8 to 11 months, depending on the progress of the client. Although a set pace is not followed, the application of techniques and sequence of steps are prescribed. Therefore, within a fairly rigid framework, engagement is flexible and personalized.

Behavioral strategies

Different from many other cognitive-behavioral therapies, the MDT primary (overt) objective is not to achieve specific behavioral outcomes. Rather, behavioral problems are acknowledged as a secondary manifestation of cognitive and emotional disturbances. By learning to manage and regulate these, behavioral improvements naturally follow. Positive and purposeful behavioral functioning depends on psychological wellbeing and stability, which is sustained by productive cognitive processes.

Techniques

MDT employs a unique set of techniques during the course of treatment, which the client learns and practices to enable self-management after treatment completion. The purpose of techniques such as mindfulness, cognitive and emotional defusion, validation, and cognitive redirection is to (1) facilitate an environment of openness, trust, and empathy, (2) cultivate an awareness that the self is changeable and connected to the world, (3) demonstrate that beliefs do not have to be dichotomous, (4) gain insight into the origins and nature of thoughts and feelings, and (5) create an understanding of the value of thoughtfulness and connectedness. Hereby, feelings and behavior associated with fear and avoidance are prevented or managed, as evidenced by the positive outcomes of MDT in terms of reduced emotional distress and dysfunctional behavior.

Based on these distinctions it is argued that individual family-based MDT is a valuable standalone psychotherapy that has proved effective in the treatment of adolescents with behavior problems and co-existing conditions, but also has promise in a wider range of applications—such as adult interventions and enhancement of performance and psychological wellbeing—that have cognitive and behavioral undertones.

Cost-benefit analysis

As all resources, both personal, private, and public, are increasingly strained, it is important—beyond clinical soundness—to develop strategies, policies, and interventions that take cognizance of this fact. In order for any personal intervention, including psychotherapy, to attract interest nowadays, it has to be cost-effective, i.e. robust, sustainable, consistent, applied at the right time, have the potential to produce greater good (e.g. returns, savings) than harm (e.g. cost, investment), and (of course) be ethical. We believe, and will demonstrate, that all of these elements are present in the application of MDT practice, especially as it applies to a vulnerable and critical population that can generate broad negative consequences if left without care. Adolescents with serious behavior problems and complex comorbidity are a population that has been failed by other approaches, only to affect later generations, communities, and nations as a whole. In the current section, the estimated cost of adolescent

behavior problems is calculated and discussed under U.S. conditions, the effectiveness of MDT based on available empirical evidence is summarized, and weighed against the costs to implement and execute an MDT treatment program to determine the cost-effectiveness of the intervention.

Cost of Adolescent Behavior problems

According to the U.S. National Vital Statistics System for Mortality, homicide and suicide are the second and third highest leading causes for adolescent deaths between ages 12 and 19 (after motor vehicle traffic accidents). These two types of behavior are strongly associated with a negative developmental pathway that requires proper intervention, but are also associated with co-existing problems and dysfunctional and risky behaviors. Miller²⁹ estimated the cost per adolescent that applied in 1998 for different types of aberrant behaviors (Table 1). These costs were converted to current monetary value by applying long-term inflation. According to the Bureau of Labor Statistics, the cumulative rate of inflation between 1998 and 2014 is 46.0%—measured as the Consumer Price Index (CPI).

Source: Miller²⁹

Miller²⁹ continued on to relate adolescent behavior problems to an estimated total annual cost (Table 2). Again, taking into account the change of the value of a dollar between 1998 and 2014, and assuming that the number of youth with behavioral problems is on the same level as in 1998, the annual costs are converted to 2014 values in Table 2. However, it can be noted that, when taking population growth as reported by the U.S. Census Bureau into account, youth crime (in terms of arrests) in fact demonstrated a net decrease of 22.6% for violent crimes between 1998 and 2014. According to FBI statistics, total arrests decreased from 2.36million to 1.47million from 1998 to 2011—a gross decrease of 37.7%. Over the last 16years, the U.S. Census Bureau estimated a population increase among 12- to 17-year-olds of almost 5%. Therefore in net real terms, the violent crime and total arrest rates for adolescents in the U.S. have decreased by 18% and 33% respectively in this time. Similar trends are reported for other countries, such as the England and Wales,³⁰ and Australia (Australian Institute of Criminology, <http://www.aic.gov.au/statistics/homicide/offenders.html>). However, other (non-individual) facts strongly influence these statistics, including politics, policy, and criminal justice responses, interpretations, and applications. When considering all dysfunctional and problematic behaviors among youths and the factors that contribute to it, the picture is even less encouraging. Many forms of risky and potentially harmful behaviors remain at alarming levels and some continue to increase steadily, such as youth suicide and drug abuse. The consequential human and financial costs are an additional burden on already strained systems that can be prevented in part or reduced by proper and effective interventions. Based on his assumptions and calculations, Miller²⁹ estimated the total cost of youth problem behaviors in 1998 at \$437 billion, which equates to \$638 billion in today's money value.

Source: Miller²⁹

The estimated total annual cost of youth problem behavior in 2014 monetary value represents almost 4% of the total U.S. gross domestic product (GDP), or just more than half of the total budgeted health care spending for 2014. These comparisons illustrate the size and severity of the tangible impact that problematic behavior among youth has on national systems, but still does not account for the direct (intangible) negative effects on the youth's micro- and meso-systems, as well as trans-generational transmission of problems. This further underscores the importance and value of an effective intervention for youth behavioral and emotional problems.

MDT Effectiveness

In this section, an attempt will be made to relate the reported performance of MDT to actual adolescent behavioral changes after treatment, which can be used to derive estimates of measurable benefits and reduced harm. Empirical studies of family-based and individual Mode Deactivation Therapy (MDT) have consistently demonstrated improvements above 30% using Child Behavior Checklist (CBCL), State-Trait Anger Expression Inventory (STAXI-2), and Devereux Scales of Mental Disorders (DSMD) outcomes.²⁸ In an experimental group of suicidal and parasuicidal youths, the average Beck Depression Inventory (BDI-II) scores decreased by more than 75% post-treatment.³¹ In all instances, effect sizes were large. Of course, these measurements are only self-reported indications of thoughts and experiences of anger and depression, which do not readily translate to reduced harm, risk, and recidivism.

Table 1 Number of problem youth ages 12-20 and cost by risk in the U.S

Risk Category	Number of Youth	Cost/Youth (\$) 1998	Cost/Youth (\$) 2014
Violent Criminal	300,000	1,097,600	1,601,957
Binge Drinker	4,817,000	68,800	100,414
Cocaine/Heroin Abuser	674,000	893,800	1,304,509
High-risk Sex Partner	6,337,000	34,000	49,623
Female	2,505,000	60,100	87,717
Male	3,532,000	13,300	19,411
Smoker	6,286,000	412,900	602,631
High School Dropout	519,000	272,900	398,300
Suicide Attempter	99,000	173,000	252,495
Youth With All Problems	Unknown	2,507,100	3,659,135

Table 2 The cost of adolescent behavior problems in the U.S

Problem Behavior	U.S. National (\$ billion) 1998	U.S. National (\$ billion) 2014
Antisocial Behavior	166	242
Substance Use	65	95
High-Risk Sexual Behavior	48	70
High School Dropout	142	207
Suicide Attempts	16	23
Total Cost	437	638

Table 3 Costs to provide MDT residential care

Cost Component	Annual Cost (\$1000)	Cost/Patient (\$)
Clinical supervision and training	25	333
Staff and patient MDT materials	15	200
Clinicians	110	1,467
Support personnel	461	6,147
Direct operating (consumables, etc.)	11,850	158,000
Fixed (rent, utilities, etc.)	1,400	18,667
Total Costs	13,861	184,813

The MDT research studies also utilized behavioral monitoring, which, although it is a more subjective method with less formalized inter-rater reliability, produces results that are nevertheless qualitatively useful to track potentially harmful behavioral incidents. In terms of aggression, elimination of both physical and sexual post-treatment incidents were above 90%,³²⁻³⁴ with follow-up results at up to 18months even better. Similarly, in the suicidal and parasuicidal group, self-harm incidents were reduced by more than 95% after treatment.³¹ Thus, assuming that all participants engaged in aggressive or suicidal/parasuicidal behavior prior to intake—in line with participant screening criteria—at least 90% did not engage in similar harmful behavior after treatment, and sustained the improvement over

time. If we assume conservatively that half of the participants with the typical MDT intake profile would have engaged in a violent offense by age 20 (e.g. 50 out of 100), then MDT treatment would prevent 90% of these adolescents from committing a violent offense after treatment (e.g. 45 out of 50). Such positive outcomes are also associated with improvements in other negative and potentially harmful behaviors such as substance abuse, high risk sexual activities, high school dropout, and suicidal/parasuicidal behavior.

Cost-Benefit of MDT

Based on evidence of the effectiveness of MDT, and the conservative assumptions previously made, MDT treatment would therefore prevent 45 out of 100 clients from engaging in violent behaviors after treatment, while also achieving secondary gains. Five clients would continue to engage in violent and aggressive acts post-treatment, while we conservatively assume that 50 clients would not have engaged in a violent crime—whether they underwent the MDT program or not—although they would have certainly benefitted in terms of lower risk, less distress, more positive and conforming behaviors, and so forth. However, the cost “savings” in terms of their improvements are considered indeterminate.

An adapted version of a CONSORT diagram type is used in Figure 4 to illustrate the estimated effects of MDT versus a control condition or no treatment on later violent offending. In this assumed scenario, 45 adolescents out of a 100 that fit the typical profile of youth with serious behavioral problems, would not have offended (or re-offended) as a direct result of receiving MDT treatment. This is used as the basis of the calculation of cost saving attributed to MDT in preventing costs related to a violent offense committed by an adolescent.

Per 100 clients who undergo the complete MDT program in a residential setting, the total cost is calculated as follows, based on an operating MDT facility in Virginia, U.S. that accommodates 50 patients at a time on a program lasting eight months average.

Therefore, the total cost of one patient to complete an 8-month MDT program is calculated at \$184,813. Now, as before, we assume that out of 100 patients treated, 45 is prevented from committing a violent act afterwards as a direct result of the MDT treatment, which is based in part on the proven effectiveness on MDT. Based on estimates by Miller,²⁹ the costs associated with one violent youth are \$1.6million (Table 1). Depending on other co-existing problematic behaviors, the total cost per youth could increase to over \$3.6million.

Based on the figures in Table 3, for 100 individual adolescents to complete an MDT program in-house, total treatment costs would amount to \$18.5million. By preventing 45 from engaging in violence as a direct outcome of the MDT intervention, \$72.0million in direct and indirect spending and costs as a result of the violent behavior would be saved. If the secondary benefit of improved behavior beyond violence is taken into account, these savings could increase to more than \$162.0million. And even then, we have not considered behavioral improvements that those 55 who would in any case not have engaged in a violent offense in all likelihood achieved, as well as other secondary benefits that the family unit and members, including parents, caregivers, and siblings received, such as improved family functioning, behavior, social and other skills, quality of relationships, and general wellbeing. It should be clear that, conservatively speaking, for each dollar that is “invested” in a patient on an MDT program, at least between 3.9 and 8.8 dollars are saved on continued mental health costs, victim and medical services, criminal justice costs, productivity loss, and so forth. This is an incredible saving to achieve, which also spans far beyond monetary value. Not only is the harm prevented

and present wellbeing improved, but future generations will also benefit from improved mental health and behavior in families and communities.

Conclusion and recommendations

In this article it was our objective to present a relatively brief overview of Mode Deactivation Therapy (MDT), a third wave cognitive behavioral therapy that was developed to overcome the inefficiencies and resistance that were encountered with available therapies in treating adolescents with serious behavioral problems and complex comorbid conditions. Since its conceptualization, for the past 15years, the methodology has been tested and refined exhaustively in numerous empirical research studies and real-life practice. A recent meta-analysis concluded the following:

On average for the 12 studies with 699 combined participants, MDT patients improved by 32.8% compared to TAU patients who improved only by 3.6% as measured by CBCL and STAXI-2 scores... Effect sizes were very high for MDT groups, which is another indicator of the significance of the positive change effect. Cohen's *d* effect sizes were consistently above 1.1, a large effect size—and superior performance—by Cohen's standards. It is even more meaningful to note that improvements between pre- and post-treatment conditions, as well as compared to the TAU controls, were consistently significant for all studies that were included in the review.²⁸

In addition to being an effective and superior treatment of adolescents with behavioral problems, MDT also proved to be a cost-effective and financially viable intervention. To complete an MDT residential program with one adolescent is estimated to cost around \$185,000, while the estimated costs involved per adolescent with violent and other behavioral problems amount to between \$1.6million and \$3.7million. By applying a likely scenario that MDT would prevent 45 out of a 100 adolescents who would have otherwise engaged in violent criminal behavior, from doing so, for every dollar spent on treating adolescents with MDT, between four and nine dollars are saved in consequential costs related to violent and other problem behaviors. It is also argued that MDT is proving particularly effective with this population that is otherwise deemed difficult-to-treat, as the approach does not directly dispute or target problematic behavior, but addresses the underlying belief processes, thereby managing not only externalized, but internalized disorders as well. Apsche et al.,³⁵ explained: This finding supports the notion that Mode Deactivation Therapy as a superior form of cognitive behavioral therapy addresses not just the acting out behavior, but internal states as well. MDT had a large effect size in all areas of the CBCL and STAXI. As symptoms of externalizing disorders are addressed, internalizing disorders can be addressed. The results of this data—from the pre- and post-treatment CBCL and STAXI assessments—confirm the hypothesis that MDT reduces internalizing disorders. It further supports the idea that these internalizing disorders are the behavioral function of the reduced externalizing disorders. Thus, as symptoms of externalizing disorders decrease, internalizing disorders may appear as co-morbid behavioral issues (p. 180).

Therefore, the validating and accepting nature of the MDT concept and practice decreases resistance of even the most difficult clients, improves the strength of the therapeutic alliance, while the mindfulness and VCR processes is a reality-based approach to cultivate awareness and insight, and improve the ability, will, and commitment to change. As a superior and cost-effective intervention to treat adolescents with behavioral problems and other complex problems, the practice of MDT is expected (and deserve) to continue to proliferate and take its place among more mainstream and established therapies.

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Conflicts of interest

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