

Multidimensional Family Therapy (MDFT) for young people in treatment for non-opioid drug use.

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1 Background

1.1 DESCRIPTION OF THE CONDITION

Youth drug use¹ that persists beyond curious experimentation is a severe problem worldwide (UNODC, 2010). Drug use such as cannabis, amphetamine and cocaine, referred to in this review as non-opioids, amongst other drugs are strongly associated with a range of health and social problems, including delinquency, poor scholastic attainment, fatal automobile accidents, suicide and other individual and public calamities (Deas & Thomas, 2001; Essau, 2006; Rowe & Liddle, 2006; ONDCP, 2000; Shelton, Taylor, Bonner & van den Bree, 2009). More than 20 million of the 12 to 25 year-olds in the US, and more than 11 million of the 12 to 34 year-olds in Europe have used drugs during the month prior to survey interviews in 2009 (Substance Abuse and Mental Health Services Administration (SAMSHA), 2010; European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), 2010). Seven percent of Australian 12-17 year olds have used some kind of drug during the month prior to survey interviews in 2008 (White & Smith, 2009). In Canada 26 percent of 15-24 year olds had used drugs during the past year (Health Canada, 2010).

Not all young drug users progress to severe dependence, however, some may be at risk and therefore require treatment (see e.g. Liddle et al., 2004; Labouive & White, 2002) For example, 8.4 percent of 18 to 25 year-olds in the US are classified as needing treatment for drug use, but less than one tenth of these young people actually receive treatment (NSDUH, 2007). Likewise among young people aged 12 to 17, 4.5 percent were estimated to be in need of treatment for a drug use problem, but only one tenth in this group actually received any (SAMSHA, 2010). There is growing public concern regarding the effectiveness and high costs of available treatments for young people, and with high rates of treatment dropout and post-treatment

¹ The terms use, abuse and dependence will be used interchangeably throughout the protocol and refer to an addiction stage of non-medical drug usage.

relapse to drug use (Austin, Macgowan & Wagner, 2005; Najavits & Weiss, 1994; Stanton & Shadish, 1997). Accordingly treatment to help young drug users should be as engaging as possible, in order to avoid dropouts and relapse (Simmons et al., 2008; National Institute on Drug Abuse, 2009).

Researchers point to the fact that many research projects have empirically validated different kinds of treatment approaches for young drug users (e.g. Rowe & Liddle, 2006; Waldron, Turner & Ozechowski, 2006; Williams, Chang & Addiction Centre Adolescent Research Group, 2000; Austin et al., 2005). The current dilemma in the field of youth substance use treatment is that it is not clear what works best and for whom and the research suggests that a number of interventions led to reduced drug use (Waldron & Turner, 2008). Treatments identified as promising are individually based cognitive and motivational therapies including Cognitive Behavioral Therapy, Multisystemic Therapy, and Family therapies (Waldron & Turner, 2008; Kaminer, 2008; Deas & Thomas, 2001; Galanter & Kleber, 2008). Family therapy covers a range of different interventions, based on different manuals and varying theoretical sources, i.e., behavioral and cognitive behavioral theory, structural and strategic family theory, and family systems theory (Williams et al., 2000; Austin et al., 2005). Promising family based interventions for the treatment of young drug users include Multidimensional Family Therapy, Brief Strategic Family Therapy and Family Behavior Therapy (Waldron & Turner, 2008; Austin et al., 2005; Rowe & Liddle, 2006; Waldron et al., 2006; Williams et al., 2000). Some reviews suggest that these family based therapies are superior in reducing youth drug use (Williams et al., 2000; Lipsey et al., 2010; Waldron, 1997).

Young people with persistent drug use have unique needs due to their particular cognitive and psychosocial developmental stage. Young people are also specifically sensitive to social influences, and family and peer groups are highly influential. Youth drug treatments facilitating positive parental and peer involvement that integrate other systems in which the young person participates (such as schools, social services, justice authorities) are important keys to reducing youth drug use (National Institute on Drug Abuse, 2009). A number of studies and reviews show positive results for family therapies in general, but there is a need to synthesize individual study results for specific family therapies to determine whether and to what extent specific family therapy interventions work for young drug users. (Williams et al., 2000; Austin et al., 2005; Waldron & Turner, 2008; Kaminer, 2008; Deas & Thomas, 2001)

This review will specifically explore the family-based intervention Multidimensional Family Therapy (MDFT) (Liddle, 2002; Liddle et al., 2001; Liddle, Rowe, Dakof, Henderson & Greenbaum, 2009) as aggregated evidence for MDFT's effects is needed. The review seeks to clarify the effects of the MDFT program for relevant groups of young people age 11-21 living with their family. The review focus is on young people enrolled in treatment for drug use, independent of how their problem is labeled. Enrolment in treatment indicates that the severity of the young person's drug use has caused a significant adult close to the young person (teacher, parent, social services worker, school counselor, etc.), or the young person themselves to seek treatment. The intervention in focus is MDFT delivered as outpatient treatment² and the review will focus primarily on non-opioid drugs use³, but will consider poly-drug use if relevant. This review will be one in a series of reviews on different manual-based family therapy interventions for young people in treatment for drug use⁴.

1.2 DESCRIPTION OF THE INTERVENTION

Multidimensional Family Therapy (MDFT) has evolved over the last twenty years and is a manual-based, family-oriented treatment, designed to eliminate drug use and associated problems in young people (Liddle, 1999; Liddle, 2002; Liddle et al., 2009).

MDFT is one of many Family Therapy forms that meet the general characteristics of manual-based Family Therapies as it deals with young people *and* their families *as a system* throughout treatment, and thereby recognizes the important role of the family system in the development and treatment of young people's drug use problems (Liddle et al., 2001; Muck et al., 2001).

MDFT is designed to take multiple risk and protective factors into account and it acknowledges that young people's drug use is linked to multiple dimensions: home life, friends, school and community (Liddle et al., 2004). As such it advocates that a multi-dimensional approach is

² A Cochrane review has evaluated psychosocial interventions for substance abuse and misuse in young offenders in locked facilities (Townsend et al., 2009).

³ A Cochrane review has evaluated psychosocial treatments for treatment of opioid dependence (Amato et al., 2009).

⁴ Please see the following Title Registrations in the Campbell Library for further information:

Lindstrøm, Skovbo Rasmussen, Kowalski, Filges, Klint Jørgensen (2011). Family Behavior Therapy (FBT) for young people in treatment for illicit non-opioid drug use

Kowalski, Lindstrøm, Skovbo Rasmussen, Filges, Klint Jørgensen (2011). Functional Family Therapy (FFT) for young people in treatment for illicit non-opioid drug use

Lindstrøm, Skovbo Rasmussen, Kowalski, Filges, Klint Jørgensen(2011). Brief Strategic Family Therapy (BSFT) for young people in treatment for illicit non-opioid drug use

needed to resolve the young person's problematic drug use, and therefore aims to modify multiple domains of functioning by intervening with the young person, family members, and other members of the young person's support network (Austin et al., 2005). This also means that MDFT is based on multiple therapeutic alliances, with the young drug-using person, parents and other family members and eventually school and juvenile justice officials. While some young people have only a single parent and few significant others relevant to therapy, others might have even two sets of parents and many significant others relevant to therapy, which is a challenge the therapist must deal with.

Treatment focuses on individual characteristics of the young person, the parents, and other key individuals in the young persons' life, as well as on the relational patterns contributing to the drug use and other problem behaviors. A variety of therapeutic techniques are used to accomplish this, and to improve the young person and the family's behaviors, attitudes, and functioning across the variety of domains (Liddle, 1999). MDFT aims to reorient the young person and family toward a more functional developmental trajectory on the basis of some key principles, including: 1) Individual biological, social, cognitive, personality, interpersonal, familial, developmental, and social ecological aspects can all contribute to the development, continuation, worsening and chronicity of drug problems. 2) The relationship with parent(s), siblings and other family members are a fundamental area of assessment and change. 3) Change is multifaceted, multi-determined and stage-oriented. 4) Motivation is not assumed, but is malleable and motivating the young person and family members about treatment participation and change is a fundamental therapeutic task. 5) Multiple therapeutic alliances are required to create a foundation for change. 6) Therapist responsibility and attitude is fundamental to success (Liddle, 2010).

Besides addressing drug problems, MDFT may lead to reductions in delinquent behavior and affiliation with delinquent peers (Rowe, 2010; Liddle et al, 2008a; Hogue et al, 2002; Liddle et al, 2002). MDFT may also improve school behaviors and grades (Liddle et al, 2009), and youths receiving MDFT may engage in fewer unprotected sex acts (Rowe, 2010; Liddle et al, 2008a; Marvel et al, 2009; Liddle et al, 2001; Liddle et al, 2009)). Finally, MDFT has also shown reduction in internalized distress, including depression and anxiety symptoms (Rowe, 2010; Liddle et al, 2004; Liddle et al, 2009; Liddle et al, 2008a).

1.2.1 Theoretical background

MDFT combines aspects of several theoretical frameworks, including family systems theory and developmental psychology (Bronfenbrenner, 1979; Minuchin, 1985; Stroufe & Rutter, 1984), ecosystems theory and the risk and protective model of adolescent substance abuse (Hogue & Liddle, 1999; Liddle & Hogue, 2000; Austin et al., 2005). The influence of ecological and developmental theory is reflected in MDFT as the intervention takes into account the changing environments and multidimensional systems in which young drug users reside (Liddle, 2002; Liddle et al., 2001). MDFT is based on the idea of subsystems, structures and hierarchies within the family that influence family members' actions.

MDFT along with other family-systems based therapies build on the assumption that families can be viewed as systems and as such each individual in the family is important for the family system as a whole (Poulsen, 2006). In family systems theory the family is perceived as a unique system consisting of interdependent and interrelated members. The family members are influenced by each other's actions and are strongly related to each other, and as such they can be viewed as a unique and changeable system. The behavior of each family member must be understood in relation to the family context. Young family member's problematic behavior is associated with maladaptive social interaction patterns in the family, and therefore interventions must be implemented at the family level. The family itself is part of a larger social system, and as young people are influenced by their families, the family is influenced by the larger social (and cultural) systems in which they exist (Poulsen, 2006; Doherty & McDaniel, 2010; O'Farrell & Fals-Steward, 2008; Kaminer & Slesnick, 2005; Austin et al., 2005). Family therapies are also concerned with the wider social context in which the individual and the family are embedded.

The focal areas of MDFT (family, peers, networks) are each considered to be a 'holon'. The term holon, which is specific to MDFT, refers to simultaneously being a whole and a part. In this sense the family is (Liddle, 2002; Minuchin & Fishman, 1981; Koestler, 1978), both a whole (e.g., each family member is an independent entity) as well as "parts" of other systems (e.g., families, school or work, peer systems, communities, and ethnic or racial group systems). The multiple ecologies in which young people reside are both wholes and parts, and both systems and subsystems. A therapist's job is to understand the workings of each system or ecology as both a whole and a part and to devise interventions that fit the individual and the systems he/she is part of. For example, relationships with parents and/or peers must be included in

therapy as part of leaving the drug-using life-style. Whole and part thinking is identified as a core element in the MDFT-intervention (Liddle, 2002).

MDFT, a change in parenting or in the parent(s)-young person interaction is not necessarily sufficient for a change in the young person's drug use. The fundamental idea behind MDFT is that only by working with both internal family factors (family patterns and rituals, perceptions of each other and oneself), as well as with external systemic factors (peer relations, school and other pro-social institutions), the young person's drug-using lifestyle can be addressed.

Liddle (2002) state that within MDFT:

“.. 1) the family is the primary context of healthy identity formation and development, 2) peer influence operates in relation to the family's buffering effect against the deviant peer subculture, and 3) adolescents need to develop an interdependent rather than an emotionally separated relationship with their parents.” (p.11)

Therefore, MDFT aims at reducing symptoms and enhancing pro-social and normative developmental functions in problem youths, by targeting the family as the foundation for intervention and simultaneously facilitating curative processes in several domains (systems) of the young persons' lives. Particular behaviors, emotions and thinking patterns related to problem formation and continuation are replaced by new behaviors, emotions, and thinking patterns associated with appropriate intrapersonal and familial development (Liddle, 2002; Liddle, Cecero, Hogue, Dauber & Stambaugh, 2006).

1.2.2 MDFT components

MDFT is manual-based but flexible regarding duration, settings and to some extent also therapeutic methods (Liddle, 2002). MDFT has been developed over time and has been used by both experienced family therapists and clinicians with no family therapy experience, but ideally (according to the MDFT manual by Liddle, 2002), the therapists as well as their supervisors should have a background in family therapy and/or child development.

The MDFT approach has been developed and tested since 1985. Since 1991, this work has been performed through the Center for Treatment Research on Adolescent Drug Abuse, Miami USA. The latest version of the MDFT manual was published in 2002 (Liddle, 2002).

MDFT is organized into phases, based upon knowledge of what is considered normal cognitive and emotional development for young people. Each phase represents one of several targets for

assessment, intervention, and change, and the therapist will not progress to the next phase until the therapy has been through the current phase.

The phases generally structuring MDFT aim to (Liddle, 2002):

- 1) form therapeutic alliances and build the foundation for therapy
- 2) take action and make changes
- 3) seal the changes and guide the family members to create a healthy internal relationship

Phase 1: Therapeutic alliances

Engaging both the young person and family is one of the main emphases in the first phase of MDFT (Liddle et al., 2001). Engagement strategies include the formulation of therapeutic alliances with the adolescent, family members, and other extra familial support systems. Liddle (2002) concludes in the MDFT manual, that the first phase is important and includes 'presenting therapy as a collaborative process', 'defining therapeutic goals that are meaningful to the young person, 'generating hope' and 'attending to the young person's experience'. The focus is on individualizing treatment for each of the family members involved. This is accomplished through the development of personal and individualized treatment objectives for each participant. The use of culturally specific themes is also cited as a useful tool for engaging diverse youths and families (Liddle, 1999).

The first phase will typically last for three weeks and is oriented at motivating and preparing the family for therapy, explaining to the family about the therapy, creating expectations, and the therapist will meet persons relevant to the family. In some cases siblings and relatives count as relevant persons, in other cases friends or for instance a social worker are relevant depending on with whom the young drug user spend time. The beginning of first phase is crucial and it can be a challenging task to engage the family positively; especially as the young person can be resistant, will often deny his/her drug use, and lack cooperation. The first phase forming therapeutic alliances allows for the MDFT program to be flexible and adaptable to different social settings, family structures and cultures, e.g., single parents, different ethnic groups, and co-occurring conditions, e.g., juvenile justice system issues, co-morbid mental health conditions.

Phase 2: Make changes

In the second phase the therapist will take action by mobilizing the young people and family network, by working with the different systems (school, peers, family, community workers), and

by the practice and training of the family members' stress and communication handling skills as well as preventing or preparing for detours.

The second phase is more behaviorally focused and includes efforts to increase the young person's pro-social behaviors, positive social networks, and antidrug behaviors and attitudes. There is also an emphasis on developmental issues, including a focus on increasing developmentally appropriate family interactions. Teaching problem-solving and decision-making skills and modifying defeating parenting beliefs and behaviors through a process called enactment are the primary techniques used by MDFT clinicians during phase two.

The therapist will work with the young person and the parents individually and both together as a family to see how they communicate and treat each other. The therapist assesses different aspects of the young person's life and to start the process of change, the therapist asks, 'what are the missing aspects of the young person's and family's lives? What set of circumstances and what specific day-to-day activities and intrapersonal and interpersonal processes could reverse the current development-destroying circumstances?' (Liddle, 2002)

Phase 3: Seal the changes and end of therapy

In the third phase the therapist will maintain the changes in the behaviors, emotions and thinking patterns of the family members. This is also the phase where the therapist will prepare for the ending of the MDFT sessions.

In this last phase the therapist works with the young person and family to generalize the newly acquired skills and behaviors for future situations to maintain the positive changes. MDFT does not include an aftercare component.

Sessions

The three phases are implemented through four types of treatment sessions (Liddle, Dakof, Turner, Henderson & Greenbaum, 2008; Liddle et al., 2006, Liddle, 2002):

- 1) sessions with the young person
- 2) sessions with the parent(s)
- 3) sessions with other family members and systems external to the family⁵
- 4) sessions to change the parent(s)-young persons-interaction(s)

Sessions with the young person

⁵ Sometimes the assessment and component three is split into two: a) a component concerning other family members and b) a component concerning systems external to the family, and thereby five components are presented in some MDFT studies (Liddle, 2002).

Within these sessions, the therapist will present therapy as a collaborative process and define therapeutic goals that are meaningful to the young person. Also the therapist will generate hope for the young person and his/her family, by focusing on the young person's internal locus of control and by presenting themselves as an ally. Finally, within this component the therapist will closely attend to the young person's experiences and needs.

During these sessions, the therapist will help the young person to learn more about their feelings and thinking patterns and how to control their anger and impulses and thereby communicate more effectively with their parents and others.

Sessions with parent(s)

MDFT has a stepwise way of reaching parents that is parallel to the way the young persons are reached in the first phase of therapy. Parenting relationship sessions are designed to close the emotional distance between parents and young people, by enhancing parents' individual functioning and their willingness to try new parenting strategies and develop new kinds of relationships. The ultimate aim is to increase parents' commitment and involvement with the young person (Liddle, 2002; Liddle, 2006).

Sessions with other family members and systems

MDFT recognizes that other family members, for example siblings, adult friends of parents or extended family members, often play key roles in the development and/or maintenance of drug taking and generally maladaptive behavior patterns of young people. Individuals who play key roles in the young people's lives will be invited to participate in family and individual sessions and usually their cooperation to such requests is achieved by stressing the serious circumstances. Also individuals external to the family could take part in therapy if the parent(s) is (are) overwhelmed and need support.

Sessions to change the parents-young person interactions

Themes in this component are: 1) problems in the parent-young person-relationship that began as developmental struggles (e.g. increasing independence for the young person), 2) problems that have grown or evolved over time (e.g. school problems, legal problems, family disengagement and despair), and 3) events such as family crises (chronic or acute) or traumas (e.g. parental drug use, physical or sexual abuse, physical abandonment).

Therapists work on basic communication skills and patterns, by focusing for instance on whether the parent(s) and the young person state their respective points of views in their

communications, and if they are able to listen and indicate that they have heard the other's point of view. Any discussion creates a context and over time, new experiences of the other individuals and of the self, will contribute to new relational outcomes.

An early marker of progress in the parent and young person's relationship is how discussions are handled. The therapist will work according to a 'first things first' philosophy, meaning that the problems must be considered in relevant order. In this 'first things first' philosophy, the therapist works on basic communication skills and patterns (Liddle, 2002). For instance, can the parents and adolescents state their points of view? Can they listen and indicate that they heard the other's point of view?

1.2.3 Duration and setting

Within the overall frame of MDFT, the MDFT components can be practiced in slightly different ways according to the clinical needs of the young person and his or her family (Rowe & Liddle, 2003; Liddle, 2002). MDFT has been developed and tested in different forms or versions, making it a uniquely flexible intervention. For example, an intensive outpatient version consists of 25 sessions over six months, and a less intensive version consists of 12 sessions over three months (Liddle, 2002). The frequency of sessions will depend on the needs of the family. Sessions could take place in clinical and/or home settings.

1.3 HOW THE INTERVENTION MIGHT WORK

MDFT has three primary objectives for the young person: 1) to reduce drug use and ultimately change drug-using lifestyle into a non-drug-using lifestyle, 2) to improve the general functioning in domains such as positive peer relations, healthy identity formation, school and other pro-social institutions and 3) to improve the parent-young-person-relationship and create a balance between autonomy and emotional connection (Liddle et al., 2001; Rowe & Liddle, 2003).

The objectives for the parent(s) include 1) facilitating parental commitment and investment as well as improving the overall relationship and daily communication between the parent(s) and the young person, and 2) increasing knowledge about and changes in parenting practices such as limit-setting, appropriate autonomy granting etc. (Liddle, 2002). Studies show that MDFT reduces drug use as well as behavioral problems in young people, (Liddle et al., 2001; Liddle et al., 2006; Williams et al., 2000; Austin et al., 2005; Waldron, 1997). The effectiveness of MDFT on drug reduction outcomes may be influenced by participant characteristics and program

mechanisms. Participant characteristics that have been found to predict program drug use reduction or abstinence are pretreatment history and severity of drug use, general peer and parental support, particularly in relation to non-drug use, and high levels of school attendance and functioning (Williams et al., 2000). Practitioners need knowledge on highly relevant participant characteristics such as age, gender, minority background, family composition (e.g., single parents) and co-occurring conditions. These participant characteristics are potential predictors of treatment outcome and practitioners need to be able to assess and tailor the program to particular types of young drug users.

MDFT may affect the young drug users through different mechanisms. One mechanism, that affects the young drug user positively, is the family systems focus (Rowe, 2010; Liddle, 2002). That is the family's ability to support and influence the young person to positive behavior changes, which in this case is equal to a non-drug-using lifestyle. Improvements in family relations and family behavior are related to the MDFT interventions focus on training family communication and social support (Rowe, 2010; Liddle, 2002; Liddle et al., 2001). Liddle (2010) states that *"MDFT offers a unique clinical focus in how it establishes individual relationships with parent and teen, works with each alone in individual sessions and targets family interactional changes ..."* (Liddle, 2010: 146).

Another feature of the MDFT model that is hypothesized to increase the success of MDFT with young people experiencing multiple problems is the comprehensive multidimensional assessment. Assessment in MDFT provides a therapeutic map, directing therapists where to intervene in the multiple domains of the young person's life. The process involves not only the identification of different problem areas, symptoms, and co-occurring disorders, but also risk and protective factors in all relevant domains, so that these factors can be targeted for change. Through a series of individual and family interviews, meetings with school, court, and other mental health professionals, and observations of directed family interactions, the therapist seeks to answer critical questions about functioning in each area. Assessment is an ongoing process throughout therapy, continually integrated with interventions to calibrate treatment planning and solving. Second, guided by this multidimensional assessment, the model addresses common root factors underlying a range of emotional and behavioral symptoms that co-occur with young persons' drug use.

An important mechanism relates to the multidimensional focus, and concerns the therapist's engagement in all relevant dimensions of the young person's life, including family relations, peer relations and school/work dimension, but also other dimensions (relations to social workers, extra familial relations) could be relevant mechanisms for promoting change. MDFT is based on the therapist's acknowledgement of "what you don't know can hurt you" (Liddle, 2002: 52) where it is the therapist's job to gain insight in all dimensions. Thus it is vital for the therapist to make comprehensive assessments of all spheres including local resources, court hearings, proceedings and school regulations, alternative school options etc. (Liddle, 2002).

Yet another active mechanism in MDFT is related to the 'holon'-thinking. This includes the therapist's approach to the young person and the systems in which the young person interacts, as being both independent systems with their own logics respectively, and parts of other systems and thereby subsystems interfering with each other (Liddle, 2002). Liddle (2002) states in the MDFT manual, that:

"..Systems, both intrapersonal and interpersonal, are interconnected and mutually influencing. An important job for the therapist is to acquire an understanding of how each system works as both a whole and a part and to devise appropriate interventions." (p.51)

According to Liddle (Liddle, 1999; Liddle et al., 2006), MDFT is successful in changing family interactions, improving family functioning, and reducing young people's drug use because:

- MDFTs focus on risk and protective factors, which diminishes risks of relapses and strengthens positive developments in the young people's lives
- MDFTs focus on wholes and parts that binds intrapersonal and interpersonal systems in a fruitful way
- MDFT is theoretically solid and can be adjusted to the specific situation

Furthermore, Liddle (2002) suggests that MDFT works by focusing on parent-young person's relationships. On the basis of both individual and family sessions, the therapist effectuates changes to the communication and the mutual respect between the young person in treatment and parent(s), and thereby the problem with drug-use can be reached.

MDFT has shown great potential to reduce adolescent drug use. Between 64 percent and 93 percent of adolescents receiving MDFT reported abstinence from substance use at one year follow-up (Liddle et al., 2008; Rowe, 2010). Furthermore, MDFT has shown positive effects on school functioning and has shown decrease in delinquent behavior and affiliation with delinquent peers (Rowe, 2010; Liddle, 2010).

Several studies show that treatment engagement and successful outcomes can be more difficult to achieve with adolescents who have co-occurring drug use and psychiatric disorders (Rowe, 2010). This is important to bear in mind, since the majority of untreated young people with a substance abuse disorder are likely to have a comorbid psychological disorder as well as a history of physical, emotional, or sexual victimization (Waldron & Turner 2008). Kaminer and Waldron (2006) noted that these co-occurring conditions may influence the onset, identification, course, and treatment of drug use problems. Drug using youths who also display conduct disorders are at increased risk of not completing treatment and have lower participation rates, both of which are linked to poorer treatment response.

1.4 WHY IT IS IMPORTANT TO DO THIS REVIEW

Persistent drug use among young people is a significant social problem around the world, and treatment of young people's drug use is challenging and costly, not least because treatments for young people's drug use problems is plagued by high dropout rates and post-treatment relapse to drug use. Research suggests that nearly half of the young drug users' never complete drug use treatment (Substance Abuse and Mental Health Services Administration, 2008). There is a need to identify effective treatments for addressing young people's drug use problems, and to reduce treatment dropout and post-treatment relapse. Furthermore, the growing interest among policy makers in increasing funding for evidence-based interventions is a strong motivation to add to the evidence base with a systematic review on a promising treatment for young drug users.

There are a number of studies indicating that MDFT is a promising treatment for young people with non-opioid drug use. By aggregating individual studies' results on MDFT, the review will address this contribute to the knowledge about treatment of young drug-users and their families. The review will inform practice by exploring the effects of MDFT for relevant participant groups.

2 Objective of the review

The aim of this review is to evaluate current evidence about the effects of MDFT on drug use reduction for young people in treatment for non-opioid drug use. Further objectives of this review are, if possible, to examine the mediators of drug use reduction effects and to examine if MDFT works better for particular groups.

3 Methods

3.1 CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

3.1.2 Types of studies

The study designs included in the review will be:

- Controlled trials⁶ (all parts of the study are prospective, i.e., generation of hypotheses recruitment of participants, assessment of baseline, allocation to intervention, section of outcomes, see Higgins & Green, 2008)
 - RCT - randomized controlled trials
 - QRCT - quasi-randomized controlled trials (i.e., participants are allocated by means such as alternate allocation, person's birth date, the date of the week or month, case number or alphabetical order)
 - NRCT - non-randomized controlled trials (i.e., participants are allocated by other actions controlled by the researcher, such as location difference)

We will include study designs that use a well-defined controlled group. Comparisons will be no intervention, wait list control, TAU and alternative active intervention.

The rationale for including NRCTs is as follows:

The aim of this review is to be as comprehensive as possible. There may be information that is contained in NRCTs that may be of relevance to this review that are not captured in RCTs.

3.1.3 Types of participants

⁶ When a study is labelled 'controlled' it means that the study includes at least two groups, typically an intervention i.e., experimental group and a control group, and pre- and post-measures.

The population included in this review will be young people aged 11-21 years enrolled in manual based MDFT drug treatment for non-opioid drug use (e.g., cannabis, amphetamine, ecstasy or cocaine).

Definitions of young people, and the age in which a person is considered a young person and may be entitled special services, such as drug treatment varies internationally (United Nations, 2011). Age group distinctions for young people are unclear as the boundaries are fluid and culturally specific (Weller, 2006). Furthermore young people start experimenting with illegal drugs at different ages in different countries (Hibell et al., 2009). Patterns of young people's independence from parents and independent living patterns likewise vary internationally. In order to capture international differences we have set the age range from 11 to 21 (Hibell et al., 2009; United Nations, 2011; SAMHSA, 2010; Danish Youth Council, 2011).

We limit the participants to age 11-21 and include only out-patient interventions in order to evaluate effects of MDFT on youth living with their family, since family interactions are cardinal in MDFT.

No universal international consensus exists concerning what categories to use when classifying drug users⁷, and different assessment tools and ways of classifying the severity of drug use are applied in different research studies (American Psychiatric Association, 2000; World Health Organization, 2009; Nordegren, 2002). We include participants regardless of formal drug use diagnosis.. The main criterion for inclusion is that the young person is enrolled in treatment for drug use (i.e., intervention or comparison condition). Referral to and enrolment in treatment requires a level of drug use, such that a parent, significant other, or authority (or the young person) found it necessary to solicit or require treatment. We define the population as young people referred to or in treatment for using non-opioid drugs.

We will include participants with poly-drug use, as long the majority of drug users in a study are non-opioid drug users. Psychosocial intervention for youth opioid dependence has been

⁷ Different tools classify clients into different categories, e.g., users, misusers and dependents. These specific categorizations are used in the Diagnostic and Statistical Manual of Mental Disorders (DSM) (American Psychiatric Association, 1994, 2000). While the DSM-IV is a widely used as an assessment tool, other relevant tools such as the International Statistical Classification of Diseases and Related Health problems (ICD, now ICD-10) developed by the World Health Organisation (WHO) are also in wide use. Differences between the tools concern both terminology and categorization criteria. For example the DSM-IV includes the category 'abuse', while the ICD-10 explicitly avoids this term on the grounds of its ambiguity; harmful use and hazardous use are the equivalent terms in WHO usage, but the categories are not identical while the ICD-10 solely operates with physical and mental criteria, the DSM-IV also includes social criteria (WHO, 2011; Nordegren, 2002).

evaluated in two Cochrane reviews (Townsend et al., 2006; Amato et al., 2009) and we wish to avoid duplication of effort. Populations with exclusive alcohol use will be excluded.

3.1.4 Types of interventions

The review will include outpatient manual based MDFT interventions of any duration delivered to young people and their families (see 1.2 Description of the intervention). The MDFT intervention must be an outpatient intervention that does not include overnight stays in a hospital or other treatment facility. The MDFT intervention can take place in the home, at community centers, in a therapist's office or at outpatient facilities.

Interventions in restrictive environments, such as prisons or other locked institutions (e.g., detention centers institutions for sentence-serving juvenile delinquents) will be excluded. MDFT is family intervention requiring active participation for the young person and his or her family to improve family functioning. The core condition of MDFT would be seriously compromised if the young person was placed outside of the family home (i.e., in-patient treatment or a restrictive institution).

Interventions focusing exclusively on treating mental disorders will also be excluded. Studies where MDFT is delivered with add-on components will be included as long as MDFT is the primary intervention.

Eligible control and comparisons will include no intervention, waitlist controls and alternative interventions, as we are interested in both absolute and relative effects. Due to ethical considerations and nature of the problem (i.e., young peoples' drug use) the likelihood of no treatment control group is small. We expect that the most frequent comparison will be alternative interventions (Lipsey, Tanner-Smith & Wilson, 2010). Alternative interventions as the comparison will complicate synthesis possibilities and analyses. We will pay careful attention to the types of comparison as is reflected in the Data Synthesis section (3.4).

3.1.5 Types of outcomes

Primary outcomes

- Abstinence or reduction of drug use measured by e.g.,:

- Biochemically tests (e.g., urine screen measures for drug use),
- Self-reported estimates on drug use (e.g., Time-line Follow Back interview) (Fals-Stewart, O'Farrell, Freitas, McFarlin & Rutigliano, 2000) and
- Psychometric scales (e.g., Addiction Severity Index) (McLellan, Luborsky, Woody & O'Brien, 1980).

Secondary outcomes

- Family functioning (e.g., measured by the Beavers Interactional Competence Scale) (Beavers & Hampson, 2000).
- Education or vocational involvement (e.g., measured by grade point average, attendance, self-reported or reported by authorities, files, registers, or employment record.)
- Retention (e.g., measured by days in treatment, completion rates and/Or attrition rates)
- Risk behavior, such as crime rates, prostitution (e.g., measured by self-reports or reports by authorities, administrative files, registers)
- Other adverse effects (e.g., measured by rates of hospitalization, suicide and over-doses)

The primary outcome is abstinence or reduction of drug use, as the overall review question is to evaluate current evidence on MDFT's effects on drug use reduction for young people in treatment. We seek evidence on how to best reduce or eliminate drug use, as drug use is understood as the young people's primary problem.

Outcomes will be considered in the following intervals:

- Short term (end of treatment to less than 6 months after end of treatment)
- Medium term (6 to 12 months after end of treatment)
- Long term (more than 12 months after end of treatment)

3.2 SEARCH METHODS FOR IDENTIFICATION OF STUDIES

3.2.1 Electronic searches

Relevant studies will be identified through electronic searches of bibliographic databases, government and policy databanks. No language or date restrictions will be applied to the searches.

The following bibliographic databases will be searched:

Medline

Embase
Cinahl
Social Science Citation Abstract
Science Citation Abstract
Socindex
PsycINFO
Cochrane
Danbib
Libris
Bibsys
Social Care Online
Eric
SweMed+
Criminal Justice Abstracts
Bibliography of Nordic Criminology

3.2.2 Search terms

An example of the search strategy for MEDLINE, searched through the OVID interface, is listed below. This strategy will be modified for the different databases. We will report details of the modifications used for the other databases in the completed review.

1. MDFT .af.
2. Multi-dimens* adj1 Famil*.af.
3. Multidimens* adj1 Famil*.af.
4. Multi adj1 dimens* adj1 Famil*.af.
5. 1-4/or

3.2.3 Searching other resources

The review authors will check reference lists of other relevant reviews and included primary studies for new leads. Citation searching in the Web of Science will also be considered.

In addition, we will contact international experts, provide the review's inclusion criteria, along with the list of included and ask them to identify unpublished and on-going studies.

The following international journals will be handsearched for relevant studies:

- Addiction
- Journal of Consulting and Clinical Psychology
- Journal of Substance Abuse Treatment
- Journal of Clinical and Adolescent Psychology

Handsearching will be performed on editions from 2011 to review submission of the journals mentioned, in order to capture any relevant studies not found in the systematic database searches.

3.2.4 Grey literature

Additional searches will be made by means of *Google* and *Google Scholar* and we will check the first 150 hits. OpenGrey (<http://www.opengrey.eu/>) will also be used to search for European grey literature. Copies of relevant documents will be made and we will record the exact URL and date of access.

In addition we will search these sites:

National Institute on Drug Abuse (NIDA) <http://www.nida.nih.gov/nidahome.htm>

The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)

<http://www.emcdda.europa.eu/index.cfm>

Substance abuse and Mental Health Services administration (SAMHSA)

<http://www.samhsa.gov/>

3.3 DATA COLLECTION AND ANALYSIS

3.3.1 Selection of studies

Two members of the review team will independently screen titles and abstracts in order to exclude studies that are clearly irrelevant under the supervision of ML (PSR, SLO & MS⁸). Studies considered eligible by at least one of the reviewers will be retrieved in full text. The full texts will then be screened by two members of the review team to determine study eligibility based on the inclusion criteria. Any disagreements about eligibility will be resolved by a third review author (TF). Reasons for exclusion will be documented for each study that is retrieved in

⁸ Stine Lian Olsen and Madina Saidj are members of the review team and will assist the review authors with screening titles and abstracts.

full text. The study inclusion coding sheet will be piloted and adjusted if required by the review authors (see Appendix 6.1).

The overall search and screening process will be illustrated in a flow-diagram.

3.3.2 Data extraction and management

At least two review authors (PSR, ML & KK) will independently code and extract data from the included studies. A data extraction sheet will be piloted on several studies and revised as necessary (see Appendix 6.2). Extracted data will be stored electronically. Any disagreements will be resolved by consulting a third reviewer with extensive content and methods expertise (TF). Analysis will be conducted in RevMan5 and/or STATA. Data and information will be extracted on; characteristics of participants (e.g., age, gender, and drug use history), intervention characteristics and control conditions, research design, sample size, outcomes and results.

3.3.3 Assessment of risk of bias in included studies

We will assess the methodological quality of studies using a risk of bias model developed by Prof. Barnaby Reeves in association with the Cochrane Non-Randomized Studies Methods Group (Reeves, Deeks, Higgins, & Wells, 2011)⁹. This model, an unpublished extension of the existing Cochrane Collaboration's risk of bias tool (Higgins & Green, 2008), covers both risk of bias in RCTs and in non-randomized studies that have a well-defined control group.

The extended model is organized and follows the same steps as the existing risk of bias model according to the Cochrane Hand book, chapter 8 (Higgins and Green, 2008). The extension to the model is explained in the three following points:

- 1) The existing Cochrane risk of bias tool needs elaboration when assessing non-randomized studies because, for non-randomized studies, particular attention must be paid to selection bias / risk of confounding. The extended model therefore specifically incorporates a formalized and structured approach for the assessment of selection bias in non-randomized studies¹⁰ by adding

⁹ This risk of bias model was introduced by Prof. Reeves at a workshop on risk of bias in non-randomized studies at SFI Campbell, February 2011. The model is a further development of work carried out in the Cochrane Non-Randomized Studies Method Group (NRSMG).

¹⁰ The extended model was developed to ensure standardisation of guidelines and procedures in the risk of bias assessment of NRS.

an explicit item about confounding (Reeves, Deeks, Higgins & Wells, 2011). It is based on a list of confounders considered important and defined in the protocol for the review. The assessment of confounding is made using a worksheet where for each confounder it is marked whether the confounder was considered by the researchers, the precision with which it was measured, the imbalance between groups and the care with which adjustment was carried out (see 6.3 Appendix). This assessment will inform the final risk of bias score for confounding.

2) Another feature of non-randomized studies that make them at greater risk of bias compared to RCTs is that RCTs must have a protocol in advance of starting to recruit whereas non-randomized studies need not. The item concerning selective reporting therefore also requires assessment of the extent to which analyses (and potentially other choices) could have been manipulated to bias the findings reported, e.g., choice of method of model fitting, potential confounders considered / included. In addition the model includes two separate yes/no items asking reviewers whether they think the researchers had a pre-specified protocol and analysis plan.

3) Finally the risk of bias assessment is refined, making it possible to discriminate between studies with varying degrees of risk. This refinement is achieved with the addition of a 5-point scale for certain items (see the following section *Risk of bias judgment* for details).

The refined assessment is pertinent when thinking of data synthesis as it operationalizes the identification of studies (especially in relation to non-randomized studies) with a very high risk of bias. The refinement increases transparency in assessment judgments and provides justification for not including a study with a very high risk of bias in the meta-analysis.

Risk of bias judgment items and assessment

The risk of bias model used in this review is based on 9 items (see 6.3 Appendix for guidelines & 6.4 Appendix for risk of bias coding sheets).

The 9 items refer to

- **sequence generation** (Judged on a low/high risk/unclear scale – NRCT will automatically have high risk of bias)
- **allocation concealment** (Judged on a low/high risk/unclear scale)
- **confounders** (Judged on a 5 point scale/unclear, only relevant for non-randomized studies i.e., NRCTs)

- **blinding** (Judged on a 5 point scale/unclear)
- **incomplete outcome data** (Judged on a 5 point scale/unclear)
- **selective outcome reporting** (Judged on a 5 point scale/unclear)
- **other potential threats to validity** (Judged on a 5 point scale/unclear)
- **a priori protocol** (Judged on a yes/no/unclear scale)
- **a priory analysis plan** (Judged on a yes/no/unclear scale)

The assessment will be based on pre-specified questions (see Appendix 6.4). “Yes” indicates a low risk, “No” indicates a high risk of bias, and “Unclear” indicates an unclear or unknown risk of bias. In the 5 point scale 1 corresponds to No/Low risk of bias (e.g., 1 = a high quality RCT) and 5 corresponds to Yes/High risk of bias (e.g., 5= too risky, too much bias, e.g., a poor quality study). A judgment of 5 points on any one of the items assessed translates to a risk of bias so high that the findings will not be considered in the data synthesis (because they are more likely to mislead than inform) (See Appendix 6.3).. A judgment of 5 will only be given with caution and only in cases of extreme biases. Judgments will be justified and reported.

Confounding

An important part of the risk of bias assessment of non-randomized studies is how the studies deal with confounding factors (see Appendix 6.3). Selection bias is understood as systematic baseline differences between groups that can therefore compromise comparability between groups.

For this review, we have identified the following confounding factors to be the most relevant: age, gender, and history of drug use (including type of drug). In each study, we will assess whether these confounding factors have been considered, and in addition we will assess other confounding factors considered in each included studies.

We focus on three confounders age, gender and drug use history -as they are major predictors of drug use. Young people are in a transitional and development life phase, and their patterns of drug use are connected to age (Labouvie & White, 2002; Kaminer, 2008; Waldron & Kaminer, 2004). Gender is also identified as a confounding factor of drug use, i.e., males generally have

higher drug use than females (Østergaard & Bastholm Andrade, 2011; McCabe, Morales, Cranford, Delva, McPherson & Boyd, 2007). And finally history of drug use and persistent patterns of use affect treatment outcomes (Labouvie & White, 2002; Kaminer, 2008).

Review authors (at least two PRS, ML, MS, & KK) will independently assess the risk of bias for each included study as described in the previous sections. Disagreements will be sought by a third reviewer with content and statistical expertise (TF). We will report the risk of bias assessment in risk of bias tables for each included study in the completed review. This assessment will also inform the data synthesis.

3.3.4 Measures of treatment effect

Discrete data

For dichotomous outcomes we will calculate odds ratios or risk ratios with 95 % confidence intervals and p-values. Urine Drug Screen data is an example of a relevant dichotomous outcome in this review.

Continuous data

For continuous outcomes, effects sizes with 95% confidence intervals will be calculated if means and standard deviations are available. If means and standard deviations are not available, the review authors will request this information from principle investigators. If no information is yielded, we will use methods by Lipsey and Wilson (2001) to calculate SDMs from e.g., F-ratios, t-values, chi-squared values and correlation coefficients. Hedges *g* will be used for estimating standardized mean differences (SMD) where scales measure the same outcomes in different ways (e.g., reduction of drug use). If there is a mix of studies with some reporting change scores and others reporting final values, we will contact authors and request the final values. If we do not obtain these values, we will analyze change scores and final values separately (Higgins & Green, 2008, section 9.4.5.2). Any scales related to drug use, family functioning, education (grade scores), etc., are examples of relevant continuous outcomes in this review.

There are statistical approaches available to re-express dichotomous and continuous data to be pooled together (Sánchez-Meca, Marín-Martínes & Chacón-Moscoso, 2003). We will only transform dichotomous effect sizes to SMD if appropriate e.g., as may be the case with the

primary outcomes 'abstinence and reduction' of drug use that can be measured with binary and continuous data.

When effect sizes cannot be pooled, study-level effects will be reported in as much detail as possible. Software for storing data and statistical analyses will be RevMan 5.0 and STATA 10.0.

3.3.5 Unit of analysis issues

We will take into account the unit of analysis of the studies to determine whether individuals were randomized in groups (i.e., cluster randomized trials), whether individuals may have undergone multiple interventions, whether there were multiple treatment groups and we will check for multiple publications for the included studies (i.e., whether several studies are based on the same data source).

Multiple intervention groups

Multiple intervention groups (with different individuals) within a study with one control group will not be pooled, nor will multiple control groups be pooled. Data will be rigorously checked to avoid overlapping samples.

Multiple interventions per individual

Multiple interventions per individual e.g., MDFT plus add on components such as motivation interviewing or a pharmacological treatment will be analyzed separately.

Multiple time points

When the results are measured at multiple time points, as a guideline they will analyzed at available time points in the following groups: short-term (<6 months after participation), medium term (6- 12 months after participation) long term (> 12 months after participation). We will not pool different time points due to the sensitivity if out comes in relation to end treatment.

Cluster randomized trials

If cluster randomized trials are included in this review we will check for consistency in the unit of allocation and the unit of analysis, as statistical errors can occur when they are different.

When suitable cluster analysis is used, effect estimates and their standard errors will be meta-analyzed (Higgins & Green, 2008). In cases where study investigators have not applied

appropriate analysis methods controlling for clustering, we will approximate the intra-cluster correlation (see Donner et al., 2001) and correct standard errors.

3.3.6 Dealing with missing data and incomplete data

The reviewers will assess missing data and attrition rates in the included studies. In the case of missing data (e.g., valid Ns, means and standard deviations) the reviewers will contact primary study authors for missing data. The review authors will record attrition rates and (if possible) reasons for attrition from included studies

The reviewers will record information on intention to treat analysis (ITT). We will run separate meta-analysis with studies that did not use ITT. We will perform sensitivity analysis to examine influences on effects in studies using ITT analysis vs. studies not using ITT analysis.

3.3.7 Assessment of heterogeneity

Statistically significant heterogeneity among primary outcome studies will be assessed with Chi-squared (Q) test and I-squared (Higgins et al., 2003). A significant Q ($p < .05$) and I-squared of at least 50% will be considered as statistical heterogeneity.

3.3.8 Assessment of publication bias

Reporting bias refers to both publication bias and selective reporting of outcome data and results. Selective reporting will be dealt with in the risk of bias assessment and any concerns will be reported.

We will use funnel plots for information about possible publication bias if we find sufficient studies (Higgins & Green, 2008). However asymmetric funnel plots are not necessarily caused by publication bias (and publication bias does not necessarily cause asymmetry in a funnel plot). If asymmetry is present, we will consider possible reasons for this.

3.4 DATA SYNTHESIS

Studies that have been coded with a very high risk of bias (that is a judgment of 5 points in any of the items) will not be included in the data synthesis. Analysis of the absolute effects of MDFT will involve comparing MDFT to no treatment and to untreated wait-list controls. The relative effects of MDFT (versus other interventions) will be conducted separately and will include studies that compare MDFT to other interventions and/or Treatment-As-Usual (TAU). All follow-up durations reported in the primary studies will be recorded and we will do separate analyses for available time points within short-term, medium-term and long-term outcomes.

Meta-analysis will be used when effect sizes are available or can be calculated and when studies include similar design features (RCTs vs. Non RCTs), intervention modalities (e.g., intervention duration) and methodology (e.g., measurement time points) and outcome measurements. Random effects meta-analysis will be used. We will report the 95% confidence intervals and provide a graphical display (forest plot) of effects sizes. When meta-analysis is inappropriate, a narrative description of the individual study results will be provided, and in this case any conclusions about the effectiveness of MDFT will not be possible.

3.4.1 Moderator analysis / Subgroup analysis and investigation of heterogeneity

We will investigate the following study-level covariates (if possible) with the aim of explaining observed heterogeneity: intervention characteristics (e.g., treatment duration, treatment intensity, composition of components), and study level summaries of participants' characteristics (e.g., gender, age, family composition, ethnicity, co-morbidity, and history of drug use) and comparison intervention characteristics.

If the number of included studies is sufficient (dependent on the spread of the study means of the covariates and study sizes, see Borenstein, Hedges, Higgins, & Rothstein (2009) and Simmonds & Higgins (2007), we will perform moderator analyses (meta-regression) to explore how observed variables are related to heterogeneity using a mixed model. We will estimate the (new) residual variance component to be used in a weighted least squares analysis conditional on this variance component estimate.

The residual variance component will be estimated using the method-of-moments estimator (Hartung et al., 2008; Konstantopoulos, 2006). We will report the 95% confidence intervals for regression parameters. Conclusions from meta-regression analysis will be cautiously drawn and will not be based on significance tests.

Otherwise single factor subgroup analysis will be performed. The assessment of any difference between subgroups will be based on 95% confidence intervals. No conclusions from subgroup analyses will be drawn and interpretation of relationships will be cautious, as they are based on subdivision of studies and indirect comparisons.

3.4.2 Sensitivity analysis

Sensitivity analysis will be used to evaluate whether the pooled effect sizes are robust across study design and components of methodological quality. For methodological quality, we will consider sensitivity analysis for each major component of the risk of bias checklists. To check for the possible influence of developer bias on effect sizes, we will run sensitivity analysis in studies conducted by program developers vs. studies conducted by independent researchers. Developer bias can occur in studies conducted by the intervention developers who may unconsciously influence the success of an intervention (Petrosino & Soydan, 2005; Eisner, 2009; Sherman & Strang, 2009). We will also consider sensitivity analysis for program fidelity, i.e., compliance with program manual and requirements for therapist training.

4 Acknowledgements

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6 Appendices

6.1 STUDY ELIGIBILITY SCREENING LEVEL ONE & TWO

Screening level one (on the basis of titles and abstracts)

Reference id. no.

Study id. no.

Reviewer's initials

Year of publication:

Author:

- 1. Is the study about a Multidimensional Family Therapy (MDFT) intervention?**
Yes
No (if no stop here and exclude)
Uncertain
- 2. Are the participants in outpatient drug treatment primarily for non- opioid drug use?**
Yes
No (if no stop here and exclude)
Uncertain
- 3. Are the participants primarily within age 11-21?**
Yes
No (if no stop here and exclude)
Uncertain
- 4. Is the study a quantitative primary/impact/outcome study**
Yes
No (if no stop here and exclude)
Uncertain

The report reference is excluded if one of the answers to question 1 to 4 are no.

If the answers are yes or uncertain the full report is retrieved for second level screening. All uncertain questions for 1-4 need to be posed again based on the full text. If information is not available or the report is unclear report authors will be contacted to clarify study eligibility.

Additional questions for second level screening

- 5. Is the report a RCT study (with a control group that is TAU, alternative intervention or no intervention)?**
 - Yes
 - No
 - Uncertain
- 6. Is the report a quasi-randomized study (with a control group that is TAU, alternative intervention, or no intervention)?**
 - Yes
 - No
 - Uncertain
- 7. Is the report a non-randomized controlled study (with a control group that is TAU, alternative intervention, or no intervention)?**
 - Yes
 - No
 - Uncertain
- 8. Is the study?**
 - Included
 - Excluded
 - Uncertain (state reason)

6.2 DATA EXTRACTION

Study design

- 1. How were comparison/control groups formed?**
 - Random assignment
 - Other (specify)
- 2. If random assignment, specify design**
 - Simple/systematic (individuals/families)
 - Stratified/blocked (identify stratifying variables)
 - Yoked pairs (created by timing of enrolment into the study)
 - Matched pairs (identify matching variables)
 - Cluster (group) randomized
 - Other (specify)
 - Can't tell
- 3. If non-random assignment, specify how groups were formed**
 - Quasi randomization
 - Time difference
 - Location difference
 - By action of researcher

By action of therapist
By participant preferences
Other (please specify)

4. Who performed group assignment?

Research staff
Clinical staff
Can't tell
Other (specify)

5. How was random assignment performed?

Computer generated
Random numbers table
Coins or dice
Other (describe)
Can't tell

6. How many separate sites were included in the study?

One
Two
Three
Specify number

7. Was random assignment performed in the same way in all sites

Yes
No (explain)
Can't tell

8. If non randomized study design– what parts of the study was prospective

Identification of participants
Assessment of baseline and intervention allocation
Assessment of outcomes
Generation of hypothesis

9. How many intervention groups were there? (MDFT counts as one)

One (MDFT)
Two (MDFT plus what?)
Three (MDFT plus what?)

10. How many intervention groups are relevant for this review?

One (MDFT)
More than one (explain)

11. How many *different* control/comparison groups were there? (i.e., groups that received different treatments, not counting multiple sites)

One
Two or more (explain)

12. How many control/comparison groups are relevant for this review?

One
More than one (explain)

13. Study sample size

N's	MDFT *	CONTROL1*	TOTAL	Pg. # & NOTES
Referred to study				
Consented				
Completed base line measures				
Randomly assigned Or non-randomly allocated				
Started treatment				
Completed treatment				
Completed 1 st follow up (... months)				
Completed 2 nd follow up (... months) **				

* Add columns for additional intervention and control/comparison groups.

** Add rows for as required for additional follow ups.

Participant/sample Characteristics:

14. Was participant inclusion criteria mentioned?

No

Yes (describe & cite pg.#)

15. Was participant exclusion criteria mentioned?

No

Yes (describe & cite pg.#)

16. Participant Characteristics

	MDFT *	CONTROL*	TOTAL	Pg. # & NOTES
Gender (e.g. % male)				
Young people's Ages				
Race/ethnicity				
Socioeconomic status				

Profession				
Family composition				
Family or peers involved in intervention				
Other characteristics				

* add columns for additional intervention and control/comparison groups.

17. Specify and describe type of drug use

- Cannabis
- Cocaine
- Amphetamine
- Opiates
- Combination (specify, pg. #)
- Combination of drugs and alcohol (specify, pg. #)
- Other (specify, pg. #)

18. Were there any differences between intervention and comparison groups at baseline?

- No
- Yes (describe differences & cite pg.#)
- Unclear

19. Was there any analysis of differences between completers and dropouts in the intervention group?

- No
- Yes (describe differences & cite pg.#)
- Unclear

20. Was there any analysis of differences between completers and dropouts in the control group?

- No
- Yes (pg. # & describe)
- Unclear

21. Was intention to treat analysis used?

- No
- Yes (pg. # & describe)
- Unclear

Settings

22. Location of interventions (check all that apply)

- Urban
- Suburban
- Rural
- Can't tell

23. Location details

- Office based
- Family home setting
- Other (specify)

MDFT characteristics

24. Characteristics of MDFT

	Min	Max	Mean	SD	Pg.# & Notes
Duration in Days Weeks Months					
Hours of contact (therapist) with young person Per week Per month Other (explain)					
Hours of contact (therapist) with family members Per week Per month Other (explain)					
Total hours of contact					

25. Other characteristics of MDFT

26. Characteristics of treatment staff/therapist (education, MDFT training, demographics, etc.)

27. Describe methods used to ensure MDFT quality (supervision, training, consultation)

28. Is there any information on adherence or fidelity to MDFT?

- Yes (describe)
- No
- Not sure

29. Was adherence/fidelity to treatment conditions adequate?

Yes (describe)
No
Not sure

Services provided to control cases

- 30. Type of control group**
Usual services (treatment as usual)
Alternative service (describe)
No service

31. Describe services provided to control group

32. Characteristics of staff, who provided services to control cases (education, demographics, etc.)

Outcome measures

33. When were data collected (check all that apply)?

Baseline
Post-tx
1. Follow up (when)
2. Follow up (when)
3. Follow up (when)
Other

34. Who conducted interviews?

Research staff
Clinical staff
Both
No interviews

35. Were data collected in the same manner for MDFT and control groups?

Yes
No (what were the differences?)
Can't tell

36. Did the authors use ITT?

Yes
No
Unclear
Not relevant

37. Was the ITT method adequate?

Yes
No
Unclear
Not relevant

Outcome measures

Instructions: Please enter outcome measures in the order in which they are described in the report. Note that a single outcome measure can be completed by multiple sources and at multiple points in time (data from specific sources and time-points will be entered later).

#	Outcome & measure	Reliability & Validity	Format	Direction	Source	Mode Admin	Blind (outcome assessors)?	Pg.# & notes
1		Info from: Other samples This sample Unclear Info provided:	Dichotomy Continuous	High score or event is Positive Negative Can't tell	Researcher Clinician Admin data Other Unclear	Self-admin Interview Other	Yes No Can't tell	

* Repeat as needed

OUT COME DATA

DICHOTOMOUS OUTCOME DATA

OUTCOME	TIME POINT (record exact time taken from baseline)	SOURCE	VALID Ns	CASES	NON-CASES	STATISTICS	Pg. # & NOTES
	<ul style="list-style-type: none"> •1st measure after baseline •1st follow-up • 2nd follow-up • 3rd follow-up •4th follow-up • other 	<ul style="list-style-type: none"> • researcher • clinician • admin data • other (specify) 	MDFT	MDFT	MDFT	RR (risk ratio) OR (odds ratio) SE (standard error) 95% CI DF P- value (enter exact p value if available) Chi2 Other Covariates (control variables)	
			Comparison	Comparison	Comparison		

Repeat as needed

CONTINUOUS OUTCOME DATA

Enter change and gain scores under Statistics (Other)

OUTCOME	TIME POINT (record exact time taken from baseline)	SOURCE (specify)	VALID Ns	Means	SDs	STATISTICS	Pg. # & NOTES
	<ul style="list-style-type: none"> •1st measure after baseline 	<ul style="list-style-type: none"> • researcher • clinician •admin data 	MDFT	MDFT	MDFT	P t F	

	<ul style="list-style-type: none"> • 1st follow-up • 2nd follow-up • 3rd follow-up • 4th follow-up • other 	<ul style="list-style-type: none"> • other (specify) 				Df ES Covariates Other CIs	
			Comparison	Comparison	Comparison		

*Repeat as need

6.3 ASSESSMENT OF RISK OF BIAS IN INCLUDED STUDIES: GUIDELINES

Risk of bias table

Item	Judgment ^a	Description (quote from paper, or describe key information)
1. Sequence generation		
2. Allocation concealment		
3. Confounding ^b .		
4. Blinding? ^b		
5. Incomplete outcome data addressed? ^b		
6. Free of selective reporting? ^b		
7. Free of other bias?		
8. <i>A priori</i> protocol? ^d		
9. <i>A priori</i> analysis plan? ^e		

^a Some items on low/high risk/unclear scale (double-line border), some on 5 point scale/unclear (single line border), some on yes/no/unclear scale (dashed border). For all items, record “unclear” if inadequate reporting prevents a judgment being made.

^b For each outcome in the study.

^c This item is based on list of confounders considered important at the outset and defined in the protocol for the review (*assessment against worksheet*).

^d Did the researchers write a protocol defining the study population, intervention and comparator, primary and other outcomes, data collection methods, etc. in advance of starting the study?

^e Did the researchers have an analysis plan defining the primary and other outcomes, statistical methods, subgroup analyses, etc. in advance of starting the study?

Risk of bias tool

Studies for which RoB tool is intended

The risk of bias model is developed by Prof. Barnaby Reeves in association with the Cochrane Non-Randomized Studies Methods Group.¹¹ This model, an extension of the Cochrane Collaboration's risk of bias tool, covers both risk of bias in randomized controlled trials (RCTs and QRCTs), but also risk of bias in non-randomized studies (in this case non-randomized controlled trials NRCTs).

The point of departure for the risk of bias model is the Cochrane Handbook for Systematic Reviews of interventions (Higgins & Green, 2008). The existing Cochrane risk of bias tool needs elaboration when assessing non-randomized studies because, for non-randomized studies, particular attention should be paid to selection bias / risk of confounding.

Assessment of risk of bias

Issues when using modified RoB tool to assess included non-randomized studies:

- Use existing principle: score judgment and provide information (preferably direct quote) to support judgment
- Additional item on confounding used for RCTs and NRCTs.
- 5-point scale for some items (distinguish “unclear” from intermediate risk of bias).
- Keep in mind the general philosophy – assessment is not about whether researchers could have done better but about risk of bias; the assessment tool must be used in a standard way whatever the difficulty / circumstances of investigating the research question of interest and whatever the study design used.
- Anchors: “1/No/low risk” of bias should correspond to a high quality RCT. “5/high risk” of bias should correspond to a risk of bias that means the findings should not be considered (too risky, too much bias, more likely to mislead than inform)

1. Sequence generation

- Low/high/unclear RoB item
- Always high RoB (not random) for a non-randomized study
- Might argue that this item redundant for NRS since always high – but important to include in RoB table (‘level playing field’ argument)

2. Allocation concealment

- Low/high/unclear RoB item
- Potentially low RoB for a non-randomized study, e.g. quasi-randomized (so high RoB to sequence generation) but concealed (reviewer judges that the people making decisions about including participants didn't know how allocation was being done, e.g. odd/even date of birth/hospital number)

3. RoB from confounding (assess for each outcome)

- Assumes a pre-specified list of potential confounders defined in the protocol
- Low(1) / 2 / 3 / 4 / high(5) / unclear RoB item
- Judgment needs to factor in:
 - proportion of confounders (from pre-specified list) that were considered
 - whether most important confounders (from pre-specified list) were considered

¹¹ This risk of bias model was introduced by Prof. Reeves at a workshop on risk of bias in non-randomized studies at SFI Campbell, February 2011. The model is a further development of work carried out in the Cochrane Non-Randomized Studies Method Group (NRSMG).

- resolution/precision with which confounders were measured
- extent of imbalance between groups at baseline
- care with which adjustment was done (typically a judgment about the statistical modeling carried out by authors)
- Low RoB requires that all important confounders are balanced at baseline (not primarily/not only a statistical judgment OR measured 'well' and 'carefully' controlled for in the analysis.

Assess against pre-specified worksheet. Reviewers will make a RoB judgment about each factor first and then 'eyeball' these for the judgment RoB table.

4. RoB from lack of blinding (assess for each outcome, as per existing RoB tool)

- Low(1) / 2 / 3 / 4 / high(5) / unclear RoB item
- Judgment needs to factor in:
 - nature of outcome (subjective / objective; source of information)
 - who was / was not blinded and the risk that those who were not blinded could introduce performance or detection bias
 - see Ch.8

5. RoB from incomplete outcome data (assess for each outcome, as per existing RoB tool)

- Low(1) / 2 / 3 / 4 / high(5) / unclear RoB item
- Judgment needs to factor in:
 - reasons for missing data
 - whether amount of missing data balanced across groups, with similar reasons
 - see Ch.8

6. RoB from selective reporting (assess for each outcome, NB different to existing Ch.8 recommendation)

- Low(1) / 2 / 3 / 4 / high(5) / unclear RoB item
- Judgment needs to factor in:
 - existing RoB guidance on selective outcome reporting
 - see Ch.8
 - also, extent to which analyses (and potentially other choices) could have been manipulated to bias the findings reported, e.g. choice of method of model fitting, potential confounders considered / included
 - look for evidence that there was a protocol in advance of doing any analysis / obtaining the data (difficult unless explicitly reported); NRS very different from RCTs. RCTs must have a protocol in advance of starting to recruit (for REC/IRB/other regulatory approval); NRS need not (especially older studies)
 - Hence, separate yes/no items asking reviewers whether they think the researchers had a pre-specified protocol and analysis plan.

Confounding Worksheet

Assessment of how researchers dealt with confounding		
Method for <i>identifying</i> relevant confounders described by researchers:	yes no	<input type="checkbox"/> <input type="checkbox"/>
If yes, describe the method used:		
Relevant confounders described:	yes no	<input type="checkbox"/> <input type="checkbox"/>
List confounders described on next page		
Method used for controlling for confounding		
At design stage (e.g. matching, regression discontinuity, instrument variable):		
.....		
.....		
.....		
At analysis stage (e.g. stratification, multivariate regression, difference-indifference):		
.....		
.....		
.....		
Describe confounders controlled for below		

Confounders described by researchers

Tick (yes[0]/no[1] judgment) if confounder considered by the researchers [Cons'd?]

Score (1[good precision] to 5[poor precision]) precision with which confounder measured

Score (1[balanced] to 5[major imbalance]) imbalance between groups

Score (1[very careful] to 5[not at all careful]) care with which adjustment for confounder was carried out

Confounder	Considered	Precision	Imbalance	Adjustment
Gender	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
History of drug use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.4 ASSESSMENT OF RISK OF BIAS FOR INCLUDED STUDIES: CODING SHEET

RISK OF BIAS FORM – MDFT SUBSTANCE ABUSE	
Reference ID: Study ID:	Reviewer ID: Date:
Author: Year:	
Notes: Queries to the author: Date contacted: Author's contact details:	

STUDY DESIGN	
<i>QUESTION</i>	<i>JUDGEMENT</i>
How was the intervention group(s) formed?	Random assignment: Other (specify): Not reported: Unclear:
Was the control groups(s) formed the same way?	Yes: No: Unclear:
- If no, then how were they formed?	Describe:
Give a description of the randomization as described by the authors	Describe:
How was the random sequence generated?	Computer generated: Random no. table: Coin tosses: Shuffling: Dice: Other (specify): Not reported: Unclear:
What was the unit of randomization?	Individual/family: Yoked / Matched pairs:

	Stratified: Blocked: Cluster: Other (specify): Not reported: Unclear:
Notes (e.g. queries to the author)	
NOTE: THIS PART IS ONLY FOR NRS – GO TO NEXT PART IF THE STUDY IS A RCT	
<i>QUESTION</i>	<i>JUDGEMENT</i>
How was the intervention group(s) formed?	Describe:
Is the intervention group formed before (historical/retrospective) or after (prospective) the hypothesis generation?	Before: After: Not reported:
How was the comparisons group(s) formed? <i>(if the same as intervention groups - note same as TX)</i>	Describe:
Is the control group formed before (historical/retrospective) or after (prospective) the hypothesis generation?	Before: After: Not reported:
Notes (e.g. queries to the author)	

RISK OF BIAS		
SEQUENCE GENERATION		
Describe the sequence generation:	Was the used sequence generation adequate?	Yes: No: Unclear:
Sequence generation	Final judgment	High/ Low/Unclear
ALLOCATION CONCEALMENT		
Describe the concealment of the allocation:	Was allocation adequately concealed regarding <u>participants</u> ? <i>Meaning that they cannot foresee assignment.</i> <i>(NRS always No - NRCT can be concealed adequate)</i>	Yes: No: Unclear:
Describe the concealment of the allocation:	Was allocation adequately concealed regarding <u>staff</u> ? <i>Meaning that they cannot foresee assignment.</i> <i>(NRS always No - NRCT can be concealed adequate)</i>	Yes: No: Unclear:
Describe the concealment of the allocation:	Was allocation adequately concealed regarding <u>researchers</u> ? <i>Meaning that they cannot foresee assignment.</i> <i>(NRS always No - NRCT can be concealed adequate)</i>	Yes: No: Unclear:
Allocation concealment	Final Judgement	High/Low/Unclear
CONFOUNDING		
	Did the authors describe the method for identifying relevant confounders?	Yes: No: Unclear:

		Unclear:
<i>See description above.</i>	<p>Could the imputation method chosen influence the outcome?</p> <p>Outcome 1</p> <p>Outcome 2</p>	<p>Yes:</p> <p>No:</p> <p>Unclear:</p> <p>Yes:</p> <p>No:</p> <p>Unclear:</p>
Incomplete outcome data	Final judgement	1; 2; 3; 4; 5; unclear
SELECTIVE OUTCOME REPORTING		
Describe incomplete or missing outcome reporting:	<p>Is the study free of selective or incomplete outcome reporting?</p> <p>Outcome 1</p> <p>Outcome 2</p>	<p>1; 2; 3; 4; 5</p> <p>Unclear:</p> <p>1; 2; 3; 4; 5</p> <p>Unclear:</p>
Selective outcome reporting	Final judgement	1; 2; 3; 4; 5; unclear
OTHER POTENTIAL THREATS TO VALIDITY		
Describe other sources of bias in this study:	<p>Is the study free from and/or have the study authors adequately dealt with other sources of bias?</p>	<p>1; 2; 3; 4; 5</p> <p>Unclear:</p>
Other potential	Final judgement	1; 2; 3; 4; 5; unclear

threats to validity		
A PRIORI PROTOCOL		
	Did the study follow a priori protocol?	Yes: No: Unclear:
A priori protocol	Final judgment	Yes/No/Unclear
A PRIORI ANALYSIS PLAN		
	Did the study follow a priori analysis plan?	Yes: No: Unclear:
A priori analysis plan	Final judgment	Yes/No/Unclear

CONFOUNDING, OUTCOME 1					
No.	Confounder	Considered	Precision	Imbalance	Adjustment
1	Age				
2	Gender				
3	History of drug use				
4	Other				
5	Other				
6	Other				

CONFOUNDING, OUTCOME 2

No.	Confounder	Considered	Precision	Imbalance	Adjustment
1	Age				
2	Gender				
3	History of drug use				
4	Other				
5	Other				
6	Other				

GUIDE

Enter pre-specified list of confounders.

- Considered - is the confounder considered by the researchers?
Yes, No
- Precision - the precision with which confounder is measured. *1, 2, 3, 4, 5 where 1=good precision, 5=poor precision*
- Imbalance - between groups. *1, 2, 3, 4, 5 where 1=balanced, 5=major imbalance*
- Adjustment - care with which adjustment for confounder was carried out. *1, 2, 3, 4, 5 where 1=very careful, 5=not at all careful*

7 Contribution of authors

Pernille Skovbo Rasmussen and Maia Lindstrøm wrote the background section. Trine Filges and Krystyna Kowalski wrote the methods sections. Anne-Marie Klint Jørgensen developed the search strategy. All authors commented on protocol drafts and contributed to revisions.

8 Declarations of interest

9 Sources of support

9.1 INTERNAL SOURCES

SFI Campbell, The Danish National Centre for Social Research

9.2 EXTERNAL SOURCES

None