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## EVALUATION REPORT

# Reducing the Risk of Criminal Exploitation Using Multisystemic Therapy – the RESET Study

## Feasibility study report

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October 2023

## About the Youth Endowment Fund

The Youth Endowment Fund (YEF) is a charity with a mission that matters. We exist to prevent children and young people becoming involved in violence. We do this by finding out what works and building a movement to put this knowledge into practice.

Children and young people at risk of becoming involved in violence deserve services that give them the best chance of a positive future. To make sure that happens, we'll fund promising projects and then use the very best evaluation to find out what works. Just as we benefit from robust trials in medicine, young people deserve support grounded in the evidence. We'll build that knowledge through our various grant rounds and funding activity.

And just as important is understanding children and young people's lives. Through our Youth Advisory Board and national network of peer researchers, we'll ensure they influence our work, and we understand and are addressing their needs. But none of this will make a difference if all we do is produce reports that stay on a shelf.

Together, we need to look at the evidence, agree what works and then build a movement to make sure that young people get the very best support possible. Our strategy sets out how we'll do this. At its heart, it says that we will fund good work, find what works and work for change. You can read it [here](#).

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## About the evaluator

This evaluation was conducted at the School of Education, Learning and Communication Sciences at the University of Warwick, in collaboration with the School of Health and Social Care at the University of Essex. The University of Warwick is one of the UK's leading research universities – its academic staff have an international reputation, with 92% of research being ranked as 'world leading or internationally excellent' in the 2021 Research Excellence Framework. The University of Warwick was ranked seventh overall for the quality of its research outputs in the United Kingdom in this national assessment of research excellence.

Our research centre has established a reputation for research across a range of topics, including youth mental health and wellbeing. Our research programme mainly involves the disciplines of education and psychology, with a particular focus on multidisciplinary research using a combined (mixed) methods approach. We also collaborate extensively with colleagues in other research centres and departments at Warwick and other universities. A number of our research projects focus upon applied interventions for mental health.

We have substantial expertise in quantitative and qualitative methods. This allows us to take on research that requires either methodological approach or, as is often the case, studies that require both types of methods to address different aspects of the research programme, often referred to as 'combined' mixed methods.

For more information about this evaluation, please contact the chief investigator of this study:

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## The project

Multisystemic Therapy (MST) is an intensive family-based intervention designed to support young people with antisocial behaviours. It aims to improve family functioning and focuses on the 'whole world' of the child, including their homes and families, schools and teachers, and neighbourhoods and friends. The therapy may use a variety of techniques, including providing practical tips for caregivers to improve children's behaviour, increasing supervision of children's whereabouts, social skills training, encouraging more associations with pro-social peers, building better community social support, supporting the development of a school-home relationship, and aspects of Cognitive Behavioural Therapy to challenge negative thought patterns. The specific approach is determined by the child and family's needs. As part of this project, an augmented version of MST (MST E) was designed and delivered to suit families where a 10 to 15-year-old child was at risk from child criminal exploitation (CCE). MST E was delivered over 4-6 months to families by MST UK and Ireland, and the therapy specifically aimed to reduce offending, behaviour problems, and substance use. An MST therapist delivered face-to-face sessions with the young person and/or their caregiver approximately 15 three times per week in the home, school and community, while a therapist was also available and 'on-call' 24 hours a day, seven days a week. The therapist also collaborated closely with schools, social care, the police, and youth offending services where appropriate.

YEF funded a feasibility evaluation of this augmented, CCE-focused version of MST (MST E). The study began by refining the logic model to define the causal processes through which the intervention aims to reduce crime and offending. Careful thought was also given to how to adapt standard MST to suit families where children were at risk from CCE. In addition, the evaluator conducted interviews with nine MST practitioners, six primary caregivers and one young person to explore how to refine MST tools for the evaluation of this intervention. In total, 258 families received MST E, and 41 signed up to participate in the evaluation across four locations in England (Sandwell, Kirklees, Nottingham, and Birmingham). The evaluator aimed to ascertain the acceptability and feasibility of MST E for stakeholders, family and clinician satisfaction with the intervention, the appropriateness of selected outcome measures, the willingness of teams to recruit participants, and the therapy completion rate. Enrolled families were asked to complete outcome questionnaires (featuring a range of outcomes including self-reported offending, empathy, behavioural difficulties, parenting, family functioning, and gang affiliation), and the evaluator collected various demographic and treatment data. Further interviews were conducted with two MST E consultants, four supervisors, eight therapists, nine primary carers and five young people to explore delivery, and the factors that may have facilitated or hindered implementation. The evaluation ran from winter 2020 to autumn 2022, and was therefore impacted by the COVID-19 pandemic, requiring both the delivery team and evaluator to adapt to challenging circumstances.

### Key conclusions

There was evidence that delivering the intervention to families was feasible, and that families found the intervention acceptable. However, there were significant evaluation challenges. COVID-19 hampered recruitment, participant retention was challenging, and young people expressed some mistrust of researchers. Collecting outcome data from sufficient numbers of young people was also not proved to be feasible.

Parents and carers did indicate that they were willing to take part in research to help others, and families reported that randomisation in a future larger study would be acceptable to them. The evaluator recommends considering the use of larger incentives to engage young people, and collecting the primary outcome from caregivers, rather than young people.

The evaluator noted that, in practice, it was difficult to clearly define the difference between standard MST and the augmented version. MST UK and Ireland reported that 195 of the 258 families that received the adapted MST completed the intervention during the study.

Implementation was facilitated by therapists' ability to form therapeutic relationships with families, the intensity of the intervention, collaboration with other services, the engagement of caregivers and young people, and the focus on upskilling caregivers.

Implementation was hindered by the lack of engagement from one caregiver in a family, changing therapists, the intensity and intrusiveness of the intervention for some, challenges with exploitation occurring online, difficulties with collaboration with schools, changing peer groups, and lack of engagement with other agencies.

## Interpretation

There was evidence that delivering the intervention was feasible and families found it acceptable. However, before proceeding to a larger study, several challenges would need further consideration. The evaluators found that the COVID-19 pandemic hampered recruitment to the study, as the opening of study recruitment was delayed, and the delivery team and evaluator team timelines diverged. This meant that 157 families were recruited to receive the intervention *before* the study began, so they could not opt to be included in the evaluation. Of the 101 families recruited later, only 78 expressed an interest in participating in the evaluation, and only 41 then met eligibility criteria and agreed to take part. A further four families were then lost to enrolment.

Evaluation retention also proved challenging. While 90% of primary carers completed outcome measures at baseline, only 41% completed post-treatment measures. Young people were particularly difficult to engage, and insufficient numbers completed outcome measures which included the proposed primary outcome measure. In future, larger studies, when choosing a primary outcome measure, a parent/carer report or other proxy measure could be used rather than data reported by children and young people. The evaluator also recommends the use of larger incentives to engage young people in the study. Parents and carers did indicate that they were willing to take part in research to help others, and families reported that randomisation in a future larger study would be acceptable to them.

The majority of planned augmentations were implemented, however some were not due to COVID-19 restrictions. For instance, the pandemic significantly reduced the possibility of any in-person contact with families. The evaluator noted that it was also difficult, in practice, to clearly define the difference between standard MST and the augmented version. The main differences identified were related to working with younger children and within primary schools (although it is also not clear whether treating 10-year-olds is that different to 11-year-olds), while including information about and considering criminal exploitation within therapy.

MST UK and Ireland reported that, 195 of the 258 families (76%) who received the programme completed the intervention; 27 (10%) were still receiving the intervention and 36 (14%) did not complete the intervention. The evaluator judged that MST E was of the required standard, and it appeared to be acceptable to families; however, it was also challenging for the evaluator to determine the acceptability specifically of the augmented version of MST for families (versus standard MST).

Implementation was facilitated by therapists' ability to form therapeutic relationships with families. Therapists' non-judgemental approach was a key factor cited. Primary carers said that they had often felt judged by other professionals and felt blamed for the behaviour problems presented by the young person. Other facilitators included the intensity of the intervention, collaboration with other services, the engagement of caregivers and young people, and the focus on upskilling caregivers.

Barriers to implementation included the lack of engagement from one caregiver in a family, changing therapists, the intensity and intrusiveness of the intervention for some (including having to engage in early morning appointments), challenges with exploitation occurring online, and changing peer groups. Engaging with other agencies and with schools also sometimes hindered delivery; in part this was caused by COVID-19 restrictions, but it was also noted that schools may have had other agendas and priorities.

Given the challenges noted in this evaluation, YEF does not currently plan to fund a larger evaluation of MST E.

## Introduction

### Background

Child criminal exploitation (CCE) is said to occur when ‘an individual or group takes advantage of an imbalance of power to coerce, control, manipulate, or deceive a child or young person under the age of 18 into any criminal activity in exchange for something the victim needs or wants, for the financial or other advantage of the perpetrator or facilitator, or through violence or the threat of violence’ (Home Office, 2019). CCE is a form of child abuse; in some circumstances, it can meet the definition of modern-day slavery and is seen in youth gangs (Robinson et al., 2019), but not solely. Safeguarding children and young people at risk of CCE or gang involvement is fundamental to protect the welfare, wellbeing and safety of children and young people, families and communities. There are few well developed interventions to support this specific group of vulnerable children and young people. There are also significant challenges in engaging this group in interventions and research, such as: difficulties identifying children at risk of CCE; children not seeing themselves as victims of abuse; families being at crisis point and having little time to engage with services and research; families and young people distrusting new individuals entering the family system (i.e. practitioners, researchers); and fear of gangs/those who have exploited the young people seeking retribution. Developing and testing appropriate interventions and engagement methods for this group and their families, while finding effective and appropriate ways to engage this group in research, is critically important.

Multisystemic therapy (MST) is an intensive family-based intervention designed to support young people with antisocial behaviours. There is evidence that MST leads to a small but significant reduction in criminal offending behaviour among children and adolescents in some studies (van der Stouwe et al., 2014). In their meta-analysis of MST, van der Stouwe et al. (2014) reported that this effect was only present when participants were offenders and younger than 15 years; larger effect sizes were associated with the successful completion of treatment and a longer duration of treatment. Further, effect sizes increased when the comparison group received a single and non-multimodal intervention as treatment-as-usual (TAU). Treatment effects were moderated by study characteristics, such as the study taking place in the USA, efficacy designs and studies rated as higher quality. The effect on delinquency was moderated by changes in externalising behaviour, substance abuse, parenting skills and mental health, and placements away from home. Treatment for those with a history of sexual offending behaviour was also associated with larger effect sizes.

It is of particular note that studies examining MST tend to report smaller effect sizes when located outside of the USA, for example, within Scandinavia (Gustle et al., 2008, Ogden et al., 2008, Sundell et al., 2008) or Canada (Leschied and Cunningham, 2002). A recent Campbell Collaboration systematic review and meta-analysis included 23 MST trials published between 1983 and 2020 (Littell et al., 2021). The authors highlighted the inconsistency of study outcomes and findings, the mixed quality of the studies and the high risk of bias in these studies. Overall, they found that, outside of the USA context, there was a lack of evidence that MST is effective.

In the UK, Butler et al. (2011) completed a small randomised controlled trial of MST, reporting that the intervention led to improvements in recidivism over and above TAU within Youth Offending Teams in North London. This group went on to complete a large single blind randomised controlled trial comparing MST to TAU within England (Fonagy et al., 2018), reporting that MST did not lead to a significant reduction in out-of-home placements; nor did it reduce the time to the next offence episode. The average number of offences committed by participants at 18-month follow-up was significantly greater for those who had received MST. Those who scored low on callous and unemotional traits had poorer outcomes at follow-up. The authors suggested that these outcomes may be associated with the relatively well-resourced nature of services for young offenders within the UK, including increased flexibility to respond to the treatment needs of young offenders, in comparison to the USA. A five-year follow-up of the same families also found no difference



between MST and TAU for offending behaviour (Fonagy et al., 2020b, Fonagy et al., 2020a). However, a qualitative study interviewing these same young people four years after the completion of this trial found that the male participants who took part in MST had more mature profiles as they transitioned into adulthood than those who took part in TAU (Conroy et al., 2021).

## **Intervention**

MST is a community-based family intervention for young people who present with complex social, clinical and educational problems, including aggression, behaviour that would be judged to criminal and substance misuse. The aim of the intervention is to improve family functioning and empower caregivers in order to reduce problematic behaviours across systems. The goal is to prevent out-of-home placements within care or custody. MST was developed in the USA in the late 1970s to address difficulties within existing services at the time when working with young people who present with antisocial behaviour (Borduin and Henggeler, 1990).

Considering that MST was not explicitly designed for use with families where a child is at risk of criminal exploitation – along with evidence indicating that MST may not be more effective than TAU within the UK – a series of proposed augmentations to the standard MST protocol for children and teenagers who are at risk of criminal exploitation was explored within Phase 1. These amendments were designed to increase the effectiveness of the intervention for children who are at risk of criminal exploitation.

## **Ethical review**

This study received a favourable ethical opinion from Yorkshire & The Humber – South Yorkshire Research Ethics Committee (Ref: 20/YH/0272) and associated Health Research Agency approval on 3 December 2020. The sponsor of this study was the University of Warwick. All participants were provided with study information. Parental consent was required for the inclusion of participants under the age of 16, while agreement from children and young people younger than 16 for their inclusion in the study was also sought. We adapted the information about the study provided to younger children to help ensure that information about the study is accessible. Young people aged 16 years or older who wished to take part were invited to sign a consent form to confirm their agreement to take part in the study. Parents who wished to take part were also invited to sign a consent form to confirm their agreement to participate in the study. All participant data were collected, stored and processed with consent. Where participants had difficulties with reading and writing, we were able to provide the study information in an alternative format (e.g. audio file). We were also able to provide translations of study documents and interpreter services to include families that did not speak English. All participants were told that they had the right to withdraw from the study at any point.

## **Data protection**

We complied with the General Data Protection Regulations (2018). All data were stored securely upon university servers. All data are confidential and were stored in such a way as to make it impossible to identify a child or any member of their family within any publication arising from this work. All incidents and near misses were reported to the University of Warwick Health and Safety Department via the Accident, Incident and Near Miss Reporting Form.

## **Project team/stakeholders**

- The intervention was originally developed by MST Services, and augmentations were made by MST UK and Ireland and further refined in collaboration with Dr Simone Fox and Cathy James from MST UK and Ireland and the study team. MST UK and Ireland consulted with MST Services. MST UK and Ireland were responsible for the delivery of the intervention and offered training and clinical

supervision to local MST teams in Birmingham, Kirklees, Nottingham and Sandwell who delivered the intervention. All worked collaboratively with the research team throughout the project and assisted with participant recruitment. MST UK and Ireland did not have any responsibility for the design of the study or the analysis and reporting of our findings. They contributed to this report by writing a description of the intervention found within this report.

- The Chief Investigator was Professor Peter Langdon from the University of Warwick and Coventry and Warwickshire Partnership NHS Trust.
- The Study Manager was Dr Nikita Hayden, supported by Emma Taylor and Caitlin Williams from the University of Warwick.
- The study team comprised Dr Frances Blumenfeld, University of Essex, who had expertise in MST. Dr Louise Denne, Mairi Ann Cullen, Dr Steve Cullen and Dr Samantha Flynn, all from the University of Warwick, provided expertise in process evaluation. Professors Richard Hastings and Kylie Gray, from the University of Warwick, provided additional expertise in conducting feasibility studies, while Dr Paul Thompson, also from the University of Warwick, provided statistical expertise.
- The research team have no conflict of interests to declare.

## Feasibility study

### Overview

#### Research questions

The aim of the current project was to examine the feasibility of an augmented version of MST, adapted specifically for children and young people aged 10–15 years of age who are at risk of criminal exploitation. To achieve this, we completed a study within existing services to test the proposed changes to the standard MST protocol using process evaluation and qualitative and quantitative research methods. The primary purpose of this methodology was to collect data to allow for the estimation of parameters necessary to inform the decision to proceed with a pilot trial.

Our research questions were as follows:

- Primary research question: (a) Is it feasible to complete a later pilot trial of MST for children at risk of criminal exploitation within existing services in England?
- Secondary research questions: (b) Do families, children and young people, clinicians, and other stakeholders consider MST for children and young people at risk of criminal exploitation an acceptable intervention, and (c) what are the likely factors that will facilitate or hinder the successful implementation of MST for children and young people at risk of criminal exploitation, and how can they be successfully managed?

#### Study objectives

The objectives of this study were:

- To collaboratively refine the logic model that represents the causal processes through which MST for children at risk of criminal exploitation likely leads to a reduction in criminal offending behaviour. This logic model was used to directly inform our process evaluation, which considers but is not limited to: (i) the impact of additional staff training; (ii) how partnerships with stakeholders are strengthened; (iii) the processes that promote or hinder greater engagement with voluntary and community agencies and other positive activities; and (iv) the processes that increase or hinder engagement in education and school transition.
- To undertake interviews with clinicians, stakeholders, families and young people to refine MST tools for working with families where there is a risk of criminal exploitation, including adaptations to any existing fidelity checklists, and to consider the most appropriate method of measuring outcomes from MST for children at risk of criminal exploitation.
- To complete a single-group modelling study of MST for children at risk of criminal exploitation, with up to 50 families receiving treatment within existing MST services, in order to estimate: (i) the acceptability and feasibility of MST for children and young people at risk of criminal exploitation for stakeholders, including families; (ii) patient and clinician satisfaction with the intervention; (iii) the appropriateness of our measures in terms of their use within a future pilot trial; (iv) the appropriateness of an adapted fidelity checklist (if possible); (v) the accrual rate and willingness of teams to recruit participants; (vi) therapy completion rate and attrition; and (vii) the within-group effect size.

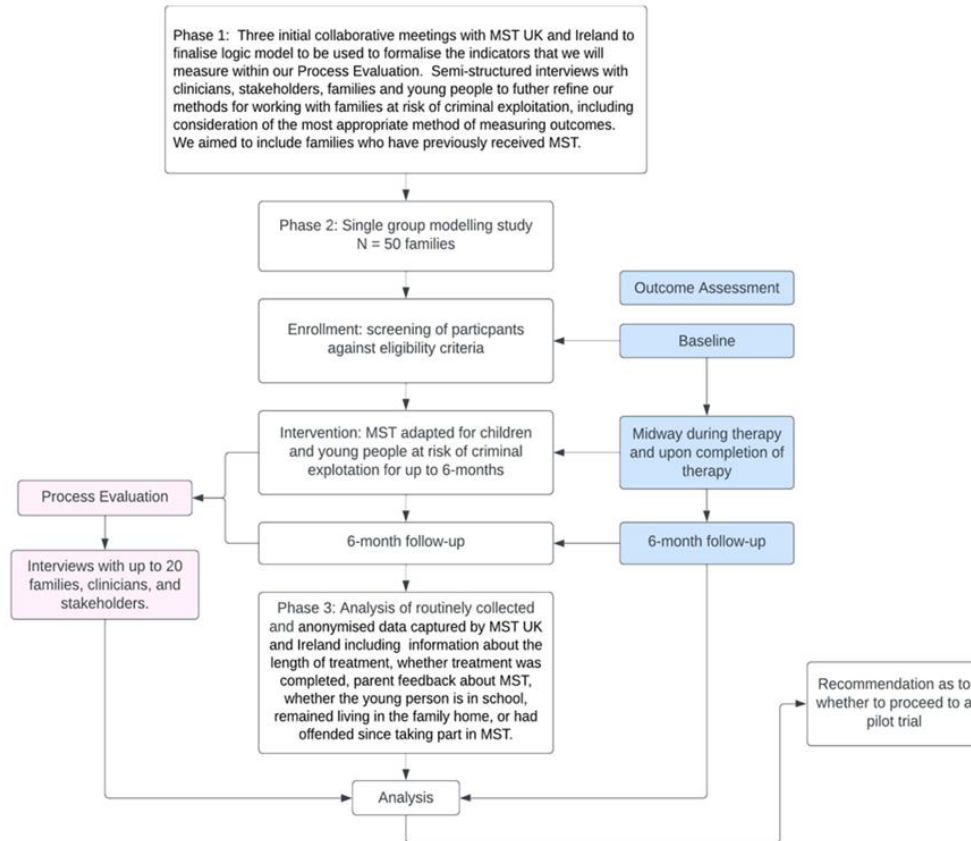
In addition, we sampled families, stakeholders and clinicians to complete in-depth interviews as part of our process evaluation to further consider whether the augmentations to the current MST protocol for children

at risk of criminal exploitation were successfully implemented, with reference to our logic model, and any associated factors that facilitated or hindered the successful implementation.

## Methods

A summary of our methods is depicted in Figure 1.

Figure 1: Flow chart depicting study methodology and planned participant recruitment



## Participant selection

Phase 1: We held three collaborative meetings with MST UK and Ireland to consider the existing Theory of Change and logic model for MST and make augmentations appropriate for families where a child is at risk of criminal exploitation. We also involved MST teams in Birmingham, Sandwell, Kirklees and Nottingham, in collaboration with MST UK and Ireland, to recruit participants for our interviews. We specifically attempted to interview families that had previously completed MST. We planned to interview up to 15 stakeholders and families.

Phases 2 and 3: For Phases 2 and 3, the study took place within community-based settings in Birmingham, Sandwell, Kirklees and Nottingham within existing MST services. We planned to recruit 50 families for Phase 2. Families that were referred to receive the intervention were invited to take part in the research study. The steps in the pathway for the study were as follows: All participants who agreed to take part and for whom parental consent were required were screened to ensure they met the eligibility criteria. Participants who met these criteria were assigned to receive MST and invited to complete our outcome measures over time. We planned to recruit and interview up to 12 participants and families and 12 key stakeholders as part of our process evaluation and our investigation of the acceptability and experience of treatment. Further information about the trial pathway and design can be found in Figure 1.

## Eligibility criteria

Our eligibility criteria were as follows:

Inclusion criteria:

(1) The child is aged between 10 and 15.

(2) The child or the family disclosed that another person or group used their power to coerce, control, manipulate or deceive the child into any criminal activity in exchange for something that the child wants or needs, for financial or other advantage of the individual or group, or through violence or threat of violence, or, at least two of the following were present suggesting that the child is likely at risk of CCE:

- a) The child had a criminal conviction, final warning or reprimands within the last 12 months.
- b) The child is exhibiting weekly aggressive behaviour that is of a significant risk to others (e.g. sexually abusive behaviour or physical fighting).
- c) The child has at least one period of having gone missing, even for a few hours, within the last six months.
- d) The child has a history of substance misuse.
- e) The child has a history of school exclusion.
- f) There is a history of association with peers or adults who are seen by others as having a negative influence upon the child.

(3) The child has an identified primary caregiver.

(4) The child lives with members of their family, which could be long-term foster carers.

Exclusion criteria: (1) There is a documented high risk of the child committing suicide; (2) there is evidence that the child has a psychotic illness; (3) there is documented evidence that the child has a Full Scale IQ <65, or there is evidence that they have a learning disability that prevents them from taking part in MST; (4) there is evidence that a family member who is living with the child has been sexually abusing them and there continues to be an active and enduring risk; and (5) the child has a diagnosis of autism and the MST team consider the problematic behaviours are associated with the diagnosis of autism, and therefore the child is judged not to be suitable for MST.

We planned to recruit up to 50 children and teenagers from one of three geographical regions within four local authorities (i.e. Birmingham, Sandwell, Nottingham and Kirklees), along with their families, to take part in this study. As this is a feasibility study, and the purpose is to provide estimates of key parameters for a future pilot trial rather than to power the current study to detect statistically significant differences, a formal a priori power calculation was not conducted (Arain et al., 2010). However, recruiting 50 participants was expected to provide a certain level of precision, around a 95% confidence interval, regarding the estimate of within-group effect. For example, the 95% confidence interval associated with a sample size of 50 is +/- 13.8. We therefore believed that this sample size provided reasonable precision around our estimates of parameters, which were used to inform the design and decision to proceed to a pilot trial, including an estimate of the standard deviation of our outcome measures.

## Data collection

### Phase 1

Within this phase, we initially held three collaborative meetings with the delivery team to refine the logic model to help formalise the key indicators that we included within our process evaluation. Following this, we completed semi-structured interviews with therapists, primary carers and one young person. We completed one interview with three therapists as a group. The aim was to refine MST tools for working with

families at risk of criminal exploitation, including adaptations to existing fidelity checklists, and to consider the most appropriate method of measuring outcomes from MST for children at risk of criminal exploitation. Within each meeting, the proposed changes to standard MST, along with selected outcome measures, and the MST Therapist Adherence Measure – Revised (TAM-R) were discussed. Each participant was asked to consider each proposed change, outcome measure and the fidelity checklist in turn and were encouraged to consider the likely benefits, disadvantages and any associated implementation challenges as part of a semi-structured interview.

Interviews were conducted by Dr Hayden by telephone or online using Microsoft teams in spring and summer of 2021. Each participant received a £30 voucher as a thank-you for their participation.

## Phase 2

Phase two was a single group modelling study focused on determining: (i) the acceptability and feasibility of MST for stakeholders, including families; (ii) patient and clinician satisfaction with the intervention; (iii) the appropriateness of our measures in terms of their use within a future pilot trial; (iv) the accrual rate and willingness of teams to recruit participants; (v) therapy completion rate and attrition; and (vi) an estimate of within-group effect size.

Families enrolled in the study received MST for children at risk of criminal exploitation and were invited to complete outcome measures within four weeks before the commencement of treatment, and then 13 weeks (midpoint), and 26 weeks (six months – end of treatment). Measures were completed online, together with a researcher in person, on the telephone or using video conferencing. Our measures were as follows:

1. Eligibility screening: Participants and their families were invited to initially take part in a screening interview to ensure that they meet the eligibility criteria for the study. An eligibility checklist was completed to ensure that the inclusion criteria were met and none of the exclusion criteria were met.
2. Primary outcome measure: The provisional primary outcome for this study was the Self Report Delinquency Measure (SRDM; Smith and McVie, 2003), which was developed and used as part of a longitudinal study of criminal offending behaviours among 4,300 children in Edinburgh. This is a measure comprising 15 items pertaining to antisocial behaviours (e.g. burglary, violence) that require children to respond 'yes' or 'no' with reference to a time period and then report the estimated frequency of behaviour and whether they have ever been caught. There is evidence that asking respondents to indicate whether they have engaged in these behaviours is accurate (Nock et al., 2007, Nock et al., 2006), and this measure has previously been used as an outcome measure within a randomised controlled trial of MST (Fonagy et al., 2018).
3. Secondary outcome measures: (a) Empathy: the parental/carer version of the Griffith Empathy Measure (GEM; Dadds et al., 2008) was used, which is a 23-item measure of cognitive and affective empathy for children and adolescents that can be used with children aged from four years. The GEM has robust psychometric properties (Dadds et al., 2008); (b) Callous and Unemotional Traits: The 24-item Inventory of Callous and Unemotional Traits parent report and youth self-report versions, robust and well validated instruments, were used (Essau et al., 2006a) (Ciucci et al., 2013); (c) Emotional and Behavioural Difficulties: The parent and self-report versions of the Strengths and Difficulties Questionnaire (SDQ) were used to assess child and teenager wellbeing. The SDQ is a robust and well-validated measure of behavioural and emotional problems (Deighton et al., 2014); (d) Peer Deviance: The Behaviour of Friends Questionnaire (BFQ; Goodnight et al., 2006) is a 10-item checklist that assesses peer delinquency by asking respondents to indicate whether their friends engage in a variety of antisocial behaviour (e.g. lying, stealing) using a 5-point Likert scale. The measure has been shown to have excellent internal consistency (Goodnight et al., 2006); (e) Parenting: The Alabama Parenting Questionnaire has robust psychometric properties and measures

parental involvement, positive parenting, monitoring/supervision, inconsistent discipline and punishment. Both the parent and child completed versions were used (Essau et al., 2006b, Frick et al., 1999); (f) Satisfaction: At the end of treatment, we assessed acceptability by asking all children, adolescents and parents to complete a questionnaire containing 10 items that are answered using a Likert scale. Items specifically ask about satisfaction with taking part in the intervention; (g) Family Functioning: This was measured using the Family Adaptability and Cohesion Scales – IV (FACES-IV), which is a 62-item self-report measure that assesses cohesion, adaptability, communication and satisfaction within a family system (Olson and Gorall, 2006); and (h) Gang Affiliation: The Gang Affiliation Risk Measure (GARM; Raby and Jones, 2016, Raby et al., 2017) is a 15-item measure of gang affiliation that was developed with teenagers and young people from England.

Also, within Phase 2, we undertook semi-structured interviews with MST consultants, supervisors, therapists, primary carers and young people, which considered whether the augmentations to the current MST protocol for children at risk of criminal exploitation were successfully implemented with reference to the logic model and recruitment and considered any associated factors that facilitated or hindered the successful implementation. In addition, the interviews explored COVID-19-related challenges, with an attempt to fully describe how these challenges differ from pre-pandemic times.

Interviews were conducted by Dr Hayden by telephone or online using Microsoft teams between May and September 2022. Each participant received a £30 voucher as a thank-you for their participation.

Following this and the completion of the next phase, Phase 3, all data sources, both qualitative and quantitative, were compared using three different types of triangulation: (a) methodological – using more than one method to collect data; (b) data – using multiple data sources; and (c) investigator – using multiple researchers to analyse the data.

### **Phase 3**

We requested anonymised data from the MST Institute (MSTi) for all families that received MST as part of our process evaluation. These data are collected and stored for all families that receive MST as routine with parental consent, which included agreement to the use of their anonymised data for research purposes. This database is referred to as the MSTi database. It contains routine data collected for all participants such as demographic information (e.g. age, gender, ethnicity), treatment information (e.g. length of treatment, whether treatment was completed) and key outcome data (e.g. whether the young person is in school, remains living in the family home or has offended since taking part in MST). Parents/carers consent to these data being collected and stored within the MSTi database, and they are reported/analysed anonymously as part of their MST participation agreement paperwork. We paid a fee to access these data, which was £663.45.

We requested and analysed these data because families received the intervention, which was funded by the YEF. The data were anonymous and pertained to families that did and did not agree to take part in our study.

**Table 1: Methods overview**

Research methods	Data collection methods	Participants/ data sources	Data analysis method	Research questions addressed	Implementation/ logic model relevance
Quantitative data: Pre-post modelling study	Quantitative data capture using questionnaires	Parents/carers Young people	Summary descriptive statistics	Is it feasible to complete a pilot trial of MST for children at risk of criminal exploitation within existing services within England?	Outcome measurement and missing data; within-group effect sizes; accrual, conversion rates, and retention; therapy completion rate
Qualitative: Pre-post modelling study	Semi-structured interviews	Therapist, MST consultants, supervisors parents, carers and young people	Framework analysis	<p>Is it feasible to complete a pilot trial of MST for children at risk of criminal exploitation within existing services within England?</p> <p>Do families, children and teenagers, clinicians, and other stakeholders consider MST for CCE an acceptable intervention?</p> <p>What are the likely factors that will facilitate or hinder the successful implementation of MST for CCE, and how can they be successfully managed?</p>	The acceptability and feasibility of MST for children at risk of criminal exploitation for stakeholders, including families; patient and clinician satisfaction with the intervention; the appropriateness of our measures in terms of their use within a future pilot trial; the appropriateness of an adapted fidelity checklist (if possible).
Qualitative: Process evaluation	Three different types of triangulation: (a) methodological – using more than one method to collect data; (b) data – using multiple data sources; and (c) investigator – using multiple researchers to analyse the data	Quantitative data from Phases 2 and 3; semi-structured interviews from Phases 1 and 2; meeting notes	Triangulation	<p>Is it feasible to complete a pilot trial of MST for children at risk of criminal exploitation within existing services within England?</p> <p>Do families, children and teenagers, clinicians, and other stakeholders</p>	The acceptability and feasibility of MST for children at risk of criminal exploitation for stakeholders, including families; patient and clinician satisfaction with the intervention; the appropriateness of our measures in terms of their use within a



				<p>consider MST for CCE an acceptable intervention?</p> <p>What are the likely factors that will facilitate or hinder the successful implementation of MST for CCE, and how can they be successfully managed?</p>	<p>future pilot trial; the appropriateness of an adapted fidelity checklist (if possible).</p>
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## Analysis

As this is a feasibility study, the analyses were descriptive in nature, but comparisons across time were made to examine change on our outcome measures where appropriate and the effect size calculated and reported. Continuous data were reported as means and standard deviations, or medians and interquartile ranges, as appropriate. Categorical data were reported as frequencies and proportions. All data were reported both overall and by site. Outcomes were estimated with their associated 95% confidence intervals. Comparisons across time were made for our primary and secondary outcome measures using paired samples t-tests, and the associated within-group effect sizes were reported. While the calculation of a within-group effect size is helpful in suggesting whether an intervention is associated with intended change, it is biased and not suitable to use directly to inform required sample sizes for future studies.

Semi-structured interviews were transcribed verbatim and analysed using Framework Analysis (Bryman and Burgess, 1997, Bryman and Burgess, 1994). This methodology was considered appropriate for this context given the specificity of the research questions, an awareness of potential issues and a pre-designed sample. It involved developing a draft thematic framework based on the research questions, assigning codes to each theme and descriptive labels to each code, and applying the codes to a sample of transcripts. Transcripts were examined line by line, and identified codes were applied. It was possible for sections of text to be coded by multiple codes where there was overlap. Based on this initial analysis, which included 20% of the transcripts being double coded (i.e. by another researcher), the framework was refined. The final datasets were coded (indexing) using NVivo software. After indexing, charting was conducted, whereby a series of matrices were created that summarised data for each theme by participant group and individual. These matrices were mapped onto each other with any areas of similarity and difference highlighted and used to interpret the data.

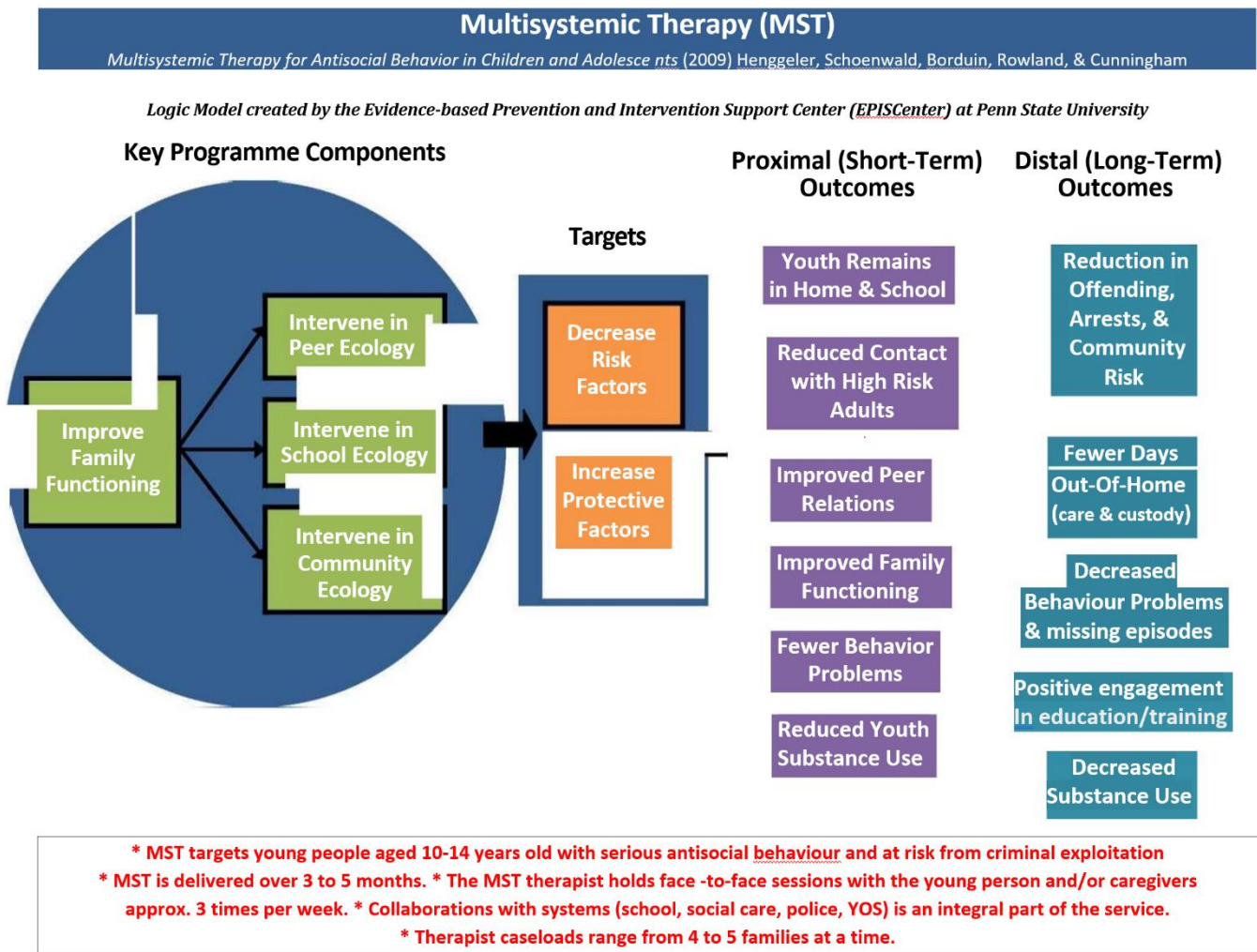
## Findings

### Theory of Change/logic model development

Within Phase 1 of this project, we held three collaborative meetings with MST UK and Ireland to consider the existing Theory of Change and logic model for MST and make augmentations appropriate for families where a child is at risk of criminal exploitation. The Theory of Change associated with MST can be found here: <http://www.mstuk.org/about-mst-uk-i/theory-change>. The logic model can be seen in Figure 2. No

changes to the logic model or Theory of Change were made. Changes to the programme components were made as detailed below.

**Figure 2: Logic model**



## Programme Components

MST is delivered over 3-5 months. Therapist meets with the carer, family, and/or young person, and others in the young person's ecology, as frequently as needed to achieve treatment goals. Services are delivered in the home, school, and community, at times convenient for the family. Families are offered 24/7 on call by the MST team

## Interventions

Specific strategies and techniques are selected and tailored after careful assessment of the "fit" of factors driving the problem behaviour. Interventions are closely monitored for effectiveness and modified as needed. Listed below are a sample of possible strategies.

## Targeted Risk & Protective Factors

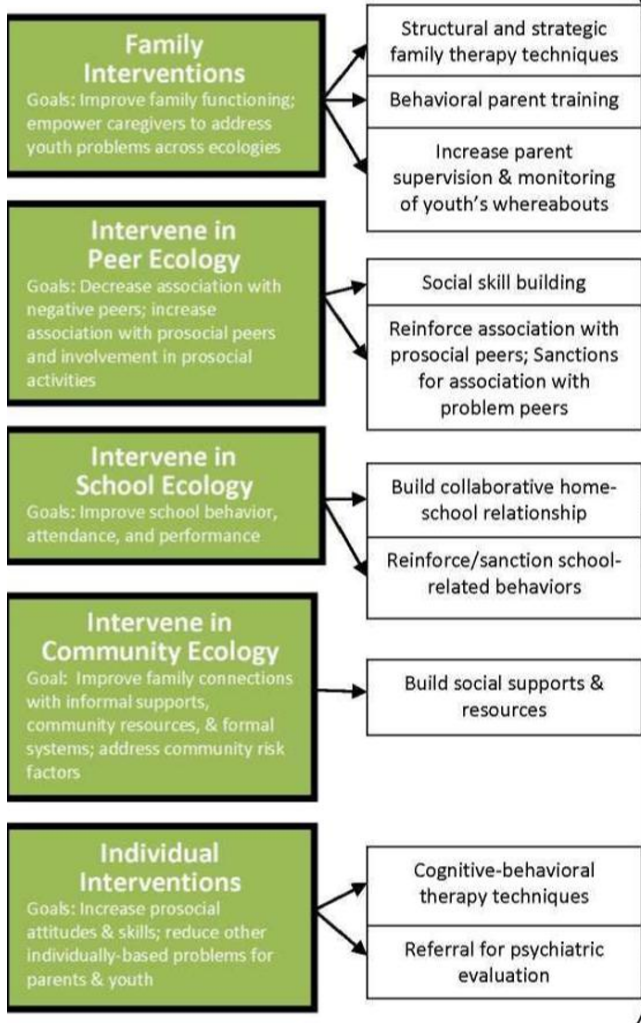
Risk factors, which increase the likelihood of negative outcomes (e.g., substance abuse, offending, school exclusion/absence, violent behaviour, missing episodes) are targeted for a decrease. Protective factors, which exert a positive influence and buffer against negative outcomes, are targeted for an increase.

## Proximal Outcomes

Outcomes impacted by the programme immediately following completion that have been demonstrated through research. Studies compared MST to "usual services" and individual therapy.

## Distal Outcomes

Outcomes impacted by the programme from months to years following programme completion that have been demonstrated through research. Studies compared youth receiving MST to "usual services" and individual therapy. Significant findings are highlighted below.



## Targeted Risk Factors

### Peer

- Association with antisocial or substance using peers
  - Poor peer relationships / peer rejection

### Family

- Poor affective relations between youth and family members
- Harsh, inconsistent, or lax discipline
- Lack of supervision
- Low social support for family

### School

- Poor academic performance
- Behaviour problems at school

### Community

- Availability of weapons and drugs
- Gang activity (adults & young people)

### Individual

- Attitudes favourable toward antisocial behaviour and substance use
- Impulsivity
- Negative affect

## Targeted Protective Factors

- Association with prosocial peers & adults
  - Engagement in prosocial activities in school and community
- Positive family relationships and supportive family environment
  - Positive parental relationships
  - Natural support network
- Commitment to education
- Conventional attitudes
- Problem-solving skills

## Youth Remains In Home and School

- Decreased out-of-home placement (Care & Custody)
- Reduced missing episodes
- Reduced offending
- Improved school attendance
- Reduced school exclusions
- Improved school performance

## Improved Peer Relations

- Decreased association with deviant peers and high risk/exploitative adults
- Increased association with positive peers & adults
- Decreased aggression
- Improved social competence

## Improved Family Functioning

- Increased family cohesion, adaptability, warmth and supportiveness
- Improved parenting practices
- Decreased conflict-hostility
- Reduced parent psychiatric symptoms and well-being

## Fewer Behaviour Problems

- Significant improvement in both internalizing and externalizing problems

## Reduced Substance Use

- Decreased alcohol use
- Decreased marijuana use
- Decreased hard drug use

## Reductions in Offending, Arrests, & Custody

- Less self-reported criminal activity at 1- & 2-year follow-up
- 25% to 70% lower rates of arrest at follow-up
- Arrested for less serious offenses

- 43% fewer days on adult probation at 14-year follow-up
- 75% fewer violent felony arrests and 33% fewer days in adult confinement at 22-year follow-up

## Fewer Days Out-Of-Home

- 47% to 64% reduction in days spent in out-of-home placement for 6 to 12 months postdischarge

## Decreased Behaviour Problems

- Fewer internalising and externalizing problems at 2-year follow-up

## Decreased Substance Use

- Decreased alcohol and marijuana use at 3-year follow-up
- 75% fewer substance-related arrests at 4-year follow-up

The resulting changes to programme components are outlined below:

### **Augmentations to the standard MST model**

The augmentations are summarised below:

- (a) Extending the length of treatment from three to five months to four to six months;
- (b) The inclusion of psychoeducation about criminal exploitation for families;
- (c) Expansion of the content of therapy to include a greater focus upon teaching coping skills, safety planning, trauma-focused work, substance misuse work and addressing both distorted cognitions and social skills for families;
- (d) Ensuring that the expectations and the content of any intervention is developmentally appropriate for children who are aged 10–12;
- (e) An increased focus upon parents setting clear expectations about curfews and peers;
- (f) Increased supervision and monitoring of social media by parents/carers;
- (g) Increased plans to retrieve a younger person if they go missing in collaboration with agencies (e.g. police);
- (h) Increased safety planning around risky behaviours in the community (e.g. weapons, aggression);
- (i) Strengthening partnerships with youth offending services, social care, health, police, youth violence and gangs to help map exploitation activity;
- (j) Increased focus upon increasing pro-social peers and activities;
- (k) Inclusion of training and resources for working with young people who are involved with risky adults/gangs, inclusive of mapping contacts with negative peer groups;
- (l) Increased focus upon the promotion of relationships with positive adults within the community;
- (m) Working with primary schools, especially around periods of transition to secondary schools;
- (n) Increased work to reduce school exclusions and weapon carrying; and
- (o) Increasing the focus upon working collaboratively with agencies.

Following the completion of Phase 2, not all the augmentations to the standard MST model were implemented by the delivery team. The main reason for this was associated with trying to deliver the intervention during the COVID-19 pandemic. The augmentations that were delivered are outlined below:

- (a) Initial training for therapists: In addition to the usual MST orientation training, therapists and supervisors received an initial two days of training in MST assessment and intervention processes with a specific focus upon CCE. This included teaching about previous research regarding the effectiveness of MST. It also included working with stakeholders such as the police, social care, exploitation teams and alternative education who work with those at risk of CCE and are focused upon working collaborative, improving communication and effective community safety planning.
- (b) Supervisor training: There was additional supervisor training about working in primary schools.

- (c) Further additional training: Quarterly booster training sessions were implemented, which are included within the standard MST model, but there was an increased focus upon CCE and related issues (e.g. community safety planning).
- (d) Additional resources: Two resource packs were developed and provided to therapists. The first focused upon knowledge and information, including best practice guidelines, information about local and regional resources, information about relevant legislation, information leaflets and information about relevant websites and videos. The second aimed to provide additional MST tools, which were collated from existing MST tools used in standard MST, but some additions were made that included an increased focus upon community safety planning, peer assessment, technology and social media, and improved stakeholder collaboration.
- (e) Psychoeducation leaflets: These were developed specifically about CCE and were given to families.
- (f) Intervention augmentation (treatment length): Treatment length for MST is approximately three to five months, and this was extended by up to one month for families where this was judged necessary by therapists and supervisors.
- (g) Intervention augmentation (younger children): Intervention adaptation (younger children): Standard MST, in the UK, was designed for use with children aged 11–17 years, and children as young as 10 years were included within MST for children and young people at risk of criminal exploitation.

## **Participants**

### **Phase 1**

Semi-structured interviews were conducted with 16 participants. These included:

- One-to-one interviews with six therapists and one group interview with three therapists, all of whom had experience of working for standard MST or MST for families of children at risk of criminal exploitation;
- Six primary carers who had received standard MST or MST for families of children at risk of criminal exploitation in the past (four mothers, one grandfather and one stepfather); and
- One young person who had received standard MST in the past.

### **Phase 2**

Families were recruited from four locations within England: (1) Sandwell, (2) Kirklees, (3) Nottingham and (4) Birmingham. Families received MST from their local team. The team in Sandwell launched in February 2020 and continued until May 2022, just after the project funding ended in March 2022. The team in Kirklees launched in March 2020 and received local funding to become embedded into existing services following the completion of the project. The Nottingham team opened in May 2020, operated throughout the funding period of the project and continued with local funding to complete work with families until October 2022. The team in Birmingham launched in February 2021 and continued operating as they became embedded into existing services following the completion of the project. The number of carers recruited into the study per site can be seen in Tables 5–8.

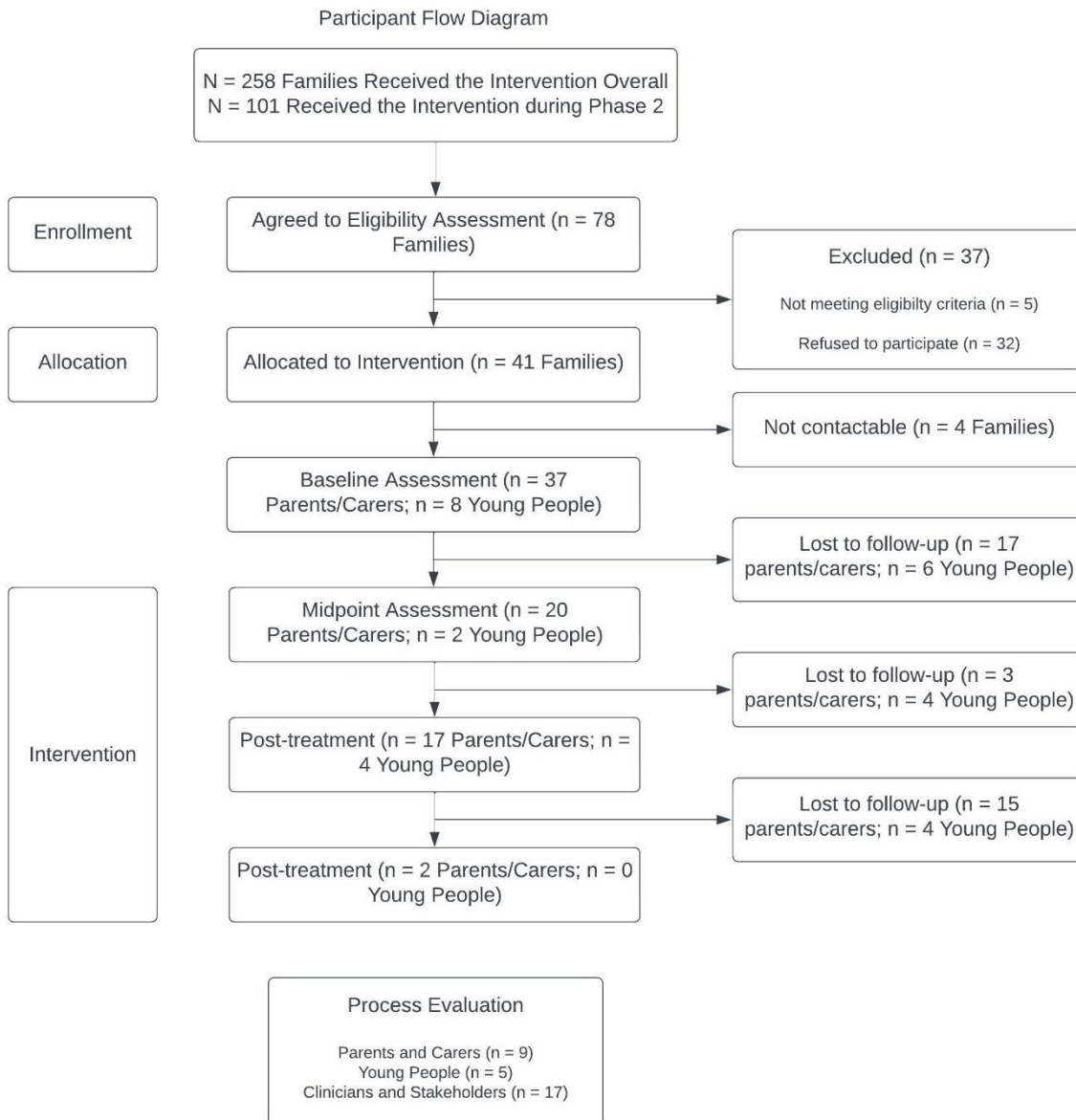
### *Accrual and retention*

In total, 258 families received MST. One hundred and fifty-seven families received the intervention prior to Phase 2 of the research opening for recruitment in August 2021. One hundred and one families received the intervention from August 2021 after recruitment for Phase 2 opened (Phase 2 lasted for 16 months). Seventy-eight of these 101 families expressed an interest in taking part and were assessed for eligibility. Seventy-seven per cent of those who agreed to receive the intervention expressed an interest in taking part in our study and were assessed for eligibility, and five did not meet eligibility criteria. This conversion rate was 1.3:1.

Forty-one families subsequently agreed to take part in the study, which is 53% of those who expressed an interest and 41% of those who received MST. This conversion rate is 1.9:1 based upon those who expressed an interest in taking part and 2.5:1 based upon the total number who received MST during this period. Participant flow is depicted in Figure 3. Four families were lost after initial enrolment, which means that our subsequent conversion rate was 2.1:1, based upon those who expressed an interest in taking part in the research, or 2.7:1 based on those who received MST during this period. The accrual rate over time per site was .58 families per month.

The average age of primary carers who consented to take part in the study was 41.99, SD = 9.81, and the majority were mothers (n = 32, 87%). Two of the parents were fathers (5%), and the remaining were grandmothers (n = 3; 8%). Twenty-nine (79%) reported their ethnicity as White British, with six (16%) reporting their ethnicity as mixed, Black, Chinese or other ethnic groups. Data on ethnicity were missing for two (5%) participants. Twenty-two (60%) primary carers reported that they were not in work, and 11 (30%) reported that someone else in the household was in employment.

Figure 3: Phase 2 participant flow diagram



Eight young people agreed to take part in Phase 2 of the study and complete outcome measures. Their average age was 13.5 ( $SD = 1.37$ ). Four (50%) were female, and seven (88%) said they were attending school. Three (38%) were attending alternative educational provision, including home schooling. Four (50%) said they were White British, with the remaining 50% coming from mixed, Black or other ethnic backgrounds, or the data were missing.

As depicted in Figure 3, 37 primary caregivers (90% of those enrolled) completed baseline assessment prior to the commencement of MST; 10% were lost. Following this point, 17 (41%) primary caregivers were lost, and 20 (49%) completed a midpoint assessment. Three (7%) families were then lost, and 17 (41%) completed post-treatment assessment. Only two (5%) primary caregivers took part in post-treatment assessment, with 15 (37%) being lost to follow-up. At follow-up, 95% of primary caregivers were lost. Eight young people completed baseline assessment, and six (75%) were then lost to midpoint, but two re-engaged when approached to complete post-treatment assessment, indicating that we retained 50% at this point. At follow-up, we lost 100% of young people.

## *Process evaluation*

Semi-structured interviews were conducted with 31 participants. These were:

- Two MST consultants who provided support and training to MST teams and had a significant role in developing the MST for children at risk of criminal exploitation model.
- Four MST supervisors who managed MST site teams and supervised MST exploitation therapists. MST supervisors have experience of MST delivered to other groups as they provide cover for other supervisors (and one had experience supervising MST that had been adapted for use with a different group).
- Eight MST therapists. Some had experience of standard MST as well as MST for children at risk of criminal exploitation (one had taken part in standard MST as a parent, and two had previously been standard MST therapists). The length of time working as an MST therapist for children at risk of criminal exploitation ranged from just two months to over two years. Three therapists no longer worked for the MST teams delivering treatment to children at risk of criminal exploitation due to site closure or because their post had been a secondment.
- Three stakeholders who were not employed by MST but have worked with, or alongside, sites and therefore understood multi-agency working and how MST for children at risk of criminal exploitation fit into other services. One was a youth worker for a criminal exploitation mentoring service, and two provided operational oversight for criminal exploitation in their local authority.
- Nine parent/carers, including eight mothers and one father. Eight of the nine families had received some of the intervention; one family never started the intervention (this was a site decision); two families had treatment end early. One was because the young person moved in with their other parent and out of the area and the other because the parent had dropped out of the intervention.
- Five young people, including two girls and three boys. The families of four of these young people had taken part in the intervention, but one young person's family did not commence treatment (the family stated that this was a site decision). Two of the young people received the intervention but did not take part in any of the pilot research.

## **Results**

### **Phase 1: Semi-structured interviews**

#### **Objective:**

**To undertake interviews with clinicians, stakeholders, families and young people to refine MST tools for working with families where there is a risk of criminal exploitation, including adaptations to any existing fidelity checklists, and to consider the most appropriate method of measuring outcomes from MST for children at risk of criminal exploitation.**

The findings from Phase 1 were used to inform Phase 2.

#### *Engaging young people*

A majority of therapists thought that engaging younger people would be challenging because they may have difficulty understanding the study and the research measures (i.e. the cohort of young people for MST for children at risk of exploitation is younger than those typically using MST) and because younger children do not always have their own mobile phones and therefore are dependent on parents as gatekeepers. Primary carers also expressed a concern that taking part in the research might be difficult for the young person.



*I think it might be a bit much for the child. I think with MST, some of the questions that [MST worker] asked [young person], he'd just go, 'Oh, whatever', because he didn't understand. (Primary carer: FG07P-4)*

The young person interviewed suggested seeing their own parents taking part may encourage them to also take part. During the project meeting group, it was decided that if a young person under the age of 16 completed a questionnaire and their parents provided informed consent, this could possibly be treated as assent to participate, even if the young person had not completed the assent form. This would not apply to young people over the age of 16 where informed consent would be required.

### *Engaging the family*

Primary carers and therapists who were interviewed noted that time is often in short supply: other services are pulling on primary carers' time, and this can make it harder to arrange appointments to do research (i.e. research is low priority). It was suggested that the research team be flexible with families and ask them for feedback on how best to work around them in terms of both timing and format. The study team noted that primary carers often preferred telephone or in-person contact (rather than email or video conferencing). It was also noted that the start of treatment is especially stressful and families are often at 'crisis point'.

NH Now, if you can imagine having to fill out something like this before you started your MST?

Carer Oh my god! No, it would have been bad. I'd have looked at it and cried, actually.

NH Do you think that would mean that you'd have been less likely to finish it?

Carer Probably, because it would have all been negative, the majority of it. You know what I mean? 'Strongly disagree' or 'never' or 'almost never. (FG07P-4)

### *Views on incentives*

Many participants thought that £5 vouchers would be an incentive to families, although a couple of therapists highlighted that for young people earning money through gang involvement, vouchers were unlikely to be incentivising. One suggested creating experiential rewards tailored for each young person (e.g. arranging a tour of their football club for taking part in all four questionnaires). This was discussed by the project team meeting group but not adopted as it would not be feasible to organise such activities for each young person.

Primary carer motivation to take part in research appeared to be to sustain MST and to help future families that are in a similar position to themselves (rather than vouchers).

### *Views on questionnaires*

Both primary carers and therapists observed that the questionnaires were relevant, but some commented that they were also long and repetitive.

*But is there gonna be a point at which the parent decides, 'Oh, this is too long. I'm gonna just start ticking boxes'? (Therapist: FG04C)*

The project team meeting group decided not to shorten the questionnaire; rather, a 'minimal dataset' was discussed and how to incentivise family carers and young people to complete at least some of the

questionnaire (especially the first three measures) if they found it too long. The order of the questionnaires was changed to make sure that the more important measures were at the start.

Difficulties with specific questions that were highlighted included questions that were non-applicable (e.g. about school when the young person did not attend), on topics where the young person's behaviours varied significantly between contexts, and difficulties defining the term 'family'.

Therapists also raised a concern around 'honesty' about parents reflecting on their parenting practices at baseline.

Participants thought young people would be more willing to complete the questionnaire with a parent or a therapist. A box indicating who was helping/completing the questionnaire with the participant (if applicable) was added to the questionnaire.

#### *Views on the appropriateness of an adapted fidelity checklist (if possible)*

Therapists and primary carers did not have any objections to the Therapist Adherence Measure - Revised (TAM-R), although family carers said that it was hard to remember the options over the telephone.

Because of this feedback, primary carers were given hard copies of the questionnaires and were advised to write down the top scale for each measure when doing the questionnaires on the telephone. The project team noted that the TAM appeared to assess aspects of the acceptability of the intervention rather than pure fidelity. There was a discussion about the value in developing a measure of adherence for MST for children at risk of criminal exploitation, but it was decided that this was beyond the scope of the current study.

#### *Acceptability for primary carers*

Primary carers spoke positively of their experiences of MST.

*[MST is] brilliant, I think [MST worker name] is an absolutely fantastic guy.* (Primary carer: FG03P-1)

*I think it helped my family a lot because now I'm in a school and I'm a completely different person to when I was before I had MST... It's like if someone said, 'Is there anything you recommend for my child who is misbehaving?' I would say, 'Yeah, MST is really good.'* (Young person: FG03Y-2)

Specifically, primary carers who were interviewed appreciated the relationship they had built up with their therapist and the intensive nature of the support received. Strategies around improved family functioning, including de-escalation and reducing conflict, were highlighted as having led to improved relationships between primary carers and young people.

Primary carers and the young person interviewed were positive about most of the proposed augmentations from standard MST to MST for children at risk of criminal exploitation, but some primary carers questioned the age group that the adapted intervention was targeting, wondering whether 10 was too young to be learning about exploitation.

Others felt this depended on the circumstances.

*If anybody was in a situation that I was in, or am in, you're just prepared to accept all the help going.* (Primary carer: FG08P-3)

### *Acceptability for therapists*

Therapists spoke positively about the MST model, citing the opportunity to work systemically and more intensely as a significant contributor to work satisfaction:

*For me, it was the opportunity to work more with systems and with the family as well... feeling like I could have more impact possibly, kind of working with all the systems and being so intense with the families and with schools, and kind of having that close working relationship and really kind of that holistic approach almost. (Therapist: ST14)*

Regarding the proposed adaptations, therapists were broadly positive, although they did not always see clear differences between standard MST and augmentations made to MST for delivery to children at risk of criminal exploitation. The proposed lowering of the target age for children and young people was felt to be workable with the view that young people would be receptive at that age. Some therapists also thought that the proposal to have more time to work with families was helpful.

### *Focus on exploitation*

There were concerns from therapists that the term exploitation or the explicit focus on gangs could put young people and primary carers off, as some may deny that they are at risk of or were being exploited. Most primary carers, however, were fine with the term, as it reflected their experiences and support needs, although one carer highlighted how upsetting it was to learn that their young person was being exploited.

*If it helps the family and stops them getting into that, I am all for it. (Primary carer: FG03P-1)*

There were also questions raised by a couple of participants (including the young person) about whether 10- and 11-years-olds were too young to learn about and understand gangs and exploitation.

The issue was important for the research team as, from an ethical perspective, it was felt important to explain the intervention to families at sign up – and that families needed to know that they were receiving MST that had been adapted. However, the MST team was concerned about introducing exploitation to families earlier than they might otherwise have done. It is possible that the need to be transparent with participants may have changed the intervention in some way by influencing sites to introduce the concepts earlier than MST would have otherwise done.

### *Facilitators*

Primary carers who were interviewed cited their relationship with the therapist as the main facilitator to taking part in the intervention, and noted, in particular, those instances when they felt that the therapists had not judged them. In addition to the approach from therapists, family carers appreciated the on-call service and the flexibility of setting up appointments.

*She taught me and my partner better ways for us dealing with [name] and how to handle [name]. And the tools... it was very non-judgemental, which I thought was really nice. (Family carer: FG08P-3)*

Another important factor cited was other family/community members being engaged in the process.

Therapists spoke about the range of experiences within the teams as an important facilitator in their work.

### *Barriers – family perspectives*

Family systems are complex, and this can pose barriers to MST implementation. For example, some family carers are also caring for parents, partners and multiple children in the family that need support and have MST-referral behaviours. Having other family members not engaged in the process was seen as difficult:

*So, we had MST involved, and my wife didn't engage with it at all. She found it too critical, too personal, so she didn't engage with it. (Primary carer: FG08P-3)*

Primary carers also pointed out that it is a steep learning curve. The perspective shift needed from thinking about the young person as perpetrator to victim and the shift to a focus upon change was challenging for some, as well as challenges of monitoring social media; this was particularly difficult for grandparent carers.

*Yeah, all of it. Every single bit of it because it was completely different to how I used to do things. Nearly every line on that spreadsheet was the opposite of how I did things a year ago, so like I say, I had to do some 360 feedback on myself and changed how I approached things; my brain said, 'You don't ever do that.' (Primary carer: FG04P-4)*

Primary carers also talked about access to extracurricular activities and positive role models sometimes being a barrier, particularly when there are multiple children and few adults and low household incomes.

### *Barriers – therapist perspectives*

Therapists noted that the ability of families to engage was sometimes a barrier. Understanding what is happening in the family relies on open and self-reflective parents. Some families were in denial or resistant to the idea that their young person was at risk of criminal exploitation. Such complexity was seen as difficult to work with within available timescales, as was agreeing priorities.

*It can sometimes feel like, 'Wow, there's so many things that we could focus on,' and I know that's where it comes to the point of prioritisation, but in terms of timeframes, what is realistic within that four to six months to be working on, especially if you're thinking on trauma-focused work or maybe something parentally. Timing can be difficult. (Therapist: ST17)*

A second theme within barriers was around the nature of exploitation. Gangs are constantly changing, so therapists were seen as having to adapt constantly. The nationwide lockdown that was imposed as a result of COVID-19 changed the nature of exploitation, opening up avenues online that are more difficult to spot.

### *COVID-19*

Participants were asked about COVID-19 and any likely impact it might have on the study. The sense was that it would not have much of an impact on either the research or the intervention as procedures had been developed to work during lockdowns. The main risk identified was if schools were closed, as this extended the length of treatment during the first lockdown. This fed into the research process by reiterating the need to be flexible and to have remote ways of working. Remote methods for taking consent and completing the questionnaires were subsequently included in the research design.

## Phase 2: Outcome data

### Objectives:

To complete a single-group modelling study of MST for children at risk of criminal exploitation, with up to 50 families receiving treatment within existing MST services, in order to estimate: (i) the acceptability and feasibility of MST for children and young people at risk of criminal exploitation for stakeholders, including families; (ii) patient and clinician satisfaction with the intervention; (iii) the appropriateness of our measures in terms of their use within a future pilot trial; (iv) the appropriateness of an adapted fidelity checklist (if possible); (v) the accrual rate and willingness of teams to recruit participants; (vi) therapy completion rate and attrition; and (vii) the within-group effect size.

Complete in-depth interviews as part of our process evaluation to further consider whether the augmentations to the current MST protocol for children at risk of criminal exploitation were successfully implemented, with reference to our logic model, and any associated factors that facilitated or hindered the successful implementation.

Descriptive data for primary and secondary outcome measures are found in Table 2 for young people and Table 3 for primary caregivers. For those who completed outcome measure, very few data were missing. Both tables include confidence intervals around the mean estimates for those responding at the corresponding time point. The paired t-tests correspond to individuals that have observations at both time points being evaluated and relate to the difference between means across time. Therefore, overlap of confidence intervals does not necessarily indicate no statistically significant differences are present.

Data collected from children and young people are reported in Table 2. Very few young people were willing to complete questionnaires, and there were challenges with both recruitment and retention. For those who responded, missing data on measure items were infrequent.

Considering secondary outcome data collected from primary caregivers, examination of change over time indicated that from baseline to midpoint, there was a reduction in Conduct Problems,  $t(15) = 3.42$ ,  $p < .01$  ( $p = .046$  after Bonferroni correction),  $d = .85$ , associated with a large within-group effect size, as measured by the SDQ and completed by primary caregivers.

Some additional effects were observed, but after correction for multiple testing and given the smaller sample size, the evidence for difference between the two groups on these measures is weak and would need to be replicated in a much larger sample. A change was observed for the SDQ Externalising Behaviours,  $t(15) = 2.97$ ,  $p = .01$  ( $p = .11$  after Bonferroni correction),  $d = .74$ , associated with a moderate within group effect size. An improvement in Prosocial Behaviour,  $t(15) = -2.36$ ,  $p = .03$  ( $p = .40$  after Bonferroni correction),  $d = .61$ , was also observed, and associated with a moderate within group effect size. The change on the SDQ Total Score from baseline to midpoint  $t(15) = 2.05$ ,  $p = .06$  ( $p = .70$  after Bonferroni correction),  $d = .51$ , was associated with a moderate effect size.

Examining the remaining outcome measures, there was no clear change from baseline to midpoint on the ICU, GEM or FACES-IV,  $p > .05$  ( $p > .65$  after Bonferroni correction). The change in scores on the APQ  $t(15) = 2.09$ ,  $p = .054$  ( $p = .65$  after Bonferroni correction),  $d = .52$ , was associated with a moderate effect size (see Table 4).

Baseline to post-treatment test effects were observed, but after correction for multiple testing and given the smaller sample size, the evidence for difference between the two groups on any of these measures was weak and would need to be replicated in a much larger sample. There was an improvement in SDQ Conduct Problems,  $t(15) = 2.15$ ,  $p = .048$  ( $p = .58$  after Bonferroni correction),  $d = .54$ , associated with a moderate within group effect size, and SDQ Externalising Behaviours,  $t(15) = 2.44$ ,  $p = .03$  ( $p = .33$  after Bonferroni correction),  $d = .61$ , again associated with a moderate within group effect size. There was also an improvement in SDQ Prosocial Behaviour,  $t(15) = -2.98$ ,  $p = .01$  ( $p = .11$  after Bonferroni correction),  $d = .74$ , and again this was associated with a moderate within group effect size. There was also an improvement from baseline to post-treatment on the APQ Total Score,  $t(15) = 2.77$ ,  $p = .01$  ( $p = .17$  after Bonferroni correction),  $d = .69$ , associated with a moderate within group effect size (see Table 4). The APQ is a measure of parenting that assessing constructs that are thought to be associated with conduct problems among children and young people, such as positive parenting, poor supervision and inconsistent discipline among others.

Our analysis of changes from midpoint to post-treatment is reported in Table 4 for completeness. The reader should note that the sample size is insufficient to draw any meaningful conclusions.

#### *Outcome data by site*

In Tables 5–8, we report outcome data summarising descriptive statistics for primary caregivers. It is of note that the percentage of missing data when participants completed questionnaires was low. The site that recruited most participants was Birmingham, followed by Kirklees.

Table 2: Descriptive data for the primary and secondary outcome measures for children and young people

Child Measures	Baseline			Midpoint			Post-treatment		
	N (% Missing)	M (SD)	95% CI	N (% Missing)	M (SD)	95% CI	N (% Missing)	M (SD)	95% CI
SRDM	8 (0)	34.13 (18.26)	[18.86, 49.39]	1 (50)	*8 (-)	-	3 (25)	10 (8.19)	[-10.33, 30.33]
SDQ									
Total	7 (12.5)	23.14 (5.31)	[18.24, 28.05]	2 (0)	23 (9.90)	[-69.94, 111.94]	4 (0)	25.25 (9.03)	[10.88, 39.62]
Emotional	7 (12.5)	5.43 (1.62)	[3.93, 6.93]	2 (0)	5 (5.66)	[-45.83, 55.83]	4 (0)	7.25 (4.86)	[-0.48, 14.98]
Conduct	7 (12.5)	5.71 (1.38)	[4.44, 6.99]	2 (0)	5.5 (2.12)	[-13.56, 24.56]	4 (0)	4.75 (1.89)	[1.74, 7.76]
Hyperactivity/inattention	7 (12.5)	8.43 (1.72)	[6.84, 10.02]	2 (0)	7.5 (0.701)	[1.15, 13.85]	4 (0)	8.25 (1.71)	[5.53, 10.97]
Peer relationship	7 (12.5)	3.57 (2.44)	[1.32, 5.83]	2 (0)	5 (1.41)	[-7.71, 17.71]	4 (0)	5 (1.15)	[3.16, 6.84]
Prosocial behaviour	7 (12.5)	6.57 (2.37)	[4.38, 8.76]	2 (0)	5 (1.41)	[-7.71, 17.71]	4 (0)	8.5 (1.73)	[5.74, 11.26]
Externalising	7 (12.5)	14.14 (2.04)	[12.26, 16.03]	2 (0)	13 (2.83)	[-12.41, 38.41]	4 (0)	13 (3.56)	[7.34, 18.66]
Internalising	7 (12.5)	9 (3.74)	[5.54, 12.46]	2 (0)	10 (7.07)	[-53.53, 73.53]	4 (0)	12.25 (5.56)	[3.40, 21.10]
T-GARM	8 (0)	8.88 (1.46)	[7.66, 10.09]	2 (0)	6.5 (0.71)	[0.15, 12.85]	4 (0)	9.5 (1)	[7.91, 11.09]
ICU	8 (0)	28.5 (12.07)	[18.41, 38.59]	2 (0)	30.5 (7.78)	[-39.38, 100.38]	4 (0)	35.5 (15.46)	[10.90, 60.10]
APQ	8 (0)	76.88 (38.19)	[19.87, 133.89]	2 (0)	154 (36.77)	[-176.36, 484.36]	4 (0)	132.5 (22.65)	[96.46, 168.54]
FACES-IV	8 (0)	174.25 (169.76)	[32.33, 316.17]	2 (0)	274 (206.48)	[-1581.11, 2129.11]	4 (0)	276.75 (105.12)	[109.48, 444.02]
BFQ	8 (0)	191.5 (187.93)	[34.39, 348.61]	2 (0)	283.5 (219.91)	[-1692.312, 2259.32]	4 (0)	302 (111.22)	[125.03, 478.97]

\*Only 1 observation, and SD and CI cannot be calculated. SRDM = Self-Report Delinquency Measure; SDQ = Strengths and Difficulties Questionnaire; T-GARM = The Gang Affiliation Measure; ICU = Inventory of Callous and Unemotional Traits; APQ = Alabama Parenting Questionnaire; FACES-IV = Family Adaptability and Cohesion Scales – IV; BFQ = Behaviour of Friends Questionnaire.

Table 3: Descriptive data for the outcome measures for parents and carers

Parent and Carer Measures	Baseline			Midpoint			Post-treatment			6-month follow-up		
	N (% Missing)	M (SD)	95% CI	N (% Missing)	M (SD)	95% CI	N (% Missing)	M (SD)	95% CI	N (% Missing)	M (SD)	95% CI*
<i>SDQ</i>												
Total	37 (0)	23.14 (5.55)	[21.29, 24.99]	20 (0)	21 (5.30)	[18.52, 23.48]	17 (0)	22.53 (5.56)	[19.67, 25.39]	2 (0)	24 (9.90)	-
Emotional	37 (0)	4.54 (2.53)	[3.70, 5.39]	20 (0)	4.1 (2.49)	[2.93,5.27]	17 (0)	5.24 (3.44)	[3.47, 7.00]	2 (0)	5.5 (3.54)	-
Conduct	37 (0)	6.97 (1.82)	[6.37, 7.58]	20 (0)	6.05 (2.52)	[4.87, 7.23]	17 (0)	5.88 (1.93)	[4.89, 6.88]	2 (0)	7 (2.83)	-
Hyperactivity/inattention	37 (0)	8.14 (2.12)	[7.43, 8.84]	20 (0)	7.65 (1.90)	[6.76, 8.54]	17 (0)	8 (1.97)	[6.99, 9.01]	2 (0)	9 (1.41)	-
Peer relationship	37 (0)	3.49 (2.08)	[2.79, 4.18]	20 (0)	3.2 (1.96)	[2.28, 4.12]	17 (0)	3.41 (2.03)	[2.37, 4.46]	2 (0)	2.5 (2.12)	-
Prosocial behaviour	37 (0)	4.97 (2.51)	[4.14, 5.81]	19 (5)	5.79 (2.49)	[4.59, 6.99]	17 (0)	6.18 (2.04)	[5.13, 7.22]	2 (0)	5.5 (3.54)	-
Externalising	37 (0)	15.11 (3.32)	[14.00, 16.21]	20 (0)	13.7 (3.33)	[12.14, 15.26]	17 (0)	13.88 (3.04)	[12.32, 15.45]	2 (0)	16 (4.24)	-
Internalising	37 (0)	8.03 (3.75)	[6.78, 9.28]	20 (0)	7.3 (4.04)	[5.41, 9.19]	17 (0)	8.65 (3.99)	[6.61, 10.69]	2 (0)	8 (5.66)	-
ICU	37 (0)	28.43 (6.80)	[26.17, 30.70]	20 (0)	29.8 (5.43)	[27.26, 32.34]	17 (0)	27.41 (7.92)	[23.34, 31.49]	2 (0)	19 (7.07)	-
GEM	37 (0)	0.27 (1.40)	[-0.20,0.73]	19 (5)	0.28 (1.25)	[-0.33,0.88]	17 (0)	0.66 (1.34)	[-0.03, 1.35]	2 (0)	0.75 (0.42)	-
APQ	37 (0)	123.76 (13.31)	[119.32, 128.20]	20 (0)	113.1 (28.40)	[99.81, 126.39]	17 (0)	114.35 (12.34)	[108.01, 120.70]	2 (0)	123 (7.07)	-
FACES-IV	37 (0)	191.08 (23.66)	[183.19, 198.97]	20 (0)	186.5 (47.59)	[164.23, 208.77]	17 (0)	186 (40.11)	[165.38, 206.62]	2 (0)	188 (18.38)	-

\*Only 2 observations, so CI not reported. SDQ = Strengths and Difficulties Questionnaire; ICU= Inventory of Callous and Unemotional Traits; GEM = Griffith Empathy Measure; APQ = Alabama Parenting Questionnaire; FACES-IV = Family Adaptability and Cohesion Scales – IV.



Table 4: Statistical analysis of the outcome measures completed by parents and carers

Parent and Carer Measures	Baseline to midpoint				Baseline to post-treatment				Midpoint to post-treatment			
	t (15)	p =	Adj <sup>†</sup> p=	d =	t (15)	p =	Adj <sup>†</sup> p=	d =	t (6)	p =	Adj <sup>†</sup> p=	d =
<i>SDQ</i>												
Total	2.05	.06	.70	.51	0.4	.70	1	.01	.48	.65	1	.18
Emotional	1.14	.27	1	.29	-1.86	.08	.99	-.47	.40	.70	1	.15
Conduct	3.42	<.01*	.046	.85	2.15	.048*	.58	.54	-.55	.60	1	-.21
Hyperactivity/inattention	1.54	.14	1	.39	1.16	.26	1	.29	.19	.86	1	.07
Peer relationship	-0.74	.47	1	-.19	0.35	.73	1	.09	1.16	.29	1	.44
Prosocial behaviour	-2.36	.03*	.40	-.61	-2.98	.01*	.11	-.74	-.32	.76	1	-.12
Externalising	2.97	.01*	.11	.74	2.44	.03*	.33	.61	-.12	.91	1	-.04
Internalising	0.31	.76	1	.08	-0.95	.36	1	-.24	.80	.46	1	.30
ICU	0.30	.77	1	.08	1.02	.33	1	.25	1.29	.24	1	.49
GEM	-0.81	.43	1	-.20	-1.34	.20	1	-.33	-2.26	.07	.74	-.86
APQ	2.09	.054	.65	.52	2.77	.01*	.17	.69	-.56	.60	1	-.21
FACES-IV	1.57	.14	1	.39	1.34	.12	1	.34	-.19	.86	1	-.07

SDQ = Strengths and Difficulties Questionnaire; ICU= Inventory of Callous and Unemotional Traits; GEM = Griffith Empathy Measure; APQ = Alabama Parenting Questionnaire; FACES-IV = Family Adaptability and Cohesion Scales – IV. \* $p < .05$ . †Bonferroni adjusted  $p < .05$

Table 5: Descriptive data for the outcome measures for parents and carers from Kirklees

Parent and Carer Measures	Baseline			Midpoint			Post-treatment			6-month follow-up		
	N (%) Missing)	M (SD)	95% CI	N (%) Missing)	M (SD)	95% CI	N (%) Missing)	M (SD)	95% CI	N (%) Missing)	M (SD)	95% CI
<i>SDQ</i>												
Total	13 (0)	23.92 (5.87)	[20.38, 27.47]	6 (0)	20.17 (3.92)	[16.05, 24.28]	4 (0)	20.75 (5.68)	[11.71, 29.79]	0 (0)	-	-
Emotional	13 (0)	4.77 (2.80)	[3.08, 6.46]	6 (0)	3.17(1.60)	[1.49, 4.85]	4 (0)	4.25 (3.20)	[-0.84, 9.34]	0 (0)	-	-
Conduct	13 (0)	7.77 (1.96)	[6.58, 8.96]	6 (0)	7.00 (2.61)	[4.26, 9.74]	4 (0)	5.50 (1.00)	[3.91, 7.09]	0 (0)	-	-
Hyperactivity/inattention	13 (0)	8.69 (1.89)	[7.55, 9.83]	6 (0)	7.83 (2.14)	[5.59, 10.08]	4 (0)	7.75 (2.63)	[3.57, 11.93]	0 (0)	-	-
Peer relationship	13 (0)	2.69 (1.70)	[1.66, 3.72]	6 (0)	2.17 (1.83)	[0.24, 4.09]	4 (0)	3.25 (1.71)	[0.53, 5.97]	0 (0)	-	-
Prosocial behaviour	13 (0)	4.85 (2.76)	[3.18, 6.52]	5 (16.67)	6.20 (2.68)	[2.87, 9.83]	4 (0)	5.50 (1.29)	[3.45, 7.55]	0 (0)	-	-
Externalising	13 (0)	16.46 (3.28)	[14.48,18.44]	6 (0)	14.83 (3.82)	[10.83, 18.84]	4 (0)	13.25 (2.22)	[9.72, 16.78]	0 (0)	-	-
Internalising	13 (0)	7.46 (3.50)	[5.34, 9.58]	6 (0)	5.33 (3.20)	[1.97, 8.70]	4 (0)	7.50 (4.20)	[-12.41, 38.41]	0 (0)	-	-
ICU	13 (0)	29.85 (7.93)	[25.06, 34.64]	6 (0)	26.67 (4.80)	[21.63, 31.71]	4 (0)	20.00 (1.83)	[17.09, 22.91]	0 (0)	-	-
GEM	13 (0)	0.19 (1.60)	[-0.78, 1.15]	5 (16.67)	0.20 (1.74)	[-1.96, 2.37]	4 (0)	0.87 (0.48)	[0.11, 1.62]	0 (0)	-	-
APQ	13 (0)	124.77 (16.38)	[114.87, 134.67]	6 (0)	99.83 (50.61)	[46.72, 152.95]	4 (0)	116.00 (11.89)	[97.08, 134.92]	0 (0)	-	-
FACES-IV	13 (0)	185.38 (19.36)	[173.69, 197.08]	6 (0)	163.33 (81.79)	[77.50, 249.17]	4 (0)	199.75 (9.74)	[184.25, 215.25]	0 (0)	-	-

\*Only 1 observation, and SD and CI cannot be calculated. SDQ = Strengths and Difficulties Questionnaire; ICU= Inventory of Callous and Unemotional Traits; GEM = Griffith Empathy Measure; APQ = Alabama Parenting Questionnaire; FACES-IV = Family Adaptability and Cohesion Scales – IV.

Table 6: Descriptive data for the outcome measures for parents and carers from Nottingham

Parent and Carer Measures	Baseline			Midpoint			Post-treatment			6-month follow-up		
	N (%) Missing)	M (SD)	95% CI	N (%) Missing)	M (SD)	95% CI	N (%) Missing)	M (SD)	95% CI	N (%) Missing)	M (SD)	95% CI
<i>SDQ</i>												
Total	6 (0)	22.83 (3.25)	[19.42, 26.24]	6 (0)	23.17 (5.88)	[17.00, 29.34]	2 (0)	27.50 (3.54)	[-4.27, 59.27]	1 (0)	-	-
Emotional	6 (0)	4.83 (2.23)	[2.49, 7.17]	6 (0)	5.00 (2.97)	[1.89, 8.11]	2 (0)	8.50 (2.12)	[-10.56, 27.56]	1 (0)	-	-
Conduct	6 (0)	7.50 (1.05)	[6.40, 8.60]	6 (0)	6.83 (2.56)	[4.14, 9.52]	2 (0)	5.50 (0.71)	[-0.85, 11.85]	1 (0)	-	-
Hyperactivity/inattention	6 (0)	8.00 (2.53)	[5.35, 10.65]	6 (0)	7.50 (1.76)	[5.65, 9.35]	2 (0)	9.00 (1.41)	[-3.71, 21.71]	1 (0)	-	-
Peer relationship	6 (0)	2.50 (1.05)	[1.40, 3.60]	6 (0)	3.83 (2.14)	[1.59, 6.08]	2 (0)	4.50 (0.71)	[-1.85, 10.85]	1 (0)	-	-
Prosocial behaviour	6 (0)	5.00 (1.41)	[3.52, 6.48]	6 (0)	5.50 (2.35)	[3.04, 7.96]	2 (0)	7.50 (3.54)	[-24.27, 39.27]	1 (0)	-	-
Externalising	6 (0)	15.50 (3.02)	[12.33, 18.67]	6 (0)	14.33 (3.67)	[10.48, 18.18]	2 (0)	14.50 (0.71)	[8.15, 20.85]	1 (0)	-	-
Internalising	6 (0)	7.33 (2.58)	[4.62, 10.04]	6 (0)	8.83 (4.96)	[3.63, 14.03]	2 (0)	13.00 (2.83)	[-12.41, 38.41]	1 (0)	-	-
ICU	6 (0)	25.33 (2.66)	[22.54, 28.12]	6 (0)	29.83 (4.58)	[25.03, 34.64]	2 (0)	28.00 (2.83)	[2.59, 53.41]	1 (0)	-	-
GEM	6 (0)	-0.24 (0.88)	[-1.16, 0.68]	6 (0)	-0.29 (0.87)	[-1.21, 0.63]	2 (0)	-0.15 (0.46)	[-4.30, 3.99]	1 (0)	-	-
APQ	6 (0)	122.67 (8.07)	[114.20, 131.13]	6 (0)	117.50 (8.46)	[108.63, 126.37]	2 (0)	118.50 (12.02)	[10.50, 226.50]	1 (0)	-	-
FACES-IV	6 (0)	207.00 (21.73)	[184.20, 229.80]	6 (0)	198.00 (25.26)	[171.49, 224.51]	2 (0)	189.00 (50.91)	[-268.42, 646.42]	1 (0)	-	-

\*Only 1 observation, and SD and CI cannot be calculated. SDQ = Strengths and Difficulties Questionnaire; ICU= Inventory of Callous and Unemotional Traits; GEM = Griffith Empathy Measure; APQ = Alabama Parenting Questionnaire; FACES-IV = Family Adaptability and Cohesion Scales – IV.

Table 7: Descriptive data for the outcome measures for parents and carers from Birmingham

Parent and Carer Measures	Baseline			Midpoint			Post-treatment			6-month follow-up		
	N (% Missing)	M (SD)	95% CI	N (% Missing)	M (SD)	95% CI	N (% Missing)	M (SD)	95% CI	N (% Missing)	M (SD)	95% CI
<i>SDQ</i>												
Total	14 (0)	23.57 (5.92)	[20.15, 26.99]	8 (0)	20.00 (5.90)	[15.06, 24.94]	7 (0)	23.43 (6.29)	[17.61, 29.25]	1 (0)	-	-
Emotional	14 (0)	5.00 (2.29)	[3.68, 6.32]	8 (0)	4.12 (2.70)	[1.87, 6.38]	7 (0)	6.57 (3.15)	[3.65, 9.49]	1 (0)	-	-
Conduct	14 (0)	6.21 (1.76)	[5.20, 7.23]	8 (0)	4.75 (2.12)	[2.98, 6.52]	7 (0)	5.86 (2.34)	[3.69, 8.02]	1 (0)	-	-
Hyperactivity/inattention	14 (0)	8.00 (2.00)	[6.85, 9.15]	8 (0)	7.62 (2.07)	[5.90, 9.35]	7 (0)	8.00 (1.91)	[6.23, 9.77]	1 (0)	-	-
Peer relationship	14 (0)	4.36 (2.31)	[3.02, 5.69]	8 (0)	3.50 (1.85)	[1.95, 5.05]	7 (0)	3.00 (2.08)	[1.07, 4.93]	1 (0)	-	-
Prosocial behaviour	14 (0)	5.29 (2.70)	[3.73, 6.85]	8 (0)	5.75 (2.76)	[3.44, 8.06]	7 (0)	6.71 (1.80)	[5.05, 8.38]	1 (0)	-	-
Externalising	14 (0)	14.21 (3.12)	[12.41, 16.01]	8 (0)	12.38 (2.56)	[10.23, 14.52]	7 (0)	13.86 (3.18)	[10.91, 16.80]	1 (0)	-	-
Internalising	14 (0)	9.36 (4.27)	[6.89, 11.82]	8 (0)	7.62 (3.74)	[4.50, 10.75]	7 (0)	9.57 (4.28)	[5.62, 13.53]	1 (0)	-	-
ICU	14 (0)	28.36 (7.72)	[23.90, 32.82]	8 (0)	32.12 (5.84)	[27.24, 37.01]	7 (0)	29.43 (5.94)	[23.93, 34.92]	1 (0)	-	-
GEM	14 (0)	0.74 (1.07)	[0.12, 1.35]	8 (0)	0.74 (1.11)	[-0.18, 1.67]	7 (0)	1.01 (0.73)	[0.34, 1.68]	1 (0)	-	-
APQ	14 (0)	125.36 (13.85)	[117.36, 133.35]	8 (0)	119.75 (9.54)	[111.77, 127.73]	7 (0)	117.14 (8.57)	[109.22, 125.07]	1 (0)	-	-
FACES-IV	14 (0)	192.07 (27.42)	[176.24, 207.91]	8 (0)	195.25 (15.88)	[181.97, 208.53]	7 (0)	193.29 (14.53)	[179.84, 206.73]	1 (0)	-	-

\*Only 1 observation, and SD and CI cannot be calculated. SDQ = Strengths and Difficulties Questionnaire; ICU= Inventory of Callous and Unemotional Traits; GEM = Griffith Empathy Measure; APQ = Alabama Parenting Questionnaire; FACES-IV = Family Adaptability and Cohesion Scales – IV.

Table 8: Descriptive data for the outcome measures for parents and carers from Sandwell

Parent and Carer Measures	Baseline			Midpoint			Post-treatment			6-month follow-up		
	N (%) Missing)	M (SD)	95% CI	N (%) Missing)	M (SD)	95% CI	N (%) Missing)	M (SD)	95% CI	N (%) Missing)	M (SD)	95% CI
<i>SDQ</i>												
Total	4 (0)	19.50 (6.40)	[9.31, 29.69]	0 (0)	-	-	4 (0)	20.25 (4.43)	[13.21, 27.29]	0 (0)	-	-
Emotional	4 (0)	1.75 (1.71)	[-0.97, 4.47]	0 (0)	-	-	4 (0)	2.25 (2.63)	[-1.93, 6.43]	0 (0)	-	-
Conduct	4 (0)	6.25 (1.50)	[3.86, 8.64]	0 (0)	-	-	4 (0)	6.50 (2.65)	[2.29, 10.71]	0 (0)	-	-
Hyperactivity/inattention	4 (0)	7.00 (2.94)	[2.32, 11.68]	0 (0)	-	-	4 (0)	7.75 (2.22)	[4.22, 11.28]	0 (0)	-	-
Peer relationship	4 (0)	4.50 (2.38)	[0.71, 8.29]	0 (0)	-	-	4 (0)	3.75 (2.99)	[-1.00, 8.50]	0 (0)	-	-
Prosocial behaviour	4 (0)	4.25 (2.99)	[-0.50, 9.00]	0 (0)	-	-	4 (0)	5.25 (2.50)	[1.27, 9.83]	0 (0)	-	-
Externalising	4 (0)	13.25 (3.86)	[7.10, 19.40]	0 (0)	-	-	4 (0)	14.25 (4.79)	[6.63, 21.87]	0 (0)	-	-
Internalising	4 (0)	6.25 (3.77)	[0.24, 12.26]	0 (0)	-	-	4 (0)	6.00 (1.15)	[4.16, 7.84]	0 (0)	-	-
ICU	4 (0)	28.75 (2.22)	[25.22, 32.28]	0 (0)	-	-	4 (0)	31.00 (12.57)	[11.00, 51.00]	0 (0)	-	-
GEM	4 (0)	-0.38 (2.24)	[-3.95, 3.18]	0 (0)	-	-	4 (0)	0.26 (2.69)	[-4.02, 4.54]	0 (0)	-	-
APQ	4 (0)	116.50 (5.00)	[108.54, 124.46]	0 (0)	-	-	4 (0)	105.75 (18.54)	[76.26, 135.24]	0 (0)	-	-
FACES-IV	4 (0)	182.25 (20.37)	[149.84, 214.66]	0 (0)	-	-	4 (0)	158.00 (75.98)	[37.10, 278.90]	0 (0)	-	-

\*Only 1 observation, and SD and CI cannot be calculated. SDQ = Strengths and Difficulties Questionnaire; ICU= Inventory of Callous and Unemotional Traits; GEM = Griffith Empathy Measure; APQ = Alabama Parenting Questionnaire; FACES-IV = Family Adaptability and Cohesion Scales – IV.

### Phase 3

Anonymised data that were routinely collected by MST teams were analysed as part of our process evaluation and are found in Tables 9–10b. The teams who took part in this study provided MST for children and young people at risk of criminal exploitation to 258 families during the study period, and the primary caregiver was the mother in 85.7% of the families. The next most frequent primary caregiver was the father (8.1%). English was the language spoken by the majority of families (98.4%), and an interpreter was required for 8.5% of families. The ethnicity of the young person was predominately White (41.9%), followed by other (31.4%) and mixed race (11.2%). The average length of time spent within treatment was  $M = 6.09$  months (1.97). The primary reason for ceasing treatment was successful completion (75.6%), with the next most frequent being a lack of engagement (7.0%). At the point that data were accessed, 10.5% of families were still receiving treatment.

Table 9: Demographic information for all families that received MST. Percentages are calculated ignoring missing data.

	Sandwell	Kirklees	Nottingham	Birmingham	Total
	N (%)	N (%)	N (%)	N (%)	N (%)
<b>Caregiver Relationship to Child</b>					
Mother (include adoptive)	47 (85.5%)	76 (84.4%)	40 (90.9%)	58 (84.1%)	221 (85.7%)
Father (include adoptive)	6 (10.9%)	7 (7.8%)	1 (2.3%)	7 (10.1%)	21 (8.1%)
Grandmother	2 (3.6%)	5 (5.6%)	3 (6.8%)	2 (2.9%)	12 (4.7%)
Grandfather	0 (0%)	0 (0%)	0 (0%)	2 (2.9%)	2 (0.8%)
Aunt	0 (0%)	1 (1.1%)	0 (0%)	0 (0%)	1 (0.4%)
Uncle	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Stepmother	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Stepfather	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Foster Mother	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Foster Father	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other family member	0 (0%)	1 (1.1%)	0 (0%)	0 (0%)	1 (0.4%)
Family Friend (not related)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
None of the above	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
<b>Language</b>					
English	55 (100%)	90 (100%)	44 (100%)	65 (94.2%)	254 (98.4%)
Other	0 (0%)	0 (0%)	0 (0%)	4 (5.7%)	4 (1.6%)
Other Spoken Language	0 (0%)	1 (1.1%)	1 (2.3%)	4 (5.6%)	6 (2.4%)
Missing	55 (100%)	89 (98.9%)	43 (97.7%)	65 (94.2%)	252 (97.7%)
<b>Interpreter Required</b>					
Yes	0 (0%)	10 (11.1%)	0 (0%)	12 (17.4%)	22 (8.5%)
No	0 (0%)	1 (1.1%)	0 (0%)	3 (4.3%)	4 (1.6%)
Missing	55 (100%)	79 (87.8%)	44 (100%)	54 (78.3%)	232 (89.9%)
<b>Ethnicity (Child)</b>					
Asian	0 (0%)	2 (2.2%)	0 (0%)	5 (7.2%)	7 (2.7%)
Black	2 (3.6%)	0 (0%)	1 (2.3%)	6 (8.7%)	9 (3.5%)
Mixed	5 (9.1%)	1 (1.1%)	12 (27.3%)	11 (15.9%)	29 (11.2%)
White	23 (41.8%)	12 (13.1%)	30 (68.2%)	43 (62.3%)	108 (41.9%)
Other	1 (1.8%)	75 (83.3%)	1 (2.3%)	4 (5.8%)	81 (31.4%)
Decline to Respond	24 (43.6%)	0 (0%)	0 (0%)	0 (0%)	24 (9.3%)

MST therapists and supervisors are required to categorise outcomes against a series of questions at the end of treatment. Staff rated that at least 70% of families had improved parenting skills, family relationships and informal social networks at the end of treatment, whereas 89.1% of young people were rated as having improved behaviour and family systems that had been sustained for at least three to four weeks by the end of treatment. Sixty-four per cent of young people were also rated as having success within education and vocation, while 68.6% were rated as having increased involvement with prosocial peers and activities, both at the end of treatment (Table 10a).

In addition, 85.3% of young people were living at home at the end of treatment, and 70.2% were currently attending school, vocational training or were in employment. During treatment, 15.1% received interventions for substance misuse, and 11.2% were categorised as improved upon the completion of treatment. Of note, 80.6% of young people were not arrested during treatment (Table 10b).

The TAM-R ((Huey Jr et al., 2000, Henggeler et al., 2006) was used by MST therapists and supervisors to monitor treatment fidelity. This measure is completed by family members, and the minimum score reported by MSTi to indicate adherence to the treatment model is .61. The percentage of individual cases meeting this threshold overall was 61%; across sites, the minimum was 58% and the maximum was 67%. The average score across all sites was  $M = .65 (.28)$ .

Table 10a: Available outcome data for all families that received MST. Note that at Kirklees and Birmingham some families were still receiving treatment and the percentages have been calculated including these families.

	Sandwell	Kirklees	Nottingham	Birmingham	Total
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Length of Treatment (months)	4.98 (1.44)	6.62 (1.71)	5.63 (1.53)	6.81 (2.5)	6.09 (1.97)
	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>
<b>Completion Rates or Reason for Treatment Cessation</b>					
Completion	45 (81.8%)	65 (72.2%)	42 (95.5%)	43 (62.3%)	195 (75.6%)
Lack of Engagement	3 (5.5%)	9 (10.0%)	2 (4.5%)	4 (5.8%)	18 (7.0%)
Placement	5 (9.1%)	0 (0%)	0 (0%)	3 (4.3%)	8 (3.1%)
MST Withdrawal	1 (1.8%)	3 (3.3%)	0 (0%)	3 (4.3%)	7 (2.7%)
Funding Withdrawal	0 (0%)	1 (1.1%)	0 (0%)	0 (0%)	1 (0.4%)
Family Moved	1 (1.8%)	0 (0%)	0 (0%)	1 (1.4%)	2 (0.8%)
Still Receiving Treatment	0 (0%)	12 (13.3%)	0 (0%)	15 (21.7%)	27 (10.5%)
<b>Evidence that Parenting Skills have Improved</b>					
No	5 (9.1%)	13 (14.4%)	0 (0%)	10 (14.5%)	28 (10.9%)
Yes	50 (90.9%)	65 (72.2%)	44 (100%)	44 (63.8%)	203 (78.7%)
Still Receiving Treatment	0 (0%)	12 (13.3%)	0 (0%)	15 (21.7%)	27 (10.5%)
<b>Evidence of Improved Family Relations that Contributed to Referral</b>					
No	4 (7.3%)	11 (12.2%)	3 (6.8%)	7 (10.1%)	25 (9.7%)
Yes	51 (92.7%)	67 (74.4%)	41 (93.8%)	47 (68.1%)	206 (79.8%)
Still Receiving Treatment	0 (0%)	12 (13.3%)	0 (0%)	15 (21.7%)	27 (10.5%)
<b>Evidence of Improved Network of Informal Social Support</b>					
No	2 (3.6%)	18 (20.0%)	5 (11.4%)	6 (8.7%)	31 (12.0%)
Yes	53 (96.4%)	60 (66.7%)	39 (88.6%)	48 (69.6%)	200 (77.5%)
Still Receiving Treatment	0 (0%)	12 (13.3%)	0 (0%)	15 (21.7%)	27 (10.5%)
<b>Evidence of Youth Success in Education and Vocational Settings</b>					
No	12 (21.8%)	28 (31.1%)	11 (25.0%)	15 (21.7%)	66 (25.6%)
Yes	43 (78.2%)	50 (55.6%)	33 (75.0%)	39 (56.5%)	165 (64.0%)
Still Receiving Treatment	0 (0%)	12 (13.3%)	0 (0%)	15 (21.7%)	27 (10.5%)
<b>Evidence of Youth Involvement with Prosocial Peers and Activities</b>					
No	9 (16.4%)	19 (21.1%)	7 (15.9%)	19 (27.5%)	54 (20.9%)
Yes	46 (83.6%)	59 (65.6%)	37 (84.1%)	35 (50.7%)	177 (68.6%)
Still Receiving Treatment	0 (0%)	12 (13.3%)	0 (0%)	15 (21.7%)	27 (10.5%)
<b>Changes in Youth Behaviour and Systems Sustained for 3-4 Weeks</b>					
No	6 (10.9%)	17 (18.9%)	2 (4.5%)	15 (21.7%)	6 (10.9%)
Yes	49 (89.1%)	61 (67.8%)	42 (95.5%)	39 (56.5%)	49 (89.1%)
Still Receiving Treatment	0 (0%)	12 (13.3%)	0 (0%)	15 (21.7%)	0 (0%)

Table 10b: Available outcome data for all families that received MST. Note that at Kirklees and Birmingham some families were still receiving treatment and the percentages have been calculated including these families.

	Sandwell	Kirklees	Nottingham	Birmingham	Total
	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>	<i>N (%)</i>
<b>Youth is Living at Home</b>					
No	4 (7.3%)	2 (2.2%)	0 (0%)	5 (7.2%)	11 (4.3%)
Yes	51 (92.7%)	76 (84.4%)	44 (100%)	49 (71.0%)	220 (85.3%)
Still Receiving Treatment	0 (0%)	12 (13.3%)	0 (0%)	15 (21.7%)	27 (10.5%)
<b>Youth is Attending School or Vocational Training or Working</b>					
No	13 (23.6%)	19 (21.1%)	9 (20.5%)	9 (13.0%)	50 (19.4%)
Yes	42 (76.4%)	59 (65.6%)	35 (79.5%)	45 (65.2%)	181 (70.2%)
Still Receiving Treatment	0 (0%)	12 (13.3%)	0 (0%)	15 (21.7%)	27 (10.5%)
<b>Current Setting for Youth</b>					
School	28 (50.9%)	49 (54.4%)	24 (54.5%)	27 (39.1%)	128 (49.6%)
School + Vocational	2 (3.6%)	1 (1.1%)	1 (2.3%)	3 (4.3%)	7 (2.7%)
Vocational	4 (7.3%)	2 (2.2%)	0 (0%)	3 (4.3%)	9 (3.5%)
Alternative Educational Programme due to Educational Needs	10 (18.2%)	6 (6.7%)	4 (9.1%)	9 (13.0%)	29 (11.0%)
Alternative Educational Programme due to Disruptive Behaviour	7 (12.7%)	18 (20.0%)	14 (31.8%)	8 (11.6%)	47 (18.2%)
Not in School but Working Part time	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Not in School and Not Working	3 (5.5%)	0 (0%)	0 (0%)	0 (0%)	3 (1.2%)
Other	1 (1.8%)	2 (2.2%)	0 (0%)	1 (1.4%)	4 (1.6%)
Missing	0 (0%)	0 (0%)	1 (2.3%)	3 (4.3%)	4 (1.6%)
<b>Youth has been Arrested since starting Treatment</b>					
No	46 (83.6%)	74 (82.2%)	41 (93.8%)	47 (68.1%)	208 (80.6%)



Yes	9 (16.4%)	4 (4.4%)	3 (6.8%)	7 (10.1%)	23 (8.9%)
Still Receiving Treatment	0 (0%)	12 (13.3%)	0 (0%)	15 (21.7%)	27 (10.5%)
	<u>M (SD)</u>	<u>M (SD)</u>	<u>M (SD)</u>	<u>M (SD)</u>	<u>M (SD)</u>
Fidelity: Therapist Adherence Scale (TAM)	.65 (.29)	.61 (.29)	.67 (.31)	.68 (.24)	.65 (.28)
Percentage (%) Scoring Above .61 Threshold	63%	59%	67%	58%	61%

## Process evaluation

Using a mixed methods approach, the process evaluation includes data gathered from recruitment and retention; primary and secondary outcome measures completed by parents and young people at baseline, mid-treatment, end of treatment and six months after treatment; participant-level data from MST sites and services; notes from the MST team in respect of challenges to recruitment; and semi-structured interviews with MST employees, stakeholders, family carers and young people.

All data sources, both qualitative and quantitative, were compared using three different types of triangulation: (a) methodological – using more than one method to collect data; (b) data – using multiple data sources; and (c) investigator - using multiple researchers to analyse the data.

## Feasibility of a future pilot trial

**Key findings:** Primary carers interviewed suggested that participating in a future clinical trial that included randomisation was acceptable. There was very little missing outcome data when outcome measures were completed, but recruitment and retention were challenging, particularly for young people.

*The acceptability of conducting research into MST for children at risk of criminal exploitation for stakeholders, including families*

### Primary carers

Interview data from primary carers suggested that participating in research was acceptable (with the caveat that those interviewed had engaged in the research process). Primary carers were positive about the focus on exploitation.

*Yeah, I think it should be out there more. Covered in schools, do a talk about it, exhibition about it, give out leaflets with your number on there if they need any help and support. I think it should be out there for parents, easy enough for parents to get hold of, that they can do their own referral if need be. (Primary carer: PC01)*

In addition, all of those who expressed a view about randomisation said that it would not be a problem.

*I probably would [take part in a study with randomisation]. (Primary carer: PC05)*

*Yeah, I would sign up for it. (Primary carer: PC03)*

Only two primary carers commented on the vouchers, one to say that they had ‘bought a pair of socks’ and another that they didn’t think they were enough of an incentive for the young person in their family.

It was clear from primary carer responses that the primary motivation for taking part was to help others in the same situation.

*I just hope that I'm a good help for everybody because I think going through that kind of experience, what I've been through with [name of child], I just hope they get more of MST out there, really to help other children to stop these crimes. (Primary carer: PC01)*

Those interviewed were predominantly families that had engaged in the process and for whom the experience was positive. We were not able to interview any families that either chose not to take part or to drop out, so it is difficult to identify the main factors involved in the low recruitment and retention figures. Feedback on the questionnaires may suggest one factor (see below).

### Young people

Young people did not object to the focus on exploitation, but only one felt that it was relevant to them, and no views were expressed on the randomisation. One young person said that they would take part anyway, but they felt that none of their friends would; however, it was not clear whether this was specifically in relation to randomisation or taking part in research generally. Only one young person spoke about their motivation to take part, and, like many primary caregivers, it was to help others.

*I'd do it to help people. As long as I knew it is helping people like me. (Young person: YP02)*

There were more data on why young people might not have chosen to take part. One cited a mistrust of the process:

I *I ain't signing.*

NH *That's fine. But why don't you like it?*

I *Looks suss. (Young person: YP03)*

Another said that there was too much information and that it wasn't fun.

*Make it more fun like every week, well, not every week, but probably like ... I don't know, make the research more fun. (Young person: YP05)*

One said that it would be okay to do when they didn't have anything else on but that there was no point asking them when they had something better to do.

The source of the request was something raised by two participants. One said that they had participated in the interview because:

*My mum told me to... I do listen to her now. Before I didn't. (Young person: YP05)*

Another suggested that had her therapist asked her to take part, she probably would have done.

### MST teams

One consultant questioned the acceptability of the research, citing the length of time that it takes to get an MST team fully up and running and questioning the rationale of conducting research before the intervention is delivered properly:

*It takes a new team setting up and getting to grips with what they need to do around two years, and to start being successful a little bit longer than that... so how do you measure the success of something that may or may not have happened anyway? (Supervisor: ST11)*

#### *The accrual rate and willingness of teams to recruit participants*

Despite the study appearing to be acceptable to primary carers, recruitment was difficult. A total of 258 families received the intervention funded by YEF. One hundred and fifty-seven received the intervention before Phase 2 opened to recruitment, while 101 received treatment during the time the study was open to recruitment. Only 78 of these 101 expressed an interest in taking part in the study. Five families that received the intervention did not meet eligibility, and 41 subsequently agreed to take part. Four families were lost after enrolment. Of the 37 families that took part, only eight young people agreed to complete the measures.

Retention was also problematic, with a 95% loss at follow-up of primary caregivers and a 100% loss of young people.

Interview data around the willingness of teams to recruit were limited. One consultant/supervisor observed that it was easy to sign families up but went on to say that it became difficult to support the research without stating why:

*So I think families have found sign-up, in terms of signing up to the study, fairly easy; it sits really nicely with MST sign-up. (Supervisor: ST11)*

*Because there was a period of time that we all felt as a team quite strongly that we wanted to be supporting the research, but we couldn't. (Supervisor: ST11)*

Another commented on the fact that it was a big ask of families:

*But I think everyone else who participated in the research, everyone's basically in a similar situation. The behaviours that are going on with their young person is a lot, so everyone did have a lot, and I suppose it's about the individuals and whether they felt they could do it. The person who sticks out to me is the one who needed an interpreter, and that made it a lot trickier for her to do anything around the research. (Supervisor: ST13)*

Only one therapist commented on recruitment:

*For me, it was quite easy; just about being transparent, isn't it? And explaining to them what the research is about and why ... we're asking them to be part of the research. What are the outcomes of the research that we'd like. And to be fair, for a lot of the families that did engage in the research, from my perspective, they said that if they didn't engage in the research, then nobody's gonna know how effective the service is or is not. (Therapist: ST12)*

Additional notes from the MST team explain some of the difficulties that teams had supporting the research.

Timeline differences between the delivery team, who continued to offer the intervention during the COVID-19 pandemic and during lockdown, and the study team, who had to delay recruitment because of the COVID-19 pandemic, meant that opportunities to recruit a significant proportion of families into the study were

missed. The timeline differences also meant that some study sites ran out of funding and closed to new family recruitment for the pilot.

Staffing issues at sites also meant that some sites could not recruit new families for several months. Several therapists were on long-term sick leave, some related to COVID-19 and some for other reasons. Therapists also found other jobs, especially those who were in fixed-term contracts in teams that were soon expected to close when funding from YEF ended. Sites therefore had to recruit and train up new therapists. The recruitment and training process took time, so there were delays before sites were back to full capacity and able to recruit.

There was also a gap between the delivery team and funder/study team expectations about whether families that did not consent to take part in the research could take part in the intervention. Some early pilot slots went to families that did not end up taking part in the research.

#### *The appropriateness of the measures in terms of their use within a future pilot trial*

Data on the appropriateness of the outcome measures employed were gathered from the outcome measures and from interviews. Although getting outcome data from young people and the collection of follow-up data from primary carers were both difficult, for those that did participate, completion of the measures themselves was good, with no cases of missing data for the primary carer reported measures and one set of missing data (the SDQ) across the seven child reported measures.

Interview data suggested that while primary carers were positive about the questionnaires, with participants noting that they were a good indicator of how far the family had progressed, it was also noted that they could be difficult. Issues raised included understanding the questions, the difficulty of talking about stressful events and the logistics of completing the questionnaires in a busy schedule.

*Sometimes, it got a bit tense because it's going back through... I'm at a better place; before, it was still healing from accepting what's happened. (Primary carer: PC01)*

*Yeah, with the double negatives... That just throws my brain and sort of throws me off a little bit for the next one because I'm thinking, 'Did I get that other one right?'* (Primary carer: PC10)

*When everybody's in and out and all that, you can't do it. I ended up on the stairs to start with; I can't go in here, so I'll go out there, and then they start going up and down the stairs. I ended up in the kitchen then; I thought I'll get out the way here. You can't go outside because you hear the noises out there. (Primary carer: PC05)*

Young people were generally happy with the questions. One said it was quite nice talking to someone but only if they did not have anything else better to do. One participant found some of the questions 'stupid' and 'annoying'. These tended to be questions around criminal activity. The nature of questions, however, did not appear to be the reason that young people did not participate. The issue appears to have been more around finding the time (motivation) to complete them.

Consultants and supervisors also commented on the logistics of and the time taken to complete questionnaires. It was felt that they were quite long, and it was suggested that they could be more integrated with the initial MST process of getting to know the family, as a lot of the information is extremely

useful. However, it was also noted that some families appeared to prefer to have the research process separate and others preferred to have it as a part of MST (i.e. preferred to tell their story to one person).

One observed that:

*It's an extra piece of work for families to do at a time when they're just desperate to get on with things. (Supervisor: ST11)*

Only one therapist commented on the questionnaires, observing that they sometimes had to reframe the question for the young person as they appeared to be uncomfortable with the content.

### *Therapy completion rate and attrition*

Data on therapy completion rate and attrition were gathered from participant-level data from MST sites and services. These data are for all who took part in the intervention and not just those who were included in the study. The rate for maintaining families in the intervention was much higher than retaining them to the study.

One hundred and ninety-five (75.6%) families completed the intervention. This ranged from 95.5% for one site (Nottingham) to 62.3% (Birmingham), noting that approximately 20% of families were still receiving the intervention in Birmingham and had not yet completed it. In Kirklees, approximately 10% of the families included were also still receiving the intervention and had not yet completed it. Intervention completion was defined as follows: 'The youth was discharged based upon the mutual agreement of the primary caregiver(s) and the MST team'.

Reasons for intervention cessation identified by the delivery sites included a lack of engagement (7%), placement (3.1%) (i.e. a formal structured placement into other services including care, remand, etc.), withdrawal by the treatment team (2.7%), family moved (0.8%) or funding withdrawal (0.4%). In addition, 10.5% of families overall were still receiving the intervention at the point of data capture.

### **Acceptability of the Intervention**

**Key findings:** All participants considered MST for children at risk of criminal exploitation to be an acceptable intervention despite there being mixed outcomes, especially around sustainability. However, there was some confusion as to whether participants were talking about the MST model more generally or MST for children and young people at risk of criminal exploitation.

MST was reported to be an acceptable intervention for children and young people at risk of criminal exploitation by all groups interviewed and across all participants:

*I think MST was perfect at the time when I needed support. (Primary carer: PC01)*

*I suppose personally, for me, it's brilliant to be part of something that you know works. When you see existing services passing families from pillar to post, working with families for years and years and years and not achieving anything, and for us you can... (Consultant: ST22)*

*And that's where MST are just fantastic because they've got this 24/7 response. And they are involved intensively. They can respond when the family need it. And that's what's so important. (Stakeholder: ST01)*

Participants also evidenced satisfaction with the intervention:

*She saved me. (Young person: YP05)*

*This is the furthest that we've felt anywhere that we've got somewhere. (Primary carer: PC08)*

*Really good ... even if we haven't had positive outcomes that we wanted for all the referral behaviours, there still has been improvement every single time. (Therapist: ST17)*

*I'm gonna start off with the last one, the good things, because I saw a lot of good things, really, especially with MST for children and young people at risk of criminal exploitation, and that's why I would always say it was our gold service. (Stakeholder: ST09)*

There was mixed evidence on outcomes, although this does not appear to have influenced participant views on the acceptability of MST. This may be because all participant groups reported improvements in family functioning and reduced behaviour problems, two key outcomes that were of particular importance to primary caregivers. Almost all young people stayed in the family home (one went into care when their mother went into hospital, another went into care because of a disagreement between their parent and grandparent, and a third was sent to family abroad). Remaining in education was another positive outcome:

*All of mine, apart from one, stayed in school. (Therapist: ST12)*

But evidence on improved peer relations, contact with high-risk negative adults and sustainability was limited. There was only one example cited in respect of sustainability:

*Going forward over the last six months since MST have been not with us anymore, everything's gone nice and swimmingly. (Primary carer: PC06)*

These data are consistent with the primary outcome data reported above that demonstrated improvements in SDQ Prosocial Behaviour, Conduct Problems and Externalising Behaviours. They are also consistent with the participant-level data from MST sites. Families, together with therapists and supervisors, reported that changes in youth behaviour and systems were sustained for three to four weeks (89.1%), and family relations that contributed to referral were improved following the intervention (79.8%). These data also showed that 85.3% of young people were living at home post intervention, and 70.2% were in school, vocational training or working.

#### *Difference between standard MST and MST for children at risk of criminal exploitation*

MST was reported to be an acceptable intervention for children at risk of criminal exploitation. However, as with the findings from Phase 1, interview data suggested that there was some confusion or a lack of understanding between the MST standard model and the augmented model targeting children at risk of criminal exploitation. It was challenging to clearly differentiate acceptability of MST for children and young people at risk of criminal exploitation relative to standard MST. Clear data in respect of this came only from interviews with the MST team and stakeholders.

Consultants/supervisors observed that the MST model is the same across all functions. The difference between standard MST and MST for children and young people at risk of criminal exploitation was seen to be the target population (i.e. a focus on children at risk of criminal exploitation). Differences therefore included the need for training around exploitation and psychoeducation for parents; the focal age of the young person; the need to work with primary schools and the transition between primary and secondary school; working with peers; a greater focus on mapping the ecological environment around the young person; more multi-agency working around safety planning; the need to establish links with existing exploitation services; and an initial focus on sustainability.

*The model doesn't differ. The MST model is the MST... so, the differences are we opened up to 10-year-olds, we don't normally work with 10-year-olds, why is that different? So, we had questions at the beginning – why is that different? So again, the school system may be different, so secondary, primary schools, so we've never worked with primary schools before. (Consultant: ST21)*

*The type of cases, obviously. The agents, the clients, what the challenges are, what the referral behaviours are ... and quite worrying at times. The families are different, the families that I work with, I think they are for the most part the families are, I think less privileged, they have less opportunities. I think the families here are a bit different. (Therapist: ST17)*

*Um, so the process around weapons, what we do when we find something and the exploitation and the signs to look out for, the training that we've received around that, that is quite important. And so that's really what separates us from the standard teams. (Therapist: ST05)*

*Yeah, I think there was a huge confusion in [location redacted] around that. So obviously the standard team, they get involved, and obviously professionals are allowed to kind of step back, let MST do their work, and they'll just be feeding back to the professionals, whereas the MST for CCE you feel you did need much more collaboration because you're dealing with contextual safeguarding. (Therapist: ST12)*

*I don't see any differences. I mean, the children who were exploited are supposed to be steered toward [name] team, but I see them in the other two teams as well. (Stakeholder: ST01)*

## **Factors that facilitate or hinder intervention implementation**

**Key findings:** The contexts surrounding families and young people at risk of criminal exploitation were complex. Many of these families are well known to and have had a long relationship with services. MST appeared to be successful for some where other services were seen to have failed them. When good therapist rapport was established, the service provided was consistent, multi-agency working was effective and the strategies employed by MST had a greater effect on young people than the pull of exploitation.

### *Facilitators*

#### Therapeutic relationship

All participant groups and many within them highlighted the relationship with the therapist as a key facilitator.

*It was clear [that] he was just a down-to-earth person, normal person. As I say, it's the way he explained things and that to us, a lot better than some people would just say, 'You do this, you do*

*that, and that's it done'. Whereas he sat down, and he explained to us everything that has to go on; he even explained to us what can happen as we go along. (Primary carer: PC05)*

*I'm not sure; it depends on the person. It does depend on the person. Having a fun worker, it's always good, it's a lot more interesting. (Young person: YP05)*

The non-judgemental way that therapists had worked was a key factor cited in terms of the success of that relationship. Primary carers said that they had often felt judged by other professionals and felt blamed for the behaviour problems presented by the young person. Stakeholders noted that other services often had a statutory role to play, or other agendas, and this can serve as a barrier to engagement with primary carers – MST did not have this hurdle to overcome.

### Intervention intensity

The intensity of the model was cited by some as a facilitator, as well as the availability of the team, the flexibility of working arrangements (time and format) and being on call 24/7:

*The duty phone and so on – some of the parents I know, they think that was the best thing ever. (Stakeholder: ST09)*

### Learning skills

The emphasis on upskilling was a key factor for those primary care providers who provided evidence of improved family functioning:

*It's highlighted the skills we had. It's given us new skills, and it's now up to us to use the tools we've been given to carry it on. (Primary carer: PC10)*

### Family engagement

Primary carer and young person engagement was also cited as a facilitator, including by some primary carers who noted that the lack of engagement on the part of a partner or other family member was a barrier.

### Collaboration within systems

Collaboration with existing services was an important facilitator for MST teams and stakeholders, especially with youth services that had already established a good relationship with the young person. In relation to this, consultants/supervisors cited service mapping at the outset as a key facilitator enabling everyone to understand each other's roles, as well as getting a good understanding of the ecological context for the young person. The ability to extend the intervention was cited by some as helpful, especially given the relative complexity of families compared to standard MST.

### *Barriers*

#### Changing therapists

Barriers to implementation were often related to facilitators. The importance of the relationship with the therapist has been noted – changing therapists was described by primary care providers and young people as a significant barrier to implementation, and this was echoed by MST teams in relation to recruitment and training.



NH *How did it feel when he left?*

I *It actually broke my heart a little. Someone that has helped me so much, and I know he was only there for a couple of weeks, but he still took me out of hell. Like, I've been to hell and back. And he was the person that took me out of that place. And to be honest, it did break my heart a little, it did. But everyone comes and goes. It is what it is. I'm used to people leaving, to be honest. (Young person: YP02)*

*There's also, you know, the original supervisor left, so there was a time when the team had multiple supervisors, inconsistent supervisor cover. I also wonder if there were some recruitment issues, so I'm not sure if all of the therapists were the best fit for MST. And then there have been elements of kind of illness/sickness, some of which have kind of moved into long-term sickness, and that has a destabilising effect on families and the team. (Supervisor: ST11)*

### Intervention intensity

In addition, young people talked about the intensity of the intervention and having to participate in early morning appointments. Primary carers cited the intrusiveness of intervention as a potential barrier and the intensity in terms of what was being asked of them. Engaging some family members and the young person was a barrier in cases, and many participant groups also cited family weariness with all the agencies involved prior to starting MST as a potential barrier.

### Compelled by professionals

One supervisor described primary carers being told by social services, 'This is your last chance', and the problems that this presented:

*I think there have been times when MST has been sold to families almost as, 'This is your last chance. This is the only thing that's left now. You've tried everything else.' So straightaway, parents are, 'Oh my God. This is our last chance, we have to do this. I don't want to do it, but I've got to do it because people are making me do it.' Mainly social workers do that because the statutory services have said things like that to families before, which has been really unhelpful because you do then get a really begrudged family who are going, 'I don't even want to do this, but they've told me I want to do it', and I suppose it doesn't help social workers when during the assessment, I make it very clear to families that we are voluntary and they don't have to do it, even when the social worker is saying they have to do it, they don't have to do it. So we have had families where it's like, 'Oh my God, I don't want you here.' (Supervisor: ST13)*

### Collaboration within systems

Therapists highlighted the difficulties of collaborating with schools as a significant barrier. This was partly due to COVID-19 and the fact that many schools stopped face-to-face meetings, but it was also noted that schools have very different agendas and are busy places – that perspective shift required of seeing the young person as a victim rather than a perpetrator was difficult for some schools.

*I understand that schools, of course, paramount to them is safeguarding. But also, for schools, they've got large figures to get sorted, they've got children's learning outcomes to get, they've got OFSTED*

*going on. So when you've got a young person potentially that is a, you know, you see it on their reports all the time where they've, you know, a young person that's disruptive, they're disrupting the class or disrupting the school. You've got that automatically. There's that sort of negative work around them. (Therapist: ST23)*

Consultants/supervisors also talked about difficulties when they did not achieve good agency working and in particular when different professionals had different agendas so not everyone signed up to safety plans. Difficulties with agency working were not just on the part of agencies – primary carers or young peoples' reluctance to engage with certain agencies, especially the police, was a significant barrier to some of the strategies that teams tried to put in place.

### Exploitation

Some barriers specifically related to exploitation were identified. By its nature, it is a covert activity and is designed not to be identified.

*It takes a lot of time to engage parents in identifying those risks because child sexual exploitation is such a hidden problem, it's designed to be covert, designed to be secretive and of pulling children away from their families and getting them involved in crime; it's all secretive, isn't it? (Consultant: ST22)*

The increasing online nature of exploitation, particularly around COVID-19, meant that some strategies that ordinarily work were no longer effective. Some participants noted that child sexual exploitation is more likely to be identified as a risk for girls than boys and that there was a reluctance on the part of some primary caregivers to accept that their young person, in addition to risk of CCE, might also be at risk of child sexual exploitation.

Competing contingencies also played a part, e.g. what gangs were offering.

*If that young person's push and pull factors to exploitation is stronger than the parents' ability to safeguard that young person. (Stakeholder: ST09)*

Changing contexts were also a factor – constantly changing peer groups, the changing nature of exploitation and the changed social environment during lockdown – which meant that primary care providers could no longer mix as easily with peer group carers, and other activities that may have led to improved peer relationships were not available.

### **Intervention feasibility**

Our findings relating to intervention feasibility are summarised below:

- (1) Interventions to reduce CCE were valued, and increased focus on this issue was desired by stakeholders. There was evidence to indicate that MST for children and young people at risk of criminal exploitation was an acceptable intervention.
- (2) It was observed that retention rates overall for those receiving MST were acceptable.
- (3) There were questions about how different MST for children and young people at risk of criminal exploitation was from standard MST. Not all the planned augmentations were implemented by the

delivery team due to the challenges associated with delivery during the COVID-19 pandemic, and findings from Phase 1 indicated that there was some confusion about the differences among therapists. The main differences seen by stakeholders were related to working with younger children and within primary schools (although it is also not clear whether treating 10-year-olds is that different to 11-year-olds), while including information about and considering criminal exploitation within therapy.

- (4) The ability of therapists to form a therapeutic relationship with families, the intensity of the intervention, collaboration with other services, good mapping of services, parent/carer and young person engagement, and the focus on upskilling parents/carers were key facilitators to the successful delivery of the intervention.
- (5) The lack of engagement of one parent or carer within a family, changing therapists, the intensity and intrusiveness of the intervention for some, challenges with exploitation occurring online, collaboration with schools, changing peer groups and lack of engagement with other agencies were seen as barriers to the successful delivery of the intervention.

Our findings overall indicated that while there were some barriers to the delivery of the intervention to children and young people at risk of criminal exploitation, it was clearly feasible to recruit and deliver the intervention to families with a child or young person who was at risk of criminal exploitation for an average of six months. Data indicated that the therapy was delivered to the required standard as defined by MSTi indexed by the TAM-R (adherence/fidelity was not assessed independently as a part of the research). Nearly 76% of families that were offered the intervention were judged to have successfully completed the intervention by the delivery team.

## **Evaluation feasibility**

Our findings relating to evaluation feasibility are summarised below:

- (1) The COVID-19 pandemic had a negative impact upon this research project. The delivery team began offering the intervention to participants before research ethics and governance approvals were in place for the project. Over time, this meant that some sites stopped seeing families as the site was due to close while the research team were able to continue to recruit families. Further, as the delivery sites delivered MST to families that did not consent to take part in the research project, this reduced therapist capacity to recruit further families that wished to receive both MST and take part in the research. This likely had an impact upon recruitment rates.
- (2) During the period when both the research team and the delivery team were recruiting into the modelling study, 77% of those who agreed to receive the intervention expressed an interest in taking part in the research and were assessed for eligibility. This conversion rate is 1.3:1, which is acceptable. Based on this rate, 130 families would need to be approached to find 100 families that might express an interest in taking part in a study.
- (3) Fifty-three per cent of those who expressed an interest in taking part subsequently provided informed consent to take part in the research. This conversion rate is 1.9:1. Based on this rate, 190 families that express an interest in taking part in a study would need to be found to recruit 100 families into a future study. The conversion rate of those who received the intervention relative to

those who provided consent to take part in the research was 2.5:1. This means that 250 families that receive the intervention would need to be approached to recruit 100 into a future research study.

- (4) However, four families that provided consent to take part in our research did not respond to further contact attempts. Revising our conversion rates based upon this loss, approximately 270 families that receive the intervention would need to be approached to recruit 100 families into a future research study. This is based upon a conversion rate of 2.7:1.
- (5) Considering our proposed outcome measures, for those who completed the measures, few data were missing, suggesting that these measures may be acceptable to research parents and carers.
- (6) Few young people agreed to take part in our study, and it is therefore challenging to evaluate whether the primary outcome measure was acceptable.
- (7) Attrition was problematic. While 90% of primary carers completed outcome measures at baseline, only 41% completed post-treatment measures. Young people were difficult to engage, and insufficient numbers completed outcome measures, which included the proposed primary outcome measure. There are implications for a future larger study. Specifically, when choosing a primary outcome measure, a parent/carer report or other proxy measure should be used rather than data reported by children and young people.
- (8) While biased, there was evidence that the intervention was associated with a reduction in Conduct Problems and Externalising Behaviours and improvements in Prosocial Behaviour as reported by parents/carers. There was also evidence to indicate an improvement in family functioning.

## Conclusion

A summary of our overall findings is found in Table 11.

**Table 11: Summary of feasibility study findings**

Research question	Finding
Is it feasible to complete a future pilot trial of MST for children at risk of criminal exploitation within existing services?	<ul style="list-style-type: none"> <li>(a) The COVID-19 pandemic had a negative impact upon this research project. Unfortunately, the research team were unable to initiate recruitment into the study at the same time the delivery team began offering the intervention to families. This was partially due to not being able to secure an ethical opinion from an NHS Research Ethics Committee, who were prioritising research studies focused upon the pandemic. Once the project opened to recruitment, some sites were beginning to stop seeing families as the site was due to close while the research team were able to continue to recruit families. Further, sites delivered the intervention to families that did not consent to take part in the research project, and this reduced therapist capacity to recruit further families that wished to receive both the intervention and take part in the research. This likely had an undue impact upon recruitment rates.</li> <li>(b) The final conversion rate, based upon those who received the intervention relative to those who consented to take part and excluding the four families that did not complete baseline measures, was 2.7:1. This means that an estimated 270 families would need to be approached to successfully recruit 100 families into a future larger study. This estimate may be</li> </ul>

	<p>an underestimate for three reasons: (i) the impact of the COVID-19 pandemic as described above; (ii) families were able to access the intervention outside the context of research; and (iii) in the current research, families were not being recruited into a study that involved randomisation.</p> <p>(c) Participant retention was challenging. Increased focus on methods to promote retention within a larger study would be needed.</p> <p>(d) Parents and carers indicated that they were willing to take part in research to help others, and there was some suggestion that incentives of increased value were needed to promote recruitment and retention of young people. If a larger study were to go ahead, incentives of increased value for young people should be considered.</p> <p>(e) Young people expressed some mistrust of researchers in this specific context. Collecting outcome data directly from sufficient numbers of young people was not feasible.</p> <p>(f) For parents/carers who were willing to complete our outcome measures, the rate of missing data was low, but not all parents/carers were retained over time. In a future larger study, the primary outcome should be completed by primary caregivers rather than children and young people.</p> <p>(g) The data captured indicated improvements in Prosocial Behaviour, Conduct Problems and Externalising Behaviours among young people, along with improvements in family functioning. These changes are biased, as comparisons were not to an appropriate comparator, such as TAU. However, the changes were associated with a moderate effect size.</p> <p>(h) Families indicated that randomisation in a future larger study would be acceptable to them.</p>
<p>Do families, children and young people, clinicians, and other stakeholders consider MST for children and young people at risk of criminal exploitation an acceptable intervention?</p>	<p>(a) Interventions to reduce CCE were valued, and an increased focus on this issue was desired by stakeholders.</p> <p>(b) There were questions about how different MST for children and young people at risk of criminal exploitation was from standard MST. Not all the planned augmentations were implemented by the delivery team, and findings from Phase 1 indicated that there was some confusion among therapists about the differences. The key differences seen were related to working with younger children and within primary schools, while also including additional information about and considering criminal exploitation with families.</p> <p>(c) The delivery team provided the intervention to 258 families during this project, and 195 were recorded as having successfully completed the intervention.</p> <p>(d) There was evidence indicating that the intervention was acceptable to families.</p>
<p>What are the likely factors that will facilitate or hinder the successful implementation of MST for children and young people at risk of criminal exploitation, and how can they be successfully managed?</p>	<p>(a) The ability of therapists to form a therapeutic relationship with families, the intensity of the intervention, collaboration with other services, good mapping of services, parent/carer and young person engagement, and the focus on upskilling parents/carers were key facilitators to the successful delivery of the intervention.</p> <p>(b) The lack of engagement of one parent or carer within a family, changing therapists, the intensity and intrusiveness of the intervention for some, challenges with exploitation occurring online, collaboration with schools, changing peer groups, and lack of engagement with other agencies were seen as barriers to the successful delivery of the intervention.</p> <p>(c) Successfully managing these barriers would involve an increased focus upon establishing a therapeutic relationship with families while working to collaborate with other services and agencies further. Some increased focus upon managing</p>

	online exploitation should be considered, which likely became more relevant during the COVID-19 pandemic.
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## Evaluator judgement and interpretation of the feasibility of the intervention and evaluation

### MST for children and young people at risk of criminal exploitation

- (a) There was evidence that delivering MST to families of children and young people at risk of criminal exploitation was feasible, considering the number of families that received MST and completed the intervention during this project. MST was also judged to be acceptable. This is clearly positive if a future larger study were to be commissioned.
- (b) There were several issues that arose that would require further consideration before progressing to a larger study:
- The planned augmentations to MST to meet the needs of children and young people at risk of criminal exploitation were not fully implemented as originally planned. This can be partially explained by the COVID-19 pandemic, which forced change to the way the intervention was delivered (e.g. reduced to no actual in-person contact with families and the impact of lockdown upon the lives of families and their children) and was beyond the control of the delivery team and therapists.
  - The COVID-19 pandemic also led to timeline divergence between the delivery team and the research team. The pandemic meant that the research team had to revise their timelines because they were unable to undertake the necessary tasks leading to an opening of recruitment, while the delivery team recruited families and continued to deliver the intervention. One hundred and fifty-seven families received the intervention prior to the study opening to recruitment, and 101 received the intervention after recruitment opened. Clarity within a future larger study would be needed as to whether therapists providing the intervention as part of that study should also provide the intervention to families that are not taking part in the study; this has implications for therapist capacity and delivery costs.
  - Among stakeholders, there was some evidence to indicate a lack of clarity around the differences between standard MST and MST for children and young people at risk of criminal exploitation. While the two models are inherently similar, greater focus upon delineating the differences within a future larger study would be required. The primary reason for this is that there is evidence that MST is not effective when delivered outside of the USA (Littell et al., 2021). A large randomised-control trial of standard MST completed within England reported that standard MST did not lead to a significant reduction in out-of-home placements, nor did it reduce the time to the next offence episode relative to TAU (Fonagy et al., 2018). After five years, there was no difference between MST and TAU for offending behaviour (Fonagy et al., 2020b, Fonagy et al., 2020a). Considering this evidence, from a successfully completed large clinical trial, it is important that the differences between standard MST and MST adapted for use with children and young people at risk of criminal exploitation are clear for all stakeholders to avoid drift towards the intervention being standard MST (which has already been tested in a large-scale UK randomised controlled trial).

### Evaluation feasibility

- (a) As previously stated, this project took place during the COVID-19 pandemic, and the entire country went into lockdown. This had some impact upon the certainty of our conclusions about the feasibility of a future evaluation, but the degree of uncertainty is difficult to gauge.
- (b) Recruitment into this study was challenging. The conversion rate was 2.7:1. The single-site accrual rate was .58 families per month. Forty-one per cent of families were retained at post-treatment.

These conversion, accrual and retention rates suggest that a future larger study would not be feasible without considerable expense. Based upon these estimates, to recruit 100 participants, 270 would need to be approached, and it would take at least 43 months for four sites to recruit 100 participants (although a definitive randomised controlled trial would likely require several hundred families in terms of sample size).

- (c) These figures are likely impacted by the COVID-19 pandemic and the use of remote working, including the timeline divergence that occurred between the delivery and research team. Drawing comparisons to a large clinical trial of MST within England (Fonagy et al., 2018) conducted when a pandemic was not happening, their conversion rate was 1.57:1, and their single-site accrual rate was 2.45 per month over 31 months. Retention at 18 months was 72% for those assigned to receive the intervention and 68% for those who were assigned to TAU. It is of note that within this trial, it took 31 months (2.6 years) to recruit participants, indicating that a longer recruitment period is likely needed for clinical trials of MST.
- (d) Parents/carers who were interviewed indicated that they were willing to take part in research to help others, and randomisation within a future larger study would be acceptable, lending weight to the argument that a future larger study would be feasible.
- (e) It was noted that young people expressed some mistrust of researchers and would require larger incentives to help encourage recruitment and retention.
- (f) While rates of missing data for those who completed our outcome measures were low, the majority of data were captured from parents/carers rather than children and young people. These issues were associated with the challenges of encouraging children and young people to take part in the research. In any future larger study, the primary outcome would probably need to be a measure completed by parents/carers or available independently from standard processes (e.g. records of contact with the criminal justice system). It is of note that the primary outcome within the previous clinical trial of MST conducted within England was out-of-home placement (Fonagy et al., 2018).
- (g) The outcome data collected suggested some positive changes from baseline to during and after MST.

## **Future research**

- The findings of the current study indicated that a future larger study of MST for children and young people at risk of criminal exploitation is not likely feasible due to poor participant recruitment and retention and the lack of clarity about the difference between standard MST and the augmented treatment.
- If any future larger study is considered for funding, further delineation of MST for children and young people at risk of criminal exploitation from standard MST would be required.
- Any future larger study is likely to require a long recruitment period of three years or more. More than four recruitment sites would be required to ensure feasible accrual rates.



## Limitations

There are several limitations to this study:

- We completed a feasibility study during the COVID-19 pandemic. As a consequence, the estimate of our parameters used to inform the decision as to whether a trial of MST for children and young people at risk of criminal exploitation may lack precision.
- There were difficulties with recruiting a sufficient number of participants, especially young people.
- There were some parameters that were not modelled, including randomisation, tools to capture cost-related information and a longer follow-up period.

## References

- ARAIN, M., CAMPBELL, M. J., COOPER, C. L. & LANCASTER, G. A. 2010. What is a pilot of feasibility study? A review of current practice and editorial policy. *BMC Medical Research Methodology*, 10, 67.
- BORDUIN, C. M. & HENGGELER, S. W. 1990. A multisystemic approach to the treatment of serious delinquent behavior. *Behavior disorders of adolescence*. Springer.
- BRYMAN, A. & BURGESS, R. G. 1994. Reflections on qualitative data analysis. *Analyzing qualitative data*, 216-226.
- BRYMAN, A. & BURGESS, R. G. 1997. Developments in qualitative data analysis: an introduction. In: RICHARDSON, J. T. E. (ed.) *Handbook of qualitative research methods*. Leicester: British Psychology Society.
- 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, 1220-1235. e2.
- CIUCCI, E., BARONCELLI, A., FRANCHI, M., GOLMARYAMI, F. N. & FRICK, P. J. 2013. The Association between Callous-Unemotional Traits and Behavioral and Academic Adjustment in Children: Further Validation of the Inventory of Callous-Unemotional Traits. *Journal of Psychopathology and Behavioral Assessment*, 36, 189-200.
- CONROY, D., SMITH, J. A., BUTLER, S., BYFORD, S., COTTRELL, D., KRAAM, A., FONAGY, P., ELLISON, R., SIMES, E. & ANOKHINA, A. 2021. The long-term impact of multisystemic therapy: an experiential study of the adolescent-young adult life transition. *Journal of Adolescent Research*, 07435584211025323.
- DADDS, M. R., HUNTER, K., HAWES, D. J., FROST, A. D., VASSALLO, S., BUNN, P., MERZ, S. & MASRY, Y. E. 2008. A measure of cognitive and affective empathy in children using parent ratings. *Child Psychiatry Hum Dev*, 39, 111-22.
- DEIGHTON, J., CROUDACE, T., FONAGY, P., BROWN, J., PATALAY, P. & WOLPERT, M. 2014. Measuring mental health and wellbeing outcomes for children and adolescents to inform practice and policy: a review of child self-report measures. *Child and adolescent psychiatry and mental health*, 8, 14.
- ESSAU, C. A., SASAGAWA, S. & FRICK, P. J. 2006a. Callous-unemotional traits in a community sample of adolescents. *Assessment*, 13, 454-69.
- ESSAU, C. A., SASAGAWA, S. & FRICK, P. J. 2006b. Psychometric Properties of the Alabama Parenting Questionnaire. *Journal of Child and Family Studies*, 15, 595-614.
- FONAGY, P., BUTLER, S., COTTRELL, D., SCOTT, S., PILLING, S., EISLER, I., FUGGLE, P., KRAAM, A., BYFORD, S. & WASON, J. 2020a. Multisystemic therapy compared with management as usual for adolescents at risk of offending: the START II RCT. *Health Services and Delivery Research*, 8, 1-114.

- FONAGY, P., BUTLER, S., COTTRELL, D., SCOTT, S., PILLING, S., EISLER, I., FUGGLE, P., KRAAM, A., BYFORD, S. & WASON, J. 2020b. 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, 420-430.
- FONAGY, P., BUTLER, S., COTTRELL, D., SCOTT, S., PILLING, S., EISLER, I., FUGGLE, P., KRAAM, A., BYFORD, S., WASON, J., ELLISON, R., SIMES, E., GANGULI, P., ALLISON, E. & 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, 119-133.
- FRICK, P. J., CHRISTIAN, R. E. & WOOTTON, J. M. 1999. Age trends in the association between parenting practices and conduct problems. *Behavior modification*, 23, 106-128.
- GOODNIGHT, J. A., BATES, J. E., NEWMAN, J. P., DODGE, K. A. & PETTIT, G. S. 2006. The interactive influences of friend deviance and reward dominance on the development of externalizing behavior during middle adolescence. *J Abnorm Child Psychol*, 34, 573-83.
- GUSTLE, L.-H., HANSSON, K., SUNDELL, K. & ANDREE-LÖFHOLM, C. 2008. Implementation of Evidence-Based Models in Social Work Practice: Practitioners' Perspectives on an MST Trial in Sweden. *Journal of Child & Adolescent Substance Abuse*, 17, 111-125.
- HENGGELER, S., BORDUIN, C., SCHOENWALD, S., HUEY, S. & CHAPMAN, J. 2006. Multisystemic Therapy Adherence Acale-Revised (TAM-R). *Unpublished instrument. Charleston, SC: Department of Psychiatry & Behavioral Sciences, Medical University of South Carolina.*
- HOME OFFICE 2019. *Child Exploitation Disruption Toolkit*, Home Office.
- HUEY JR, S. J., HENGGELER, S. W., BRONDINO, M. J. & PICKREL, S. G. 2000. Mechanisms of change in multisystemic therapy: reducing delinquent behavior through therapist adherence and improved family and peer functioning. *Journal of consulting and clinical psychology*, 68, 451.
- LESCHIED, A. W. & CUNNINGHAM, A. J. 2002. *Seeking Effective Interventions for Serious Young Offenders: Interim Results of a Four-year Randomized Study Of multisystemic Therapy in Ontario, Canada*, Centre for Children and Families in the Justice System (London Family Court ....
- LITTELL, J. H., PIGOTT, T. D., NILSEN, K. H., GREEN, S. J. & MONTGOMERY, O. L. 2021. Multisystemic Therapy® for social, emotional, and behavioural problems in youth age 10 to 17: An updated systematic review and meta-analysis. *Campbell Systematic Reviews*, 17, e1158.
- NOCK, M. K., KAZDIN, A. E., HIRIPI, E. & KESSLER, R. C. 2006. Prevalence, subtypes, and correlates of DSM-IV conduct disorder in the National Comorbidity Survey Replication. *Psychol Med*, 36, 699-710.
- NOCK, M. K., KAZDIN, A. E., HIRIPI, E. & KESSLER, R. C. 2007. Lifetime prevalence, correlates, and persistence of oppositional defiant disorder: results from the National Comorbidity Survey Replication. *J Child Psychol Psychiatry*, 48, 703-13.
- OGDEN, T., CHRISTENSEN, B., SHEIDOW, A. J. & HOLTH, P. 2008. Bridging the Gap Between Science and Practice: The Effective Nationwide Transport of MST Programs in Norway. *Journal of Child & Adolescent Substance Abuse*, 17, 93-109.
- OLSON, D. H. & GORALL, D. M. 2006. Faces IV and the Circumplex model. *Minneapolis, MN: Life Innovations.*
- RABY, C. & JONES, F. 2016. Identifying risks for male street gang affiliation: a systematic review and narrative synthesis. *The Journal of Forensic Psychiatry & Psychology*, 27, 601-644.

- RABY, C., JONES, F. W., HULBERT, S. & STOUT, J. 2017. Design, development and validity testing of the gang affiliation risk measure (GARM). *The Journal of Forensic Psychiatry & Psychology*, 28, 753-776.
- ROBINSON, G., MCLEAN, R. & DENSLEY, J. 2019. Working county lines: Child criminal exploitation and illicit drug dealing in Glasgow and Merseyside. *International Journal of Offender Therapy and Comparative Criminology*, 63, 694-711.
- SMITH, D. J. & MCVIE, S. 2003. Theory and method in the Edinburgh study of youth transitions and crime. *British Journal of Criminology*, 43, 169-195.
- SUNDELL, K., HANSSON, K., LOFHOLM, C. A., OLSSON, T., GUSTLE, L. H. & KADESJO, C. 2008. The transportability of multisystemic therapy to Sweden: short-term results from a randomized trial of conduct-disordered youths. *J Fam Psychol*, 22, 550-60.
- VAN DER STOUWE, T., ASSCHER, J. J., STAMS, G. J., DEKOVIC, M. & VAN DER LAAN, P. H. 2014. The effectiveness of Multisystemic Therapy (MST): a meta-analysis. *Clin Psychol Rev*, 34, 468-81.

