THE EFFECTIVENESS OF PARENTING AND FAMILY-BASED INTERVENTIONS FOR SEVERE AND PERSISTENT CONDUCT PROBLEMS IN CHILDREN AND ADOLESCENTS AGED 10-17: A SCOPING REVIEW

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Thesis Structure

This thesis analyses the findings of a scoping review that was conducted to explore and provide updated research on the parenting and family-based interventions for children and adolescents aged 10-17 with severe and persistent conduct problems. Chapter one provides an introduction to the complexities of conduct problems, including their causal mechanisms, the relevance to New Zealand youth justice contexts and an analysis of the original Cochrane review; the foundations of which this report was established. It ends with providing a context for and the role of scoping reviews in psychological literature and the relevant objectives in conducting the current study. The research methodology and specific method for the scoping review is outlined in chapter two. The results section is summarised in chapter three and chapter four consists of the discussion, referring to the effectiveness of relevant interventions identified.

Abbreviations

ADHD: Attention Deficit Hyperactivity Disorder

ASD: Autism Spectrum Disorder

CD: Conduct Disorder

FFT: Functional Family Therapy

MAU: Management as Usual

MST: Multisystemic Therapy

MTFC: Multidimensional Treatment Foster Care (also referred to as Treatment Foster Care Oregon; TFCO)

ODD: Oppositional Defiant Disorder

RCT: Randomised Control Trial

TAU: Treatment as Usual

WA: Wrap-around

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Abstract

Severe and persistent conduct problems are complex manifestations of behaviour, a result of multiple family systemic and developmental processes. Parenting and family-based interventions are regarded as the best method in treating these heterogeneous symptom profiles, a multimodal approach which targets a range of factors across an individual's ecological system. However, the mechanisms involved in influencing treatment response or effectiveness are yet to be extensively understood or researched. This thesis acts as a scoping review which aimed to identify the extent of literature in the field, including effectiveness of interventions and discussion of common elements, and to determine the feasibility of a future network meta-analysis on the topic. Electronic databases (e.g. PsycINFO, Medline, and ERIC) were searched and studies were included based off of specific inclusion criteria. Twenty-five full-text empirical publications were included in analysis. A synthesis of study and participant characteristics, outcome measures, terminology, and interventions used by each study was included in the results, alongside a report of strengths and limitations as concluded by relevant authors. An additional critical appraisal checklist for RCTs was conducted to quality assess included studies. Despite some varied results, findings overall favoured the use of parenting and family-based interventions in reducing offending-related behaviours and/or conduct problems compared to a comparator group. However, the transportability of specific interventions across nations was found to be mixed, most probably due to the comparability of 'treatment as usual' comparator conditions. Further research is necessary in order to determine relevant mechanisms or common elements that influence treatment effectiveness.

Chapter One: Introduction

Child and/or adolescent conduct disorder (CD) and delinquency is associated with incredibly high individual, societal and economic burdens (Piotrowska et al., 2015). Its potential for ongoing criminal activity, antisocial behaviour, continuity over the lifespan, and poor prognosis if left untreated (Dretzke et al., 2009), alongside intergenerational continuity (Raudino et al., 2013) marks CD as a highly important topic of research. Childhood conduct problems are significant developmental precursors of adult criminality and antisocial behaviour (Taskiran et al., 2017). CD is one of the least recognised and least understood psychiatric disorders (Fairchild et al., 2019), yet continues to be the most prevalent behavioural disorder in youth delinquents (Aalsma, 2018), perhaps due to its heterogeneity in symptom presentation and causal mechanisms (Viding & McCrory, 2020). CD, delinquency, misconduct, antisocial behaviour and externalising behaviours, whilst all similar, have distinct definitions that are discussed further on in this introduction and encapsulated as a singular definition of problem behaviour. Children with conduct problems are more likely to present with a variety of future unfavourable outcomes (Fergusson et al., 2009). On an individual level, CD is associated with greater substance use disorders, later crime, mental health problems, relationship issues (Fergusson et al., 2009), violence, early pregnancy, a failure to complete high school, and a diagnosis of antisocial personality disorder in adulthood (Erskine et al., 2014). Similarly, adolescents who have higher externalising behaviours such as CD are more likely to have poorer social and economic outcomes, greater mental health concerns, and less favourable family lives (Colman et al., 2009). Adolescents with CD are faced with greater risk of early mortality; however, this is likely due to the increase in substance use that often comorbidly occurs alongside CD (Border et al., 2018).

Additionally, the pattern of antisocial behaviour recurring in the same families and over multiple generations is of importance. That is, parental antisocial behaviour is strongly

related to child antisocial behaviour (Thornberry et al., 2009). The causal processes involved suggest that antisocial behaviours exhibited by caregivers contributes to impaired, inconsistent parenting, which in turn leads to a greater risk of conduct problems in their offspring (Raudino et al., 2013). The fact that approximately 80% of youth offenders grew up experiencing family violence (Gluckman, 2018) emphasises this continuation of maltreatment across generations. This intergenerational cycle of risk, whereby delinquent parents 'pass on' antisocial behaviours to their children, outlines the fundamentals of intervening at the parent and family level.

CD impacts approximately 2-3% of individuals worldwide (Fairchild et al., 2019; Polanczyk et al., 2015) with rates higher among males than females (3-4% in boys and 1-2% in girls) (Polanczyk et al., 2015) and is a leading cause of referral to mental health services (Coghill, 2013). In a measure of global health burden, CD surpassed both ADHD and ASD (Erskine et al., 2013). Economically, the long-term costs of misconduct are significant. Disruptive behaviours disorders such as CD cost more than emotional disorders, particularly in education services (Coghill, 2013). Previous New Zealand (NZ) research on the lifetime cost of a chronic antisocial adolescent male sits at approximately $3 million (Church et al, 2007). The complexity of problems evident in individuals with severe and persistent conduct problems makes intervention multifaceted and often, ongoing. Young people presenting with life-course persistent conduct problems use significantly more services over their lifespan, from criminal justice, health, and social welfare domains, signifying high future costs to society (Rivenbark et al., 2018). As such, there are substantial benefits to intervention, such as the savings to the criminal justice system, increased academic achievement, and employment opportunities.

Relevance to New Zealand

From a New Zealand perspective, longitudinal studies such as the Christchurch Health and Development Study (CHDS) and the Dunedin Multi-Disciplinary Health and Development Study (DMHDS) have highlighted the potential for adverse long-term outcomes of childhood conduct problems. Youth that present with conduct issues in these studies showed an increased risk of a failure to complete high school, future crime and imprisonment, further mental health concerns, inter-partner violence, substance use (Erskine et al., 2016; Fergusson et al., 2007) and teen pregnancy (Woodward & Fergusson, 1999). In both the CHDS and DMHDS, children with early conduct behaviours had rates of later offending and/or conviction 4.1 to 10.4 times higher in comparison to children without a history of conduct behaviours (Fergusson et al., 2004a).

The research, treatment, and management of conduct disorder has significant implications for the NZ Youth Justice System. At present, NZ's adult prison population is nearing 9,000 (Department of Corrections, 2021). Young people who engage with the justice system have the potential to continue this behaviour into adulthood; this being a primary explanation for why the research into treatment for children and/or adolescents is critical in an attempt to reduce the worsening of such behaviour. In 2019/2020, there were 1,518 children or young people who had charges finalised in court (Ministry of Justice, 2020a). Whilst overall youth offending has decreased 59% over the last ten years (Ministry of Justice, 2020a), the proportion who end up in the Youth Court has increased. It is minor offending that has reduced more significantly, with more serious and persistent offending that is continuing; offences which must be brought to Youth Court attention (Ministry of Justice, 2020a). Of these offenders, the majority were male and Māori – a group who is over-represented within the criminal justice system. Overall, just under half of 14-16-year-olds reoffended within twelve months and was higher for those that received an order of

Supervision, Supervision with Activity, or Supervision with Residence (Ministry of Justice, 2020a). This rate of recidivism, which has remained relatively stable since 2009 (Ministry of Justice, 2020a), indicates that intervention efforts to manage youth delinquency has had limited success. However, most individuals that receive one of these high-end court orders do reduce the frequency and seriousness of their offending. This is important, as the youth that receive these orders are the most serious offenders and even a reduction is a step in the right direction.

As expected, youth that offend have ongoing and complex problems within their lives, likely acting as underlying causes of their offending. Data provided by the Ministry of Justice (2020b) indicated that the majority of youth that engaged in youth justice family group conferences had already had concerns brought to light about them or their family regarding care and protection concerns. This suggests that their caregivers, family systems or community in which they live likely plays a role in their delinquency. However, it must be noted that the majority of young people with care and protection concerns within NZ will never be involved in the Youth Justice System (Richardson & McCann, 2021). The Ministry of Social Development's (2010) analysis of NZ's 1989 birth cohort study examined the costs associated with child welfare, youth justice, and the crossover between these groups. It was determined that 83% of costs spent on incarcerated youth had a previous care and protection history (Jamieson, 2010). Thus, there is a crucial role in the identification and treatment of children with known welfare histories (Reil et al., 2021), contributing to the onset of severe conduct problems.

Age of Children and Adolescents

The current review focused on children or adolescents aged 10-17. The United Nations refers to the adolescence period between the ages of 10 and 19, and the up until the age of 18, most adolescents are protected under the United Nations Convention on the Rights

of the Child (UNICEF, 2019). Within New Zealand, age parameters in youth justice contexts highlight the difference between 'children' (aged 10 to 13) and 'young persons' or 'youth' (14-17 years) (YouthLaw, 2022). The age of criminal responsibility in NZ, Australia, England and Wales, is 10 years old (AIHW, 2016), whereas in comparison, the age of criminal responsibility in Nordic countries (i.e. Denmark, Finland, Iceland, Norway or Sweden) is 15 years of age. The current thesis and scoping review referred to children and adolescents aged 10-17, in part based on similar research by Woolfenden et al. (2001) that utilised the same age-range. As the age of ten is an average age of criminal responsibility across many countries, an age range any lower would incorporate interventions that target younger children, with less serious conduct problems or offending. Any older, and one would be analysing individuals who fall into the adult criminal justice system.

Defining the Problem

Whilst the present review refers to the issue as 'severe and persistent conduct problems', it is important to explain the various ways in which such behaviour can be defined and conceptualised.

Conduct Disorder

Diagnostic and Statistical Manual of Mental Disorders, 5th ed. (DSM-V). A specific paradigm for explaining misconduct is from a psychiatric or medical framework. CD is determined from a psychological diagnosis from the DSM-V (American Psychiatric Association [APA], 2013). CD is characterised by repetitive and persistent behaviours of disruptive or impulse-control concerns which violate the rights of others or appropriate age and societal norms. Such symptoms of behaviour fall into four categories; (1) aggression to people and animals (i.e. bullying, initiating physical fights, being physically cruel to animals), (2) destruction of property (i.e. deliberate engagement in fire setting or destroying others' property), (3) deceitfulness and/or theft (e.g. lies, steals, breaking into houses/cars), or

(4) a serious violations of rules (e.g. truancy, running away from home) (Murray & Farrington, 2010). The behavioural disturbance must cause clinically significant deficits in social, academic, or occupational functioning and can be specified as childhood, adolescent, or unspecified onset (APA, 2013). Thus, CD may present as a range of antisocial, aggressive, delinquent, defiant or disruptive behaviours. Children with CD may disobey authority figures, may be destructive or impulsive, attempt to lie, cheat or manipulate, display inconsistencies at school, have poor judgements, take risks, often have an inability to sensitise with other feelings or needs or have an inability to accept responsibility of their actions. As such, CD is a highly heterogenous disorder due to the incredibly diverse range of symptom profiles that can manifest across individuals. However, it must be noted that a diagnosis of CD is based purely on behavioural standards of the DSM-V, neglecting any cognitive or emotional processes that influence such symptoms (Fairchild et al., 2019). This means that an individual must meet at least three out of the fifteen behavioural criteria for a psychological diagnosis to take place. The DSM-V does not consider other factors, such as the impact of trauma or one's community. Thus, an individual may in fact have underlying antisocial psychological tendencies, but do not necessarily meet the DSM-V's behavioural criteria classifications. Consequently, CD is a dichotomous construct, whereby a young person is classified as having conduct disorder or not.

International Classification of Diseases, 10th ed. (ICD-10). CD is also a diagnosis within the ICD-10. The ICD-10 definition for CD is similar to that of the DSM-V, characterised by repetitive, persistent patterns of dissocial, aggressive or defiant behaviours that amount to major violations of age-appropriate social expectations (World Health Organisation [WHO], 2016). Presenting behaviours must be more extreme than 'typical' childish naughtiness or adolescent rebelliousness and should suggest an ongoing pattern (i.e. six months or more). As such, isolated dissocial acts are insufficient enough for a diagnosis

(WHO, 2016). Similar to the DSM-V, the following behaviours are examples of conduct disorder in the ICD-10: fighting or bullying, cruelty to people or animals, severe destructiveness, lying, truancy, running away from home, or fire-setting. The ICD-10 may categorise CD in terms of being; confined to the family context, or as unsocialized or socialized conduct disorder (i.e. group delinquency, gang offences, or truancy from school). ODD is a subcategory of CD in the ICD-10, said to usually occur in younger children, however, ODD behaviours are not delinquent and are less extreme in nature. It must be noted that in the most recent ICD-11 (WHO, 2019), conduct disorder is now referred to as 'conduct-dissocial disorder.' However, this terminology does not have any implications for the current review as it relatively new and is too early to include as its own search term.

Delinquency

The next term that severe and persistent conduct problems undeniably encompasses is the construct of delinquency. Delinquency, although comparable to conduct disorder, is used in more of a legal referral manner for youth that engage in criminal activity. These activities are acts which are prohibited by law (Murray & Farrington, 2010) and confront the laws of civil society (Kenchadze, 2015). Delinquent or criminal behaviour differs from the norms of societal behaviour due to specific legislation, laws, and moral judgement from society (Kenchadze, 2015). Many acts of delinquency are also behavioural symptoms of CD, a potential reason for why the two are used interchangeably. It has been suggested that the majority of, but not all juvenile delinquents, could be diagnosed with conduct disorder (Woolfenden et al., 2001). As such, delinquency is viewed from a legal and societal framework, whereby the misconduct has extended to illegal behaviour. Criminologists focus on delinquency and the violation of legal or social norms. Delinquency thus also infers a dichotomous outcome, meaning a young person is either a delinquent or they are not.

Anti-Social Behavioural Problems

The third paradigm refers to misconduct more broadly, from a definition of 'anti-social behavioural problems.' This terminology covers disciplines of sociology, criminology, and psychology. This construct refers to antisocial behaviour as a continuum, whereby there will likely be varying degrees and presentations of such behaviour. This paradigm is not dichotomous and does not analyse behavioural problems as a disorder or as criminality. Antisocial behaviour is a heterogenous notion encompassing rule breaking behaviours (i.e., lying, stealing, vandalism, arson), physically aggressive behaviours (i.e., fighting, bullying), oppositional behaviours or as having a lack of empathy (Piotrowska et al., 2015). Whilst DSM-V or ICD-10 terminology is prevalent in clinical work, this potentially less influence in other disciplines such as education (Advisory Group on Conduct Problems [AGCP], 2009).

Adolescent Externalising Problems (AEPs) and Disruptive Behavioural Problems (DBPs)

Comparable terminology of misconduct refers to AEPs and DBPs. AEPs is a broad definition, which encompasses serious conduct problems, delinquency and substance misuse (Hogue et al., 2020). Whilst conduct and substance use problems do co-occur at high rates among youth, this terminology is too broad for the current review. Such a definition would potentially incorporate adolescents with only substance use concerns or problems that lack the severity within the legal system. The current review is not focusing on substance misuse alone. Similarly, DBPs are an overarching term used to encompass the clinical significance of conduct problems. DBPs include ADHD, ODD and CD (Ogundele, 2018), a definition that is too widespread and encompasses behaviours that lack the severity the current review is aiming to cover (i.e. ADHD and ODD). ODD and CD are mutually exclusive, whereby ODD is a milder disorder than CD. The DSM-V does not allow for co-morbid diagnoses of ODD and CD and the current thesis focused on more complex conduct problems.

Severe and Persistent Conduct Problems

This thesis proposes the term ‘severe and persistent conduct problems’ to encompass the diversity in defining conduct, antisocial or delinquent manifestations of behaviour. The heterogeneity of defining problem behaviour in children and/or adolescents and the diversity of characteristics can be incredibly complex for a meta-analysis. With this terminology, it is intended that (a), the severity of behaviour is emphasised, (b) a range of definitions have been considered and (c), a range of relevant studies are eligible for inclusion. In must be noted that in this thesis, ‘severe and persistent conduct problems’ are used interchangeably with ‘conduct problems’ and ‘misconduct.’

Causes of Severe and Persistent Conduct Problems

The development and manifestation of severe and persistent conduct behaviours has been widely studied and said to be caused by a multitude of dispositional and contextual risk factors (Frick & Dickens, 2006). The following section outlines several family systemic and developmental mechanisms that have been linked to the onset of conduct problems.

Family Systemic Mechanisms

Family Structure and Parenting Practices

The role of family systemic mechanisms and parenting practices are critical in the presentation of complex conduct problems. Thus, considerable emphasis should be placed on family and/or parenting factors; the fundamentals of interventions that are analysed in this review. *Family systems theory* (Kerr & Bowen, 1988) emphasises that individual functioning is the result of complex family relations and interactions, each member said to influence one another and the entire system, thus contributing to changes in behaviour. Therefore, nuclear and extended family units play a role in the emotional and behavioural development of individuals due to the emotional connectivity of families. Maladaptive parenting strategies (e.g., harsh, or inconsistent discipline and punishment, overreaction, or psychological control)

are key in the presentation of misconduct (Fairchild et al., 2019). On the other hand, positive parenting practices may serve as a protective factor to genetic predisposition or sociological risk factors (Van Ryzin et al., 2015; Vanderbilt-Adriance et al., 2015). Family structures encompass the concepts of attachment, developmental trauma and social learning conditions which are discussed in detail below. Whilst they are all distinct, separate theories, they all occur within the family system and all contribute to the overall development and functioning of a child.

Aberrant Attachment Development

Bowlby's (1969) *attachment theory* highlights that the early interactions and first attachments with a primary caregiver are fundamental for the infant's representation of the world, their own psychological development, and future relationships via their individual internal working models (IWM). Attachment theory and the formation of a high quality parent-child relationship is an important determinant of child well-being and future personality development (Brumariu, 2015). Infants use caregivers as a source of comfort, reassurance, or as a "secure base" to explore the world around them, relying on attachment figures in the event of a threat (Weinfield et al., 2008). Therefore, in times of fear, an infant will seek physical proximity and comfort from its attachment figure, developing from consistent and reliable caregiver responses. Young children will form an attachment even if the quality of the relationship is insensitive or unreliable. This becomes known as an 'insecure' attachment type, whereby the infant has lacked consistent comfort, attention, or responsiveness from their caregivers (Weinfield et al., 2008). Such insecure attachment relationships may present as insecure avoidant, which often develops due to a lack of sensitive responses from a caregiver, as insecure-anxious/ambivalent, which may develop due to inconsistent responses from caregivers, or as disorganised, whereby an infant's attachment figure may also be a source of fear for them. When a child has been raised in an environment

that completely neglects their need for stimulation or affection, alongside an absence of adequate caregiving, they may be at risk for developing Reactive Attachment Disorder (RAD) or Disinhibited Social Engagement Disorder (DSED), outlined in the DSM-V (APA, 2013).Without a healthy attachment formation between the child and their caregiver, the development of an individual's mental health and social adaptation will be impacted (Toof et al., 2020), with implications for neurodevelopment, behavioural, and self-regulation (Weinfield et al., 2008).

In the current context, early attachment relationships are a central factor in the development and onset of conduct problems (Cyr et al., 2014). Research has suggested that the attachment formation in children with conduct disorder is often evident as a disorganised attachment style (Pasalich et al., 2012; Theule et al., 2016). Additionally, children who present with higher levels of callous-unemotional traits are at an increased risk of experiencing disrupted parent-child attachment relationships (Pasalich et al., 2012) and that children who present with an insecure attachment demonstrate higher aggression levels (Cyr et al., 2014). Thus, one's early relations and attachment formations with caregivers is crucial for a multititude of future social and behavioural implications.

Developmental Trauma

The exposure to chronic and severe maltreatment is critical in the manifestation of severe and persistent misconduct. Developmental trauma or "complex trauma" is the term used to specify the presence of multiple, early and ongoing experiences of abuse, neglect, maltreatment or adversity within the child's important relationships (van der Kolk, 2005). In particular, developmental trauma that occurs during the first three to five years of life has a more detrimental impact on future child development, because the most crucial aspects of psychological development occur within these years (van der Kolk, 2005). Specifically, results of meta-analyses emphasise that children or adolescents with CD have a higher

prevalence of current and lifetime trauma (Bernhard et al., 2018), that sexual abuse in early childhood may increase the likelihood of CD developing (Maniglio, 2015) and that childhood trauma exposure is a key risk factor for juvenile offending (Becker & Kerig, 2011). Additionally, adverse childhood experiences (ACEs) are positively associated with juvenile justice system contact (Graf et al., 2021). Trauma and attachment are closely related, whereby early traumatic experiences impact the formation of one's attachment style, a cycle that can repeat itself from parent to future offspring (Toof et al., 2020). When a young child is faced with ongoing developmental trauma and maltreatment within their family system specifically, it is evident and understandable as to why they present with severe and pervasive misconduct.

Social Learning Conditions

Bandura's social learning theory (SLT) asserts that all learning is dependent upon direct experience, through the observation and imitation of other's behaviour (Bandura, 1978). As such, one's social relationships allow for recurring learning experiences due to the ongoing social interactions and opportunities in which individuals learn to behave (Reid et al., 2002). In the current context of antisocial behaviour, children learn to exhibit aggressive behaviours because they have been provided ample opportunity to observe others act aggressively, often which, behaviours that are reinforced over time. That, is, people are not 'born' with innate aggressive tendencies, instead they must be learnt (Reid et al., 2002). As such, a young person's environment is incredibly important in the development of misconduct. This is because the people or groups an individual is in social contact with, either directly or indirectly, are thought to contribute to the values, behaviours, and attitudes they adopt. For example, a child's aggression may be influenced by marital discord, whereby they learn to imitate aggressive behaviour modelled by their parents, in turn, learning that aggression is normal in one's relationships (Bandura, 1978).

Social learning theory underpins the fundamentals of many family-based interventions for conduct problems. More specifically, the findings of Patterson and colleagues (Patterson, 1982; Snyder et al., 2003, as cited in Fisher & Gilliam, 2012) and the works of the Oregon Social Learning Center emphasised the role of family processes and *coercion theory* in shaping child behaviour (Fisher & Gilliam, 2012). Coercion theory highlights that a child's interactions with a caregiver are critical in predicting the future onset of conduct problems (Smith et al., 2014). Problem child behaviour emerges within the family system as parents use inconsistent discipline, use minimal positive reinforcement or display low rates of monitoring or supervision (Patterson, 1982; Fisher & Gilliam, 2012). As such, the child has difficulty predicting responses from their caregivers, they do not learn what behaviours are positive and parents fail to notice problem behaviours. Through the transactional child-parent dyad, caregivers unintentionally reinforce a child's difficult behaviour, which in turn, leads to caregiver negativity and hostility. This interaction or 'cycle' of mutual reinforcement continues until someone 'wins' (i.e., the parent gives in to the child's demands). Thus, the parent has inadvertently strengthened the child's aversive behaviour. Children learn that the pattern of escalating their problem behaviour results in parents 'giving in', which may translate to future interactions with peers or teachers. As such, coercive interactions between a caregiver and their child are a strong predictor of subsequent noncompliance and future conduct problems (Smith et al., 2014).

Welfare Histories or Foster Care Involvement

Children and/or adolescents involved in foster care or welfare systems may be explained as a 'subgroup' of the current population, however, it must be noted that these children endure and have high exposures to an array of maladaptive social learning conditions, aberrant attachment development, trauma, or high-risk family-systems as discussed above. The group of children who have been subjected to foster care or child

welfare services have complex symptomology (Tarren-Sweeney, 2008). Children in care report a range of difficulties, including conduct disorders, trauma-related anxiety, inattention/hyperactivity, learning and language difficulties or self-injury and food maintenance behaviours (Tarren-Sweeney, 2008). Foster children are three to four times more likely to have clinically significant scores on the Child Behaviour Checklist (CBCL) for externalising problems; a caregiver-reported rating scale of child mental health problems whereby such children commonly present with conduct problems or conduct disorder (DeJong, 2010; Tarren-Sweeney, 2008). Children with known welfare histories or foster care placements are at particular risk for later delinquency and justice system involvement (Eastman et al., 2019; Goodkind et al., 2020; Ryan & Testa, 2005). This may be due to the link between childhood abuse and/or neglect, child protection and involved in the justice system (Eastman et al., 2019). Individuals with a history of trauma or child welfare will have an earlier offending onset, offend more often and spend more time incarcerated in comparison to youth without a history of foster care placement (Yang et al., 2017). Thus, the increased link between children who spend time in care and the onset of severe and persistent conduct behaviours is an important group to consider. Children in care or those with known welfare histories are a heterogeneous population, each young person presenting with their own complex histories. Being placed in care is not always predictive of future delinquency or conduct problems, but is instead the impact of maltreatment and placement instability that makes this group significant to consider (Ryan & Testa, 2005). This particular group of children is important in the current context in relation to the development of interventions designed specifically to treat high-risk children with significant histories of maltreatment and trauma or as an alternative to foster care (Fisher & Gilliam, 2012).

Developmental Mechanisms that Connect One's Early Experiences to Conduct Problems in Late Childhood

The presentation of severe and persistent conduct problems must be in part, explained by certain developmental mechanisms that have been influenced by early, chaotic, or adverse family experiences that have been discussed. The role of developmental trauma, social learning conditions, family or parenting structures, coercive family processes and aberrant attachment development most probably all influence the formation of a young child's neurodevelopment, emotional regulation, and theory of mind; all of which are relevant in the manifestation of conduct problems. Additionally, the theory of latent vulnerability emphasises the long-term potential for maladaptive behaviours to present later in life caused by early and pervasive maltreatment (McCrory & Viding, 2015).

Maladaptive Neurodevelopment

The human brain develops 'bottom-up', in a sequential, hierarchical manner from basic functions such as heart rate and hunger in the brainstem and midbrain, to more complex processes such as emotional reactivity and abstract thought in the limbic system and prefrontal cortex (PFC) (Perry et al., 1995). By the age of three, a child's brain has grown to 90 percent of its full development, evolving in a 'use-dependent' manner. This means that certain neural pathways or synaptic connections become 'strengthened' as they are activated more frequently. The brain's plasticity in these early years is a fundamental reason for why a child's environment is critical as their brain develops in response to experience, particularly those experiences that are repeated (Perry et al., 1995). When young children are subject to ongoing, chronic periods of severe stress, neglect, or abuse, it can have pervasive effects on the development on the brain (van der Kolk, 2005). The brain 'sensitises' to a state of hyper-arousal or disassociation (Perry et al., 1995). When a brain is hyper aroused, an individual's fight or flight system is always 'on', often resulting in impulsive, defiant, or aggressive

responses apparent in conduct behaviours. Their brain has learnt to be hyper-vigilant, responsive to potentially threatening cues, signals, or reminders of the trauma (van der Kolk, 2005). Ongoing exposure to developmental trauma activates the child's biological stress response systems (Kavanaugh et al., 2017). More specifically, long-term alterations of an individual's fear or stress-response system due to chronic over stimulation of the hypothalamic- pituitary-adrenal (HPA) axis is evident, whereby such children that have experienced chronic and severe maltreatment often have abnormally high levels of cortisol (Opendak et al., 2017). Consistent changes in cortisol levels cause alterations of metabolic rate, heart rate or blood pressure (De Bellis & Zisk, 2014). Thus, changes in the brain, caused by consistent developmental trauma, also produces a change in physical symptoms. Extended research on the impact of childhood maltreatment on the prolonged activation of neurobiological stress response systems, which contributes to brain abnormalities and deficits in neurocognitive functioning (Kavanaugh et al., 2017) emphasises the considerable impact of maltreatment. Consistent, and early experiences of trauma alter the state of a child's brain and nervous system, which in turn, goes on to impact future development of the child.

Maladaptive Development of Emotional Regulation

The development of brain structures crucial for emotional regulation (i.e., amygdala, PFC, and hippocampus) is greatly connected to the quality and sensitivity of caregiving and attachment in early life (Perry et al., 2017). This is due to the reliance infants have on caregivers to regulate infants behaviour and rhythms of physiology, including heart rate, stress response systems and emotion regulation (Opendak et al., 2017). As an insecure attachment is formed, a child is more at risk of emotional dysregulation as they have been unable to effectively learn ways to express their emotions, alleviate distress or manage negative emotions (Brumariu, 2015). If caregivers are inconsistent, violent, neglectful or emotionally absent, children have difficulties developing their own emotional regulation or in

relying on others to aid them (van derk Kolk, 2005). Children may be less able to understand and manage emotions, receive less emotional support, and have fewer adaptive emotional-regulation skills (Dvir et al., 2014). Such children also have a higher risk for reactive aggression, driven by negative emotional states and higher cortisol activity, as discussed in relation to brain development (Dvir et al., 2014). Emotional dysregulation, alongside greater reactive aggression is crucial in the current context of severe and persistent misconduct. Such states are a result of insecure attachment patterns or formations and maladaptive neurodevelopment in early life (van der Kolk, 2005).

Maladaptive Development of Theory of Mind (ToM)

Severe and persistent misconduct may also be associated with a maladaptive development of ToM and mentalising capacity, hindering the development of empathy. ToM refers to the ability to infer the mental states of others (Austin et al., 2020) which is important in the current context of misconduct as presentations of aggressive, deceitful, or delinquent behaviours likely have characteristics associated with deficits in relating to others. Higher executive function and ToM abilities predict less conduct problems (Austin et al., 2020). Thus, being unable to understand others' beliefs, intentions or thoughts suggests that such individuals may also underestimate maladaptive behaviours such as lying and betraying others (Austin et al., 2020). Greater severity and persistence of conduct behaviour problems in children has been linked to the presence and earlier onset of callous unemotional (CU) traits, otherwise known as the limited prosocial emotions (LPE) specifier. To qualify for the LPE specifier, an individual must have shown at least two of the following characteristics: a lack of remorse or guilt, a lack of empathy, shallow or deficient affect or as being unconcerned about performance at school or work (Pisano et al., 2017). Individuals with CU traits are characterised by poorer outcomes in terms of an increased risk of psychopathy development in adulthood, such as greater thrill-seeking and interpersonal psychopathic traits

and as having more severe antisocial behaviour (e.g., criminality, aggression, and substance use) (Colins et al., 2020). The specific impairments in affective empathy for those with CD and CU traits (Milone et al., 2019) is noteworthy, and gives reason that individuals presenting with complex behaviour may have difficulties in understanding others, contributing to lack of empathy.

Theory of Latent Vulnerability

The exposure to ongoing maltreatment or neglect in early childhood embeds an enduring vulnerability to psychiatric disorders across the lifespan. The latent vulnerability theory refers to how one's neurocognitive and biological systems are linked to subsequent mental health concerns (McCrory & Viding, 2015). This framework depicts that early adversity can cause processes in the body and brain to remain hidden or 'latent' in early childhood but embed a long-term risk of psychiatric concerns that may manifest later in life. That is, a young brain adapts in response to early, adverse experiences and/ or high-risk environments (McCrory & Viding, 2015). However, this does not mean future psychiatric disorders are inevitable, but rather is based on the interaction with other risk or protective factors in one's life (e.g., genotypes or social factors) in combination with future stressors that may heighten or lower the risk of a mental health problems in the future (McCrory & Viding, 2015). In the context of severe and persistent misconduct, in the short-term, a child's neurobiological systems may have learnt to adapt to unpredictable or adverse home environments to help them cope or survive. However, these mechanisms are maladaptive to normative social functioning, and in the long-term, these changes in the brain can increase the risk of aggressive, delinquent, or defiant behaviours presenting themselves.

Other Relevant Risk Factors

The role of socioeconomic disadvantage, of peer pressure and the susceptibility to greater risk-taking behaviours in adolescence, the nature of severe and persistent conduct

problems progressing across the lifespan and the influence of genetics are all significant in how antisocial behaviours can manifest.

Genetics

Severe and persistent misconduct is an incredibly complex diagnosis due to its heterogeneity in symptom presentation and causal mechanisms. The causes of antisocial behaviour problems are mainly due to the interplay between one's environment and their genetic propensity (Azeredo et al., 2019; Piotrowska et al., 2015). A parent with a severe psychiatric disorder produces an increased risk of their offspring developing disruptive behaviour disorders such as CD (Ayano et al., 2021). Evocative gene-environment correlations suggest that a child's genes predispose them to behaviours that may evoke certain environmental effects. For example, a child with a difficult temperament may evoke coercive, harsh or inconsistent punishment from caregivers (Fairchild et al., 2019), as discussed in relation to coercion theory. Additionally, the influence of unfavourable environments on the development of misconduct is larger in those with a genetic predisposition in comparison to those who are adopted without such genetic underpinnings (Fairchild et al., 2019). Therefore, the role of genetic influence is significant in relation to the development of conduct problems.

Sociological Determinants

The impact of deficits in family systems and/or parenting practices on child problem behaviour cannot be considered alone. The influence of sociological factors such as poverty or gang culture and the impact this has on family units is considerable (Shaw & Shelby, 2014). Lower socioeconomic status (SES) is associated with greater levels of antisocial behaviour (Piotrowska et al., 2015) an onset of CD (Murray & Farrington, 2010), and self-reported crime or official convictions (Fergusson et al., 2004b). These maladaptive outcomes for children may be because poverty places parents in a vulnerable situation whereby the

family may have inadequate food, housing or clothing, are subjected to more neighbourhood danger (Shaw & Shelby, 2014) and have less social supports available (McLoyd, 2010). Children facing poverty are more likely to be subjected to stressful experiences at home or in their community, i.e., violence and mental health concerns. Via the family stress model of economic hardship (McLoyd, 2010), children who present with conduct problems are impacted by socioeconomic disadvantage as it increases stress levels and financial hardship in parents. These chronic life stressors are said to impact parental psychological functioning, contributing to presentations of anxiety, anger, depression, or substance use (Shaw & Shelby, 2014). Deficits in parental psychological functioning in turn impacts parenting, whereby instances of parental conflict, harsh, inconsistent, or less supportive parenting are more prominent (Shaw & Shelby, 2014). The influence of poverty and inadequate living standards is an important contextual factor that gives reason (at least in part) for the intergenerational continuity of antisocial behaviours (Raudino et al., 2013).

However, the presence of high family cohesion may buffer children living in poor neighbourhoods, contributing to fewer behavioural problems (Jennings et al., 2018; Murray & Farrington, 2010). Youth experiencing low SES come to police attention more often than youth from middle or high-class areas (Maxwell et al., 2004). Alongside this, community gang culture and high community crime rates provide a base for individuals to learn delinquent activity, perpetuate symptoms of disruptive behaviour and limit access to relevant treatment services (Aalsma, 2018). Whilst gang affiliation may provide young people with a sense of identity, belonging and family, the association between gang affiliation and increased deviant behaviour (in comparison to individuals who do not belong to a gang) is important (Gatti et al., 2005). Thus, the role of unique sociological factors is influential in impacting their wider ecological and family system.

Adolescent Development

Adolescence encompasses the transition from childhood to adulthood, a period of significant functional and structural changes within the brain (Dumontheil, 2016). Hogue et al. (2020) referred to adolescence as a complex maturational period whereby the young person must balance the development of increased autonomy, alongside continued adult monitoring by parents or caregivers. An adolescents' susceptibility to impulsivity and risk-taking behaviour can be attributed to contrasts in different areas of brain development, in what is known as the dual systems model (Shulman et al., 2016). That is, an individual's earlier maturing socioemotional or limbic system (e.g., striatum and amygdala), heightened by novel and exciting activities, does not match the slower to develop, cognitive control system (e.g., PFC) (Shulman et al., 2016). By mid-adolescence, the limbic system is almost fully mature, whereas the PFC has yet to develop (Shulman et al., 2016). This gives reason for the imbalance between sensation-seeking, reward sensitivity and self-regulation difficulties that occur in this period, contributing to a peak in offending in adolescence.

Additionally, an array of social cognitive changes occur in the adolescence period, whereby they become increasingly socially oriented towards their peers. As such, adolescents show greater vulnerability to peer influence and social approval (Dumontheil, 2016). Developmentally, peer relationships serve as a base for learning self-regulation, social skills, rules and processes (Chen et al., 2015). Thus, deviant peers may reinforce problem behaviours, therefore serving as an important risk factor. On the other hand, prosocial peers are linked with future success for both male and female youth (Scott & Brown, 2018). The presence of greater risk-taking behaviours is important in its relation to the current context of misconduct. The combination of peer influence and greater risk-taking behaviours, alongside deficits in self-regulation gives reason for the rise of problem behaviour in adolescence (Gluckman, 2018). As this review focuses on young people aged 10-17, it highlights that the

immense changes occurring during the adolescent period are important in the presentation of conduct behaviours.

Lifespan Development of Misconduct

A significant theme in this area of research surrounds the life-course continuity of antisocial behaviour. From a psychological perspective, this may manifest from ODD to CD and from CD to APD (Loeber & Burke, 2011). Whilst ODD often presents before CD in the lifespan, such an ODD diagnosis is not necessary to later diagnose an individual with CD in adolescence, similar in that not having an ODD diagnosis does not mean CD will not later be diagnosed. Comparably, although CD is a significant risk factor for APD later in life, and should thus regarded with significant importance, children with CD do not always continue down this antisocial path in adulthood. However, in the new ICD-11, conduct disorder is reconceptualised as an adult disorder, i.e. there is no distinction between childhood CD and adult APD (WHO, 2019).

Similarly, Moffit's (1993) 'life-course persistent' (LCP) and 'adolescent limited' (AL) subgroups of antisocial behaviour highlights the two subgroups that emerge in offending behaviours. Early-onset CD or delinquent behaviour is associated with the highest risk of poor outcomes (Bevilacqua et al., 2018). LCP offenders begin their offending in childhood, at an earlier developmental period, and then persist this into adolescence and adulthood. This group is associated with greater experiences of negative parenting, psychopathic personality traits, neurocognitive concerns, severe hyperactivity, and behaviour concerns in early life (Moffitt & Caspi, 2001). LCP individuals are also more strongly associated with family-system risk factors and have a greater number of risk factors overall compared to the AL group (Jolliffe et al., 2017). On the other hand, the larger group of AL offenders begin and limit their offending to the adolescence period. For this group, behaviour is often largely influenced by their peers and social contexts (Dumontheil, 2016). Those that

follow a LCP pathway reflect a combination of individual, family and community factors that contribute to the onset of conduct problems. In comparison, the principal mechanism for those in the AL pathway, who exhibit a marked increase in conduct problems in adolescence, is related to peer influence. Nonetheless, intervention is critical in terms of reducing further antisocial behavioural problems throughout the lifespan.

Psychosocial Interventions for Reducing Severe and Persistent Conduct Problems

Individual and Group Interventions

Whilst a range of interventions have been used to treat severe, ongoing externalising and disruptive behavioural disorders such as conduct disorder and delinquency, this review focuses solely on the parenting and/or family-based modalities. The following section briefly outlines alternate methods for treating conduct disorders or externalising behaviours.

Prevention. In terms of preventative-based treatments, primary-level preventative efforts of CD and delinquency are fundamental for society, particularly in terms of targeting high-risk families or parents who have already had contact with the crime or social welfare sector. This would occur on a governmental level, through health and welfare policies to prevent antisocial behaviour very early on in one's life. Intervention methods that specifically target at-risk families (i.e., those living in gang-affiliated areas, parents with criminal histories and ongoing mental health difficulties) or young children with behavioural problems is crucial in preventing the further development of misconduct and continuing the "intergenerational cycle" of antisocial behaviour and maltreatment (Gluckman, 2018). Prevention-based programs target the previous research that youth who present with conduct problems come from disadvantaged homes (Fergusson et al., 2012). Prominent prevention-based programs are based on home-visiting programmes, which often start before or around birth, providing assistance or support for a variety of parenting or child behaviour factors. For example, within NZ, the Early Start programme is an intensive, home-visitation service for

families with new babies experiencing social disadvantage or family system challenges that may influence the development of their child (Fergusson et al., 2012). This program has found to be successful in producing fewer problem behaviours at age three, and in improving a range of emotional, regulatory, and social development (Fergusson et al., 2012).

Individual Child Therapies. Individual child therapies may focus on eliminating cognitive distortions and negative self-evaluations, reducing aggressive behaviours or learning to develop more pro-social interactions (Gatti et al., 2019). Individual cognitive-behaviour therapy or social skills training are the most prominent interventions in this category, aiming to develop problem-solving skills and emotional regulation (Sagar et al., 2019). CBT is more effective with older children, perhaps why parenting-based treatments are viewed as a 'first-line' approach to intervention in younger children presenting with disruptive behaviours. Whilst treatments such as CBT and trauma-focused CBT have found to be effective in treating the co-morbid symptoms such as PTSD, substance-use or other mental health disorders (Hogue et al., 2020; Kar, 2011), such treatments are not included as stand-alone interventions in this analysis.

School-based and Teacher Interventions. The use of intervention in the classroom or school setting to treat conduct problems is important. Similar to parenting interventions, the foundation of school-based interventions focus on social learning principles (e.g. time out or reinforcement) to reduce disruptive behaviour (AGCP, 2013). Additionally, school-based programs aim to promote positive behaviours, teach social and emotional skills and prevent aggressive behaviour escalating further. Examples of school-based interventions are School-Wide Positive Behaviour Support (SWPBS), Prevent – Teach – Reinforce (PTR) (AGCP, 2013) or PATHS training.

Group-based or Residential Interventions. Mentoring interventions, wilderness programmes, restorative justice and alternative education are all inconclusive intervention

methods within NZ (AGCP, 2013) and are not included in this review. Similarly, military training or "boot camp" style programmes are not an intervention category that are included in this analysis, a method that is not recommended in NZ (AGCP, 2013). Instead, this treatment type is regarded as ineffective, said to potentially increase antisocial behaviours. Additionally, institutional facilities may be used to reduce the risk of re-offending in the most severe cases of antisocial behaviour in young people. This treatment type, while court-ordered, aims to serve the wider community by reducing the risk of harm (AGCP, 2013). However, it is the hope of using family-based or multimodal interventions that improvements in offending can occur before the institution level is needed.

Family-based and Parenting Interventions

Whilst individual, group-based or preventative interventions are important, family and parenting based interventions are the focus of this thesis, with children and/or adolescents whose problem behaviour is already evident and ongoing. Family-based and/or parenting treatments intervene at multiple levels of an adolescent's social ecological system, targeting risk factors at the individual, family, peer, school or community level (Dopp et al., 2017). Thus, child problem behaviours are treated indirectly via improvement in parenting or family system complications. Although family therapy (FT) has the strongest evidence basis in the treatment of adolescent substance misuse and conduct problems and is associated with better long-term adolescent outcomes (Henderson et al., 2019), widespread delivery and adoption of this approach has yet to occur (Hogue et al., 2019). This may be due to the mismatch between specific community needs, dissemination methods used by such models and their unique set of quality assurance procedures (Hogue et al., 2017). The following is a brief outline of some of the interventions that are expected to be found in analysis, however, there are likely more to be found, those that are perhaps less well known.

Parent Management Training. Parent Behaviour Management Training is often regarded as the first step in intervention, particularly in early and middle childhood. Parent training basis itself on improving maladaptive parent-child interactions and inconsistent discipline. Fundamentally, it is centred off of social learning theory, whereby coercive, aggressive or externalising behaviours are learnt via observation and modelling (Fairchild et al., 2019). Life-course offenders, those with the most chronic and severe trajectories of behaviour often begin such behaviours in early life. Thus, intervening in an early, preventative manner, in preschool with parenting techniques is a first-line treatment (Fairchild et al., 2019). The potential for disruptive, externalising behaviours in preschool children continuing this into later years (D'Souza et al., 2019) emphasises the importance of early intervention, whereby approximately a quarter of childhood behaviour problems evolve into conduct disorder (Carr, 2019). Often, therapists or facilitators of these programs teach and demonstrate parents a range of effective parenting skills for managing child behaviour, such as the use of positive reinforcement, avoiding physical punishment, time out and recording child behaviour. Such skills are intended to foster parent-child interactions and improve parents' skills in using consistent discipline. Widely used, validated programs of this sort include Triple P (Positive Parenting Programmes), the Incredible Years Programmes (IYP) and Parent Child Interaction Training (PCIT) (Carr, 2019). However, as these treatments are for the most part, first-step interventions, often in younger children, it is not expected our review will focus on these.

Multimodal Interventions. Multimodal interventions are based on the ecological conceptualisation of problem behaviour, treating conduct behaviours across various settings in a child's life, such as families, schools, teachers and peers (Fairchild et al., 2019). Multimodal interventions occur as children grow older and their conduct problems become more entrenched. Multisystemic Therapy (MST) is a prominent treatment type in this area

that is tailored for each individual presentation of antisocial behaviours (Carr, 2019). MST focuses on improving family functioning/ disorganisation and parenting skills, strengthening a young person's association with prosocial peers and developing practices for improved social and emotional regulation, school and community achievement (Fairchild et al., 2019). This intervention type is intensive, therapists and support staff are on-call 24 hours a day, seven days a week for 3-5 months (Carr, 2019). Goals often focus on not only decreasing adolescent problem behaviour, but improving family functioning, parenting skills, emotion regulation and association with prosocial peers (Fairchild et al., 2019). Additionally, Functional Family Therapy (FFT) is a second form of multimodal intervention implemented to treat adolescents with conduct problems and prevent future adverse outcomes (Fairchild et al., 2019). This family-based intervention type often occurs over a three-month period, intended to improve parenting skills, family problem-solving skills and emotional cohesion (Fairchild et al., 2019).

Out-of-Home Interventions. Alongside multimodal home-based interventions, community-based, residential programs can also be utilised. For youth with conduct problems, programs in which the young person is living out of home, in residential or foster care placements can treat severe CD and delinquency (Fairchild et al., 2019). This may be because the young person's conduct problems have had them removed from their home, or because of care and protection or youth justice issues. For example, Teaching Family Homes and Multidimensional Treatment Foster Care (MTFC), now known as Treatment Foster Care Oregon (TFCO) makes use of specifically trained foster parents to establish and teach behavioural management skills (Fairchild et al., 2019). For example, TFCO places youth for 6-9 months with trained foster carers who establish consistent boundaries and daily reinforcement systems. During their stay, the adolescent has weekly contact with therapists to support in training focused on anger management, problem-solving skills, and educational

planning. Concurrently, biological parents may receive behavioural parent training to assist their child in the reintegration to their home and community (Fairchild et al., 2019).

Effectiveness of Family-Based and Parenting Interventions

The effectiveness of family-based and parenting interventions has highlighted its position as a relevant and useful treatment approach. Specific analyses on interventions have been beneficial, concluding that family therapy is effective for treating disruptive behavioural disorders (Carr, 2019) and that parenting interventions do lead to a reduction in disruptive child behaviour (Michelson et al., 2013; van Aar et al., 2017) or conduct problems (Dretzke et al., 2009). Weber et al. (2019) recommended parenting interventions as a first-line approach for child externalizing disorders due to the indirect influence on child behaviour via an improvement in parenting practices. It has been concluded that family and/or parent training programs are an effective and evidence-based intervention method for reducing behavioural problems in children (Piquero et al., 2016). However, Piquero et al. (2016) meta-analysis focused on children and families five years or younger, and as a preventative measure, rather than children or adolescents whose criminal, delinquent or conduct behaviour is well-established. A meta-analysis of the psychosocial interventions for CD were found to have a small but significant effect on decreasing child and adolescent CD from teacher and parent ratings (Bakker et al., 2017). However, this review did not look at the outcomes more broadly, in terms of delinquency as well as CD or outcomes for family functioning and parental mental health. Family-based interventions target key risk factors in youth with more serious conduct behaviours at multiple levels of their social ecology (i.e., individual, family, peer, school, and neighborhood), and have been found to have modest, yet long-lasting effects on antisocial behaviour (Dopp et al., 2017). This is in contrast with other treatments for juvenile offenders which may have a narrow focus on the individual, failing to address the multifaceted nature of conduct problems. A contrasting meta-analysis on noninstitutional

psychosocial interventions for youth delinquents did not find any one intervention type to be more effective than control treatments in reducing future criminality or preventing recidivism (Olsson et al., 2021).

There have been recent high-level meta-analyses of specific interventions such as MST (Littell et al., 2021), or FFT (Hartnett et al., 2017; Filges et al. 2018), however, to the author's knowledge, no other study has analysed this specific group of participants and assessed a wide range of interventions that are used. The Littell et al. (2021) publication extensively analysed the impacts and effects of MST for participants with a range of social, emotional, and behavioural problems. It was concluded that the quality of studies was mixed, and that the effects of MST were inconsistent. Additionally, findings were not observed outside of the USA.

The most similar research to the current thesis, by Woolfenden et al. (2001) analysed outcomes of family and parenting interventions for childhood and adolescent diagnosed conduct disorder, or referred delinquency based on four objectives. They determined if family and parenting interventions improved (1) child behaviour, (2) parenting and parental mental health, (3) family functioning, and (4) the long-term psychosocial outcomes for the child. However, findings were mixed. For a change in child/adolescent behaviour, no significant differences were found in included studies, only two studies reported on parental mental health and no studies focused on parenting as an outcome. Additionally, no significant differences were found for family functioning and for long-term outcomes for the child (i.e., peer relations) and little data was found on academic performance or future employment. However, one study reported a reduction in sibling delinquency. Despite this, main findings showed that family or parenting interventions significantly decreased time spent by youth in institutions, reduced re-arrest rates and decreased self-reported delinquency, in comparison to those receiving a usual intervention. Thus, authors concluded that family and parenting

interventions for juvenile delinquents and their families are successful in terms of the cost-saving benefit to society for the reduction in time spent incarcerated.

Of the nine hundred and seventy studies that were originally found through the authors search strategy, only eight trials were eligible for inclusion. Only one of these study populations were children or adolescents with conduct disorder, the other seven being juvenile delinquents. As there was lack of substantial evidence that family/ parenting interventions decrease the risk of children being incarcerated or improved parenting, parental mental health, family functioning, academic performance, future employment, and peer relations, it is hoped that more is found in these areas in the current analysis in terms of secondary outcomes. Additionally, the original authors reported that main findings should be taken with caution, due to the heterogeneity of results and the limited number of trials included.

Justification for the Present Scoping Review

This thesis provides the relevant research protocol and discussion of findings for the publication of a future scoping review. The original beginnings of this topic originated from the Woolfenden et al. (2001) Cochrane review of family-based and parenting interventions for children and adolescents with conduct disorder or delinquency that have been discussed above. However, like many psychological disorders, knowledge on the symptomology, manifestation, and treatment of conduct problems has likely progressed. This research is now twenty years old, and there is much to gain from an updated analysis of interventions for severe and persistent conduct problems. The specific nature of the proposed population in review highlights the necessity for further research. A multitude of reviews that were found target substance misuse problems as well as conduct problems, which as discussed, is not the population we are targeting. In this area, it is known that family and evidence-based interventions exist for child problem behaviour, however, the challenges the come with this

population and their family systems, highlights the need for research on the effectiveness and implementation of interventions. The purpose of scoping reviews and the role common elements add to literature is discussed below, both specific to the current review.

Purpose of Scoping Reviews

Scoping reviews are utilised to determine if an extensive systematic review of the topic is necessary, thus producing an overview or summary of the current research. Such reviews are useful when the research topic has yet to be extensively analysed, acting as an important precursor in research. Scoping reviews can have several key objectives, for example: to identify the types or volume of literature in the field, to clarify key concepts and/or definitions, to identify how research is conducted in the given field or to identify gaps of knowledge (Munn et al., 2018). Thus, a scoping review on the current family and/or parenting interventions for treating severe and persistent misconduct acts as a feasibility pilot in determining if there is enough research to conduct a formal systematic or Cochrane review in the future. To our knowledge, no scoping reviews have been conducted on this area and the extent of research is not known. The topic is complex, highlighting that a scoping review of the relevant literature is necessary. The present scoping review can also determine what the different intervention types are, potential common elements and heterogeneity in the literature.

The Role of Common Elements in Research

Common elements or ‘practice elements’ are distinct, clinical techniques used as part of a much larger intervention plan (Chorpita et al., 2005). As such, core features of multiple, yet similar evidence-based interventions are identified, whereby such techniques are ‘distilled’ into fewer, overlapping elements; the common features of all therapy types (Hogue et al., 2017). For example, intervention practices that target similar areas of child functioning via the same mechanisms are grouped together. This forms one single practice element, i.e.,

praise, emotion regulation or problem-solving (Hogue et al., 2020). By focusing on core elements of evidence-based treatments, clinicians are provided with fundamental techniques to use on a diversity of symptom profiles (Hogue et al., 2020).

For example, core elements of CBT have been identified as an approach for treating AEPs (Hogue et al., 2020). This research determined six common elements of CBT, those being (1) a functional analysis of behavioural problems, (2) prosocial activity sampling, (3) cognitive monitoring and restructuring, (4) emotion regulation training, (5) problem-solving training, and (6) communication training. These core elements provide clinicians with guidance and encouragement in treating adolescent AEPs via CBT. Previous literature has examined core elements of family therapy for adolescent behaviour problems, determining four main factors after analysis. These are (1) interactional change; supporting families to engage with new, more effective relational skills, (2) relational reframe; transforming from a symptom-focused clinical problem to a problem that is instead focused on relations, (3) adolescent engagement, and (4) relational emphasis; interventions that focus on improving overall family functioning (Hogue et al., 2019). By potentially identifying if authors discuss common elements in this review, core elements of family and/or parenting practices for severe and persistent conduct problems can be determined and used as a base for future research in the area.

Aim and Objectives

It is evident that there is a need for further, specific research into the parenting and family-based interventions for severe and persistent conduct problems. More specifically, this review aims to build from the 2001 Cochrane Review of family and parenting interventions for children and adolescents with conduct disorder or delinquency; research which is now twenty years old (Woolfenden et al., 2001). The goal of our scoping review is to identify all available research studies evaluating the effectiveness of parenting and family-based

interventions in reducing severe and persistent conduct problems among 10–17-year-olds and to determine the feasibility of a future network meta-analysis or Cochrane review. Thus, the current review has three main research questions it hopes to answer. Such findings will therefore aid in furthering the research on the complexity of the current topic, all of which are outlined below:

1. What parenting and family-based interventions have been rigorously evaluated for effectiveness in reducing severe and persistent conduct problems and/or related outcomes (e.g. offending) among 10-17-year olds?
2. Which studies identify common elements or core components?
3. What is the feasibility of carrying out a network meta-analysis of high-quality intervention trials to identify the effectiveness of individual common elements in decreasing conduct problems and/or related outcomes?

Chapter Two: Methodology

Purpose

The present chapter describes the methodology in establishing the relevant research questions, eligibility criteria, search strategy, study selection and charting of data for the current research topic. This chapter was done in collaboration with the author's research partner and was submitted as a protocol for the proposed scoping review. Therefore, the methodology for our individual theses is identical, however we will then diverge and examine separate sub-topics of the research area in the discussion. The methodological approach was comprehensive and ongoing. Meetings were held fortnightly to discuss areas of concern before the protocol was submitted. The remainder of this chapter details the final version of the protocol.

Registration

The scoping review protocol was submitted to the Open Science Framework database on the 27th January 2022. This provides a real time trace of any changes made to the protocol and allows for greater transparency of the research process.

Reporting Guidelines

The planning and documentation of this scoping review protocol is guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocol (PRISMA-P; Shamseer et al., (2015) and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews PRISMA- ScR (Tricco et al., 2018). The proposed scoping review will be reported following the PRISMA-SCR and the updated PRISMA 2020 statement guidelines (Page et al., 2021).

Scoping Review Methodology

This scoping review protocol uses the Arksey and O'Malley (2005) methodological framework for scoping studies, with revisions from Levac et al. (2010). The framework describes

six stages of research: (1) identifying the research questions; (2) identifying relevant studies; (3) study selection; (4) charting the data; (5) collating, summarising, and reporting the results; and (6) consultation.

Stage 1: Identifying the Research Question

Scoping Review Goals. We aim to have a clear scope of inquiry (Levac et al., 2010) for our research question(s), while capturing the breadth of research evidence in our field of interest. We formulated our research questions following the PICO/PICOTS technique (i.e., population, interventions, comparisons, outcomes, timing, setting, study design), which also serves as a guideline to our database searches in the subsequent stages of our review. These are presented in Table 1.

Research Questions. Since the goal of our upcoming scoping review is to scope and identify all available research studies that evaluated the effectiveness of parenting and family-based interventions in reducing severe and persistent conduct problems among 10-17 year olds, and to determine the feasibility of a future network meta-analysis of common elements embedded in these interventions, we aim to answer the following tentative research questions:

1. What parenting and family-based interventions have been conducted that rigorously evaluated for their effectiveness in reducing severe and persistent conduct problems and/or related outcomes (e.g. offending) among 10-17-year olds?
2. Which studies identify common elements or core components?
3. What is the feasibility of carrying out a network meta-analysis of high-quality intervention trials to identify the effectiveness of individual common elements in decreasing conduct problems and/or related outcomes?

Definitions. To establish a clear scope of our review, we developed some key terms and definitions relevant to our scoping review. These are defined as below:

Severe and Persistent Conduct Problems. For the purpose of this review, we proposed the term 'severe and persistent conduct problems', used interchangeably with 'severe and persistent misconduct', to emphasise the extent of problem behaviour and to accommodate the complexity and diversity in defining children and adolescents' conduct, delinquent or antisocial manifestations of behaviour across disciplines. We identify children and adolescents as having severe and persistent conduct problems if they have (i) a diagnosis of conduct disorder through the ICD/DSM; and/or (ii) a history of recurrent offending and contact with the juvenile justice system; or (iii) clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, but did not receive a formal diagnosis of conduct disorder.

Parenting and Family-based Interventions. In the context of misconduct, we define parenting and family-based interventions as interventions or programmes that aim to reduce severe and persistent misconduct in children and adolescents through addressing parenting and/or family system factors, such as parent-child or family-child relationships, patterns of interactions, behavioural management, and monitoring.

Common Elements. Common elements, also known as practice elements, are defined as distinct, operationalizable clinical techniques and procedures that exist within a larger intervention protocol (Chorpita et al., 2005). Components of similar evidence-based interventions are identified; whereby such techniques are 'distilled' into fewer, overlapping elements. For example, intervention practices that target similar areas of child functioning via the same mechanisms are grouped together to form one single practice element (i.e., praise, emotion regulation or problem-solving) (Chorpita & Daleiden, 2009).

Table 1

PICO/PICOTS technique for devising the review research questions

Criteria	Determinants
Population	Children and/or adolescents between 10 and 17 who exhibit a "severe and persistent" level of conduct problems, for example: - DSM or ICD diagnosis of conduct disorder - Clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews - Youth offending history >60% of study participants must be in the 10-17 age range.
Intervention	Programs, treatments, or interventions that target parenting and/or family system factors, those being: individualised interventions or group-based interventions.
Comparison	Treatment as usual (i.e., treatment the individual would have received in the absence of parenting and/or family-based intervention), another intervention type (i.e., individual CBT, restorative justice), no intervention, or a wait-list control (i.e., those waiting to be included in an intervention).
Outcome	Primary outcomes will be based on either: - A behavioural measurement, through psychometrics, interviews with youth or others (e.g. teachers, parents) or direct observations; - The legal system (i.e. re-offending, re-imprisonment and other sentencing such as probation, community service, court ordered diversions to behavioural or substance use treatment) Outcomes will be considered if they were obtained from: administrative records (such as criminal court and juvenile justice records); validated and non-validated psychometric behavioural measures; interviews; survey questionnaires; and direct observation.
Timing	Outcome measures must be measured pre and post intervention.
Settings	Programs, treatments, or interventions that are delivered in the community or clinical setting. Countries where parenting and/ or family-based interventions are administered.
Study Design	Randomised Controlled Trials (RCTs), including individual RCTs, cluster RCTs, Step-Wedge designs with random time allocation

Stage 2: Identifying Relevant Studies

The second stage of a scoping review involves a decision plan on the search strategy and the inclusion and exclusion criteria for studies. Our search will be an iterative process, as we strive to achieve a balance between breadth, comprehensiveness, and feasibility without compromising our ability to answer the research questions (Levac et al., 2010).

Search Methods. The literature search will be conducted on the following electronic databases: ERIC, CINCH, PsycINFO and MEDLINE. These databases were chosen to ensure a comprehensive sample of literature from health, social science, criminology and education are included. The grey literature search will include searches for reference lists of all relevant studies found through the database searches will be assessed to determine eligibility and possible inclusion in the scoping review. All citations identified throughout the search will be imported into the online systematic review application Covidence for appropriate screening. The complete search syntax for each database is detailed in Appendix A.

Inclusion and Exclusion criteria. Studies will be included if they meet the PICOTS table 1 criteria defined in Stage 1. There will be no restrictions placed on publication year as we aim to conduct a comprehensive search of the literature. References of the original Cochrane review (Wooldenden et al., 2001) will be cross checked. There will be no limits on the language and country of publication. The first stage of the current search will only include controlled trials.

Studies that exclusively evaluated interventions or programmes designed for youth with sexual and substance use offences without a corresponding diagnosis or indication of other conduct problems will be excluded as they are often specialised treatment approaches. Also excluded were studies evaluating the effectiveness of interventions designed to address Oppositional Defiant Disorder (ODD) as ODD does not meet the threshold of more severe conduct issues.

Outcome Measures.

Primary Outcome Measures. To be included in the current review, studies must include a primary outcome measure that was measured before and after treatment or intervention occurred. Primary outcomes were based on individual behavioural characteristics, determined via a behavioural measurement, through psychometrics, interviews with youth or others (e.g., teachers, parents), direct observations, or were determined through the legal system (i.e., re-offending, re-imprisonment, and other sentencing such as probation, community service, court ordered diversions to behavioural, or substance use treatment).

Secondary Outcome Measures. If studies only included secondary outcome measures, without the presence of the primary outcome, they will be excluded. Secondary outcome measures include factors such as, but not limited to, family functioning (i.e., parent-child relations, sibling delinquency or sibling relations), parenting (i.e., parental mental health, parenting skills) and/or long-term outcomes for the child (i.e., academic performance, school attendance, future employment, or peer relations).

Stage 3: Study Selection

Screening round 1: Titles and Abstracts. The first part of study selection consists of a title and abstract scan using Covidence software. Two reviewers (VL, SW) will independently screen the titles and abstracts of the studies retrieved from the search by applying the inclusion/exclusion criteria. The aim is to eliminate studies that are irrelevant to our scoping review objectives and research questions. If the eligibility of a study is unclear at this stage, the full text will be retrieved to determine its selection. The two reviewers will meet before and after the screening process to discuss any obstacles and uncertainties related to study selection and refine the search strategy as needed. If there are disagreements on study selection between the two reviewers, a third reviewer (M-TS) will be consulted to determine

the inclusion/exclusion of studies. All instances of disagreements and outcomes will be recorded.

Screening round 2: Full-text assessment. The second part of study selection involves the full text retrieval of eligible studies identified from the title and abstracts scan. Two reviewers (VL, SW) will independently assess the full-text of the studies to determine eligibility for final full inclusion. Disagreements will be resolved by a third reviewer (M-TS) as required. Reasons for exclusion at this stage will be clearly documented. Following the PRISMA guidelines, a flowchart will be developed to demonstrate the study selection process and decisions at each stage of the review.

Stage 4: Charting the Data (Data Extraction)

The goal of stage 4 is to chart relevant information of each included study. The data charting form was collaboratively developed by our research team following Arksey and O'Malley (2005) Arksey and O'Malley (2005)framework and the Cochrane data extraction form template (Higgins, 2019). Two reviewers (VL, SW) will independently extract data for the first five to ten included studies and meet to compare and evaluate the consistency of data charting and extraction process. This is to ensure the approach to data extraction is in line with our research questions and objectives. The blank data extraction form is detailed in Appendix B.

Stage 5: Collating, Summarising, and Reporting the Results

The next stage of the scoping review involves collating, summarising and reporting the results collected in stage 4 charting. As per Arksey and O'Malley's (2005) framework, the analysis of results should include: (i) a numerical summary of included studies; and (ii) a qualitative thematic analysis. The numerical analysis should describe basic characteristics of included studies, for example; study design, intervention type, study populations and geographical location. Data will be extracted from the charting form and will be collated to

produce descriptive tables outlining these key features. In terms of thematic analysis, Braun and Clarke's (2006) method for coding data will be followed, allowing for a wide range of data and analytical options. There must be a consistent approach to reporting relevant findings, enabling comparisons across intervention types and gaps in the literature to be identified (Arksey & O'Malley, 2005). Two reviewers (VL, SW) will be responsible for this stage of the scoping review, however meetings with the entire review team will occur to discuss and agree on thematic analysis.

Strengths of the study and gaps in the existing research should be outlined following thematic analysis. Identifying gaps in the literature will assess the need for a future systematic review or meta-analysis. Finally, the implications of current findings within the broader context must be considered and included.

Stage 6: Consultation

The final stage in conducting a scoping review involves the consultation with key stakeholders. Arksey and O'Malley (2005) propose this as an optional stage, whereas Levac et al. (2010) propose this stage as essential in enhancing the validity of the study and providing additional insights into findings. The current scoping review involved consultation with two internationally recognised Clinical Psychologists whose research specialises in the implementation of evidence-based practices and core elements of treatments that target complex child and/or adolescent behaviour. Their knowledge has provided expertise and new perspectives on common elements and taxonomy of interventions, and will continue to provide further insight on our findings as the review continues. The bulk of the consultation stage will occur in the upcoming identification of common elements and meta-analysis.

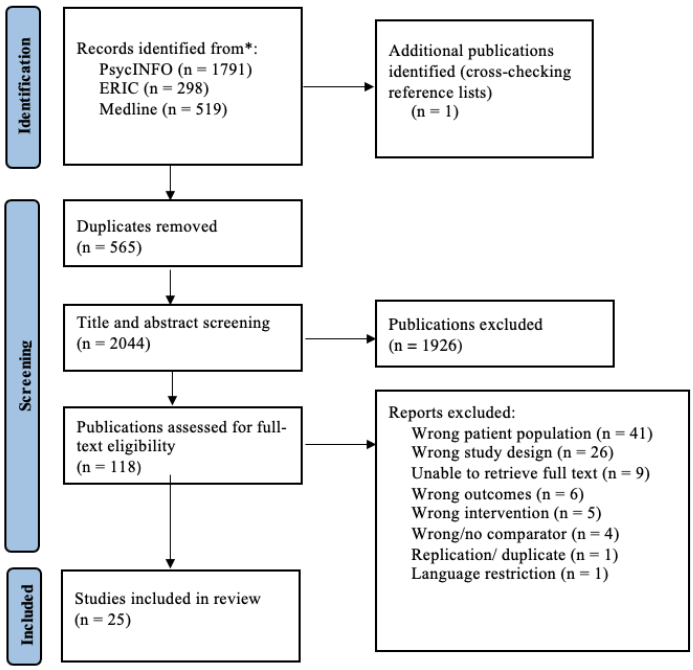
Chapter Three: Results

Publication Selection

The current literature search yielded 2608 studies for title and abstract review: 1791 from the PsycINFO database, 298 in ERIC and 519 in Medline. After duplicates were removed, this left 2044 studies to screen in the title and abstract stage. There were 118 full-text studies assessed for eligibility, however, 93 were then excluded due to specific inclusion and exclusion criteria outlined in the methodology section. Twenty-five studies were included in the final analysis, however, many of these reports included additional follow-up studies or studies with the same population. Thus, they were collated and merged as one singular study. Appendix C presents a summary of all included RCT studies in the current scoping analysis, denoting the primary study for those with multiple relevant studies. Appendix D outlines the characteristics of all excluded studies in the full-text review stage. The flow-chart of the study selection is summarised in figure 1.

Figure 1

PRISMA flow-chart of study selection process



Study Characteristics

The key study characteristics of the twenty-five included studies are described in Table 2 and 3. All included studies were peer-reviewed journal articles, published from 1983 (Emshoff & Blakely, 1983) to 2021 (Gan et al., 2021). Sample size varied from thirty-five participants (Westermark et al., 2011) to 917 participants (Sexton et al., 2011). In terms of gender representation, three articles had only male participants, and one study had just female participants. Almost all of the remaining studies had a skew towards greater numbers of male participants compared to female participants, with the exception of Hogue et al. (2020) which had 107 males and 98 females, and Westermark et al. (2011), which had 18 males and 17 female; which is considerably more equal in gender representation. Age of participants was fairly consistent across studies and ranged from 10 to 19 years. Although the inclusion criteria for the current review was 10-17 years, a study was considered if greater than 60% of their population was in this range. This is why age ranges of 13-18 years or 14-19 years were included. Appendix E outlines the key characteristics of all included studies in the full-text review stage. Sixteen included studies were drawn from the USA; however, a range of United Kingdom and European (The Netherlands, Germany, Sweden, Norway) studies were also included. Only one study was completed in a non-Western country, that being Gan et al. (2021) from Singapore. All of these are classified as high-income countries; however, a range of ethnicities were included in the given studies.

The majority of participants had been referred to studies for intervention due to ongoing involvement with their local justice systems due to chronic offending, arrests or delinquency. One study (Westermark et al., 2011) recruited participants who met diagnostic criteria for CD and were at risk for out-of-home placements. Only one study (Weiss et al., 2013) recruited participants from a school perspective, youth who were contained in behaviour intervention classrooms.

Table 2

Summary of study characteristics

Age ranges	
10-17 years	1
11-17 years	3
11- 18 years	1
12-17 years	5
12-18 years	3
13-17 years	3
13-18 years	2
14-19 years	1
Age not specified	6
Country	
USA	16
The Netherlands	1
Germany	1
UK	3
Singapore	1
Norway	1
Sweden	2
Demographics	
Male	3
Female	1
Male & Female	21
Year	
1981-1990	1
1991-2000	6
2001-2010	7
2011-2020	10
2021	1
Intervention Used	
MST	10
MTFC	3
FFT	4
WA	2
Other	6

Table 3

Study and participant characteristics of included empirical studies

Author(s)	n	Gender	Age	Country & Ethnicity	Referral Characteristics
Asscher et al. (2013)	*n* = 256	*n* = 188 boys, *n* = 68 girls	12-18 years (M = 16.02)	The Netherlands; Dutch (55%); Moroccan (34%); Surinamese (32%)	Referred by Child Protection Council, juvenile judges, social workers and GPS as they met criteria for MST; 71% of participants had been arrested at least once
Azrin et al. (2001)	*n = 56*	*n* = 46 male, *n* = 10 female	12- 17 years M = 15.4	USA; 21% were ethnic minority status	Referred by juvenile detention centre staff, judges, probation officers and school administrators; DSM-IV diagnosis of CD and Substance Abuse/Dependence
Bank et al. (1991)	*n = 55*	*N* = 55 male	M = 14 (no older than 16)	Germany	Referred by Juvenile Court; minimum of 2 recorded offences
Borduin et al. (1995)	*n* = 176	67.5% male	12-17 years (M = 14.8)	USA	Referrals made for youth that had at least 2 arrests by juvenile court personnel
Butler et al. (2011)	*n* = 108	*n* = 89 male, *n* = 19 female	13-17 years	UK	Consecutive referrals from two local youth offending services; average of two offences at intake (range 0-6)
Carney & Buttell (2007)	*n* = 141	62% male	Youth 17 and under (M = 14.8)	USA; 48% African American	Youth court-ordered into community-based treatment programs
Chamberlain & Reid (1998)	*n* = 79	All male	12-17 years (M = 14.9)	USA; 85% White	History of serious and chronic delinquency who were referred for community placement by the juvenile justice system (average of 14 criminal referrals each)
Coldiron et al. (2019)	*n* = 65	*n* = 31 male, *n* = 16 female	14-19 years (M = 16.0)	USA; 63.8% African American	Dually involved youth in both DCF and DJJ services; average of 3-4 arrests
Dakof et al. (2015)	*n = 112*	Male = 88%	13 - 18 years (M = 16.1)	USA; Hispanic = 59%, African American = 35%	Enrolled in juvenile drug court
Dembo et al. (2000)	*n* = 303	55% male	M = 15 years	USA; 59% Anglo, 39% African American	Youth processed at the Hillsborough County Juvenile Assessment Center (JEC) for one or more charges.
Emshoff & Blakely (1983)	*n* = 73	Two-thirds male	M = 14.5 years	USA; 2/3 white	Youth referred has committed serious misdemeanours or nonserious felonies
Fonagy et al. (2018)	*n* = 684	Male & female	11-17 years	UK	Participants met at least one indicator of antisocial behaviour
Gan et al. (2021)	*n = 120*	*n* = 107 male, *n* = 13 female	13-18 years (M = 16.2)	Singapore	Community probation youth
Gottfredson et al. (2018)	*n* = 129	All males	11-17 years	USA; 80% African American	Juvenile justice-involved youth; judge ordered ‘family services’ as probation condition
Henggeler et al. (1992)	*n* = 84	*n* = 65 male, *n* = 19 female	M = 15.2 years	USA; 56% African American	Serious juvenile offenders; average of 3.5 previous arrests
Henggeler et al. (1997)	*n* = 155	*n* = 127 male, *n* = 28 female	11-17 years	USA; 80.6% were African American	Juvenile offenders who have committed a serious criminal offense or have three prior criminal offenses other than status offences
Hogue et al. (2015)	*n* = 205	*n* = 107 male, *n* = 98 female	12-18 years	USA	MH track: youth met DSM-IV criteria for CD or ODD SU track: DSM-IV symptoms of Substance Dependence/Abuse

Humayun et al. (2017)	*n* = 111	*n* = 78 male, *n* = 33 female	10-17 years	UK; 90% White	Youth had been sentenced for offending or were receiving agency intervention following contact with police
Leve et al. (2005)	*n* = 81	100% female	13-17 years	USA; 74% Caucasian	Chronic delinquents; lifetime average of 11.9 criminal referrals
Ogden et al. (2004)	*n* = 100	*n* = *63* male, *n* = 37 female	12-17 years	Norway	Referred for services for a range of problems (44% referred for 3+ problems), e.g., emotional disturbance, status offences, substance abuse, criminal offences, school expulsions, harm to self or other
Sexton et al. (2010)	*n* = 917	*n* = 724 male, *n* = 193 female	13-17 years	USA; 78% White,	Youth offenders who had been remanded for probation services
Sundell et al. (2008)	*n* = 156	*n* = *95* male, *n* =61 female	12 – 17 years	Sweden; 47% not of Swedish heritage	Met diagnostic criteria for CD, 67% had been arrested at least once
Timmons-Mitchell et al. (2006)	*n* = 93	*n* = 73 male, *n* =20 female	M = 15.1 years	USA; 77.5% European American	Justice involved youth who were recruited if they met inclusion criteria
Weiss et al. (2013)	*n* = 164	*n* = 136 male, *n* =28 female	11–18-year-olds	USA; 60% African American	Youth with serious conduct problems, who were in self-contained behaviour intervention classrooms
Westermark et al. (2011)	*n* = 35	*n* = 18 male, *n* =17 female	12- 18 youth	Sweden	Clinical diagnosis of CD and were at risk of out-of-home placement

Main Findings

The aims, key conclusion(s), and context of included studies are outlined in Appendix E. Five studies specifically outlined conduct disorder as their context for intervention, with participants having to meet a DSM-IV/V diagnosis of CD or having serious conduct problems (Weiss et al., 2013). Only one study (Fonagy et al., 2018) outlined their context as youth that either had a diagnosis of CD or that had offended. The remaining 19 studies emphasised offending and juvenile delinquency as their context for intervention. All aims in some manner discussed examining the effectiveness or results of a specific intervention compared to a control, in contributing to changes in conduct problems, offending or incarceration rates, probation, foster care involvement or recidivism.

It must be noted that scoping reviews do not extend to estimating treatment effect sizes. The use of 'vote counting' that is occasionally used in meta-analyses or Cochrane reviews was not used in this review. This is due to the subjective nature of decision making in comparing 'positive' and 'negative' studies to determine an effect, and because vote counting does not account for differences in weights of each study (Higgins & Thomas, 2022). This review focused on suggestions of effectiveness, however, a formal synthesis of quality design and appropriate weighting of studies by sample size, length of follow-up, differences in population or comparator conditions is required. The following findings highlights statistically significant treatment effects, without regards to effect size. Key conclusions, as depicted in Appendix E, demonstrated that overall family and /or parenting-based interventions produced better outcomes by decreasing offending or conduct problems in comparison to the control treatment. Specific studies supported the effectiveness of MST in all but two studies (Fonagy et al., 2018; Sundell et al., 2008). Studies that intervened with MTFC consistently reported favourable outcomes. Earlier studies that utilised parent-training (Bank et al., 1991), family behavioural therapy (Azrin et al., 2001), broad-based interventions

(Emshoff & Blakely, 1983) and family empowerment interventions (Dembo et al., 2000) showed preferable outcomes than their control. Wraparound interventions produced mixed results in terms of significant differences to TAU, however, wraparound services did decrease the likelihood of subsequent delinquent behaviours (Carney & Buttell, 2003). The most inconsistent treatment results were to do with FFT, whereby its reported effectiveness was only supported in half of the relevant studies.

Outcome Measures

Table 4 outlines the key primary and secondary outcome measurements of each study and their corresponding measure type (i.e. official offending records, psychometric, observation or semi-structured interview). A multitude of methods or psychometric assessments were used to examine severe and persistent conduct problems in this review. In terms of primary outcomes, common themes were associated with measuring juvenile justice outcomes, delinquent behaviours, or youth problem behaviours. 17 studies measured delinquent behaviours via arrest and offending records, recidivism rates and criminal referral or incarceration histories. These were obtained from the young person's local Juvenile Justice departments, police departments or court data. Twelve studies used the cross-informant Achenbach System of Empirically Based Assessment (ASEBA) scales, namely the caregiver-report CBCL and self-report YSR. The Self-Reported Delinquency scale (SRD) was also a prominent measure, nine studies using this assessment.

All except three studies (Bank et al., 1991, Coldiron et al., 2019; Sexton et al., 2010), utilised a multi-modal or multi-informant approach to assess primary outcomes. That is, more than one methodology was conducted, often a range of psychometric assessments, official records and interviews or observations were used with parents and the youth in question to further emphasise the behavioural problem. The length of time for follow-ups of outcomes

varied for each study. However, the most common follow-up times were six, twelve and eighteen months post intervention finishing. The longest follow-up time was four years (Borduin et al., 1995).

Although not the central focus of the current scoping review, secondary outcomes were examined in 20 studies. Specifically, family factors, including family relations, satisfaction and functioning, parenting factors such as parenting skills, monitoring, parent-child relationship and interactions, parental mental health, peer relations and social competence, youth drug use, school attendance and problem-solving skills were the most common identified secondary outcomes. Eight studies reported an effect on family functioning outcomes (Azrin et al., 2001; Bank et al., 1991; Borduin et al.,1995; Gan et al., 2021; Henggeler et al., 1992; Henggeler et al., 1997; Ogden et al., 2004; Weiss et al., 2013), six studies reported on peer relations or social competence (Asscher et al., 2013; Borduin et al., 1995; Henggeler et al., 1992; Henggeler et al., 1997; Odgen et al., 2004; Sundell et al., 2008) and eight studies examined parenting factors or parental mental health (Asscher et al., 2013; Fonagy et al., 2018; Henggeler et al., 1992; Henggeler et al., 1997; Humayun et al., 2017; Sundell et al., 2008; Weiss et al., 2013 & Westermark et al., 2011).

Table 4

Outcome measures and terminology

Author(s)	Primary outcome measure	Measure Type	Time to follow-up	Secondary Outcomes	Terminology
Asscher et al. (2013)	*Externalising behaviour* subscale of CBCL	Psychometric	Mean = 5.72 months (immediately after intervention)	Parent and adolescent cognitions Parenting Peer relationships Treatment adherence	Severe and violent antisocial behaviour
	DSM symptoms scales for behavioural problems assessed with Disruptive Behaviours Disorder rating scales	Psychometric			
	Violent offending and *Property offences* subscales of SRD	Psychometric			
Azrin et al. (2001)	Parent Version-Child Assessment Schedule (P-CAS)	Structured clinical interview	Immediately post and six month follow-up	Youth Drug Use History Problem Solving Skills Measures of Mood, Personal and Family Satisfaction	Conduct problems
	Structured Clinical Interview for DSM-IV (SCID-IV)	Structured clinical interview			
	Arrest history records	Offending records			
	CBCL (*delinquency, externalising, internalising school and total scales used)*	Psychometric Psychometric			
	YSR	Psychometric			
	ECBI	Psychometric			
	SESBI				
Bank et al. (1991)	Official Offense Reports Institution time	Offending records	6 month follow-up	Family Measures	Chronically offending delinquent
Borduin et al. (1995)	Criminal activity (probation, arrest rates)	Offending records	4 years	Family relations Peer relations	Serious juvenile offending
	Adolescent behaviour problems (Revised Behaviour Problem Checklist – *RBPC)*	Psychometric			
	SCL-90 (psychiatric symptomology)	Psychometric			
Butler et al. (2011)	Offending behaviour (police records of custodial sentences)	Offending records	6-month intervals	n/s	Youth offending
	SRYB	Psychometric			
	YSR (Delinquency and aggression subscales)	Psychometric			
	ABAS	Psychometric			
	APSD	Psychometric			
Carney & Buttell (2003)	Recidivism (via interviews with parents on child delinquent behaviour, school attendance, runaway instances and court rearrest data)	Offending rates, interviews	6,12, 18 month follow-up	n/s	Delinquent youth

Chamberlain & Reid (1998)	Records on the number of days youth were in care, on the run, in detention or in the state training school Delinquent and criminal activities (official criminal referral data) *EBC* General Delinquency Index (*general delinquency, index offences and felony assaults subscales)*	Offending records Offending records Psychometric Psychometric	Every 2 months 6 month intervals	n/s	Chronic and serious juvenile delinquency
Coldiron et al. (2019)	Juvenile justice outcomes (offence and arrest rates)	Offending records	Follow-up = 20 months	Child welfare outcomes Educational outcomes	Serious emotional disturbance
Dakof et al. (2015)	National Youth Survey SRD (*general delinquency and index offenses subscales)* YSR (*externalising subscale)* Arrests rates	 Psychometric Psychometric Offending records	 6 month follow-ups	Substance use	Delinquency and externalising symptoms
Dembo et al. (2000)	Number of Arrests EBC	Offending records Psychometric	12 months	Emotional/Psychological Functioning (SCL-90) Self-Reported Alcohol, and Illicit Drug Use	Youth offending
Emshoff & Blakely (1983)	Delinquent activities (police and court data, self-reported delinquent behaviour via interviews) Psychometrics not explicitly stated	Offending records, interviews, psychometrics	3 month intervals	School attendance	Delinquent youth
Fonagy et al. (2018)	Offence records (Police National Computer and Young Offender information System) *YSR;SDQ; ABAS*	Offending records Psychometrics	6, 12 and 18-months	Out-of-home placement Psychiatric outcomes Parenting skills and family functioning	Antisocial behaviour
Gan et al. (2021)	Probation completion (official case closure reports) YSR	Offending records Psychometric	Approx. 9.82 months	Family functioning	Youth offenders
Gottfredson et al. (2018)	Youth delinquency	Offending records & Interviews with youth and parents	18-month period 6 months post-randomisation	Youth substance use Family functioning Youth peer relationships Parent behaviour Constructive time use	Mental, emotional, and behavioural (MEB) disorders
Henggeler et al. (1992)	Criminal behaviour and incarceration (archival records – post referral arrests and incarceration)	Offending records	1.7 years	Family relations Peer relations	Serious behaviour problems; juvenile offenders

	SRD	Psychometric		Adolescent symptomatology Parental symptomology Adolescent social competence	
Henggeler et al. (1997)	Criminal activity *SRD*	Offending records Psychometric	1.7 years	Family relations Peer relations Adolescent emotional adjustment Parental emotional adjustment Parental monitoring MST treatment adherence	Chronic or violent juvenile offending
Hogue et al. (2015)	*Externalising and internalising behaviour* subscales of *CBCL* *SRD*	Psychometric Psychometric	3, 6, 12 months post-baseline	Substance Use	Adolescent behaviour problems
Humayun et al. (2017)	*SRD* Criminal activity APACS (symptoms of CD or ODD)	Psychometric Offending records Semi-structured interview	6 and 18 month follow-ups	Parent youth relationship Parent-youth interactions	Youth offending and antisocial behaviour
Leve et al. (2005)	Days in locked settings, criminal referrals CBCL (*delinquency subscale)* *SRD*	Offending records Psychometric Psychometric	12 months	n/s	Serious and chronic delinquency
Ogden et al. (2004)	*Externalising scale* of CBCL *SRD*	Psychometric Psychometric	6 months	Social competence (SCPQ, SSRS, CBCL) Family adaptability, satisfaction Out of home placement	Serious behaviour problems
Sexton et al. (2010)	Recidivism	Offending records	12 months	Treatment adherence	High-risk behaviour disordered youth
Sundell et al. (2008)	*CBCL; YSR (total, externalising and internalising subscales)* *SRD*	Psychometric Psychometric	7 months	Sense of Coherence Youth substance use Youth social competence Parenting skills Mother's mental health School attendance	Conduct-disordered youth
Timmons-Mitchell et al. (2006)	Recidivism, official charges Youth functioning (CAFAS)	Offending records Psychometric	18-months 6-months	n/s	Juvenile justice involved youth

Weiss et al. (2013)	CBCL, YSR (*externalising subscale)* Criminal charges *SRD*	Psychometric Offending records Psychometric	18 months	Family relationships Parenting behaviours Parental mental health	Serious conduct problems
Westermark et al. (2011)	CBCL, YSR (*externalising subscale)*	Psychometric	24-months	Mother's mental well-being	Serious behavioural problems

Note: n/s = not stated

ABAS: Antisocial Beliefs and Attitudes Scales

APSD: Antisocial Process Screening Device

CBCL: Child Behaviour Checklist

EBC: Elliot Behaviour Checklist

SRD: Self-Reported Delinquency Scale

YSR: Youth Self-Report scale (CBCL)

ECBI: Eyberg Child Behaviour Inventory

SESBI: Sutter-Eyberg Student Behaviour Inventory

SRYB: Self-Report of Youth Behaviour

Terminology Used

Table 4 also outlines the range of terminology used by study authors to describe and refer to severe and persistent conduct problems. It is evident that a diversity of phrases were used to explain problem behaviour. Nine studies used the word 'offending' in their terms, whereas six studies included 'delinquent' or 'delinquency' as part of their key terminology to describe problem behaviour. Ten studies used the terms 'severe', 'serious' or 'chronic' to accentuate the severity and extent of the ongoing behaviour. Only two studies referred to such behaviour as 'antisocial behaviour' (Humayun et al., 2017l; Fonagy et al., 2018). Three studies used 'conduct' in their terminology, e.g., 'conduct problems' (Azrin et al., 2001; Weiss et al., 2013) or 'conduct-disordered youth' (Sundell et al., 2008). Four studies (Westermark et al., 2011; Ogden et al., 2004; Hogue et al., 2015; Henggeler et al., 1992) referred to the issue as 'serious behaviour problems' or 'adolescent behaviour problems.' Only one study (Coldiron et al., 2019) used the term 'serious emotional disturbance.' To highlight the specific age range, nine studies used the term 'youth', four studies utilised the term 'juvenile', and one study used 'adolescent' in their terminology. One study referred to behaviour as 'externalising symptoms' (Dakof et al., 2015). Thus, there is a range of distinct terms to refer to the current behaviours in question.

Interventions Included and their Comparator

Table 5 characterises the main intervention examined by each study, the length of said intervention, if there was a relevant protocol or manual and the comparator that was used as required for an RCT. Ten studies examined Multisystemic Therapy (MST), which includes a relevant manual to guide other researchers and clinicians. All MST studies compared MST to a treatment as usual (TAU) group, explained as 'usual services' in the relevant region. TAU can encompass a range of individual, family-based treatments or other treatments that are practiced in the juvenile justice system (i.e., probation, curfews, participation with other

agencies). Not all studies discussed the length of MST, however, on average, treatment ranged from 3-12 months.

Three studies considered Multidimensional Treatment Foster Care (MTFC), that was always compared to community-based, or group care control conditions. Four studies examined Functional Family Therapy (FFT). Two studies (Carney & Buttlell, 2003; Coldiron et al., 2019) examined Wraparound services and one set of studies looked at a Family Empowerment Intervention (FEI) (Dembo et al., 2000). Earlier studies such as Emshoff and Blakely (1983) analysed treatment as a 'family condition', parent training in Bank et al. (1991) study or Family Behaviour Therapy (FBT) in Azrin et al. (2001), highlighting the beginnings of examining family or parenting-based interventions as an RCT. This was before specific, manualised interventions such as MST and FFT were developed. Almost all studies, with the exception of three (Gottfredson et al., 2018; Dembo et al., 2000; Carney & Buttell, 2003) discussed the treatment integrity and/or treatment fidelity of their included intervention.

In terms of comparator conditions, fifteen studies had a comparator condition as some form of TAU. Descriptors of TAU included, management as usual (MAU), usual child welfare services, or 'conventional' services. TAU services included any intervention method that would commonly be used in the corresponding nation, instead of the specific family or parenting intervention. For example, individual or cognitive behavioural treatments, other family-based or community interventions, child welfare-related services, including residential care, foster-care or group-care/ therapy, juvenile probation services, case management services, or received court orders including one or more stipulations, e.g., curfew, school attendance, participation with other agencies were used as comparators.

Table 5

Intervention used and treatment integrity

Author(s)	Intervention type	Manual/ Protocol?	Length of intervention	Comparison Intervention	Treatment integrity discussed?
Asscher et al. (2013)	MST	Y	Average of 5.7 months	TAU	Yes
Azrin et al. (2001)	FBT	N	15 sessions over 6 months	Individual- Cognitive Problem-Solving (ICPS)	Yes
Bank et al. (1991)	Parent Training	N	Mean: 44.8 hours	Usual Treatment (community control)	No
Butler et al. (2011)	MST	Y	11-30 weeks (M = 20.4 weeks)	Youth Offending Treatment (YOT) (usual services)	Yes
Borduin et al. (1995)	MST	Y	Mean: 23.9 hours	Usual treatment (Individual therapy)	Yes
Carney & Buttell (2003)	WA approach	N	Wraparound service team remains in place until problems are resolved, the youth quits, turns 18 or moves out of the country	Conventional services	No
Chamberlain & Reid (1998)	MTFC	Y	n/s	Community-based group-care	Yes
Coldiron et al. (2019)	WA approach	N	n/s	TAU	Yes
Dakof et al. (2015)	MDFT	Y	4-6 months; 2 sessions per week	Adolescent Group Therapy (AGT)	Yes
Dembo et al. (2000)	Family Empowerment Intervention (FEI)	N	n/s	Extended Services Intervention (ESI)	No
Emshoff & Blakely (1983)	Family condition	N	18 weeks	Multi-focus condition	Yes
Fonagy et al. (2018)	MST	Y	3-5 months (3 sessions per week)	MAU	Yes
Gan et al. (2021)	FFT	Y	Average of 4.7 months; 12 sessions	TAU (attending programs addressing offense or family related needs)	Yes
Gottfredson et al. (2018)	FFT-G (focus on gang involvement)	Y	0-6.3 months (m= 2.6)	Family Therapy Treatment Program	No
Henggeler et al. (1992)	MST	Y	Average of 13.4 weeks	TAU	Yes
Henggeler et al. (1997)	MST	Y	116.6 – 122.6 hours	TAU	Yes
Hogue et al. (2015)	Usual-Care Family Therapy (UC-FT)	Y (but not used)	8.7 sessions	Usual Care- Other	Yes
Humayun et al. (2017)	FFT + MAU	Y	12 sessions across 3-6 months	MAU	Yes
Leve et al. (2005)	MTFC	Y	n/s	Group Care	Yes
Ogden et al. (2004)	MST	Y	n/s	Usual Child Welfare Services (CS)	Yes
Sexton et al. (2010)	FFT	Y	3-6 months (12 sessions)	TAU	Yes
Sundell et al. (2008)	MST	Y	145.8 days	TAU	Yes
Timmons-Mitchell et al. (2006)	MST	Y	Average of 144.84 days	TAU	Yes

Weiss et al. (2013)	MST	Y	n/s	TAU	Yes
Westermark et al. (2011)	MTFC	Y	n/s	TAU	Yes

Note: n/s = not stated
FBT: Family Behaviour Therapy
FFT: Functional Family Therapy
MAU: Management as Usual
MDFT: Multidimensional Family Therapy
MST: Multisystemic Therapy
MTFC: Multidimensional Treatment Foster Care
TAU: Treatment as Usual
WA: Wraparound

Strengths and Limitations (as reported by study authors)

Results of the quality assessment are presented in Table 6. One of the most common methodological limitations reported by authors was an insufficient sample size, contributing to a lack of difference between treatment groups or as having insufficient power to determine treatment effects. A few studies also discussed a limitation in assessing treatment integrity, which relied on a sole measure (Asscher et al., 2013) or the limitations of measures for therapist adherence (Sexton et al., 2010). Therapists themselves were also discussed as a limitation, in terms of staff burnout (Bank et al., 1991), therapist motivation and commitment (Borduin et al., 1995) and a lack of representation for all staff in the wider population (Hogue et al., 2015). Additionally, many studies discussed their concerns over a lack of generalisability of their findings to wider populations and other areas (Timmons-Mitchell et al., 2006; Gottfredsen et al., 2018; Dakof et al., 2015; Chamberlain et al., 2007; Carney & Buttell, 2003). Further limitations highlighted that results were the first of its kind and needs additional research. Five studies did not discuss any limitations.

A range of studies discussed their methodological strengths in terms of being the first RCT to investigate effectiveness of MST, MTFC or FFT in a country other than USA, where the intervention was first established (i.e., Singapore, Sweden, the Netherlands). Authors concluded that this was a strength in adding to the generalisability of the relevant intervention outside the USA. Many studies also discussed their strengths in using a multi-informant, multimodal methodology, adding to a study's comprehensive assessment nature. Eight studies did not discuss any strengths of their study.

Ten out of 29 studies analysed attrition rates. Attrition refers to the loss of participants from a sample, contributing to incomplete outcome data. Attrition rates were higher as follow-up assessments increased. That is, a 24-month follow-up assessment had a greater attrition rate in studies than in a 12-month follow-up assessment.

Table 6

Strengths and limitations of included publications (as discussed by authors)

Author(s)	Was attrition discussed?	Strengths as identified by authors	Limitations as identified by authors
Asscher et al. (2013)	No	First RCT of MST in a Dutch sample, Large sample size compared to previous MST trials, Youth and parent reports.	Focused on the short-term effectiveness of intervention, follow-ups occurred immediately after treatment, Power of some subgroups may have been too low to detect accurate effects (e.g. small sample of females), Reliance on one measure to assess treatment integrity.
Azrin et al. (2001)	No	Included a combination of features rarely found in all studies.	Lack of difference between treatments may be due to insufficient power, or large within group heterogeneity and variance.
Bank et al. (1991)	No	n/s	Considerable effort to prevent staff burnout.
Borduin et al. (1995)		Favourable results most probably due to comprehensive nature of MST and ecologically valid delivery.	Comparison treatment was neither comprehensive nor delivered in adolescents' natural ecologies, Therapist motivation and commitment.
Butler et al. (2011)	No	Frist RCT to evaluate effectiveness of MST in comparison to a well-structured alternative treatment.	Small sample size, insufficient power to detect more modest treatment effects across the 18-month follow-up period, Study was not designed to investigate adequately any treatment mechanisms.
Carney & Buttell (2003)	No	n/s	The three sites chosen for the study represented the main entry points for juvenile delinquent youth in the country. Analyses was conducted on 28.2% of the eligible youth within the country, meaning generalisability of findings is limited, Overrepresentation in the treatment group of youth who were already involved in case management services.
Chamberlain & Reid (1998)	No	n/s	Interventions occurred with only boys, in a metropolitan area, Only a small group of minority individuals (15%)
Coldiron et al. (2019)	No	n/s	Very small sample size, decreased power to detect true differences, Pilot nature of the study capped the possible sample size to 50 as the contract only allowed for 25 youth to initially be enrolled in the WA condition, Although the provider was very well-versed in the WA model and all the WA staff had prior experience, it may have been unrealistic to expect meaningful effects concurrent to initial installation.
Dakof et al. (2015)	Yes	Study methods were high-standard,	Only one community, generalisability cannot be assumed,

		Findings may be more able applied to other real-world settings, Rare, 24-month follow-up	Sample was primarily Hispanic, African American and male – results may not be easily generalisable to females or other races, Sample size was small.
Dembo et al. (2000)	No	n/s	n/s
Emshoff & Blakely (1983)	No	n/s	n/s
Fonagy et al. (2018)	No	Findings of the trial are generalisable to the UK population, Largest evaluation of the long-term effects of MST.	There was substantial attrition by 48 months on secondary outcomes, Most of the MST sites that took part in the trial had shut down by the 36-month follow-up point and the researchers could not contact the clinicians who had delivered the intervention.
Gan et al. (2021)	Yes	First independent RCT investigating FFT's effectiveness in a non-Western culture, Studied outcomes other than recidivism Cross-cultural transportability of FFT.	Caregiver-specific outcomes were not examined, Time points time 2 and time 3 psychometric data were not standardized, Unable to investigate the effects of case experience and therapist fidelity on client outcomes.
Gottfredson et al. (2018)	Yes	Comprehensive nature and ecologically valid delivery.	20% of FFT-G subjects did not receive FFT-G and 21% of control subjected FFT. Contamination most likely resulted in an understatement of FFT-G effects because subjects were treated in all analyses according to condition assignment, Limited to males and one city, lacks generalisability to other groups, Longer-term follow-up interviews.
Henggeler et al. (1992)	Yes	n/s	No follow-up on psychosocial measures, No evaluation of treatment process, Alternative treatment control-factors (e.g., observational measures of parent-adolescent interaction, school performance) were not assessed.
Henggeler et al. (1997)	Yes	The effects of treatment adherence and fidelity were explored.	n/s
Hogue et al. (2015)	Yes	High ecological validity, generalisability of findings to real-world practice, Use of randomisation strengthened internal validity.	Only one site practice FT, impossible to fully separate condition effects, Did not pursue cost-benefit analyses, Number of participating sites was too small to control for site clustering effects, Participating therapists may not have been representative of all staff, not randomly assigned to conditions.
Humayun et al. (2017)	No	First RCT of FFT outside the USA independent of program developers, Reasonably large sample, high rates of retention, Multimethod, multi-informant assessment methods,	Fidelity was low, Number of cases therapists saw over the course of the study was relatively low.

		Experienced family therapists, trained by program developer and team in the USA.	
Leve et al (2005)	No	Study conducted on girls, adds to sparse literature on this group.	Small sample size, Majority of participating girls were Caucasian, lacks generalisability for entire female juvenile justice population), Findings are the first of their kind and need to be replicated.
Ogden et al. (2004)	Yes	n/s	Some measures may not be directly comparable to English counterparts, Outcomes were only assessed immediately post-treatment for MST.
Sexton et al. (2010)	No	Largest single RCT of FFT, First study conducted by community-based practitioners in a community setting.	The method used to measure therapist adherence also had methodological weaknesses; validity and reliability of the ratings relied on supervision by an FFT model expert, Measures of therapist model adherence also had limitations.
Sundell et al. (2008)	Yes	n/s	n/s
Timmons-Mitchell et al. (2006)	No	First independent effectiveness trial of MST in the US, Study methodology and results may be of interest to researchers, clinicians, and policymakers.	Sample size insufficient to allow for investigation of possible mediators, Measures restricted to only key outcomes, Generalisability concerns; the court and areas that administered MST not representative of areas that might use MST.
Weiss et al. (2013)	No	Multi-informant, multi-system assessment, First US study of non-court-referred adolescents with serious conduct problems, Treatment fidelity observed.	n/s
Westermark et al. (2011)	Yes	First RCT of MTFC outside the USA.	Small sample size (due to the size of the treatment facility), All results based on self-declarations.

Note: n/s = not stated

Critical Appraisal

Table 7 outlines the Joanna Briggs Institute (JBI) critical appraisal checklist for RCTs. Appendix F displays the critical appraisal checklist that was filled out for each study (Tufanaru et al., 2020). The use of the JBI appraisal tool allows for an effective assessment of the methodological quality of a study, such as potential risk of bias, blinding, sequence generation and allocation concealment. Although not a requirement for scoping reviews, analysis of literature and critique of study quality is an essential aspect of systematic reviews. Thus, the assessment of bias in the current review will assist in future research endeavours. Thirteen questions were included as a requirement of the checklist, and answered as either 'yes', 'no', or 'unclear.'

The main questions that were unclear in the majority of the studies were questions four, five and six. In terms of question four, "were participants blind to treatment assignment?" all but three studies were largely unclear. Only two reports specifically stated that participants were not blinded (Butler et al., 2011; Fonagy et al., 2018). For example, MST supervisors may have informed patients of their assignment (Butler et al., 2011) or stated that participants could not be masked (Fonagy et al., 2018). Gan et al. (2021) was the only study to discuss that their participants were blind to their treatment group allocation. Blinding of participants is completed to ensure that participants are not aware of the group they are receiving, removing the risk that they may behave differently and distort results (Tufanaru et al., 2020). However, this is often not possible or is much harder to in the case of psychological interventions compared to pharmacological trials and many studies report 'unclear' findings for blinding of participants in psychological interventions (Juul et al., 2021) which is what occurred in this review.

The nature of implementing the identified interventions would make blinding of clinicians or case managers involved in treatment very difficult or near impossible. This is

most probably why results of question five were largely unclear. In this sense, it is more important for outcome assessors (question six) to be blind to treatment assignment. When outcome assessors are not blind, there is risk that measurement of outcomes may be distorted (Tufanaru et al., 2020). For example, Dakof et al. (2015) stated that efforts were made to keep assessors blind to study hypothesis and treatment allocation.

A major concern was question one, "was true randomisation used for assignment of participants to treatment groups?" The very nature of this scoping review meant that specific inclusion criteria outlined the requirement of reports as an RCT. However, eight studies were either unclear or did not use true randomisation of participants. Whilst we know that all studies were 'randomised', questions are raised about the procedures used for randomisation in many instances.

Only two studies (Borduin et al., 1995; Coldiron et al., 2019) specifically stated that they did not perform intent-to- treat analyses. Coldiron et al. (2019) instead deciding to exclude youth from outcomes analyses who did not receive the intervention. However, participants were excluded due clearly stated reasons, such as moving countries after the randomisation process, refusing services or having been found ineligible for services after randomisation. The fact that this study clearly outlined their reasons to not analyse participants in the groups to which they were randomised is more beneficial than having unclear reporting.

Table 7

Joanna Briggs Institute (JBI) Critical Appraisal Checklist for included RCTs

Author (Year)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13
Asscher et al (2013)	Yes	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Azrin et al. (2001)	Yes	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes
Bank et al. (1991)	Yes	Unclear	Yes	Unclear	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Yes
Borduin et al. (1995)	Yes	Unclear	No	Unclear	Unclear	Unclear	Yes	Yes	No	Yes	Yes	Yes	Yes
Butler et al. (2011)	Yes	Yes	No	No	No	Unclear	Yes	No	Yes	Yes	Unclear	Yes	Yes
Carney & Buttell (2003)	Yes	Unclear	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Unclear	Yes	Yes	Yes	Yes
Chamberlain & Reid (1998)	Yes	Unclear	Yes	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Coldiron et al. (2019)	Unclear	Unclear	Yes	Unclear	Unclear	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Dakof et al. (2015)	Yes	Unclear	Yes	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dembo et al. (2000)	Unclear	Unclear	Yes	Unclear	Unclear	Unclear	Yes	Unclear	Yes	Yes	Yes	Yes	Yes
Emshoff & Blakely (1983)	Unclear	Unclear	Yes	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Unclear	Unclear
Fonagy et al. (2018)	Yes	Yes	Yes	No	Unclear	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes
Gan et al. (2021)	Yes	Yes	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Gottfredson et al. (2018)	Yes	Yes	Yes	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Unclear	Yes
Henggeler et al. (1992)	No	Unclear	Unclear	Unclear	Unclear	Unclear	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes
Henggeler et al. (1997)	No	No	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Unclear	Yes
Hogue et al. (2015)	Yes	Yes	No	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Humayun et al. (2017)	Yes	Yes	Yes	Unclear	Unclear	Unclear	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes
Leve et al. (2005)	Unclear	Unclear	Yes	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ogden et al (2004)	Yes	Unclear	Unclear	Unclear	Unclear	Unclear	Yes	Unclear	Yes	Yes	Yes	Unclear	Yes
Sexton & Turner (2010)	Yes	Yes	No	Unclear	Unclear	Unclear	Yes	Unclear	Yes	Yes	Yes	Unclear	Yes
Sundell et al. (2008)	Yes	Yes	Yes	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Timmons-Mitchell et al. (2006)	Yes	Yes	Yes	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weiss et al. (2013)	Unclear	Yes	Unclear	Unclear	No	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Westermark et al. (2011)	Unclear	Unclear	Yes	Unclear	Unclear	Unclear	Yes	Unclear	Yes	Yes	Yes	Yes	Yes

Note:
Q1: Was true randomization used for assignment of participants to treatment groups?
Q2: Was allocation to treatment groups concealed?
Q3: Were treatment groups similar at the baseline?
Q4: Were participants blind to treatment assignment?
Q5: Were those delivering treatment blind to treatment assignment?
Q6: Were outcomes assessors blind to treatment assignment?
Q7: Were treatment groups treated identically other than the intervention of interest?
Q8: Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?
Q9: Were participants analysed in the groups to which they were randomized? - ITT
Q10: Were outcomes measured in the same way for treatment groups?
Q11: Were outcomes measured in a reliable way?
Q12: Was appropriate statistical analysis used?
Q13: Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?

Chapter Four: Discussion

Purpose

The following chapter outlines the main contribution and analyses of findings from the results chapter. As mentioned, the methodology was done in combination with the author's research partner due to the quantity and nature of this complex topic. Thus, the results were also identical. However, the following chapter will discuss distinct and separate elements of family interventions for severe and persistent conduct problems. As such, the two theses are differentiated and can both be utilised in their own regard for thesis discussion and future research endeavours. Whilst the two concepts overlap slightly, the current thesis discussion will largely focus on the effectiveness of interventions identified, including the types of outcome measures used and the role of comparator conditions, whereas a separate thesis will examine the implementation of identified interventions (i.e., treatment fidelity and attrition). Following discussion of effectiveness, implications of the research will be discussed, followed by an in-depth examination of this review's strengths and limitations. The chapter will conclude with a discussion of directions for future research in the area.

Treatment Effectiveness

A range of intervention types were found in this literature search and will be discussed below in terms of their effectiveness. It appears that at first glance, the different family or parenting-based approaches for severe and persistent conduct problems were largely effective in treating primary outcomes, such as reducing criminal behaviours and conduct problems, as well as improving secondary outcomes (i.e., perceived parenting and family relations, substance use and other mental health problems). The power of multimodal interventions appears useful in changing antisocial trajectories and managing complex conduct problems. However, one must consider the role of comparator conditions, outcome

measures used and the quality of study design when referring to treatment effectiveness due to subjectivity of vote counting (Higgins & Thomas, 2022). Instead, interventions can be said to be in the right direction in terms of effectiveness, yet, the strength of the effect or accurate weighting of studies was not conducted.

Efficacy, Effectiveness, and Transportability

In a broad sense, the present thesis discussion focuses on the effectiveness of identified interventions, however, this terminology also encompasses treatment efficacy. In general, treatment efficacy refers to the ability of an intervention to produce a desired effect in best standard or controlled environments (CEU, 2001), whereas effectiveness refers to the outcomes produced in daily 'real world' practice, rather than due to specific study conditions (Fisher & Gillian, 2012). Whilst efficacy studies are also included in the analysis of effectiveness, discrepancies in results may be caused by if one study is more efficacious, rather than effective. A 'third wave' terminology refers to the extent an intervention has 'robust transportability' across different cultures, countries and across different health, social service, or legal jurisdictions. An intervention may be deemed efficacious or effective, however, what is its ability to be transported across different populations than what it was developed or intended for? The upcoming discussion will focus on the effectiveness of each intervention category in an interpretation of author conclusions, current data, and quality of study design, followed by an in-depth interpretation of treatment transportability.

Effectiveness of MST

MST is at present, cited as one of the best available treatment approaches for youth presenting with a range of social, emotional, or behavioural problems (Fairchild et al., 2019). MST is a family-based, intensive, and multi-modal treatment approach, that basis itself on social learning and family systems theories, whereby children are the product of reciprocal interactions in their environment (Fairchild et al., 2019). The development of MST aimed to

address the complex problems in specific youth, and basis on individual concerns and follows nine principles. MST was the primary intervention found in this scoping review, which was not surprising given its establishment in the literature as a prominent family-based intervention.

Results from the present study found that those studies that used MST to target conducting problems were reported as largely effective. That is, MST was more effective than TAU in changing conduct symptoms (Asscher et al., 2013), it produced long-lasting change in criminal behaviours, such as reducing rearrest rates (Borduin et al., 1995), in reducing nonviolent offending (Butler et al., 2011) and in decreasing recidivism (Timmons-Mitchell et al., 2006). MST was equally reported as effective across age and ethnic groups (Asscher et al., 2013) and was reported to be effective in decreasing criminal activity compared to usual services (Henggeler et al., 1992). One study specifically discussed treatment efficacy (Weiss et al., 2013), which concluded that results supported the efficacy of MST independent of its original developers.

However, the effectiveness of MST was only found when treatment fidelity was high (Henggeler et al., 1997). When treatment fidelity is accounted for, studies reported that MST was effective for violent and chronic offenders (Henggeler et al., 1997). Additionally, the effects of intervention must be discussed in terms of their limitations. Although Butler et al. (2011), concluded that MST was effective, their main limitation was that the sample size was small (n =108), and that there was insufficient power to detect more modest treatment effects.

MST displayed positive outcomes in the European context (Asscher et al., 2013), and suggested that MST is generalisable outside the USA due to replications in Norway (Ogden et al., 2004), emphasising their effectiveness and transportability. However, other studies did not support the effectiveness of MST in comparison usual services for conduct disorder in Sweden (Sundell et al., 2008) or for UK offending rates (Fonagy et al., 2018). In terms of

secondary outcomes, MST was reported as effective in enhancing parental sense of competence and positive parenting (Asscher et al., 2013), in improving parental mental health (Weiss et al., 2013) and produced favourable effects for perceived family relations and observed family interactions (Borduin et al., 1995).

There appears to be some support in MST contributing to improved outcomes. However, the current mixed results appear consistent with findings of a recent Campbell review of MST (Littell et al., 2021). It was concluded that MST may have strengths in decreasing self-reported delinquency and parent-reported outcomes, yet there was little evidence for the positive effect on youth symptoms, peer relations or school outcomes, however, these factors more closely relate to secondary outcomes in the current review. It could it be that some of differences in results found for MST were due to the quality of study designs. Given that studies were spread over approximately fifteen years, with diverse populations and authors, likely there was some differences in the quality of research and study design. For example, as shown in table 7 of the results, both Henggeler et al. (1992) and Henggeler et al. (1997) had much more unclear results, suggesting that the quality of their study is questionable. Whilst they both generally highlighted the effectiveness of MST; one must question such results due to poorer study design. Additionally, this author is a designer and purveyor of MST, suggesting a conflict of interest involved. In comparison, whilst Fonagy et al. (2018) concluded a lack of effectiveness of MST, their study design had less risk of bias and was an independent evaluation. In the current review, it appears that MST is mostly effective in reducing offending behaviours or conduct problems, as well as some secondary outcomes. However, the quality of a study's design as well as the transportability of findings in countries outside of the USA is varied and should be considered upon implementation.

Effectiveness of MTFC

MTFC, now referred to as Treatment Foster Care Oregon (TFCO) is an intervention alternative to residential care, aiming to improving antisocial behaviour in children in out-of-home care (Sinclair et al., 2015). A multifaceted intervention, based on social learning theories from the Oregon Social Learning centre (OSLC), individuals are placed with specifically trained foster families. Simultaneously, family therapy is available for biological parents, individual and skills training for the youth alongside school-based interventions.

Results of the present study suggested that MTFC had reported positive effects on rates of official offenses and self-reports of violent behaviour (Chamberlain & Reid, 1998) and was reported as more effective in reducing delinquency and incarceration rates compared to a control condition (Leve et al., 2005). MTFC was concluded as an effective method for treating complex youth behavioural problems in Sweden and was favoured over TAU (Westermark et al., 2011). These findings are consistent with previous literature which emphasised the favourability of MTFC over standard group care (Astrom et al., 2020), whereby youth with complex problems should be treated through treatment foster care rather residential care (Gutterswijk et al., 2020) due to the reductions in antisocial behaviour, the number of criminal referrals and time spent in locked settings (Macdonald et al., 2008). The use of MTFC may only be supported for individuals with the highest levels of antisocial behaviour (Sinclair et al., 2015), the group this review aims to encompass.

Therefore, all three reports found in this scoping review that used MTFC concluded that it was effective in producing favourable outcomes, showed generalisability across cultures and was consistent with prior research. However, as only three studies were found for this intervention type and this population, its generalisability should be questioned. Evidence of findings may be subject to bias given two of the studies were from program developers. Children in care, or ‘looked after children’ come with unique sets of challenges

and further research is needed on the effectiveness for this intervention on this specific population. Limitations of these studies highlighted that populations in these studies were not representative (Chamberlain & Reid, 1998; Leve et al., 2005), that findings are the first of their kind and should be replicated (Leve et al., 2005), small sample sizes and self-declaration results (Westermark et al., 2011). These limitations highlight that further research is needed and the effectiveness of MTFC may uncertain. All three of the included studies appeared similar in their risk of bias assessment or study design quality.

Effectiveness of FFT

FFT is a short-term, strengths-based therapy program for juvenile offenders or youth with disruptive behaviour problems, aiming to address family-based and complex behavioural problems. The model has five specific phases: engagement, motivation, relational assessment, behaviour change and generalisation that aim to improve adolescent functioning (Waldron & Turner, 2008).

In the current review, four studies addressed complex conduct and delinquent problems through FFT. Results reported that FFT was effective in improving mental well-being and that the FFT group had higher probation competition rates (Gan et al., 2021) and that FFT was reported as effective in reducing recidivism based on official records (Gottfredson et al., 2018). FFT was reported as no more effective than usual services when results were generalised across all therapists, however FFT was reported as effective in improving behavioural problems only when there was high therapist adherence to the model (Sexton & Turner, 2010). However, although FFT produced large reductions in CD and offending rates, there were no significant differences between groups (Humayun et al., 2017). The lack of difference between groups in this study may have been due to the fact that FFT was combined with management as usual (MAU) in one group and compared to a MAU group alone. In terms of secondary outcomes, FFT was somewhat effective in improving

family functioning (Gan et al., 2021) and findings showed that FFT is effective in non-Western cultures (Gan et al., 2021).

Thus, the effectiveness of FFT was mixed in terms of improving primary outcomes which appears consistent with findings of previous research . Meta-analyses have highlighted the effectiveness of FFT over comparison groups for substance misuse problems (Hartnett et al., 2017), whereas others have stated the small number of studies does not allow effectiveness conclusions to be made specifically for drug use (Filges et al., 2018). Although these findings are based on a substance misuse population, it adds weight to the current findings. When analysing the quality of study design, Gan et al. (2021) appeared to have a low risk of bias alongside effective results. In comparison, both Humayun et al. (2017) and Sexton and Turner (2010) had similar, slightly higher risk of bias levels, questioning the study design and author conclusions. However, both studies were clear in why FFT may have lacked effectiveness.

Effectiveness of WA services

Wraparound services are broad, holistic, and intensive, individualised intervention services for youth presenting with complex problems (Coldiron et al., 2019). Efforts of WA services are strengths-based in nature, encouraging behaviours that may decrease the likelihood of delinquent behaviours (Carney & Buttell, 2003). WA services draw from multiple service models in their approach and are based on the idea that delinquency is a product of multiple influences (Carney & Buttell, 2003).

Two studies utilised the wraparound services approach in intervention. Mixed results were found for WA services, indicating that those who received WA services were less likely to engage in future delinquent behaviours (Carney & Buttell, 2003), yet there were no significant differences overall between WA and TAU groups (Coldiron et al., 2019). However, WA services were effective for the time to first rearrest and for secondary,

educational outcomes (Coldiron et al., 2019). This intervention is broad in nature, however, what constituted the 'wraparound approach' differed between the two studies identified in this review. One study focused on 13 'core tasks' (Carney & Buttell, 2003), and the other described a range of services such as residential treatment facility, case management, probation intervention and peer support (Coldiron et al., 2019).

WA services are therefore interpreted as a general approach to intervention, rather than a prescribed and manualised intervention as seen in other treatments discussed above. The more 'general' an intervention is considered, the more difficult it is to discuss effectiveness due to a lack of clarity in its treatment approach. WA services vastly differ and can be administered in several ways. Perhaps, the wrap-around approach is just a broad, widespread terminology. This adds weight to the current research objectives in determining common elements. WA treatments might therefore be thought of as more as a common element, rather than a distinct intervention type. WA services, as well as all interventions for severe and persistent conduct problems need to be operationalised in order to be replicated.

Effectiveness of 'Other' Interventions

A range of interventions are included in the 'other' category of family-based or parenting interventions. These may have been based on a 'family condition' (Emshoff & Blakely, 1983), a 'parent training' intervention (Bank et al., 1991), a 'family empowerment intervention' (Dembo et al, 2000) or a 'family behaviour therapy' (FBT) (Azrin et al., 2001). These emphasised the effectiveness of their given interventions in reducing the prevalence of arrests (Bank et al., 1991; Dembo et al., 2000), whereby a broad-based intervention is preferable (Emshoff & Blakely, 1983). However, FBT and its comparator (ICPS) were equally found to be equally effective in improving conduct problems (Azrin et al., 2001). These studies are some of the earliest studies identified, perhaps before other interventions were introduced or fully established. Little research was found of these intervention types to

compare their findings to, however, their findings on family-behaviour and parenting interventions likely helped establish this modality as a beneficial treatment type, contributing further research in this field.

Two studies in the 'other' category were more recent studies, and although they were family-based, they did not fall into the predominant intervention categories. Dakof et al. (2015) studied the effectiveness of 'multidimensional family therapy' (MDFT). Results found that both treatment groups displayed reductions in delinquency, externalising behaviours and rearrest rates, however, the MDFT group displayed greater maintenance of treatment gains. This emphasises the long-term effectiveness of family therapy treatments. Hogue et al. (2015) compared usual-care family therapy (UC-FT) to non- family treatment (UC-other) for conduct disorder, concluding that whilst both groups showed improvements, family therapy may be a better alternative due to its effectiveness for conduct problems. These two studies contribute to the effectiveness of family-based interventions as a whole.

In answering the first objective of the present review, "what parenting, and family-based interventions have been conducted that rigorously evaluated for their effectiveness in reducing conduct problems or offending?", it was determined that the parenting or family-based interventions identified were all effective in some manner in improving conduct problems or offending related concerns (i.e., probation competition, arrest rates, delinquency, recidivism). MST was the prominent intervention found for treating this specific group, however, its effectiveness outside the USA was questioned. MTFC produced consistently favourable results over the control condition, however, there were only three studies with this intervention. Both FFT and 'other' interventions displayed mostly effective results. One must refer to the implementation and fidelity discussion of the identified interventions to further understand their potential for effectiveness or positive impact. Results appeared to favour family-based interventions overall, despite some mixed findings. However, the quality of

study designs must be considered when referring to mixed results, in that whilst all relevant studies were included, they are not all equal in the assessment of design quality.

Outcome Measures

Whilst the effectiveness of such interventions has been discussed, the use of appropriate measures for primary and secondary outcomes must be addressed. A multimodal, multi-informant approach is considered good practice for psychological assessment (De Los Reyes et al., 2015), specifically for children and adolescents (Achenbach et al., 1987; Hartley et al., 2011) and for constructs such as offending (Maxfield et al., 2000).

Primary Outcomes

Achenbach System of Empirically Based Assessment (**ASEBA) scales.** A large proportion of studies identified in this review measured pre- and post-intervention conduct problems with the cross-informant ASEBA (caregiver-report CBCL and adolescent self-report YSR) 'rule-breaking (pre-2001 'delinquency') and 'aggressive behaviour' syndrome scales, and the 'externalizing' broadband scale. Two studies were excluded from the review because they solely estimated pre- and post-study difficulties from the CBCL/YSR total problems score, which is a measure of global mental health. Their justification for this was due to the broad range of diagnosis in the participating youth (Glisson et al., 2010; Hansson & Olsson, 2012). However, when looking specifically at aggressive, delinquent, and externalising behaviours, the internalising behaviour scales are not relevant for assessing a change in conduct problems. One might see an improvement in internalising behaviours after intervention, however, their externalising and conduct problems may still be apparent. With a total problems scale, we are unable to specifically see a change in conduct problems. Rather than noting a change in externalising behaviours or delinquency specific to their aim, authors just noted a change in total problem behaviour. This general symptom description, rather than

a focus on externalising behaviours, may have been due to the report's additional aim of improving out-of-home placements (Glisson et al., 2010).

The CBCL and YSR are widely used measures and are found to reliable and valid instruments for assessing psychopathological symptoms (Ferdinand, 2007; Grigorenko et al., 2010; Lacalle et al., 2012). Having both self-report and parent-report has been found to improve prediction and is specifically recommended in youth assessment (Skarphedinsson et al., 2021). However, only four studies in this review included both the CBCL and YSR. The remaining eight used either the CBCL or YSR, rather than both.

Self-Reported Delinquency (SRD) Scale. Another prominent psychometric measurement used was the self-reported delinquency scale (Elliot & Ageton, 1980). The SRD consists of 47 items, whereby youth must identify the number of times in a set number of months that they had committed the delinquent act. The scale is broken into three subscales: a general delinquency scale, minor delinquency scale and an index offense scale (i.e., serious offences). This measure has produced good reliability as well as both convergent and criterion validity (Pechorro et al., 2019). This outcome measure is more specific than a generalised or total CBCL scale, as it solely assesses offending acts, rather than a range of traits.

Official Offending Records. The use of official offending data from courts, police or judicial services was the main outcome measure found in this review. This may have referred to arrest history/ rates, probation completion, incarceration, custodial sentences, or recidivism. Whilst used in twenty of the identified studies, the use of official records may not be accessible in some nations. Ogden et al. (2004) discussed that whilst official data concerning arrests or convictions is an ideal measure, Norway does not make arrests for youth under 15 years of age and youth under 18 are often referred to child welfare services rather than being prosecuted. The two Swedish studies as well as the only Dutch study all

included multiple psychometric measurements of behaviour, rather than offending records. Therefore, it appears that archival data is not always the most appropriate outcome measure, specifically in European nations whereby this measure is not directly comparable to English counterparts. It may be useful in instances that official offending records cannot be obtained that a second form of assessment is also used. For example, Westermark et al. (2011), which assessed primary outcomes with only the CBCL and YSR, discussed a limitation of their study was that all results were based on self-declarations.

An intervention's effectiveness cannot be influenced by the outcome measure used, instead, it is the estimation of intervention effectiveness which may be influenced by the specific outcome measure. Having data from multiple informants, (i.e., parents, children, teachers, and judicial data) or from multiple modalities, (i.e., psychometrics, interviews, observations, or official offending records) and settings improves the accuracy of assessment. However, none of the identified studies in this review utilised teachers as informants for primary outcome analyses. In terms of studies whose intervention was less effective or were equally effective in comparison to the control group, there appeared no consistency between the types of outcome measures used. The effectiveness of intervention is likely not impacted by type of outcome measure used, however, one must recognise that the use of official records for measuring offending is not comparable in many European nations. Additionally, offending records or admin data only have an outcome if youth get 'caught.' Thus, it is inherently conservative as an outcome measure.

Secondary Outcomes

Whilst secondary outcomes were not the focus of this review, twenty studies reported an effect on a range of secondary outcomes. Results showed some improvements in family functioning (Gan et al., 2021). Family cohesion increased significantly over time (Ogden et al., 2004), as were the favourable effects on perceived family relations and observed family

interactions (Borduin et al., 1995; Sundell et al., 2008). Significant effect on school absences, improvement in parenting styles, parental mental health (Weiss et al., 2013) and in increasing positive parenting and parental sense of competence (Asscher et al., 2013) were also observed.

Parenting and family-based interventions all appeared effective in improving secondary outcomes that are associated with severe and persistent conduct problems. Whilst not directly related to an improvement in youth behaviour, offending or conduct problems, secondary outcomes are important in the complex manifestation of symptoms. All included treatments were multimodal interventions, which aimed to target an array of multisystem factors in a young person's life. Misconduct has a considerable impact on not only conduct problems or offending, but on youth peer relationships, school attendance, their wider family functioning, parental mental health, drug/alcohol use and child welfare outcomes. Thus, one must recognise benefit of improving these outcomes simultaneously and the effectiveness of interventions that target the home, school, and wider community systems.

Cross-Cultural Transportability

The identified interventions appear to have diverse effectiveness likely due to the differences in social services, health, and justice systems as well as how comparable 'treatment as usual' is across nations. As discussed, findings of treatment effectiveness in the current context were mixed for studies that were conducted outside of the USA. Sundell et al. (2008) did not support the effectiveness of MST relative to usual care in Sweden and Humayun et al. (2017) found no signifcant differences for UK youth between groups (FFT and management as usual). Fonagy et al. (2020) found that there were no signficant differences for UK youth in the MST group compared to management-as-usual, concluding that findings are not consistent with results from USA studies of MST. Whilst Asscher et al. (2013) found that MST was more effective in changing CD symptoms of youth in The

Netherlands, there were no differences between MST and TAU for official judicial data, thus producing mixed findings. The remainder of studies conducted outside the USA produced positive results in terms of effectiveness. It was concluded that MTFC was effective for Swedish youth and was favoured over TAU (Westermark et al., 2011), that FFT displayed effectiveness in Singapore (Gan et al., 2021) and that MST was effective in comparison to usual services in Norway and is generalisable outside the USA (Ogden et al. 2004). The effectivness of family-based interventions is therefore not consistent in nations outside the USA and further analysis of this must occur.

Differences in Health and Social Service Systems

The difference of USA and European results may be further explained by the vast differences in social service and health care systems. For example, the Family Nurse Partnership (FNP) is an intensive home-based intervention developed in the USA to support teenage mothers. Its use and transportability in England were extensively studied (Robling et al., 2016; Sanders et al., 2019), however, results highlighted that adding FNP in comparison to usual care in the UK added no additional short-term benefits. Therefore, its effectiveness was not supported in the UK setting and authors concluded that specific programme-benefits identified in USA populations could not be transferred to different health-care settings. The extent of care found in ‘usual-care’ conditions in the UK suggested the effect of FNP was washed out. The UK’s universal health care system may have contributed to less of a difference between groups, in comparison to USA studies, in which there is no universal health care. In trying to determine reasons for insufficient effectiveness, it is important to consider if the intervention was in fact different than the control group (Sanders et al., 2019). This conclusion highlights the importance of control group conditions in determining effectiveness.

Role of TAU

Studies found in this review highlight that the effectiveness of a given intervention was consistently compared to a 'usual service', 'treatment as usual' or 'management as usual.' Thus, the weight of a treatment's effectiveness must be considered against what this 'usual service' actually is. A lack of signficant differences in offending rates (Fonagy et al., 2018), emphasised the differences between standard UK treatments in comparison to standard USA treatment. That is, a failure to replicate USA results was most probably due to greater effectiveness of TAU in the UK, rather than because of the poor implementation of MST in the UK (Fonagy et al., 2018). Criminal justice systems in the UK are more rehabilitation focused, rather than a punishment focus apparent in the USA. Fonagy et al. (2020) highlighted that the social learning principles of MST are similar to that of TAU in the UK, whereby TAU is more comparable to MST in the UK than to TAU services in the USA. This gives reason for a lack of difference between treatment groups in many studies. Thus, comparator conditions across nations likely differ in terms what they refer to as TAU or MAU. The quality of TAU is essential in determining the effectiveness of an intervention, due to the differences in a countries quality of youth services and treatment that is therefore given (Asscher et al., 2013). As there were large differences in treatment effectiveness for interventions outside the USA, this may due to some differences in health or legal jurisdictions emphaised by the use of TAU conditions and the lack of difference between intervention groups and control groups. However, it must be noted that differences in effectiveness may also be accounted for by different study designs and the quality of a study, as well as differences in implementation quality (e.g. better outcomes may have been found due to the use of better therapists).

In the current review, all but one of the included RCT's utilised Western-based populations. All the included interventions were conceptualised from a Western ideology,

predominately developed in the United States, yet few studies have examined the cross-cultural transportability of family-based interventions for offending or conduct problems (Gan et al., 2019). It has been suggested that interventions such as MST are culturally competent and results with high proportions of ethnic minorities have been effective (Brondino et al., 1997), however, more recent studies have suggested that MST may sometimes have negative effects for youth outside the USA (Littell et al., 2021). Findings in the present review have been discussed and were mixed on the generalisability of MST in countries outside the USA. Concerns must also be recognised for MST, whereby the areas that house MST programs may not be representative of all areas that adopt MST (Timmons-Mitchell et al., 2006). The very nature of MST principles asserts that social-ecological factors in a youth's wider context are targeted and that from a therapist standpoint, considering cultural differences in MST intervention is important (Fox et al., 2017). One must use caution when implementing Western-based interventions for juvenile offenders or those with conduct problems outside these areas.

Common Elements

Upon undertaking this project, a primary research question was related to determining which studies identify or discuss common elements. However, after review, only three reports discussed common elements in their studies. Chamberlain et al. (2007), the follow-up study of Leve et al., (2005) discussed in their introduction that components of MTFC included strategies for improving emotion regulation and aggressive behaviours, and to recognise symptoms of anxiety, potentially related to their individual developmental trauma. They also discussed the implementation of gender-specific components of intervention related to female youth. However, it was concluded that these components were unable to be tested for efficacy. Fonagy et al., (2020) mentioned that effective treatments for antisocial behaviour have been shown to comprise of multiple common elements. Carney & Buttell

(2003) discussed that wraparound services rely on 13 ‘core tasks’, such as (1) identifying key figures in an individual’s life or (2) implementing a non-judgmental family centred approach. A lack of discussion on common elements in the identified literature gives reason for further research on this area.

However, all interventions identified in this thesis were family-based, addressed multiple areas in one’s life, and generally continued over many months. One can ascertain, that whilst each of the interventions likely differ in the core components and underlying mechanisms that define and drive the intervention, the family-based component is a core feature containing a number of common elements. This modality, in comparison to individualised or group-based treatments, highlights that understanding the range of causal mechanisms involved at the family-system and community level in contributing to the onset of conduct problems is important in deciding treatment.

Feasibility of a Future Network Meta-Analysis

A primary objective for not only this scoping review, but scoping reviews in general is to determine the feasibility of conducting a future meta-analysis or high-quality systematic review by identifying the extent of, or gaps in the literature. Often, scoping reviews are conducted when the topic has yet to be extensively reviewed or if studies on the topic are heterogenous with respect to populations, interventions, outcomes and their measurement, setting and study designs. This review has pointed up some of these challenged for future synthesis. While several high-quality systematic reviews of individual programs and services have indicated small and/or inconsistent effects, the measurement of the impact of core features across similar family-based approaches has not been rigorously evaluated. A future network meta-analysis, simultaneously conduct direct and indirect comparisons of interventions (Li et al., 2011), can be used to generate effect sizes for individual elements far more accurately than other approaches currently used. Unfortunately, the technique generally

requires a large number of studies and interventions (or their delivery) that are similar enough but that vary in the right ways to looks at a wide range of potential elements, and these elements must be specified well enough to identify and classify them. This study indicates that there are likely sufficient studies to undertake a beginning analysis, but that far more information is needed about the individual components of the approaches and their variation in delivery. This information is likely available, but is not generally contained in sufficient detail within the primary studies. It is likely that the treatment manuals and/or other types of studies will be required to identify and classify the elements needed. That said, this is promising. The information is available, there have been a relatively large number of studies conducted to date, and there now exists a technique (network meta-analysis) to generate meaningful effect sizes for a limited set of elements.

Implications

This thesis presents implications for both clinical practice and theory regarding the considerable role parenting and family-based interventions have on the outcomes for children and adolescents with severe and persistent conduct problems. It cannot be determined which intervention is 'more' effective, and such a determination would be beyond the scope of this descriptive review. Arguably, MST, TFCO and FFT are the most established intervention types, however both MST and FFT produced mixed results, and both FFT and TFCO had very few included publications. Having said that, this updated research is highly informative. Woolfenden et al. (2001) had significantly fewer included total studies (n = 8) in comparison to the present review (n = 25), emphasising the amount of research that has been done since the original review. In conjunction, six of the eight Woolfenden et al. (2001) studies were also included in the current analysis. The other two were excluded due to populations with less severe behaviours (i.e., youth that presented with a range of non-compliant or tantrum

behaviours). In retrospect, the substantial increase in literature found emphasises the present review's relevance.

It is important that clinicians are aware of the relevant evidence-based interventions for children or adolescents who present with severe and persistent conduct problems. Juvenile delinquency and conduct problems are multidetermined, interventions should therefore focus on the broad, individualised nature of problem behaviour. From the current findings, family interventions are often found to be effective in reducing offending related outcomes and conduct problems. This may be because parenting and family-based interventions appear to target the complexity of the problem, rather than treating individual factors alone. Additionally, professionals must consider the time that goes into implementing these interventions (e.g., MST professionals are required 24/7) and the cost this may have (Albers & Shlonsky, 2020).

The findings of the current review are also beneficial for policy and youth justice contexts. Whilst preventative-based methods are regarded as a primary mechanism in contributing to a change in conduct problems, this is not always possible. Youth who present with such problems earlier in life, have complex family and community systems which may prevent them for having access to early interventions. On the severe end of conduct problems, individuals can be placed in youth justice settings. Perhaps with more knowledge on effective interventions for reducing offending behaviours and/or conduct problems, policy makers can implement relevant family interventions before youth justice residence is necessary. It must be noted that the identified treatment approaches are complex social interventions designed for a specific country. Thus, there is more to just the effectiveness of a given intervention. Rather, there seems to be a notion of 'cross-national transportability' in that one must consider the ability for an intervention to transport the same effectiveness in diverse populations or diverse social service or justice systems. Thus, when implementing an

intervention policy makers and/or clinicans should consider the transportability of an intervention in its ability to produce effective results.

Implications for New Zealand

Current policies in NZ are focused on prevention, reducing escalation and "early and sustainable exits." (Ministry of Justice, n.d.). The types of offending that reaches the Youth Court in NZ are serious and complex. The presence of any one complication in a young person's life, for example, care and protection concerns, ongoing maltreatment, family systemic complications or sociological factors, suggests why a young person has offended or presents with severe conduct problems. Whilst it is important for young people to be held responsible for their offending, this thesis highlights that it is possible to reduce arrest rates, recidivism or offending and improve conduct problems through family-based, multimodal interventions. Interventions should focus on the rehabilitation and reintegration into society, preventing further antisocial behaviour into adulthood. However, in comparison to international justice systems, New Zealand has a much more restorative, rather than punitive approach (Marshall, 2014).

In NZ specifically, care and cultural competency must be considered when implementing these family and parenting-based interventions for Māori individuals. As mentioned, young Māori offenders are disproportionally and over represented in the NZ Youth Justice System. Whilst considerable efforts have been made to incorporate bicultural and Kaupapa Māori practices into youth justice interventions in NZ, a considerable Western ideology is still prominent. Maori 'law of wrongdoing' asserts that responsibility is collective of the whanau, hapu, or iwi, not an individual's issue on their own (Maxwell et al, 2004). This notion also asserted that there must be understanding of why the youth offended, often caused by a lack of balance between the individual's social and family environments (Maxwell et al., 2004). This belief appears to tie into the premise of Western-based parenting

and family interventions in the current review, whereby intervention and understanding of conduct problems intervenes at the wider family system and community level. Māori principles emphasise involving an offender's wider system in intervention or decision-making and to strengthen child-family relations, both of which likely have some links to the current interventions. However, there is currently no known data on the implementation or effectiveness of the interventions found in this review on a Māori population. As such, the effectiveness of such interventions for this group is of question.

Strengths of this Review

A comprehensive literature search of a specific population was conducted in this review. According to Shamseer et al. (2015), high standard systematic and scoping reviews must have two (or more) reviewers conducting the search. Two independent reviewers in this project extracted the data from different databases after determining the relevant search syntax together. Additionally, both reviewers individually screened articles in both the abstract and full-text stage and met on two occasions to ensure both screening and data charting was comparable. Disagreements were discussed with both supervisors on fortnightly meetings. With two reviewers, it is intended that studies are not missed. The Covidence software was a strength as it automatically removed duplicates and allowed both reviewers to choose specific exclusion criteria.

The fundamental strength of this project was the specific nature of this review. That is, included publications were relevant to the distinct, yet complex target population. To the author's knowledge, no other scoping or systematic reviews have analysed family and/or parenting based interventions for this population since the original Cochrane review in 2001 (Woolfenden et al., 2001) and none have assessed for common elements. Therefore, this updated research is highly beneficial. Scoping reviews are highly valuable in identifying the amount of literature in the field, identify gaps in research and produce a summary of current

research. Therefore, conducting a scoping review is a strength in and of itself for this topic as an extensive overview of the current literature has been performed and can be utilised for future meta-analyses.

Additionally, this review included JBI critical appraisal checklist for RCTs. Risk of bias and methodological quality assessments are not required for a scoping review (Tricco et al., 2018) and are instead usually a focus in full systematic reviews. Thus, this review has appeared to go beyond what is necessary or required.

Lastly, two studies were at first included in the full-text analysis stage, however, upon further inspection of these studies, it was decided that they should be excluded due to the use of inadequate outcome measures. The protocol, whilst stating that outcome measures should be either a behavioural measurement or a legal system measurement, may not have been specific enough. Two studies used the total CBCL scale to measure conduct problems, rather than a separate externalising or aggressive subscale of the CBCL that is specific to conduct problems. The total CBCL scale is insufficient in measuring a change in conduct problems overall. Thus, this area was overlooked and may have been a methodological flaw. Perhaps a more specific list or discussion of outcome measures should have occurred in the protocol stage. However, this was a significant find and contributes to the literature, a strength that this aspect was picked up on.

Limitations of this Review

Despite relevant strengths of this review, methodological limitations must be accounted for. Firstly, due to time and administration constraints, only three databases were searched. It was intended that more databases would be included, however, some databases were not able to be accessed through the University of Canterbury. This goes against what was proposed in the protocol as it was intended that CINCH, an Australian criminology database would be included. Time constraints meant that these could not be obtained through

a partnering University and second supervisor in Melbourne. As such, the search was perhaps not as comprehensive as it could have been, and studies may have been missed. However, cross-checking previous studies and reference lists was done to reduce the potential for any major studies that met criteria were not missed. Whilst the search was comprehensive and allowed for greater sensitivity due to a considerable number of articles first identified, many of these were not relevant, thus lacking precision of the search. Having greater comprehensiveness of a search reduces its precision, however according to the Cochrane database, searches should aim for high sensitivity (Lefebvre et al., 2021). Perhaps it would have been helpful to specifically exclude substance use or sexual offending (i.e., 'NOT substance use; NOT sexual offending) as many studies were excluded due to a focus on this population (see appendix D).

Additionally, scoping reviews often use a greater range of study methodologies in comparison to systematic reviews, which often focus on RCTs (Arksey & O'Malley, 2005). It may have been a methodological flaw to limit designs in the current review to only RCTs in this level of analysis before a full meta-analysis was conducted. However, it was decided to include only RCTs as it was believed many more RCTs would be found and aimed to limit the final number of full-text studies to an achievable level for a master's thesis. Also, as one of the purposes was to see whether it was feasible to do a network meta-analysis, this is only advisable when using the same RCT study design. Furthermore, another major limitation was that this review did not include grey literature. However, grey literature such as dissertations were often unable to be accessed and were thus excluded from full-text analysis (outlined in appendix d).

The nature of the specific population made it difficult to include more studies. The complexity of severe and persistent conduct problems meant that many participants presented with comorbid concerns such as substance abuse or sexual offending. Exclusion criteria

outlined that those interventions that exclusively evaluated programmes designed for youth with sexual or substance use offences, without corresponding diagnosis or indication of conduct problems, would not be included. However, the search found that numerous studies in the full-text review also focused on participants or outcomes with sexual or substance use problems. This may be due to issues with the wide search syntax which did not exclude these concerns. Some studies with outcomes of sexual offending or substance use were included, but only if they focused on conduct problems or offending outcomes.

Due to practical constraints, the review was restricted to studies that were published in English. One study was excluded in the full text review stage due language constraints. Time constraints meant that possible translation methods were not available. All but one study was from a Western perspective, however, language constrictions likely did not bias the findings a great deal in terms of culture. Established parenting/ family interventions were developed from a Western conceptualisation of conduct problems and as discussed, must be considered when generalising to other cultural contexts.

Additionally, the JBI critical appraisal checklist was completed to account for bias and as a method to incorporate critiques on research evidence and methodological study. Whilst this table is beneficial in further adding to synthesis and interpretation of results, some weaknesses were encountered when conducting this appraisal. The JBI tool had a clear checklist as evident in appendix F, with accompanying guidelines for users. However, the joint role of two researchers, and the subjectivity of the tool at times may bring into question its usefulness. Having researchers complete half of the studies each, although beneficial in terms of time constraints, may have impacted the results. Researchers may have interpreted the results or understanding differently for each domain/question of the checklist.

Future Research

A range of advances are possible for further research on the effectiveness, implementation, taxonomy and core components of parenting and family-based interventions for severe and persistent conduct problems. As a key aim and purpose of this review is to provide a base for understanding the feasibility of conducting future meta-analyses on the given topic, the hope with the current scoping review data is that this can occur. Therefore, this is the primary goal of future research. The following aspects are considered other top priorities in future research endeavours.

Future research should focus on identifying common elements or in the taxonomy of intervention systems. Few studies discussed common elements and it would be highly beneficial for research to explore and identify the core components of parenting or family-based interventions and how this can be utilised in implementing such interventions. Relevant common elements may identify the length of intervention, therapist attributes, time to follow-up or session themes. The operationalisation of core components of all family-based interventions would produce a consolidated approach to treatment, thus signifying 'what' aspects of family-based treatments contribute to best or most effective outcomes.

In general more research on the topic is necessary. Studies in this review discussed limitations in that findings were the first of its kind and need to be replicated. Thus, additional RCTs should be conducted to determine if relevant effectiveness and results of an intervention can be replicated. It would also be helpful if further research was conducted from a New Zealand or Australian perspective. That is, RCT's should be conducted on the current population with participants closer to home, examining the effectiveness of MST, MTFC or FFT due to a lack of findings from this area. This would aid in the generalisability of findings to NZ. Additionally, analyses and use of Kaupapa Māori approaches or models should be examined in the context of conduct problems or offending. Specific interventions

for this population have been outlined in an Oranga Tamariki, Kaupapa Māori approaches (2019) document, such as The Meihana Model, Te Pikinga ki Runga or Awhi Whānau. The use of these approaches may be beneficial to incorporate within identified interventions for Māori populations, particularly due to the over-representation of Māori youth offenders.

Additionally, future research may want to further analyse the role of follow-up times in how this impacts effectiveness. That is, are improved offending rates or decreases in conduct problems sustained over time, and how does effectiveness of an intervention differ across time points. The current thesis mentioned follow-up times in table 4, but did not analyse this further. Are certain interventions more effective in the long-term in comparison to others? This may influence the long-term trajectories of a youth's antisocial behaviours or conduct problems.

Conclusion

As emphasised by this review, the manifestation of severe and persistent conduct problems in youth are complex and ongoing, a result of multiple transactional developmental and family systemic mechanisms. The treatments for these severe and heterogenous emotional and behavioural disturbances, although widely studied, have yet to be extensively examined, as a whole, in terms of their effectiveness and implementation. Analysis of randomised controlled trials indicated that there are a range of parenting or family-based treatment types used in the specific population this review examined. MST was the most prominent treatment found, followed by FFT and MTFC. Despite some mixed results, findings overall favoured the use of parenting and family-based interventions for severe and persistent conduct problems. However, the role of and differences between 'treatment as usual' across nations is important in the terms of the robust transportability of interventions. Additionally, the quality of study design must be considered when examining effectiveness. As a whole, effective parenting and family-based treatments address the multiple

determinants of severe and persistent conduct problems and the contributing factors of these difficulties, including family systems, peers, school environments or one's community.

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Appendix A

Search Syntax

Search strategy according to database, separated for subject heading, title and abstract search.

PSYCINFO (Online: EBSCO)

	SUBJECT HEADINGS	**Results**	**Date searched**
1.	SU (conduct and (problem or disorder) OR SU juvenile delinquen* OR SU ((antisocial or crim*) and (behavio*)) OR SU violence OR SU gangs OR SU externali* symptoms OR SU ((youth or juvenile) and justice) OR SU recidivism **Narrow by SubjectAge:** - school age (6-12 yrs) **Narrow by SubjectAge:** - adolescence (13-17 yrs)	40,331	3/12/21
2.	SU ((family or parent*) and (train* or psychotherap* or treat* or therap* or interven* or program* or manag*)) OR SU (multisystemic therapy or multi-systemic therapy or mst or multi systemic therapy) OR SU (family therapy or strategic family therapy or network family therapy or structural family therapy)	95,554	3/12/21
3.	1 OR 2	133,920	3/12/21
4.	SU RCT or randomi* or "control* trial*" or "control* clinical" or "clinical trial*" or "random* assign*" or "random* allocat*" or "wait* list*" or wait*-list* or "control* group*" or "control* condition*" or quasi-ex* or "quasi ex*" or (control* n2 intervention) or (control* n2 treat*) or "control* stud*" or "control* variable" or "comparison group" or "comparative stud*" or "before and after stud*" or "pretest post" or "pre-test post"	78,009	3/12/21
5.	2 OR 4	171,764	3/12/21
6.	1 AND 2 AND 3	57	3/12/21

	TITLE	**Results**	**Date searched**
1.	TI (adolescen* or child* or youth* or "pre adolesc*" or teen* or juvenile* or minor*)	530,744	3/12/21
2.	TI (conduct n2(disorder* or problem*)) OR TI juvenile delinquen* OR TI (antisocial or n2(behavio* or problem* or issue* or difficult*)) OR TI violence OR TI criminal behavio* OR TI misconduct OR TI criminal offen* OR TI (externali*ing and (problem* or behavi*)) OR TI (law* n2(break* or breach* or violat* or contraven* or infring* or transgress*)) OR TI ((youth or juvenile) and justice) OR TI ((offen* or reoffen* or re offen* or recidivism) and (juvenile or young or youth or adolescen* or teen*)	55,804	3/12/21
3.	1 OR 2	567,584	
4.	TI ((family or parent*) and (train* or treat* or therap* or interven* or program* or manage* or psychotherapy*)) OR TI(multisystemic therapy or mst or multi-systemic therapy or multi systemic therapy) OR TI (functional family therapy or fft) OR TI(multidimensional treatment foster care or mtfc or multi-dimensional treatment foster care) OR TI (treatment foster care oregon or tfco) OR TI (wraparound or wrap around) OR TI (“strategic family therapy” or “structural family therapy” or “network family therapy” or “systemic family therapy”)	33,601	3/12/21

5.	TI (RCT or randomi* or "control* trial*" or "control* clinical" or "clinical trial*" or "random* assign*" or "random* allocat*" or "wait* list*" or wait*-list* or "control* group*" or "control* condition*" or quasi-ex* or "quasi ex*" or (control* n2 intervention) or (control* n2 treat*) or "control* stud*" or "control* variable" or "comparison group" or "comparative stud*" or "before and after stud*" or "pretest post" or "pre test post")	54,624	3/12/21
6.	1 AND 2 AND 4 AND 5	42	3/12/21

	ABSTRACT	**Results**	**Date searched**
1.	AB(conduct n2(disorder* or problem*)) OR AB juvenile delinquen* OR AB(antisocial or n2(behavio* or problem* or issue* or difficult*)) OR AB violence OR AB criminal behavio* OR AB misconduct OR AB criminal offen* OR AB (externali*ing and (problem* or behavi*)) OR AB (law* n2(break* or breach* or violat* or contraven* or infring* or transgress*)) OR AB((youth or juvenile) and justice) OR AB((offen* or reoffen* or re offen* or recidivism) and (juvenile or young or youth or adolescen* or teen*)	132,353	3/12/21
2.	AB((family or parent*) and (train* or treat* or therap* or interven* or program* or manage* or psychotherapy*)) OR AB(multisystemic therapy or mst or multi-systemic therapy or multi systemic therapy) OR AB(functional family therapy or fft) OR AB(multidimensional treatment foster care or mtfc or multi-dimensional treatment foster care) OR AB(treatment foster care oregon or tfco) OR AB(wraparound or wrap around) OR AB("strategic family therapy" or "structural family therapy" or "network family therapy" or "systemic family therapy")	249,760	3/12/21
3.	AB(adolescen* or child* or youth* or "pre adolesc*" or teen* or juvenile* or minor*)	933,266	3/12/21
4.	AB (RCT or randomi* or "control* trial*" or "control* clinical" or "clinical trial*" or "random* assign*" or "random* allocat*" or "wait* list*" or wait*-list* or "control* group*" or "control* condition*" or quasi-ex* or "quasi ex*" or (control* n2 intervention) or (control* n2 treat*) or "control* stud*" or "control* variable" or "comparison group" or "comparative stud*" or "before and after stud*" or "pretest post" or "pre test post")	281,720	3/12/21
5.	3 OR 4	1,158,694	3/12/21
6.	1 AND 2 AND 3 AND 4	1692	3/12/21

ERIC (Online: EBSCO)

	SUBJECT HEADINGS	**Results**	**Date searched**
1.	SU (conduct and (problem or disorder)) OR SU juvenile delinquen* OR SU ((antisocial or crim*) and (behavio*)) OR SU violence OR SU gangs OR SU externali* symptoms OR SU ((youth or juvenile) and justice) OR SU recidivism	23,009	3/12/21
2.	SU ((family or parent*) and (train* or psychotherap* or treat* or therap* or interven* or program* or manag*)) OR SU (multisystemic therapy or multi-systemic therapy or mst or multi systemic therapy) OR SU (family therapy or strategic family therapy or network family therapy or structural family therapy)	47,232	3/12/21
3.	1 OR 2	68,370	3/12/21

4.	RCT or randomi* or "control* trial*" or "control* clinical" or "clinical trial*" or "random* assign*" or "random* allocat*" or "wait* list*" or wait*-list* or "control* group*" or "control* condition*" or quasi-ex* or "quasi ex*" or (control* n2 intervention) or (control* n2 treat*) or "control* stud*" or "control* variable" or "comparison group" or "comparative stud*" or "before and after stud*" or "pretest post" or "pre test post"	14,596	3/12/21
5.	SU(adolescen* or child* or youth* or "pre adolesc*" or teen* or juvenile* or minor*)	316, 176	3/12/21
6.	1 AND 2 AND 4 AND 5	18	3/12/21

	TITLE	**Results**	**Date searched**
1.	TI (adolescen* or child* or youth* or "pre adolesc*" or teen* or juvenile* or minor*)	180,447	3/12/21
2.	TI (conduct n2(disorder* or problem*)) OR TI juvenile delinquen* OR TI (antisocial or n2(behavio* or problem* or issue* or difficult*)) OR TI violence OR TI criminal behavio* OR TI misconduct OR TI criminal offen* OR TI (externali*ing and (problem* or behavi*)) OR TI (law* n2(break* or breach* or violat* or contraven* or infring* or transgress*)) OR TI ((youth or juvenile) and justice) OR TI ((offen* or reoffen* or re offen* or recidivism) and (juvenile or young or youth or adolescen* or teen*)	7,988	3/12/21
3.	1 OR 2	184, 825	
4.	TI ((family or parent*) and (train* or treat* or therap* or interven* or program* or manage* or psychotherapy*)) OR TI(multisystemic therapy or mst or multi-systemic therapy or multi systemic therapy) OR TI (functional family therapy or fft) OR TI(multidimensional treatment foster care or mtfc or multi-dimensional treatment foster care) OR TI (treatment foster care oregon or tfco) OR TI (wraparound or wrap around) OR TI (“strategic family therapy” or “structural family therapy” or “network family therapy” or “systemic family therapy”)	8,636	3/12/21
5.	TI (RCT or randomi* or "control* trial*" or "control* clinical" or "clinical trial*" or "random* assign*" or "random* allocat*" or "wait* list*" or wait*-list* or "control* group*" or "control* condition*" or quasi-ex* or "quasi ex*" or (control* n2 intervention) or (control* n2 treat*) or "control* stud*" or "control* variable" or "comparison group" or "comparative stud*" or "before and after stud*" or "pretest post" or "pre test post")	6,176	3/12/21
6.	1 AND 2 AND 3 AND 4	12	3/12/21

	ABSTRACT	**Results**	**Date searched**
1.	AB(conduct n2(disorder* or problem*)) OR AB juvenile delinquen* OR AB(antisocial or n2(behavio* or problem* or issue* or difficult*)) OR AB violence OR AB criminal behavio* OR AB misconduct OR AB criminal offen* OR AB (externali*ing and (problem* or behavi*)) OR AB (law* n2(break* or breach* or violat* or contraven* or infring* or transgress*)) OR AB((youth or juvenile) and justice) OR AB((offen* or reoffen* or re offen* or recidivism) and (juvenile or young or youth or adolescen* or teen*)	22,427	3/12/21
2.	AB((family or parent*) and (train* or treat* or therap* or interven* or program* or manage* or psychotherapy*)) OR AB(multisystemic therapy or mst or multi-systemic therapy or multi systemic therapy) OR AB(functional family therapy or fft	92,317	3/12/21

	) OR AB(multidimensional treatment foster care or mtfc or multi-dimensional treatment foster care) OR AB(treatment foster care oregon or tfco) OR AB(wraparound or wrap around) OR AB("strategic family therapy" or "structural family therapy" or "network family therapy" or "systemic family therapy")		
3.	1 OR 2	111,091	3/12/21
4.	AB(adolescen* or child* or youth* or "pre adolesc*" or teen* or juvenile* or minor*)	379,105	3/12/21
5.	AB (RCT or randomi* or "control* trial*" or "control* clinical" or "clinical trial*" or "random* assign*" or "random* allocat*" or "wait* list*" or wait*-list* or "control* group*" or "control* condition*" or quasi-ex* or "quasi ex*" or (control* n2 intervention) or (control* n2 treat*) or "control* stud*" or "control* variable" or "comparison group" or "comparative stud*" or "before and after stud*" or "pretest post" or "pre test post")	43,864	3/12/21
6.	1 AND 2 AND 3 AND 4	268	3/12/21

MEDLINE (OVID)

	SUBJECT HEADINGS	**Results**	**Date searched**
1.	((conduct and (problem or disorder)) or juvenile delinquen* or ((antisocial or crim*) and behavio*) or violence or gangs or externali* symptoms or ((youth or juvenile) and justice) or recidivism).sw.	41,373	03/12/2021
2.	(RCT or randomi* or "control* trial*" or "control* clinical" or "clinical trial*" or "random* assign*" or "random* allocat*" or "wait* list*" or wait*-list* or "control* group*" or "control* condition*" or quasi-ex* or "quasi ex*" or (control* adj2 intervention) or (control* adj2 treat*) or "control* stud*" or "control* variable" or "comparison group" or "comparative stud*" or "before and after stud*" or "pretest post" or "pre test post").sw.	2,956,019	03/12/2021
3.	((family or parent*) and (train* or psychotherapy* or treat* or therap* or interven* or program* or manag*)) or (multisystemic therapy or milti-systemic therapy or mst or multi systemic therapy) or (family therapy or strategic family therapy or network family therapy or structural family therapy)).sw.	22,021	03/12/2021
4.	(adolescen* or child* or youth* or "pre adolesc*" or teen* or juvenile* or minor*). sw.	3,255,472	03/12/2021
5.	1 AND 2 AND 3 AND 4	108	03/12/2021

	TITLE	**Results**	**Date searched**
1.	("conduct adj2 (disorder* or problem*) or "juvenile delinquen*" or "antisocial adj2 (behavio* or problem* or issue* or difficult*)" or "violence" or "criminal behavio*" or "misconduct" or "criminal offen* OR externali*ing and (problem* or behave*)" or "(law* adj2 (break* or breach* or violay* or contravene* or infring* or transgress*) OR (youth or juvenile) and justice" or "(offen* or reoffen* or re offen* or recidivism) and (juvenile or young or youth or adolescen* or teen*)").m_titl.	30650	03/12/2021
2.	(adoelscen* or child* or youth* or "pore adolesc*" or teen* or juvenile* or minor*).m_titl.	1,027,637	03/12/2021

3.	(RCT or randomi* or "control* trial*" or "control* clinical" or "clinical trial*" or "random* assign*" or "random* allocat*" or "wait* list*" or wait*-list* or "control* group*" or "control* condition*" or quasi-ex* or "quasi ex*" or (control* n2 intervention) or (control* n2 treat*) or "control* stud*" or "control* variable" or "comparison group" or "comparative stud*" or "before and after stud*" or "pretest post" or "pre test post").m_titl.	407,271	03/12/2021
4.	(((family or parent*) and (train* or treat* or therap* or interven* or program* or manage* or psychotherapy*)) or (multisystemic therapy or mst of multi-systemic therapy or multi systemic therapy) or (functional family therapy or fft) or (multidimensional treatment foster care or mtfc or multidimensional treatment foster care) or (treatment foster care Oregon or tfco) or wraparound or wrap around) or (strategic family therapy or structural family therapy or network family therapy).mp. or systemic family therapy.m_titl. [mp=title,abstract,original title, name of substance work, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	587,816	03/12/2021
5.	1 AND 2 AND 3 AND 4	36	03/12/2021

	ABSTRACT	**Results**	**Date searched**
1.	(“conduct adj2 (disorder* or problem*) or “juvenile delinquen*” or “antisocial adj2 (behavio* or problem* or issue* or difficult*)” or “violence” or “criminal behavio*” or “misconduct” or “criminal offen* OR externali*ing and (problem* or behave*)” or “(law* adj2 (break* or breach* or violay* or contravene* or infring* or transgress*) OR (youth or juvenile) and justice” or “(offen* or reoffen* or re offen* or recidivism) and (juvenile or young or youth or adolescen* or teen*)”).ab.	48,789	03/12/2021
2.	(adoelscen* or child* or youth* or “pore adolesc*” or teen* or juvenile* or minor*).ab	1,672,668	03/12/2021
3.	(RCT or randomi* or "control* trial*" or "control* clinical" or "clinical trial*" or "random* assign*" or "random* allocat*" or "wait* list*" or wait*-list* or "control* group*" or "control* condition*" or quasi-ex* or "quasi ex*" or (control* n2 intervention) or (control* n2 treat*) or "control* stud*" or "control* variable" or "comparison group" or "comparative stud*" or "before and after stud*" or "pretest post" or "pre test post").ab.	1,686,238	03/12/2021
4.	(((family or parent*) and (train* or treat* or therap* or interven* or program* or manage* or psychotherapy*)) or (multisystemic therapy or mst of multi-systemic therapy or multi systemic therapy) or (functional family therapy or fft) or (multidimensional treatment foster care or mtfc or multidimensional treatment foster care) or (treatment foster care Oregon or tfco) or wraparound or wrap around) or (strategic family therapy or structural family therapy or network family therapy or systemic family therapy)).ab	421,366	03/12/2021
5.	1 AND 2 AND 3 AND 4	375	03/12/2021

Appendix B

Data Extraction Form

This form was completed for each study or report in the full-text extraction stage.

A) General Information

1. Date form completed	
2. Name of reviewer extracting data	
3. Reference citation	
4. Title of study	
5. Publication type	
6. Country of study published or conducted	

B) Eligibility

Characteristics		Eligibility met?			Location in text (page/figure/table)
		Yes	No	Unclear	
Design					
Participants	Age range (60%)				
	Conduct problem				
	Offending				
Intervention					
Primary outcome measure					
DECISION	INCLUDE EXCLUDE				
Reason for exclusion					
Notes					

DO NOT PROCEED IF STUDY IS EXCLUDED FROM REVIEW

C) Methods

	Descriptions as stated in paper	Location in text (page/figure/table)
Aim of study		
Study design		
Notes		

D) Participants

	Descriptions as stated in paper	Location in text (page/figure/table)
Number of participants		
Age range		
Gender ratio		

Conduct problem/ Offending		
Other descriptors		
Co-morbidities (if any)		
Other relevant sociodemographic (if any)		
Notes		

E) Intervention

	Descriptions as stated in paper	Location in text (page/figure/table)
Intervention used		
Manual /Protocol exists (Y/N)		
Intervention Setting		
Intervention Provider		
Duration of intervention		
People involved (family or parents)		
Group based or individual		
Co-interventions (if any)		
Integrity of intervention delivery		
Compliance to intervention		
Notes		

F) Outcomes

Primary outcome 1: Conduct problem	Descriptions as stated in paper	Location in text (page/figure/table)
Assessment/Measurement Tool		
Is Measure Tool validated?		
Duration between pre and post-test		
Follow up measures (Y/N) If yes, please state:		
Notes		

Primary outcome 2: Offending	Descriptions as stated in paper	Location in text (page/figure/table)
Assessment/Measurement Tool		
Is Measure Tool validated?		
The duration between pre and post-test		
Follow up measure (Y/N) If yes, please state:		
Notes		

G) Common elements (if any)

	Descriptions as stated in the paper	Location in text (page/figure/table)
Common elements		

H) Strengths and Limitation

	Descriptions as stated in the paper	Location in text (page/figure/table)
Strengths		
Limitations		
Strategies to mitigate limitation (if any)		
Notes		

G) Conclusion

	Descriptions as stated in the paper	Location in text (page/figure/table)
Key conclusions by authors		
Notes		

Appendix C

Included RCT Studies in Analysis

**Denotes the primary study on an included report*

Asscher 2013

*Asscher, J. J., Deković, M., Manders, W. A., van der Laan, P. H., & Prins, P. J. M. (2013). A randomized controlled trial of the effectiveness of multisystemic therapy in the Netherlands: Post-treatment changes and moderator effects. *Journal of Experimental Criminology, 9*(2), 169-187. doi:10.1007/s11292-012-9165-9

Asscher, J. J., Deković, M., Manders, W., van der Laan, P. H., Prins, P. J. M., & van Arum, S. (2014). Sustainability of the effects of multisystemic therapy for juvenile delinquents in the Netherlands: Effects on delinquency and recidivism. *Journal of Experimental Criminology, 10*(2), 227-243. doi:10.1007/s11292-013-9198-8

Asscher, J. J., Deković, M., Van den Akker, A. L., Prins, P. J. M., & Van der Laan, P. H. (2018). Do extremely violent juveniles respond differently to treatment? *International Journal of Offender Therapy and Comparative Criminology, 62*(4), 958-977. doi:10.1177/0306624X16670951

Deković, M., Asscher, J. J., Manders, W. A., Prins, P. J. M., & van der Laan, P. (2012). Within-intervention change: Mediators of intervention effects during multisystemic therapy. *Journal of Consulting and Clinical Psychology, 80*(4), 574-587. doi:10.1037/a0028482

Manders, W. A., Deković, M., Asscher, J. J., van der Laan, P. H., & Prins, P. J. M. (2013). Psychopathy as predictor and moderator of multisystemic therapy outcomes among adolescents treated for antisocial behavior. *Journal of Abnormal Child Psychology, 41*(7), 1121-1132. doi:10.1007/s10802-013-9749-5

Azrin 2001

Azrin, N. H., Donohue, B., Teichner, G. A., Crum, T., Howell, J., & DeCato, L. A. (2001). A controlled evaluation and description of individual-cognitive problem solving and family-behavior therapies in dually diagnosed conduct-disordered and substance-dependent youth. *Journal of child & adolescent substance abuse, 11*(1), 1-43. doi:10.1300/J029v11n01_01

Bank 1991

Bank, L., Marlowe, J. H., Reid, J. B., Patterson, G. R., & Weinrott, M. R. (1991). A comparative evaluation of parent-training interventions for families of chronic delinquents. *Journal of Abnormal Child Psychology, 19*(1), 15-33. doi:10.1007/BF00910562

Borduin 1995

*****Borduin, C.M., Mann, B.J., Cone, L.T., Henggeler, S.W., Fucci, B.r., Blaske, D.M., & Williams, R.A. (1995). Multisystemic treatment of serious juvenile offenders: Long-term prevention of cirinality and violence. *Journal of Consulting and clinical Psychology, 63(4),* 569-578. http://dx.doi.org.ezproxy.canterbury.ac.nz/10.1037/0022-006X.63.4.569

Sawyer, A. M., & Borduin, C. M. (2011). Effects of multisystemic therapy through midlife: A 219-year follow-up to a randomized clinical trial with serious and violent juvenile

offenders. *Journal of Consulting and Clinical Psychology, 79*(5), 643-652. doi:10.1037/a0024862

Schaeffer, C. M., & Borduin, C. M. (2005). Long-Term Follow-Up to a Randomized Clinical Trial of Multisystemic Therapy With Serious and Violent Juvenile Offenders. *Journal of Consulting and Clinical Psychology, 73*(3), 445-453. doi:10.1037/0022-006X.73.3.445

Butler 2011

Butler, S., Baruch, G., Hickey, N., & Fonagy, P. (2011). A randomized controlled trial of multisystemic therapy and a statutory therapeutic intervention for young offenders. *Journal of the American Academy of Child & Adolescent Psychiatry, 50*(12), 1220-1235. doi:10.1016/j.jaac.2011.09.017

Carney 2003

Carney, M. M., & Buttell, F. (2003). Reducing juvenile recidivism: Evaluating the wraparound services model. *Research on Social Work Practice, 13*(5), 551-568. doi:10.1177/1049731503253364

Chamberlain 1998

*Chamberlain, P., & Reid, J. B. (1998). Comparison of two community alternatives to incarceration for chronic juvenile offenders. *Journal of Consulting and Clinical Psychology, 66*(4), 624-633. doi:10.1037/0022-006X.66.4.624

Eddy, J. M., Whaley, R. B., & Chamberlain, P. (2004). The Prevention of Violent Behavior by Chronic and Serious Male Juvenile Offenders: A 2-Year Follow-up of a Randomized Clinical Trial. *Journal of Emotional and Behavioral Disorders, 12*(1), 2-8. doi:10.1177/10634266040120010101

Coldiron 2019

Coldiron, J. S., Hensley, S. W., Parigoris, R. M., & Bruns, E. J. (2019). Randomized control trial findings of a wraparound program for dually involved youth. *Journal of Emotional and Behavioral Disorders, 27*(4), 195-208. doi:10.1177/1063426619861074

Dakof 2015

Dakof, G. A., Henderson, C. E., Rowe, C. L., Boustani, M., Greenbaum, P. E., Wang, W., . . . Liddle, H. A. (2015). A randomized clinical trial of family therapy in juvenile drug court. *Journal of Family Psychology, 29*(2), 232-241. doi:10.1037/fam0000053

Dembo 2000

Dembo, R., Shemwell, M., Guida, J., Schmeidler, J., Pacheco, K., & Seeberger, W. (1998). A longitudinal study of the impact of a family empowerment intervention on juvenile offender psychosocial functioning: A first assessment. *Journal of child & adolescent substance abuse, 8*(1), 15-54. doi:10.1300/J029v08n01_02

*Dembo, R., Ramirez-Garnica, G., Rollie, M., Schmeidler, J., Livingston, S., & Hartsfield, A. (2000). Youth recidivism twelve months after a Family Empowerment Intervention: Final report. *Journal of Offender Rehabilitation, 31*(3-4), 29-65. doi:10.1300/J076v31n03_03

Dembo, R., Ramirez-Garnica, G., Schmeidler, J., Rollie, M., Livingstone, S., & Hartfield, A. (2001). Long-term impact of a Family Empowerment Intervention on juvenile

offender recidivism. *Journal of Offender Rehabilitation, 33*(1), 33-57. doi:10.1300/J076v33n01_02

Emshoff & Blakely 1983

Emshoff, J. G., & Blakely, C. H. (1983). The diversion of delinquent youth: family-frcused intervention. *Children and Youth Services Review, 5*(4), 343-356. doi:10.1016/0190-7409(83)90002-6

Fonagy 2018

*Fonagy, P., Butler, S., Cottrell, D., Scott, S., Pilling, S., Eisler, I., . . . Goodyer, I. M. (2018). Multisystemic therapy versus management as usual in the treatment of adolescent antisocial behaviour (START): A pragmatic, randomised controlled, superiority trial. *The Lancet Psychiatry, 5*(2), 119-133. doi:10.1016/S2215-0366(18)30001-4

Fonagy, P., Butler, S., Cottrell, D., Scott, S., Pilling, S., Eisler, I., . . . Goodyer, I. M. (2020). Multisystemic therapy versus management as usual in the treatment of adolescent antisocial behaviour (START): 5-year follow-up of a pragmatic, randomised, controlled, superiority trial. *The Lancet Psychiatry, 7*(5), 420-430. doi:10.1016/S2215-0366(20)30131-0

Gan 2021

Gan, D. Z. Q., Zhou, Y., Abdul Wahab, N. D. b., Ruby, K., & Hoo, E. (2021). Effectiveness of functional family therapy in a non-western context: Findings from a randomized-controlled evaluation of youth offenders in singapore. *Family Process*. doi:10.1111/famp.12630

Gottfredson 2018

Gottfredson, D. C., Kearley, B., Thornberry, T. P., Slothower, M., Devlin, D., & Fader, J. J. (2018). Scaling-up evidence-based programs using a public funding stream: A randomized trial of Functional Family Therapy for court-involved youth. *Prevention Science, 19*(7), 939-953. doi:10.1007/s11121-018-0936-z

Henggeler 1992

Henggeler, Scott W.; Melton, Gary B.; Smith, Linda A. (1992). Family Preservation Using Multisystemic Therapy: An Effective Alternative to Incarcerating Serious Juvenile Offenders. Journal of Consulting and Clinical Psychology, 60(6), 953-961

Henggeler 1997

Henggeler, S. W., Melton, G. B., Brondino, M. J., Scherer, D. G., & Hanley, J. H. (1997). Multisystemic therapy with violent and chronic juvenile offenders and their families: The role of treatment fidelity in successful dissemination. *Journal of Consulting and Clinical Psychology, 65*(5), 821-833. doi:10.1037/0022-006X.65.5.821

Hogue 2015

Hogue, A., Dauber, S., Henderson, C. E., Bobek, M., Johnson, C., Lichvar, E., & Morgenstern, J. (2015). Randomized trial of family therapy versus nonfamily treatment for adolescent behavior problems in usual care. *Journal of clinical child and adolescent psychology, 44*(6), 954-969. doi:10.1080/15374416.2014.963857

Humayun 2017
Humayun, S., Herlitz, L., Chesnokov, M., Doolan, M., Landau, S., & Scott, S. (2017). Randomized controlled trial of Functional Family Therapy for offending and antisocial behavior in UK youth. *Journal of Child Psychology and Psychiatry, 58*(9), 1023-1032. doi:10.1111/jcpp.12743

Leve 2005
* Leve, L. D., Chamberlain, P., & Reid, J. B. (2005). Intervention outcomes for girls referred from juvenile justice: Effects on delinquency. *Journal of Consulting and Clinical Psychology, 73*(6), 1181-1184. doi:10.1037/0022-006X.73.6.1181
Chamberlain, P., Leve, L. D., & DeGarmo, D. S. (2007). Multidimensional treatment foster care for girls in the juvenile justice system: 2-year follow-up of a randomized clinical trial. *Journal of Consulting and Clinical Psychology, 75*(1), 187-193. doi:10.1037/0022-006X.75.1.187

Ogden 2004
Ogden, T., & Halliday-Boykins, C. A. (2004). Multisystemic treatment of antisocial adolescents in Norway: Replication of clinical outcomes outside of the US. *Child and Adolescent Mental Health, 9*(2), 77-83. doi:10.1111/j.1475-3588.2004.00085.x

Sexton 2010
Sexton, T., & Turner, C. W. (2010). The effectiveness of functional family therapy for youth with behavioral problems in a community practice setting. *Journal of Family Psychology, 24*(3), 339-348. doi:10.1037/a0019406

Sundell 2008
Sundell, K., Hansson, K., Löfholm, C. A., Olsson, T., Gustle, L.-H., & Kadesjö, C. (2008). The transportability of multisystemic therapy to Sweden: Short-term results from a randomized trial of conduct-disordered youths. *Journal of Family Psychology, 22*(4), 550-560. doi:10.1037/a0012790

Timmons-Mitchell 2006
Timmons-Mitchell, J., Bender, M. B., Kishna, M. A., & Mitchell, C. C. (2006). An Independent Effectiveness Trial of Multisystemic Therapy With Juvenile Justice Youth. *Journal of clinical child and adolescent psychology, 35*(2), 227-236. doi:10.1207/s15374424jccp3502_6

Weiss 2013
Weiss, B., Han, S., Harris, V., Catron, T., Ngo, V. K., Caron, A., . . . Guth, C. (2013). An independent randomized clinical trial of multisystemic therapy with non-court-referred adolescents with serious conduct problems. *Journal of Consulting and Clinical Psychology, 81*(6), 1027-1039. doi:10.1037/a0033928

Westermark 2011
Westermark, P. K., Hansson, K., & Olsson, M. (2011). Multidimensional treatment foster care (MTFC): Results from an independent replication. *Journal of Family Therapy, 33*(1), 20-41. doi:10.1111/j.1467-6427.2010.00515

Appendix D

Characteristics of Excluded Studies

Study ID	PICOTS Criterion/a	Details of Exclusion
Adams (2003)	n/a	Unable to retrieve full text (dissertation)
Alexander (1976)	**Outcomes**: primary outcomes are based on a (a) behavioural measurement of CD or (b) legal system measures	Main outcome was focused on dropping out of therapy and on therapist attributes
Anderson et al. (2021)	**Study design:** Randomised Controlled Trials (RCTs), including individual RCTs, cluster RCTs, Step-Wedge designs with random time allocation	Mixed methods design and age-range unclear
Apsche (2008)	**Intervention**: Programs, treatments, or interventions that target parenting and/or family system factors, those being: individualised interventions or group-based interventions	Wrong intervention
Astrom (2020)	**Study design:** RCT	Systematic review design
Bailey (1999)	n/a	Unable to retrieve full text (dissertation)
Bakker (2017)	**Study design:** RCT	Systematic review design
Baldwin (2012)	**Study design**: RCT	Systematic review design
Bannon (2007)	**Intervention:** Programs, treatments, or interventions that target parenting and/or family system factors, those being: individualised interventions or group-based interventions	Prevention based intervention
Baruch (2011)	**Study design:** RCT	No randomisation
Bjorknes (2012)	**Population:** children and adolescents between 10 and 17	Wrong patient population (3-9yrs)
Bourduin (2009)	**Population:** must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Participants were sexual offenders, no discussion of co-morbid conduct problems or general offending
Brestan (1998)	**Study design:** RCT	Systematic review design
Brody (2012)	**Study design:** RCT	Wrong study design
Brody (2008)	**Population:** must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Wrong patient population
Brown (1999)	**Outcome:** primary outcomes are based on a (a) behavioural measurement, or (b) legal system measures	Focused on school outcomes only
Burke (2012)	**Interventions:** programs, treatments, or interventions that target parenting and/or family system factors, those being:	Prevention focused intervention

	individualised interventions or group-based interventions.	
Bustamante (2000)	n/a	Unable to retrieve full text (dissertation)
Byrnes (1999)	**Study design:** RCT	Wrong study design
Caldwell (2014)	**Population**: Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	8-12 year-olds
Caldwell (2010)	**Population:** children and adolescents between 10 and 17	8-12 year-olds
Carr (2014)	**Study design:** RCT	Systematic review, non RCT
Cervenka (1996)	**Study design:** RCT	Non RCT, description of FEI – led to Dembo (2000)
Curtis (2013)	**Study design:** RCT	Benchmark study, non RCT
Curtis (2009)	**Study design:** RCT	No comparator, benchmark study
Dadds (1987)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	'Young' children, age-range unclear
Darnell (2015)	**Study design:** RCT	Quasi-experimental design
DeVries (2017)	**Population:** must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	'at-risk youth', preventative-based
Demeusy (2021)	**Intervention:** treatment as usual (i.e., treatment the individual would have received in the absence of parenting and/or family-based intervention), another intervention type (i.e., individual CBT, restorative justice), no intervention, or a wait-list control (i.e., those waiting to be included in an intervention)	Preventative intervention
Douds (1977)	**Study design:** RCT	Non RCT
Eeren (2018)	**Study design:** RCT	Quasi-experimental design
Eichelberger (2022)	n/a	Unable to retrieve full text (dissertation)
Fonagy (2013)	**Study design:** RCT	Was a protocol
Fraser (2004)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	6-12 year olds
Fujuwara (2015)	n/a	Unable to retrieve full text

Gilman (2019)	**Study design:** RCT	No randomisation
Glisson et al. (2010)	**Outcomes:** Primary outcomes are based on a (a) behavioural measurement of CD, or (b) legal system measures	Focused on total problems of CBCL, not externalising subscales
Gordon (1998)	**Study design:** RCT	Quasi-experimental design, no random assignment
Gordon (1995)	**Study design: RCT**	Quasi-experimental design, no random assignment
Green (2014)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Incomplete participant characteristics, focused on children in care
Hansson & Olsson (2012)	**Outcomes:** primary outcomes are based on a (a) behavioural measurement, or (b) legal system measures	Focused on total problems of CBCL, not externalising subscales
He (2018)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Wrong patient population
Hewitt-Ramirez (2018)	n/a	Language restrictions
Horigian (2015)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Substance users, no diagnosis of CD or other offending-related behaviours
Jalling (2016)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Substance users, no diagnosis of CD or other offending-related behaviours
Johnides (2017)	**Population:** Children and/or adolescents between 10 and 17 who exhibit a "severe and persistent" level of conduct problems	Focus on caregivers, not youth
Joseph (2012)	n/a	Unable to retrieve full text
Karam (2017)	**Study design:** RCT	Quasi-experimental
Klein (1977)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	"soft" delinquency offences
Kliem (2014)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of	Preventative based program

	conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	
Lee (2013)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Must have comorbidity, excluded if conduct problems with no other comorbidities
Letourneau (2009)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Sexual offenders, no diagnosis of CD or other offending-related behaviours
Leve (2007)	**Outcomes:** Primary outcomes are based on a (a) behavioural measurement of CD, or (b) legal system measures	Primary outcome was school attendance
Liddle (2009)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Substance users, no diagnosis of CD or other offending-related behaviours
McCarter (2016)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	First time offenders
Milburn (2012)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Focused on sexual behaviour and substance use
Minor (1990)	**Intervention:** Programs, treatments, or interventions that target parenting and/or family system factors, those being: individualised interventions or group-based interventions.	Wrong intervention
Molleda (2017)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Not severe and persistent sample, participants recruited through school
Morris (2014)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-	Emotional and behavioural difficulties at school, not severe and persistent problems

	structured psychiatric interviews, or youth offending history	
Myers (2000)	**Study design:** RCT	Not randomised
Ogden (2008)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Ages 4-12, almost 50% have ADHD
Olsen (2020)	**Population:** Children and adolescents between 10 and 17	Unclear participant characteristics
Oruche (2018)	**Population:** Children and adolescents between 10 and 17	Unclear participant characteristics
Painter (2008)	**Study design:** RCT	Quasi-experimental design
Pol (2018)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Focus on cannabis use disorder, and comorbid 'problem' behaviours. No diagnosis of CD or related offending behaviours
Pullmann (2006)	**Study design:** RCT	Non RCT
Robbins (2002)	**Study design:** RCT	Non RCT
Robbins (2019)	**Intervention:** Treatment as usual, another intervention type, no intervention, or a wait-list control	Wrong comparator
Rovers (2019)	**Intervention:** Treatment as usual, another intervention type, no intervention, or a wait-list control	No comparator
Rowland (2008)	n/a	Unable to retrieve full text (dissertation)
Ruffolo (2005)	**Population:** Children and adolescents between 10 and 17	Unclear age of population
Santisteban (2003)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Focused on substance use
Scavenius (2020)	**Population:** Children and adolescents between 10 and 17	Focused on 'young children'
Sexton (2011)	n/a	Replication study
Shaykhi (2018)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Targeted all schools, no diagnosis of CD or offending-related behaviour
Sheidow (2020)	**Population:** Must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of	Focused on substance use

	conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	
Stephanik (1997)	n/a	Unable to retrieve full text (dissertation)
Thorell (2009)	**Population:** Children and adolescents between 10 and 17	3-12 years with ADHD
Tighe (2012)	**Study design:** RCT	Qualitative study
Valdez (2013)	**Population: M**ust have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Focused on alcohol/ drug use, no diagnosis of CD or offending-related behaviours
vanderPol (2020)	**Population: M**ust have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Focused on cannabis use disorder, no diagnosis of CD or offending-related behaviours
vanderPol (2018)	**Population:** must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Focused on cannabis use disorder, no diagnosis of CD or offending-related behaviours
VanHolen (2018)	**Population:** must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Foster care children focused, 4-18 years
Vappie-Aydin (2008)	n/a	Unable to retrieve full text (dissertation)
Wachlarowicz (2012)	**Population:** Children and adolescents between 10 and 17	Focused on parents, with children 5-10 years
Wagner (2014)	**Population:** Children and adolescents between 10 and 17	Focus was on siblings
Wells (2010)	**Study design:** RCT	Case example study
Wetterborg (2019)	**Population:** must have a DSM or ICD diagnosis of conduct disorder, clinically indicated scores on standardised measures of conduct problems, or structured or semi-structured psychiatric interviews, or youth offending history	Adolescent externalising problems, not severe and persistent & wrong primary outcomes

Appendix E

Key Characteristics of Included Studies

Author(s)	Type	Aim	Conduct Problem/ Offending; Context	Intervention	Main Findings	Population of interest
Asscher et al. (2013)	Journal Article	Determine the effectiveness of MST in the Netherlands	Offending	MST	MST in European context was favourable MST more effective than TAU in changing externalising problems and CD symptoms; however official judicial data suggested no differences between MST and TAU MST beneficial in enhancing parental sense of competence and produced increases in positive parenting	Adolescents and families in the Netherlands
Azrin et al. (2001)	Journal Article	Examine the effectiveness of a family behavioural therapy for adolescent behavioural problems and drug use	DSM-IV diagnosis of CD and substance abuse/dependence	Family Behaviour Therapy	FBT and comparator were equally effective in improving conduct problems and reducing alcohol/drug use.	Adolescents and families in the USA
Bank et al. (1991)	Journal Article	Evaluate the extent to which parent training could affect delinquent career trajectories	Established status as repeat offender	Parent Training	Indicates the effectiveness of parent-training for treating chronic adolescent delinquents Large and significant reductions in rates and prevalence of arrests were observed in both conditions, however, intervention group produced quicker results.	Adolescents and parents in Germany
Borduin et al. (1995)	Journal Article	Examine long-term effects of MST on predominately serious juvenile offenders	Offending	MST	MST produced long-lasting change in youths' criminal behaviours. Less likely to be rearrested and committed less serious offenses. More effective than control group in reducing the number of crimes The MST program had a positive impact on perceived family relationships, observed family interactions, and results in decreased symptoms in parents and behaviour problems in adolescents.	Adolescents and families in USA
Butler et al. (2011)	Journal Article	To evaluate whether MST is more effective in recuing youth offending and out-of-home placement, and to determine if MST leads to greater improvements in family function and relevant mediators	Offending	MST	MST intervention significantly reduced the likelihood of nonviolent offending during follow-ups.	Youth and families in the UK

		that influence effectiveness				
Carney & Buttell (2003)	Journal Article	Evaluate effectiveness of wraparound services vs. conventional services	Offending	Wraparound services	Adolescents involved in wraparound services approach were less likely to engage in future at-risk and delinquent behaviour in comparison to control group.	Juveniles and families in USA
Chamberlain & Reid (1998)	Journal Article	Evaluate the effectiveness of MTFC on criminal offending and incarceration rates in comparison to GC	Offending	MTFC	MTFC group produced more favourable outcomes than GC. MTFC program had a significant effect on general rates of offending, on self-reports of serious violent behaviour, and on rates of official offenses Results affirm the use of multimodal, problem-focused interventions in changing antisocial trajectories of juvenile offenders	Youth, foster families and biological families in USA
Coldiron et al. (2019)	Journal Article	Compare outcomes with foster care youth involved in the juvenile justice system for wraparound and TAU group	Offending	Wraparound services	No significant differences were found between the wraparound and TAU groups (small sample sizes). However, improvements in both time to first rearrest and being on track educationally favoured the WA approach.	Youth in USA
Dakof et al. (2015)	Journal Article	An evaluation of the effectiveness of two different treatments delivered in juvenile drug court	Youth offender	Multidimensional Family Therapy	Youth in both treatments showed significant reductions in delinquency, externalising symptoms, rearrests and substance use Family therapy showed greater maintenance of treatment gains	Adolescents in USA
Dembo et al. (2000)	Journal Article	To determine the impact of a Family Empowerment intervention on 12-month recidivism	Youth offenders	Family Empowerment Intervention (FEI)	Youth in FEI group experienced significantly lower rates of new convictions and fewer new convictions Considerable juvenile justice system cost savings	Youth in USA
Emshoff & Blakely (1983)	Journal Article	To analyse the procedures for services provided for juvenile-justice involved youth	Offending	Family condition	A broad-based intervention effort is preferable to the targeting of the family alone	Youth and families in USA
Fonagy et al. (2018)	Journal Article	To analyse the medium-to-long term effectiveness of MST compared with MAU	Offending behaviour or diagnosis of CD	MST	The 5-year follow-up reported here found no significant difference in overall recorded offending rates with convictions in young people in the MST group compared with those in MAU. Findings are not consistent with results from MST studies in the USA	Youth in the UK
Gan et al. (2021)	Journal Article	Analyse the effectiveness of FFT on mental health, family functioning	Offending	FFT	Findings supported FFT's effectiveness in improving mental well-being. Youth in FFT during probation had higher completion rates	Adolescents in Singapore

		and probation completion rates				
Gottfredson et al. (2018)	Journal Article	To evaluate the effects of EB program included in FFT	Justice-involved youth	FFT-G	FFT-G was effective for reducing recidivism measured in official records	Adolescents in USA
Henggeler et al. (1992)	Journal Article	To examine the effectiveness of MST in treating youth with serious behaviour problems and multi-problem families	Juvenile offenders	MST	The findings of this study support MST's effectiveness in reducing criminal activity as compared with usual services	Youth and families in USA
Henggeler et al. (1997)	Journal Article	To examine whether MST effects could be maintained	Violent or chronic juvenile offenders	MST	Association between high adherence to MST principles and greater functioning in serious juvenile offenders Results highlight importance of maintaining treatment fidelity	Adolescents and families in USA
Hogue et al. (2015)	Journal Article	To compare usual care family therapy (UC-FT), to non-family treatment (UC-other)	Conduct and substance use disorder	Usual-Care Family Therapy	Non-manualised family therapy can be effective for adolescent behaviour problems, it may be superior to non-family alternatives. Both groups made improvements in multiple problem-areas at one-year follow-up.	Youth and families in USA
Humayun et al. (2017)	Journal Article	To establish how much family change is needed to produce reductions in youth ASB	Antisocial behaviour; offending	FFT	No significant differences between FFT + MAU and MAU alone at either 6- or 18-months follow-ups. Significant reductions of youth CD, ODD, ASB and offending over time, but no significant differences between groups. Failed to show greater reductions in offending and antisocial behaviour in FFT group.	Youth and families in UK
Leve et al. (2005)	Journal Article	To examine whether MTFC girls had lower rates of delinquency than comparison	Delinquency	MTFC	When compared to the control condition, MTFC was more effective at reducing incarceration and delinquency MTFC group showed better outcomes at 12 and 24 months compared to control group	Female youth and families in USA
Ogden et al (2004)	Journal Article	Analyse whether or not the positive outcomes in the US could be replicated in Norway	Serious antisocial behaviour	MST	In comparison to usual services in Norway, MST is found to be more effective Findings replicate those obtained by developers in the US; demonstrate generalisability of MST outside the US	Youth & families in Norway
Sexton et al. (2010)	Journal Article	To determine effectiveness of FFT in behaviour disordered youth in community juvenile justice settings	Offending	FFT	Compared to supervised probation services, FFT intervention was no more effective FFT had a significant impact on reducing violent or felony crimes when accompanied by model-specific adherence.	Youth and families in USA
Sundell et al. (2008)	Journal Article	To investigate short-term outcomes of MST compared to	Diagnosis of CD	MST	Results do not support the short-term effectiveness of MST in comparison with usual CD services in Sweden.	Youth and families in Sweden

		TAU in Swedish context and if MST effectiveness can be explained by treatment fidelity, maturity, or other variables.			Youth in both conditions decreased their problem behaviour and displayed improved family relations.	
Timmons-Mitchell et al. (2006)	Journal Article	Aimed to examine youth recidivism	Offending	MST	When compared to usual court services, MST reduced recidivism rates. Both groups displayed improvement in youth functioning. MST group showed significant differences and greater functioning in the home, at school and in community.	Youth and families in USA
Weiss et al. (2013)	Journal Article	To conduct an independent evaluation of MST, with non-court-referred youth with conduct problems	Serious conduct problems	MST	Results support the efficacy of MST when evaluated independently of its developers. However, smaller effect sizes and lack of effect on arrest data suggests it is challenging for youth who do come from through the juvenile justice system. MST was effective in improving parental mental health problems and externalising problems on the CBCL	Youth and families in USA
Westermark et al. (2011)	Journal Article	Examined outcomes of youth assigned to either MTFC or TAU	Met clinical diagnosis for CD	MTFC	MTFC is effective in treating behavioural problems for young people in Swedish. Most analyses indicated positive treatment results favouring MTFC over TAU.	Adolescents in Sweden

Appendix F

JBI Critical Appraisal Checklist

This checklist was completed for each full-text study.

JBI Critical Appraisal Checklist for
Randomized Controlled Trials

Reviewer_____

Date_____

Author_____Year_____ Record Number_____

		Yes	No	Unclear	NA
1.	Was true randomization used for assignment of participants to treatment groups?	☐	☐	☐	☐
2.	Was allocation to treatment groups concealed?	☐	☐	☐	☐
3.	Were treatment groups similar at the baseline?	☐	☐	☐	☐
4.	Were participants blind to treatment assignment?	☐	☐	☐	☐
5.	Were those delivering treatment blind to treatment assignment?	☐	☐	☐	☐
6.	Were outcomes assessors blind to treatment assignment?	☐	☐	☐	☐
7.	Were treatment groups treated identically other than the intervention of interest?	☐	☐	☐	☐
8.	Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	☐	☐	☐	☐
9.	Were participants analyzed in the groups to which they were randomized?	☐	☐	☐	☐
10.	Were outcomes measured in the same way for treatment groups?	☐	☐	☐	☐
11.	Were outcomes measured in a reliable way?	☐	☐	☐	☐
12.	Was appropriate statistical analysis used?	☐	☐	☐	☐
13.	Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?	☐	☐	☐	☐