Systematic review

EFFECTIVE INTERVENTIONS AND PRACTICES FOR PARENTS EXPERIENCING COMPLEX & MULTIPLE NEEDS

Foundations

What Works Centre for Children & Families

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About Foundations, the national What Works Centre for Children & Families

Foundations, the national What Works Centre for Children & Families, believes all children should have the foundational relationships they need to thrive in life. By researching and evaluating the effectiveness of family support services and interventions, we're generating the actionable evidence needed to improve them, so more vulnerable children can live safely and happily at home with the foundations they need to reach their full potential.

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About the Research Institute Child Development and Education, University of Amsterdam

The Research Institute Child Development and Education is an interdisciplinary institute focusing on promoting healthy, prosocial development, meaningful learning, and educational achievements of children and adolescents. The child development research programme aims to gain knowledge on variations in typical and atypical child development, and on preventive and clinical intervention

programmes that can be used to effectively support child development. The Institute is based in the Social and Behavioural Science Division of the University of Amsterdam.

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GLOSSARY OF TERMS / ABBREVIATIONS & ACRONYMS

Abbreviation / acronym / terms	Description
ABC	Attachment and Biobehavioural Catch-up
ACE	Adverse Childhood Experience
CARE	Communicating and Relating Effectively
CI	Confidence Interval (95%), the range of values for which we are 95% confident that the true value lies
FIR	Fathering in Recovery
IMPEP	Infant Massage Parenting Enhancement Program
IPV	Intimate partner violence
PALME	Parental training for Lone Mothers guided by Educators
PAT	Parents as Teachers
PCIT	Parent-Child Interaction Therapy
ePALS	Play and Learning Strategies – Internet adaptation
PICOS	Population, Intervention, Comparison, Outcomes, Study design
RCT	Randomised controlled trial
RoB	Risk of Bias
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
SD	Standard deviation
SLT	Social Learning Theory
STEEP-B	Step Towards Effective and Enjoyable Parenting – adaptation for adolescent mothers
VIPP-LD	Video-feedback Intervention for Positive Parenting – Learning Difficulties

Abbreviation / acronym / terms	Description
VIPP-PMH	Video-feedback Intervention for Positive Parenting – adapted for perinatal mental health
VIPP-SD	Video-feedback Intervention to Promote Positive Parenting and Sensitive Discipline

EXECUTIVE SUMMARY

Overview

There is strong evidence showing the potential benefits of parenting interventions to improve the wellbeing of children supported by early help and children's social care services. However, less is known about what type of interventions can support parents experiencing complex and multiple problems – such as poor mental health, poverty or substance abuse addiction – who are considered at an enhanced risk for child maltreatment. This review aims to provide insight into the parenting interventions and practice elements (discrete practices, strategies, techniques and delivery characteristics) that are effective in working with this group of parents. The review focuses on parents of children aged 0 to 10 years.

The review sought to answer the following questions:

- **RQ1:** What are the practice elements shared by interventions with evidence of effectiveness in reducing child maltreatment and/or improving child outcomes when delivered to parents experiencing complex and multiple needs?
a. Which parenting interventions have strong evidence of their effectiveness in reducing child maltreatment and/or improving child outcomes when delivered to parents experiencing multiple and complex needs, within a context relevant to UK early help and children's social care practice?
b. To what extent do practice elements and delivery/implementation factors contribute to or detract from the effectiveness of interventions? Have any been observed to be superfluous or contra-indicated?
- **RQ2:** What are the family and contextual moderators of effectiveness in parenting interventions (and where possible in practice elements) for this group?

Methods

Following established systematic review methods, we identified randomised controlled trials of parenting interventions with parents with children aged 0 to 10 years old, and the protocol was published on Foundation's website and registered on Open Science.[1] Risk of bias was assessed using the Cochrane Risk of Bias Tool for randomised controlled trials version 1.0.

We used quantitative and narrative synthesis methods to determine how effective parenting interventions are for parents experiencing multiple and complex needs across child and parent outcomes of interest. Practice elements were coded from the content for each parenting programme based on trial reports, programme manuals, and other relevant papers. We used quantitative synthesis methods (meta-regression analyses) to identify which practice elements, delivery/implementation factors, and family and contextual factors yield larger subgroup effects on

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[1] Registration DOI: https://osf.io/3s2ku/

three prioritised key outcomes (child maltreatment & negative parenting; parent poor mental health; positive parenting).

Key findings

We identified 131 reports presenting findings from 106 trials of 56 parenting programmes that met our inclusion criteria. Of these, 95 trials of 50 programmes were able to be included in the meta-analysis. Trials involved disadvantaged and at-risk populations, with a wide range of risk factors represented.

We found small to moderate positive impacts of parenting interventions on the majority of the child outcomes assessed: child attachment, child behaviour problems, child externalising behaviour, child wellbeing, and parent–child relationships. For child internalising behaviours, analyses revealed a negative but statistically non-significant effect. We found small but non-significant effects for maltreatment and harsh parenting, and small to moderate significant effects on negative parenting, and positive parenting. We also found a small but significant positive effect on parental factors that represent important risks in terms of poor child outcomes: parental mental health and parental stress.

For programmes based solely or partly on social learning theory we observed significant effects for all three prioritised outcomes (child maltreatment & negative parenting; parent poor mental health; positive parenting). Generally, the effect sizes tended to be smaller for programmes with theoretical foundations other than social learning theory (e.g. attachment, mindfulness, mentalisation) although our analysis was limited due to the small number of trials. Both programmes with fixed and flexible programme delivery models were found effective, although programmes with a fixed delivery model tended to yield higher effect sizes for maltreatment & negative parenting outcomes. We found no differences in effects by programme duration, and no differences between group and individual programmes – both were effective, although there tended to be stronger effects for group delivery for the maltreatment & negative parenting outcome.

We observed a tendency towards stronger effects for programmes that included practices related to the setting of expectations about appropriate boundaries, and programmes that included activities to equip parents with skills in child-directed interactions.

We observed significant effects on child maltreatment & negative parenting and positive parenting regardless of the level of prevention based on the risk of child maltreatment and whether or not the trial included mainly parents with poor mental health, parents of children with conduct problems, or low-income parents. Our analysis found larger effects on child maltreatment & negative parenting and positive parenting for trials with mainly parents from minoritised ethnic groups. Effects on parental poor mental health were generally smaller and non-significant for some subgroups.

Recommendations and next steps

Our findings provide a clear endorsement of the role of parenting programmes for parents experiencing complex and multiple needs, suggesting that they should be a central part of service

provision for this group. Our analyses show that a range of different programme types are effective with this group and does not point to a need to use only more resource-intensive programmes such as individual rather than group-based or longer programmes. Our analyses show that we can have greater confidence about the effectiveness of programmes that include certain practice elements, such as use of rule-setting and child-directed interactions, and programmes based on social learning theory.

Key recommendations

- Policymakers, commissioners, and leaders of family support services should support wider adoption of effective programmes that are feasible to implement in the UK context, and invest in supporting high-quality implementation at scale.
- Continued investment in the development and refinement of parenting programmes for these parents to strengthen the effects of programmes, including the development and testing of programmes based on attachment and other approaches (e.g. psychotherapeutic approaches, trauma-informed approaches, mentalising, and mindfulness) and those that involve the use of modules that can be delivered flexibly to parents based on need.
- More investment in efforts to assess the role of practice elements in programme effectiveness and to test whether routine practice might be strengthened by incorporating some of the practice elements of effective programmes in wider case work and support for parents.
- To achieve radical improvement in outcome for the most vulnerable children, the provision of evidence-based interventions must be supported by national efforts to address the structural and material contexts of family adversity.
- More research is needed using a range of different methods to identify the practice elements of effective programmes and to test whether they could be incorporated into routine services.
- Further research is also needed to identify the contextual and family circumstances that influence programme effectiveness, and to explore longer-term outcomes and how to sustain and enhance them.

INTRODUCTION

Project background

Parenting support is considered by many as a critical component for keeping children safe within a child welfare context. Parenting interventions are behavioural interventions directed at parents or other caregivers of the child that typically focus on parents learning new parenting skills and behaviours to improve the way they relate to their child (World Health Organization, 2022). They typically consist of a structured series of sessions, are often manualised, and delivered in group or individual formats in the home, community, health setting, or online. Besides improving parenting behaviours and strengthening the quality of the parent–child relationship, interventions may also address parental knowledge about child development; attitudes towards violent parenting such as spanking; parenting beliefs; and parenting self-efficacy (Backhaus et al., 2023a, 2023b). Parenting interventions may be combined with a range of other types of child and family support. Numerous reviews have found that parenting programmes are an effective set of interventions for improving behavioural, socio-emotional and mental health outcomes for parents and children generally and can significantly reduce maltreating behaviours including physical and psychological abuse (Chen & Chan, 2015; Gubbels, van der Put and Assink, 2019; Backhaus et al., 2023a). The evidence about their effectiveness in reducing other specific subtypes of maltreatment, such as neglect, and in preventing the recurrence of child physical abuse, is more limited (Vlahovicova et al., 2017).

We also know less about whether parenting interventions can prevent the need for children's social care services in families where child maltreatment has not yet occurred (van der Put et al., 2018). Parents experiencing complex and multiple problems – such as poor mental health, poverty or addiction – are considered at an enhanced risk for maltreatment. These parents are often coping with a variety of complex problems that sustain and reinforce each other in ways that compromise parents' ability to understand and respond appropriately to their child's needs. The needs of these families may be distinctly different than those eligible for indicated parenting support (Kolthof, Kikkert & Dekker, 2015).

This review aims to shed light on what type of parenting interventions are effective in working with parents experiencing complex and multiple needs, and to identify what works in different contexts and for different groups of parents.

Previous systematic reviews

Previous systematic reviews have shown how intervention effectiveness may vary for different groups of parents. It is well documented that parenting programmes yield meaningfully different effects in prevention versus treatment settings (Leijten et al., 2019). Previous meta-analyses reached different conclusions in relation to whether parents from minoritised ethnic groups benefit more or less from parenting interventions (Gardner et al., 2019; Backhaus et al., 2023a), but found that the socio-economic status of parents did not moderate intervention effectiveness (Gardner et al., 2019; Backhaus et al., 2023a). The age of the child at the start of the intervention was not found

to be a significant moderator of the effect of parenting interventions on maltreatment (Euser et al., 2015; Backhaus et al., 2023a).

Previous meta-analyses also provide insight into the effects of structural elements of parenting programmes, such as duration of the intervention and presence of ancillary services. Euser et al. (2015) found larger effect sizes for programmes that aim to prevent maltreatment with a moderate length (6–12 months) or a moderate number of sessions (16–30 sessions). Several other reviews found no evidence of any moderation effect by delivery format (e.g. individual or group), delivery location or delivery setting (Chen & Chan, 2015; Gubbels, van der Put & Assink, 2019; Backhaus et al., 2023a).

The provision of other services as part of the parenting intervention has been associated with smaller programme effects, especially in prevention settings (Kaminski et al., 2008; Leijten et al., 2019), and the provision of practical and instrumental assistance aimed at reducing child maltreatment was also found to be negatively associated with programme effectiveness in home visiting programmes (Gubbels et al., 2021).

Reviews assessing the effectiveness of interventions to reduce the impact of parental risk factors have come to mixed conclusions with regards to the role that parenting interventions can play. Reviews of interventions to improve parenting capacity and/or parent–child relationships in families affected by parental poor mental health mostly found positive effects, including upon parental responsiveness and child development, with more limited evidence of effect upon parent–child relationships (Letourneau et al., 2017; Leijten et al., 2019; Rayce et al., 2020; Barlow, Sleed & Midgley, 2021). A review of trauma-informed parenting interventions found evidence of increasing positive parenting practices, as well as reducing internalising and externalising problems among children (Lindstrom Johnson et al., 2018). Interventions for parents experiencing complex post-traumatic stress disorder and/or with childhood experience of maltreatment may improve parent–child relationships slightly compared to usual service provision, but noting low certainty of evidence (Jones et al., 2023). A recent umbrella review by Barrett et al. (2024) concludes that despite a large volume of research into interventions that address the risk factors of interest in isolation, there is limited evidence for the effectiveness of interventions for families with children who experience a combination of commonly co-occurring risks, for example parental interpersonal violence and abuse, parent poor mental health, and substance misuse.

Emergent learning about components and practice elements

An important theme emerging in recent years is the analysis of how specific intervention components or practice elements (discrete practices, strategies, techniques, and components) influence intervention effectiveness. This work has been undertaken using methods including meta-regressions of individual programme components (i.e. clusters of parenting techniques taught) associated with programme effects (Kaminski et al., 2008; Leijten et al., 2018, 2019).

For example, Leijten et al. (2019) found that programmes demonstrated larger effects for reducing disruptive child behaviour when they promoted positive reinforcement, praise, and used natural or logical consequences. A recent network meta-analysis by Leijten, Melendez-Torres and Gardner (2022) aimed at identifying the optimal combination of parenting programme components to reduce disruptive child behaviour problems, found that four active parenting programme types

were effective in treatment settings: behaviour management, behaviour management with parental self-management, behaviour management with psychoeducation, and relationship enhancement. Behaviour management had the largest chance of being most effective in treatment settings. In prevention settings, only behaviour management and behaviour management with parental self-management were effective.

Using a much smaller sample of interventions focused on preventing recurrence of maltreatment, the qualitative comparative analysis by Melendez-Torres, Leijten and Gardner (2019) highlighted alternative punishment strategies and parental self-management strategies as effective parenting intervention components to reduce child abuse recurrence. Components of parenting interventions that have been shown to be effective in reducing violent parenting behaviours include, for example: ignoring negative child behaviours that are aimed at eliciting attention; using logical consequences (e.g. losing privileges); praising and rewarding appropriate child behaviours; and improving parental self-management skills such as emotion-regulation (World Health Organization, 2022).

Recent analyses also provide insight into the contexts within which different intervention content may be effective. For example, van der Put et al. (2018) conclude that components associated with greater effectiveness differ for interventions targeting families at risk for child maltreatment versus interventions aimed at maltreating families. They found larger effect sizes for interventions focusing on increasing self-confidence of parents in preventive interventions, while in curative interventions larger effect sizes were found for improving parenting skills, improving personal skills of parents, addressing parents' poor mental health, providing social and/or emotional support, and improving a child's wellbeing. Similarly, the findings by Leijten et al. (2019) support that parenting programmes need to emphasise different strategies and techniques for families whose children have significant conduct problems, compared to families considered to be at risk based on for example young parenthood or socio-economic deprivation. In short, what is optimal for each family may depend on complex interactions between family characteristics and programme and delivery components (Leijten, Melendez-Torres & Gardner, 2022), and there is need for differentiation in the content of parenting programmes implemented to different families.

Design and aims

As evidence is rapidly accumulating about the optimal techniques at different levels of service intervention, and for parents facing different challenges, it is timely to look further at what is likely to be effective for parents facing complex and multiple needs. Insight into effective parenting interventions and their common elements are essential resources for social workers in their work with parents experiencing complex and multiple needs. This review aimed to help identify the interventions and practice elements that are effective in working with parents experiencing complex and multiple needs to inform the development of Practice Guides covering effective parenting practice with this group of parents. The children of this group of parents include those defined under section 17 of the Children Act 1989 as being unlikely to achieve or maintain a reasonable level of health or development without additional support, and/or under section 47 as are suffering or likely to suffer significant harm.

To do so, we identified randomised controlled trials of parenting interventions with parents with children aged 0 to 10 years old and synthesised study findings. The meta-analysis involved

examining the pooled effect of parenting interventions for several key outcomes and testing whether and which practice elements (discrete practices, strategies, techniques, and delivery characteristics) and family and contextual factors moderate the effectiveness of these parenting interventions.

OBJECTIVES

Research objectives

The review aimed to identify and describe:

1. The parenting interventions that are supported by strong causal evidence with regard to their effectiveness in reducing child maltreatment and/or improving child outcomes for parents with complex and multiple needs within a context relevant to the UK's early help and CSC practice
2. The practice elements (discrete practices, strategies, techniques, and delivery characteristics) that are shared by effective parenting interventions and observed to contribute to intervention effectiveness for these parents
3. The magnitude of effects and evidence about for whom – and in which contexts, circumstances, and combinations – the identified interventions and practices have the highest likelihood of being effective for these parents
4. Information relevant for their successful implementation within the UK context.

Research questions

This review aimed to answer two overarching research questions:

1. What are the practice elements shared by interventions with evidence of effectiveness in reducing child maltreatment and/or improving child outcomes when delivered to parents experiencing complex and multiple needs?
   a. Which parenting interventions have strong evidence of their effectiveness in reducing child maltreatment and/or improving child outcomes when delivered to parents experiencing multiple and complex needs, within a context relevant to UK early help and children's social care practice? What are their pooled effects?
   b. To what extent do practice elements and delivery/implementation factors contribute to or detract from the effectiveness of interventions? Have any been observed to be superfluous or contra-indicated (including – where possible – for specific subgroups)?
2. What are the family and contextual moderators of effectiveness in parenting interventions for this group?

To answer RQ1, we used quantitative and narrative synthesis methods to determine how effective parenting interventions are for parents experiencing multiple and complex needs across all our outcomes of interest. We used quantitative synthesis methods to determine/identify which practice elements yield larger subgroup effects on three key outcomes (child maltreatment & negative parenting; parent poor mental health; positive parenting). To answer RQ2, we conducted subgroup analyses to compare effects for different subgroups on the abovementioned three key outcomes.

METHODS

Protocol registration and ethical review

This systematic review followed a review protocol, published on the Foundations website[2] and registered with the Open Science Framework[3] .

There were a few departures from the protocol:
1. Based on the outcomes reported in the included studies, we expanded the list of target outcomes to also include child abuse risk, attachment (attachment or bonding of the child with the parent), parent–child relationship (perceptions of the relationship and responsiveness of the child to the parent), and physiological outcomes (e.g. children's respiratory sinus arrhythmia) given their relevance to the research questions.
2. Under RQ2, we removed the reference to the possibility of identifying family and contextual moderators of effectiveness in practice elements and remained at the level of parenting interventions. The reason for this amendment is that the number of trials and effect sizes, did not give sufficient statistical power to examine moderators of practice elements.
3. For the search to identify papers published since August 2022, we limited the number of databases from 11 to 5 databases. This amendment was informed by preliminary searches returning a significantly higher number of papers than was anticipated and resourced for in this review.
4. Given the short timeline for the review, it was not feasible to contact trial authors to obtain any missing data for the risk of bias assessment. We focused our requests on missing information in relation to the trial results. When no judgement could be made on the basis of the information provided in the paper, we rated the relevant domain as 'unclear risk'.
5. Rather than quantitative synthesis, we narratively synthesised results on the following outcomes due to included papers reporting limited data on these outcomes: number of out of home placements, reunification rates, educational attendance, educational attainment, and physiological outcomes.
6. For the subgroup analysis, we created a combined category of child maltreatment (including harsh parenting) and negative parenting, given that the number of papers reporting on child maltreatment was too low to conduct subgroup analysis.

In order to ensure transparency, this report follows reporting guidelines including the Cochrane Handbook for Systematic Review (Higgins et al., 2023), and the PRISMA guidelines for reporting systematic reviews (Page et al., 2021).

Given that the review involved no primary data collection, the research team and Foundations determined that no ethical review processes were needed. Foundations convened an Advisory Group to advise on research approach and interpretation of findings.

Eligibility criteria

Table 1 shows the inclusion and exclusion criteria for the review.

Table 1. Inclusion and exclusion criteria

Picos domain	Inclusion criteria	Exclusion criteria
Population	**Age:** Parents of children with mean age up to 10 years (inc. the prenatal period), defined as having more complex and multiple needs.[4] **Level of prevention based on the risk of maltreatment:** studies with parents • who were referred by agencies (e.g. social services) to receive an intervention based on their levels of maltreatment (treated) • who were offered an intervention based on scoring highly on child maltreatment instruments (indicated) with higher level needs • who were offered an intervention based on risk factors for maltreatment (selective)	**Age:** Interventions targeted at parents of children over 10 years. **Level of prevention based on the risk of maltreatment:** • Universal programmes • Parents who were offered an intervention based on risk factors for maltreatment (selective) – but do not have higher level needs **Trials specifically aimed at special groups such as:** • parents of children with physical, learning or developmental disabilities[5] • parents of children with severe mental illness • parents of children with medical conditions – including premature infants (born at low birth weight or with congenital diseases) • carers of children in foster care, kinship carers • adoptive parents • adults (i.e. non-parents) providing care to children in institutional and non-residential settings

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[4] Studies targeting other caregivers (e.g. foster carers and adults providing care to children in institutional settings) were out of scope, but we anticipated that some included studies would involve populations which include small numbers of other caregivers.

[5] Parents of children with ADHD were eligible only if ADHD was comorbid with severe conduct problems (treated or indicated) and if other inclusion criteria were met.

Picos domain	Inclusion criteria	Exclusion criteria
Intervention	**Parenting intervention:** a structured set of activities or services, aimed at improving how parents approach and execute their role as parents, specifically their parenting knowledge, attitudes, skills, behaviours, and practices (inc. interventions focused on preparing for parenthood). At least 50% of sessions or content is directed at parental knowledge, skills, attitudes or behaviour.	Interventions in which less than 50% of sessions or content is directed at parental knowledge, skills, attitudes or behaviour. Interventions in which more than 50% of sessions or content is directed at specific aspects of parenting (e.g. toileting, feeding, sleeping) rather than general parenting skills). Interventions which: • focus narrowly on very specific child risks such as accidents, or which teach skills for dealing with specific medical conditions or physical disabilities; • primarily aim to deliver financial, social or other support to parents but not to change parents' knowledge, skills, attitudes or behaviour; • are primarily aimed at enhancing educational outcomes (e.g. family literacy, school readiness support). Interventions that are not offered in a structured format and/or that do not have a structured approach.
Comparison	No treatment, waiting list, minimal intervention, service as usual.	Studies/study arms with only an active condition such as a variant of the same parenting intervention, a different parenting intervention or an alternative intervention.

Picos domain	Inclusion criteria	Exclusion criteria
Outcomes	• Child maltreatment (incl. harsh parenting) • Child abuse risk • Negative parenting • Positive parenting • Parental mental health • Parenting stress • Child externalising/behavioural problems • Child internalising problems • Child wellbeing • Number of out of home placements • Reunification rates • Educational attendance • Educational attainment • Child attachment • Parent–child relationship • Physiological outcomes used as indicator for any of the above outcomes See table 2 for full outcome descriptions.	• Rate of care seeking (by child or for child by parent/caregiver) • Child physical health • Placement stability
Study design	Randomised controlled trials and cluster-randomised controlled trials	Any study design other than randomised controlled trials and cluster-randomised controlled trials
Context	High-income countries (World Bank, 2024)	Low- and middle-income countries

Population

The review is focused on families with complex and multiple needs who are eligible for early help, targeted early help, or children's social care services. Eligible for inclusion were studies with parents who were referred by agencies to receive an intervention based on their levels of maltreatment (treated), parents who were offered an intervention based on scoring highly on child maltreatment instruments (indicated), and parents with higher-level needs who were offered an intervention based on selected risk factors for maltreatment (selective). Parents with higher-level needs are defined as those with individual, interpersonal, or family factors that create a known risk of maltreatment. Based on available evidence regarding their association with an increased risk of child maltreatment (Mulder et al., 2018; Austin, Lesak & Shanahan, 2020; Younas & Morrison

Gutman, 2022; National Institute for Health and Care Excellence, 2023) the factors considered in this review are:

- Parental substance abuse
- Parental incarceration
- Parental mental health
- Parental intellectual disability
- Past or current experience of intimate partner violence
- Parental childhood experience of maltreatment or other adverse childhood experiences
- Children with severe child socio-emotional and conduct problems
- Highly deprived socio-economic status
- Teenage/adolescent parenthood
- Traveller, refugee, asylum seeking, or undocumented migrant status.

Recognising that parents have a number of characteristics and features that might be relevant, we distinguished different categories of risk factors to define and operationalise complex and multiple needs. Based on reviewed evidence, we distinguished three sets of criteria (and associated thresholds) based on which a study would be eligible for inclusion in the review:

1. Evidence of the study population meeting the threshold for a risk factor that is considered to constitute a complex need in itself. Risk factors that fall into this category are parental substance abuse, parental incarceration, parental poor mental health, parental intellectual disability, past or current experience of intimate partner violence (IPV), parental childhood experience of maltreatment or other adverse childhood experiences.
2. Evidence of the study population meeting the threshold for a risk factor that is considered to constitute a complex need in the presence of another risk factor. Risk factors that fall into this category are children with severe child socio-emotional and conduct problems, highly deprived socio-economic status, teenage/adolescent parenthood, and traveller, refugee, asylum seeking, or undocumented migrant status. These trials were eligible for inclusion when there was also evidence of the presence of another second risk in a substantial proportion of the study population.
3. Evidence of the presence of multiple risks among the study population (three or more risks evidenced or parents scoring moderate or high on a multi-risk assessment). Study populations in this category did not meet the cut-off for any of the individual risks as set for the previous two categories, but rather faced an accumulation of risks.

Further detail regarding the criteria and associated thresholds is set out in Appendix A.

The review considers trials involving parents of children aged up to 10 years (based on mean age). This reflects the fact that parenting support for parents with adolescents tend to have quite different content and approaches (Backhaus et al., 2023a), and focusing on a narrower age group was intended to reduce heterogeneity. Trials focusing on specific groups (e.g. parents of children with disabilities or medical conditions) were also excluded on the basis that targeted content for these groups will typically differ significantly from the parenting interventions which focus more on general parenting (and would hence significantly increase heterogeneity).

Intervention

A parenting intervention is defined for the purposes of this review as being a structured set of activities or services, with set eligibility requirements, aimed at improving how parents (and caregivers) approach and execute their role as parents (or caregivers), specifically their parenting knowledge, attitudes, skills, behaviours, and practices (based on World Health Organization, 2022). Only studies of preventive and treatment/curative interventions with at least 50% of sessions or content directed at parents with the aim of changing parenting knowledge, skills, attitudes, or behaviour were eligible for inclusion. For some of the papers we assessed for eligibility, we were able to draw on the meta-analysis by Gubbels et al. (2021) which classified the programme components of 77 home visiting programmes into components directly related to parenting and other non-parenting components.

The parenting component may be combined with other content (e.g. parent relationship or life skills), types of support, types of therapy (e.g. cognitive behavioural therapy), forms of family-based therapy (e.g. multisystemic therapies), or child-focused interventions. Family support programmes with parenting as an aspect were eligible, such as home visiting programmes in which parents are visited at home and provided with information, support and/or training regarding child health, development, and care. Although interventions with a flexible structure were included, completely unstructured interventions were not eligible for inclusion, for instance home visits not offered in a structured format, or therapies that do not have a structured approach. Parenting interventions of all durations were eligible, including one-off sessions.

No restrictions were applied in terms of the theoretical foundation or approach on which the intervention was based (e.g. social learning theory, attachment, mentalisation, mindfulness, psychotherapeutic). Common parenting interventions are primarily based on social learning theory (Kaehler et al., 2016; Patterson, 1982). According to social learning theory, children develop disruptive behaviours when parents negatively reinforce defiant behaviours and model adverse behaviours to their children. Key components of social learning theory-based programmes include:

c. modelling and observation (parents are taught to model desirable behaviours)
d. positive reinforcement (parents are taught to use praise, reward, and warm attention to encourage desirable behaviours, for example through child-led joint play activities)
e. effective discipline (parents learn positive non-violent discipline techniques, such as natural consequences, setting clear boundaries).

Attachment-based approaches to parenting interventions are more common in interventions targeting young (i.e. preschool) children. Attachment theory highlights the role of caregiving that is sensitive and contingently responsive in supporting the social, emotional, and cognitive development of infants and toddlers (Lyons-Ruth, 1996; Kohlhoff 2022). Attachment-based interventions aim to improve parental capacity to provide sensitive and responsive caregiving, with the ultimate goal of improving secure attachment and reducing insecure and disorganised attachment (Byrne, Murphy & Connon, 2020; Lavander, Waters & Hobson, 2023). Many attachment-based programmes are dyadic (i.e. work with the parent and child together) and focus on helping parents to provide more sensitive attuned caregiving by targeting the parents behaviour directly (i.e. video-feedback and ABC use in- the-moment observations to improve the parent's

understanding about meaning of a child's behaviours) or indirectly by focusing on the parent's own attachment representations and/or their capacity for mentalisation. So, for example, parent-child psychotherapy aims to support parents to provide more sensitive parenting behaviours by helping the parent to understand how their own parenting behaviours (as observed in the therapeutic setting) relate to their own experiences of being parented and also helping the parent to mentalise (i.e. think about their child's behaviours in terms of what the child might be thinking or feeling).

Parenting content may be delivered using a range of learning activities, may be group-based or individual parent/family-based including the children or not, and may be delivered by professional or paraprofessional staff in the home, at a centre or online (Backhaus et al., 2023a).

Outcomes

The outcomes of interest include those focused on both child wellbeing as well as parenting practices. Outcomes relating to improvements in parenting practices are included as these are a key mechanism for improving children's wellbeing and outcomes, and many of the studies which are of relevance to this review, report parenting outcomes but not child outcomes. Outcomes relating to aspects of parental wellbeing that are theorised most proximal to parenting practices are also included, namely parental mental health and stress.

Study design

Only randomised controlled trials and cluster-randomised controlled trials were eligible. This reflects the fact that there are sufficient numbers of these robust studies to eliminate the need to include other study designs, where conclusions about the causal effects of the intervention are harder to draw.

The comparison conditions included no treatment, wait-list, service as usual and minimal additions to it, but we excluded studies with an active control. This assessment was made on the basis of the content and intensity of the comparison condition. For 'service as usual' we relied on the author's own categorisation.

Context Trials took place in a country categorised by the World Bank (2024) as high-income as these contexts were deemed most comparable to the UK service context.

Trials were not included in the meta-analysis if we could not calculate Cohen's d based on available data, or in case the intervention was substantially different due to targeting a specific population, e.g. parents with a learning disability.

Publication restrictions

The following publication restrictions were applied during the screening process:

- **Language –** In order for the research team to extract and interpret findings, we restricted the language of studies to either be published in English, or available in an English translation.

- **Publication period** – Only studies published since 2003 were eligible for inclusion. This decision was informed by a practical need to keep the number of included trials manageable within the resources and time available for the review. Moreover, it was our expectation that interventions developed earlier than 2003 but still in line with current research would have been evaluated since 2003, either in their original or adapted form. Another consideration was that trials published since 2003 would likely have more comparable service contexts.
- **Publication status** – Only peer-reviewed publications were eligible for inclusion. Non-peer-reviewed publications, protocols, dissertations, and unpublished studies were excluded. This decision was informed by the resources and time available for the review, and it was expected that the majority of robust trials would have been reported in peer-reviewed publications.

Information sources

The review builds on two recent systematic reviews and meta-analyses of parenting interventions based on social learning theory in families of children aged 2 to 10 years and covering the period 1984–2022 (Backhaus et al., 2023a, 2023b). This work was undertaken to support the development of WHO Guidelines on parenting interventions to prevent maltreatment and enhance parent–child relationships (World Health Organization, 2022).

The global meta-analyses by Backhaus et al. (2023a, 2023b) included 346 studies of parenting interventions based on social learning theory in families of children aged 2–10 years. These 346 studies were selected from a larger dataset which includes:

1. Trials included in a systematic review completed in 2014 (Leijten et al., 2016) that used the same inclusion and exclusion criteria.
2. Trials identified through updated searches in 2019 (n = 13,022) and 2022 (n = 7,838) across 11 databases covering the period between 1 January 2014 and 1 August 2022 (3ie Database of Impact evaluations, ASSIA, Campbell Library, The Cochrane Library (Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials), EMBASE, ERIC, MEDLINE, National Criminal Justice Reference Service, The International Bibliography of the Social Sciences, PsycINFO, PILOTS), and the following trial registries: ClinicalTrials.gov, Australian New Zealand Clinical Trials Registry, WHO International Clinical Trials Registry Platform, metaRegister of Controlled Trials (mRCT).
3. Eligible trials identified through hand-searched reference lists of 29 relevant systematic reviews, and contacting of authors by email to request study results and unpublished manuscripts identified through the trial registries mentioned under 2.

More detail regarding the search is provided in Backhaus et al. (2023a, 2023b). The returns of the search covering the period 2014–2022 are contained in a database with 20,860 papers, which we refer to as 'the global dataset'.

The search for this current review involved three components, building on the global dataset to ensure we included trials covering a wider range of parenting interventions and the most recent publications (see figure 1). Our search covered:

- *Component 1:* We identified eligible trials from the 346 studies included in the meta-analyses by Backhaus et al. (2023a, 2023b).
- *Component 2*: To extend coverage of Component 1 to trials where children had a mean age below 2 years old, and trials of parenting interventions that are not primarily based on social learning theory, we ran keyword searches in the global dataset to identify other eligible trials. We also screened the list of studies included in ten relevant systematic reviews focusing on trials of parenting interventions:
  - Targeting parents of children aged 0–2 years old
  - With theoretical underpinnings and approaches other than social learning
  - Targeting specific high-risk groups (e.g. teenage parents) to ensure that no key studies published during the period 2003–2013 were missed.
- *Component 3*: To cover papers published in the period between 1 August 2022 and 18 January 2024, we replicated a modified version of the search used by Backhaus et al. (2023a, 2023b) in the following databases:
  - ASSIA
  - the Cochrane Library (Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials)
  - the International Bibliography of the Social Sciences
  - MEDLINE
  - PsycINFO.

Figure 1: Sources of reviews for further screening
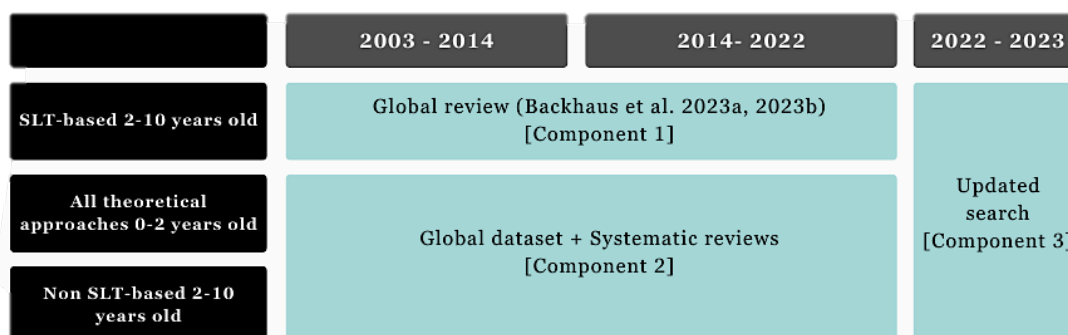
Search strategy

The search strategy was customised for each of the three above-mentioned components.

Component 1: Identifying relevant trials from the global review

We screened the full list of studies published since 2003 and conducted in high-income countries that was included in the meta-analyses by Backhaus et al. (2023a, 2023b). Hence no search terms were applied, apart from applying a filter on context (high-income) and year of publication (2003–2022).

Component 2: Global dataset search

We used filters with keywords for study design (randomised controlled trials) and population (parents) in the global dataset. Following this, we ran searches for key words related to theoretical underpinnings and approaches other than social learning theory such as attachment, sensitivity/responsiveness, mentalisation, psychotherapeutic, and family systems. See Appendix B for the full list of keywords. The team screened up to 500 returns for each theoretical approach, after which artificial intelligence-assisted features in Rayyan were used to obtain a rating of how relevant each article is based on the articles that were included/excluded during the initial screening. After obtaining the rating, the team continued screening with articles sorted from highest (most relevant) to lowest (least relevant) ratings. Further key words were used to identify key home visitation and parenting programmes and population risk factors (e.g. parental substance abuse, parent poor mental health). The returns for population risk factors were screened in full. Further details on this part of the search can be found in Appendix B.

The 10 systematic reviews and meta-analyses selected for screening (listed in Appendix C) were prioritised from a longlist of 140 reviews. The longlist was compiled:

1. Based on the review team's expert knowledge of the field
2. By identifying relevant systematic reviews from an evidence gap map carried out for the global review
3. Through selective forward citation-searches (i.e. a search to find other relevant reviews that cited the reviews included in our longlist).

The systematic reviews were prioritised by the research team taking into consideration the time period covered by the review, number and type of studies included in the review, target age group, and sensitivity of the search conducted for the review. We screened the full lists of studies included in these 10 systematic reviews.

Component 3: Updated search

For the updated search covering papers published between August 2022 to January 2024, we amended the search used in the reviews by Backhaus et al. (2023a, 2023b). The original search string included terms in relation to three conceptual categories:

1. Intervention
2. Parenting (including abuse)
3. Child behavioural and emotional problems.

To reflect the extended coverage of the current review we included search terms relating to theoretical underpinnings and approaches other than social learning theory (e.g. attachment, sensitivity/responsiveness, mentalisation, mindfulness, psychotherapeutic). An example search in PsycInfo database (Ovid) can be found in Appendix D. No language restrictions or other filters were imposed. Searches were conducted on 21 January 2024.

Selection process

Identified records were filtered for inclusion in the review across two phases: title and abstract screening and full-text review.

A total of six researchers were involved in the title and abstract screening stage (AB, CA, ET, JK, PC, RD). Titles and abstracts were screened by one reviewer, with a second reviewer resolving any queries. At this stage, reviewers took the approach of 'if uncertain, put it through the full-text review' to ensure that any ambiguous information could be fully assessed. To establish internal reliability, sets of twenty papers were double-screened (between two groups of three reviewers each) until 85% agreement was reached on a set.

The same researchers then reviewed the full texts of papers against the eligibility criteria. One reviewer read the full-text version of each eligible study, bringing in a second reviewer, and as necessary, a third or fourth reviewer to resolve any uncertainties. Two co-investigators (FG, JB) reviewed 37 papers to resolve final queries and make final decisions. Queries mostly related to eligibility of the intervention, the comparison condition, and population risk factors.

In cases where there were multiple reasons for exclusion, only one reason was selected for each paper.

Data collection process

A data extraction template was created in Excel. This extraction template spreadsheet was developed by the research team, building off the extraction sheet and codebook developed for the global review. The extraction template was piloted with two studies and refined before formal data extraction commenced. Further minor revisions were made during extraction.

A total of seven researchers were involved in the extraction process (AB, CA, ET, HH, JK, PC, RD). This included two senior members in the team who supported queries around data extraction (AB, ET). They checked the extraction in full for a sample of 5% of trials, with further quality assurance on extraction fields and studies that were experienced as more challenging. For the studies included in the meta-analyses by Backhaus et al. (2023a, 2023b) (identified through Component 1), the majority of data fields had already been extracted and were copied into our data extraction spreadsheet.

In 23 cases, further information about the analysis or results was sought from the corresponding authors by email.

Prior to the start of extraction, study papers were mapped onto trials to avoid duplicate reporting of the same trial, and to ensure that findings of individual studies from the same trial were not over-weighted in the analysis.

Data management and processing

Rayyan was used for title and abstract screening for Component 2. Citations were imported into the online systematic review software Covidence for full-text screening. Citations identified in the updated search covering 2022–2024 (Component 3) were also imported into a separate Covidence

review. The screening process (duplicate identification, title and abstract screening, full-text review) for Component 3 was carried out on Covidence.

Duplicate identification was done within Components 2 and 3 of the search, rather than across components. This meant that a subset of papers has been screened under more than one component. For example, papers published between January 2022 and August 2022 were screened for titles and abstracts under both Component 2 and Component 3.

Quantitative meta-analysis was conducted using STATA v17.

Data items

Outcomes were defined as per table 2 below (based on Backhaus et al. (2023a, 2023b)). Results on other outcomes within our scope of interest that did not fall under these categories were also extracted. Data on all timepoints were extracted.

Table 2. Outcomes of interest

Outcome	Definition
1) Child maltreatment and subtypes –including harsh parenting	This review defines child maltreatment as parenting behaviours on a spectrum from harsh to severely abusive parenting. A systematic item-by-item analysis of instruments that measure child maltreatment compared to harsh parenting instruments in the parenting intervention field revealed that there is a strong overlap of parenting behaviours measured by instruments designed to measure child maltreatment and instruments designed to measure harsh parenting (Backhaus et al., 2022). Therefore, this review includes both types of instruments in the analysis of maltreatment outcomes. Examples are the Corporal Punishment scale of the Parenting Questionnaire (example item: "I hit my child with a belt, strap or switch"), the Harsh/Negative Discipline scale of the Parent Behavior Checklist (example item: "I yell at my child for whining"), or for an example of neglect, the Poor Monitoring scale of the Alabama Parenting Questionnaire (example item: "You don't tell your child where you are going"). As such, this review includes any parenting behaviours as maltreatment that tapped into any form of physical or emotional violence and neglectful behaviours, and includes measures of recurrence/re-offending.
2) Child abuse risk	Child abuse risk measured through the (brief) child abuse potential inventory.
3) Negative parenting	Negative parenting includes all parenting behaviours that are either harmful, ineffective for behaviour management or reflect a poor parent–child relationship. Examples of such behaviours are overprotective parenting, laxness, hostile parenting or emotional violence.
4) Positive parenting	Positive parenting includes all parenting behaviours that promote a positive parent–child relationship. Examples of such behaviours are appropriate disciplining, praise, warmth, and nurturing behaviours.

Outcome	Definition
5) Parent poor mental health	Parents' poor mental health includes measures of depression, anxiety, worry, poor perceived life quality, PTSD, or stress symptoms.
6) Parenting stress	Parenting stress includes perceived stress by parents related to their parenting role. One of the most widely used instruments for measuring parenting stress is the Parenting Stress Inventory.
7) Child behaviour problems overall	This outcome category is an overarching category for all internalising and externalising child behaviour problems.
8) Externalising child behaviours	Externalising behaviours include symptoms of conduct problems, oppositional, defiant, ADHD, or aggressive behaviours in children.
9) Internalising child behaviours	Internalising behaviours include behaviours such as anxious, withdrawing, psychosomatic, or depressed behaviours in children.
10) Child wellbeing	Child wellbeing includes validated quality of life and wellbeing scales such as prosocial behaviour (Strengths and Difficulties Questionnaire) and Child Outcome Rating Scale (CORS).
11) Number of out of home placements	Out of home placement captures the impact on out-of-home care.
12) Reunification rates	Reunification means returning a child to live with one or both parents, or wider family, following a period of being looked after by the local authority (either short-term, intermediate or longer-term placements).
13) Educational attendance	Educational attendance includes measures of school attendance, absenteeism, out-of-school suspensions.
14) Educational attainment	Educational attainment includes school grades, school completion, literacy and numeracy tests.
15) Child attachment	Child attachment includes measures of attachment or bonding of the child with the parent.
17) Parent–child relationship	Parent–child relationship includes perceptions of the relationship and responsiveness of the child to the parent (measures that relate to parenting behaviour are categorised as Positive Parenting or Negative Parenting).
17) Physiological outcomes	Includes physiological measures in parents and children used as indicator for any of the above outcomes. Examples are respiratory sinus arrhythmia as an indicator of emotion regulation, and blood pressure as an indicator of parenting stress.

The following data items were extracted and recorded for included papers:

- Reference
    - First author's last name
    - Publication year
    - Publication title
- Study details
    - Study location (country)
    - Year(s) when trial was conducted
    - Brief description of the community, context or population where trial took place (e.g. poor neighbourhood, rural area, etc.)
- Study design:
    - Treatment/intervention arms
    - Trial registration
    - Cluster RCT (yes/no)
    - Intraclass correlation (for cluster RCTs only)
    - Average group size (for cluster RCTs only)
    - Total sample size
- Comparison
    - Control condition (No treatment, waitlist, minimal intervention, service as usual)
    - Description of control condition if minimal intervention or service as usual
    - Intention-to-treat (yes/no)
- Intervention
    - Intervention name
    - Country where the intervention was developed
    - Brief intervention description if it is an unbranded or original programme which is not well known
    - Theoretical underpinning of the intervention
    - Referral pathway
    - Delivery modality (face-to-face, online, phone calls, printed materials, hybrid)
    - Delivery format (individual, group, self-directed, combination)
    - Pacing (directed by parent or by practitioner)
    - Duration (number of weeks)
    - Intended number of sessions
    - Frequency of sessions per month
    - Percentage of sessions received by trial participants
    - Practitioner type (professional, semi-professional, lay worker)
    - Practitioner qualifications
    - Other services provided to trial participants

- Population risk factors
  - Level of prevention (based on the risk of maltreatment)
  - Level of prevention (based on child conduct problems)
  - Risk category and basis for inclusion (only for trials with higher level needs who are offered an intervention based on risk factors for maltreatment)
  - Parental poor mental health
- Demographics:
  - Age of youngest and oldest child in the trial
  - Mean age of children in the trial
  - Percentage of boys in the trial
  - Parent mean age
  - Percentage of mothers in the trial
  - Ethnicity of parents in the trial (description and whether majority of trial participants are from minoritised ethnic groups)
  - Socio-economic status of study sample (low or middle-high income)
  - Household income
  - Percentage of single parents
- Outcomes:
  - Time points of measurement (number of weeks after the end of the intervention)
  - Drop-out at time point
  - Outcome category (see above table 2)
  - Measure name
  - Duplicate measure (yes/no)
  - Method (questionnaire, observation, administrative data, other)
  - Source questionnaire (e.g. child, parent)
  - Number of participants at baseline (intervention and control)
  - Number of participants at post-test (intervention and control)
  - Mean of value and standard deviation at baseline (intervention and control)
  - Mean of value and standard deviation at post-test (intervention and control).

For trials covered by multiple papers, we identified the key paper and extracted any additional information from the other papers.

For trials that were not included in the meta-analysis, we did not extract information on outcomes.

For handling missing data for the quantitative analyses (largely means and standard deviations for relevant outcomes at post-test), we attempted to locate the missing data through checking other associated papers that were included in our review, to contact the authors for additional information, or to transform the existing data into a usable effect size. When it was not possible to obtain the missing data through any of these steps (n = 5), we excluded the data from the meta-analyses but presented the study in the descriptive sections of this review.

We relied on the study authors' categorisation on whether the study conducted an intention-to-treat analysis. In cases where this was not specified in the paper, the review team would assess this based on the information provided.

Practice element coding

To obtain sufficient information about included programmes to be able to code practice elements (discrete practices, strategies, techniques, and delivery characteristics), the research team reached out to programme developers and/or study authors for programme manuals. If this was not available (e.g. due to copyright issues, lack of response), the research team also obtained study protocols or papers that described the programme development through a search of the programme name in university libraries, Google Scholar, and via the Google search engine.

Programme elements were coded from the following materials, prioritised in order:

1. Included study from the review
2. Programme manual (if available)
3. Study protocol or paper on programme development (if programme manual was not available)
4. Other studies evaluating the programme (if programme manual was not available).

A coding framework was developed through a review of prior literature (Gubbels, van der Put & Assink, 2019; Leijten et al., 2019) and developed further with input in particular from the subject matter experts on our team (Professor Jane Barlow, Professor Frances Gardner). See Appendix E for the coding framework. Two researchers (ET and NJ) then completed the coding of programme elements from the above-mentioned sources using the following steps:

1. Relevant details about the programme and included study were extracted into an Excel spreadsheet (i.e. study ID, first author's last name, year of publication, programme name).
2. The included study was reviewed and distinct practice elements from the description of the programme were extracted. Only practice elements that were delivered *to* parents *about parenting* were extracted. Each practice element was recorded on a new row of the Excel spreadsheet as a 'Level 1 Practice Element'.
f. For each practice element extracted, any available definitions were also extracted and entered into the Excel spreadsheet. The page number that the practice element was extracted from was also recorded.
3. We compared the Level 1 Practice Element against the coding framework to determine if it fit under any of the Level 2 Practice Elements already identified in the coding framework.
a. If there was a fit, we would record the relevant Level 2 Practice Element name for the Level 1 Practice Element.
b. If there was no fit, we would highlight this for later review.
4. Steps 2 and 3 were repeated for other sources (e.g. programme manual, study protocol, paper on programme development, other studies) until all available sources were exhausted.
5. When all Level 1 Practice Elements had been extracted from the included studies, we reviewed all practice elements that did not fit under the initial coding framework and recoded these as new Level 2 Practice Elements.

To ensure inter-rater reliability, both coders first coded two programmes separately and compared their coding. Discrepancies were resolved by discussion. Where discrepancies could not be resolved, a third coder (JB) was consulted. After coding of the first two programmes, inter-rater

reliability was established and both coders went on to code different programmes with ongoing review and consultation.

Risk of bias assessment

Risk of bias for the included studies was assessed and reported at the study level. Risk of bias assessments provide an indication of the likelihood that the design or methods employed by a given study may produce misleading results. Bias can occur in favour of the intervention or control group, or both within the same study. When a study is assessed as having a 'high risk of bias', it does not necessarily infer that the findings are not reliable, or that the study was poorly conducted, but it does mean that we have less confidence in the findings they present. We completed the assessment only for studies that were included in the meta-analysis (n = 95)

For the studies included in the meta-analysis, we used the Cochrane Risk of Bias Tool for randomised controlled trials version 1.0 (Higgins et al., 2011). The quality of the studies included in the global meta-analyses by (Backhaus et al., 2023a, 2023b) had already been appraised using this version, coding trials rather than outcomes. For efficiency, this data was used, and we followed the same approach for the additional trials identified through our search.

Risk of bias was assessed in the following domains:
- **Randomisation sequence generation:** selection bias due to inadequate generation of a random sequence
- **Allocation concealment:** selection bias due to inadequate concealment of allocations prior to assignment
- **Blinding of participants and personnel:** performance bias due to knowledge of the allocated interventions by participants and personnel during the study
- **Blinding of outcome assessment:** detection bias due to knowledge of the allocated interventions by outcome assessors
- **Incomplete outcome data:** risk of attrition bias due to the amount, nature, or handling of incomplete outcome data
- **Selective reporting:** reporting bias due to selective outcome reporting
- **Other sources of bias:** these may include documenting who designed the intervention and developer involvement, assessment of reliability and validity of outcome measurement instruments and associated risk of bias related to reporting agent.

For the blinding of outcome assessment, we selected 'low risk' when a study had a combination (around 50%) of observation measures by a blinded research team and self-report measures.

While developer involvement was recorded for all studies, we did not automatically assess 'other sources of bias' as 'high risk' because of developer involvement.

Domains for which no judgement could be made based on the information provided in the paper, were rated as 'unclear risk'. We rated the risk of bias due to selective outcome reporting as unclear, in case the trial protocol could not be located. According to Cochrane, the overall risk of bias for a trial is high once one of the subdomains is judged as high risk of bias. Given that it is very hard to blind parents to the trial arm once the intervention has started (high risk of bias for blinding of participants) and that all self-report data is at high risk of bias for blinding of outcome assessors,

we used a different set of criteria on judging whether a trial was at overall high risk of bias. Otherwise, we would have appraised all included trials to be at high risk of bias.

Each study is rated as:

- Low risk of bias – the study is judged to be at a low risk of bias for all domains
- High risk of bias – the study is considered to be at 'high risk' in at least one domain or there are concerns across multiple domains that reduce confidence in the study's findings.

We judged a trial as high risk of bias if any of the following subdomains was judged as high risk of bias:

- Random sequence generation
- Allocation concealment
- Incomplete outcome data
- Selective outcome reporting
- Other bias.

We also judged a trial as high risk of bias if a minimum of three of the following domains were judged as unclear risk of bias:

- Random sequence generation
- Allocation concealment
- Incomplete outcome data
- Selective outcome reporting.

This approach was based on Cochrane's suggestion of high risk of bias judgement if at least one domain was judged as high risk of bias or if multiple crucial domains were judged as unclear.

No studies were excluded based on the risk of bias assessment.

A total of six researchers (AB, ET, HH, JK, PC, RD) were involved in the risk of bias assessments (excluding those appraised in the meta-analysis by Backhaus et al., 2023a, 2023b) and each study was assessed by one reviewer, with input from a second reviewer where criteria were unclear.

The overarching risk of bias for each main effect meta-analysis is presented in relevant sections of this report.

Effect measures

A standardised effect size (Cohen's d) was calculated for each reported outcome in each study included in the meta-synthesis representing the impact of the evaluated intervention. Effect sizes were calculated based on sample size, means, and standard deviations reported at post-intervention for intervention and control group. As recommended in the analysis of randomised trials, we preferred to use means and standard deviations that were produced using covariance-adjusted for baseline. When these were not reported, we used unadjusted post-test means and standard deviations, or effect sizes estimated based on t-test and F-test statistics, preferably on intention-to-treat analyses.

For categorical data we used the Campbell Collaboration web-based effect size calculator (Wilson, 2023), specifically the 2 by 2 frequency table for binary data, to calculate Cohen's d (logit method).

Synthesis methods

For the first research question, we examined the pooled effect of parenting interventions for all available outcomes from the list below, and tested whether and which practice elements and delivery/implementation factors moderate the effectiveness of parenting interventions. For the second research question, we tested whether and which family and contextual factors moderate the effectiveness of parenting interventions.

Testing pooled effects

In the first set of analyses, we examined the summary effect (i.e. pooled effect) for outcomes of parenting interventions in parents with complex and multiple needs. For this, we ran separate sets of main effect meta-analyses by outcome. Our meta-analysis followed a two-stage process.
In the first stage, we calculated a standardised effect size (Cohen's d) for each reported outcome of interest in each study, following the process outlined above. Effect sizes were labelled with respect to the outcome domain, and grouped with dichotomous coding to pre-specified outcome groupings.

In the second stage, a pooled effect across all eligible effect sizes was calculated for each of the following outcomes:

- Child maltreatment and subtypes – including harsh parenting
- Child abuse risk
- Negative parenting
- Positive parenting
- Parental mental health
- Parenting stress
- Child behaviour problems overall
- Externalising child behaviours
- Internalising child behaviours
- Child wellbeing
- Child attachment
- Parent–child relationship.

Most studies included in this review present multiple effect sizes for the same outcomes (e.g. same outcome reported by multiple informants [parent, child, social worker], or the same outcome assessed using multiple instruments). Various approaches to address these dependent effect sizes exist, including selection-based protocols (i.e. set of decision rules to select the "most appropriate" effect size), multivariate meta-analysis, and robust variance estimation meta-analysis (Tanner-Smith, Tipton & Polanin, 2016). Robust variance estimation meta-analysis is considered the gold standard to address the issue of multiple relevant effect sizes, because selection-based protocols are prone to bias and lose important information by including only a subset of effect sizes, and multi-variate analysis are appropriate only when effect sizes are correlated but not conceptually and statistically exchangeable (in our analysis, we assume that multiple effect sizes are

conceptually the same). Robust variance estimation takes into account that effect sizes might be correlated and estimates an approximate correlation matrix of these effect sizes. In more statistical terms, robust variance estimation weights the multiple effect sizes in a trial using an approximate variance-covariance matrix, since the exact variance-covariance matrix are not reported in trials. Robust variance estimation results in valid point estimates and significance tests. All analyses are estimated assuming an intercorrelation within studies of p =.8 and random effects.

If there are insufficient trials and effect sizes reported for a given outcome to estimate a reliable summary effect, the results will be presented descriptively. For the following outcomes a negative pooled main effect was treated as indicative of greater effectiveness; thus, a positive coefficient is interpreted as a decrease in effectiveness:

- Child maltreatment, including harsh parenting
- Child abuse risk
- Negative parenting
- Child behaviour problems overall
- Child externalising behaviours
- Child internalising behaviours
- Poor parent mental health
- Parenting stress.

For the following outcomes the opposite is true: a positive effect size was treated as indicative of greater effectiveness:

- Positive parenting
- Child wellbeing
- Child attachment
- Parent−child relationship.

Effect sizes were reverse coded as required.

Rather than pooling effect sizes, we synthesised the following outcomes narratively:

- Educational attendance
- Educational attainment
- Number of out of home placements
- Reunification rates
- Physiological outcomes.

This decision was based on the finding that few trials included data on these outcomes.

Isolating and testing impact of key delivery/implementation and contextual moderators

In the second set of analyses, we examined whether key delivery/implementation factors and contextual factors impact the effectiveness of parenting interventions for parents with complex and multiple needs. In these moderation analyses, we focused on three key outcomes: child maltreatment & negative parenting (a combined category); positive parenting; and parent mental

health. Moderation analyses are prone to the issue of multiplicity (i.e. the more analysis conducted the higher the chance of a false positive result). Therefore, to minimise this risk, we considered these three outcomes as particularly important given the high rates of child maltreatment and parent mental health concerns in the populations relevant for the Practice Guide. Furthermore, we have included positive parenting practices as a key outcome for moderation analyses because the aim of multiple included interventions is to strengthen more positive, effective and non-violent parenting practices.

We ran subgroup analysis for the following moderators:

- Family characteristics
    - Level of prevention based on the risk of maltreatment (selective versus indicated/treatment)
    - Trial composition of parents with poor mental health
    - Trial composition of parents from minoritised ethnic groups
    - Income of trial population (low vs middle-high)
    - Trial composition of teenage parents
    - Level of child conduct problems (high versus low)
    - Child age (trial mean age)
- Programme structure
    - Delivery format (group, individual, self-directed, combination)
    - Delivery modality (face-to-face versus hybrid/online)
    - Programme length (number of sessions).

The moderators were selected by subject matter experts on the review team (FG, SB, JB, AS) based on their relevance to the practice guide, expectation of there being sufficient information on these variables, on their being measurable at trial level, and there being sufficient variation in the variables. Prior to running the analyses, subject matter experts articulated for each moderator the expected confounders, the type of analysis (exploratory/confirmatory) and hypothesis (whether expecting a difference and in which direction). The feasibility of running each of these moderator analyses was confirmed on the basis of there being sufficient trials in each category/group. We note that moderator analyses in a systematic review like this one, based on trial aggregate (rather than individual level) data, can only analyse characteristics at the trial level, and not at individual level. This potentially limits the nature and precision of the analyses, and restricts the statistical power to detect moderator effects.

We ran a multitude of meta-regression analyses using robust variance estimation techniques. Moderators were either categorical (e.g. indicated prevention trial vs treatment trial), or followed a continuous structure (e.g. mean child age of a trial). Moderation analysis using categorical moderators tested whether there is a difference in effect between the groups tested (e.g. indicated vs treatment trials). Moderation analysis using continuous moderators tested whether the continuous moderator is predictive of the outcome of interest (e.g. effectiveness decreases/increases with increase in child age).

Given the heterogeneous set of included studies (i.e. different populations, different theoretical foundations, etc.), we do not present the results of the differential or interaction test. Instead, we

describe the effects for each subgroup. Our concern is that the differential effect might be highly confounded by other factors. For example, we might find that attachment programmes are more or less effective than social learning theory-based programmes. However, this might be confounded by the age group of children (i.e. attachment programmes often delivered to very young children versus social learning theory programmes often delivered to preschool and primary school age children).

Isolating and testing the individual impact of key practice elements

In the third set of analyses, we aimed to examine whether key practice elements impact the effectiveness of parenting interventions for parents with complex and multiple needs. We focused moderation effects on the same three key outcomes: child maltreatment & negative parenting, positive parenting, and parent mental health. We applied the same moderation techniques using robust variance estimation meta-regression analyses as described earlier.

We tested for each key practice element whether inclusion is associated with programme effects. The meta-regression coefficients of these models represent the difference in effect size between trials that compare a parenting programme with the key practice element against a control, and trials that compare a parenting programme without the key practice element against a control. We selected the following five practice elements for subgroup analyses because these concern key decisions that commissioners would need to make in deciding which programmes to use:

- Predominant theoretical approach(es) underpinning the programme (e.g. attachment, social learning theory)
- Fixed versus flexible/modular delivery (fixed delivery referring to a standardized set and ordering of sessions/content)
- Proactive parenting – operationalised specifically as setting expectations about appropriate and inappropriate behaviour through use of boundaries and routines
- Relationship enhancement/promoting sensitivity – operationalised specifically as equipping parent with the skills to engage in child-directed interactions
- Skills for parents themselves – operationalised specifically as emotion regulation skills.

The feasibility of running each of these moderator analyses was confirmed on the basis of there being sufficient trials in each category/group.

Preliminary findings were shared with the Advisory Group to support interpretation of findings.

Reporting bias assessment

The presence of publication bias arising due to missing results (i.e. only studies published that show positive significant findings) was assessed by examining the distribution of results in a funnel plot. We created a funnel plot for each meta-analysis and visually examined these for effect size distributions (Appendix O). Due to the dependency of effect sizes, statistical examinations (Egger's regression, Trim and Fill) are not recommended (Rodgers & Pustejovsky, 2021).

Certainty assessment

Due to time and financial constraints, an extensive GRADE (Grading of Recommendations, Assessment, Development, and Evaluations) assessment was not feasible. However, the results provide various information that support a judgement of certainty in the results:

- A Risk of Bias chart is included for each meta-analysis in the main findings section
- Heterogeneity estimates are presented alongside the pooled main effects and subgroup analyses are conducted to explore levels of heterogeneity for three key outcomes
- Forest plots for each meta-analysis provide insights into the consistency of effects
- Detailed eligibility criteria restricted included trials to our pre-set PICO criteria, and thus contribute to higher certainty in the directness of our findings
- Risk of publication bias is assessed for all meta-analytic main effects.

KEY FINDINGS

Study selection

Figure 2 presents the PRISMA flow diagram for the selection of studies. In the global database containing 20,860 records, 16,220 items were excluded by applying filters with keywords (e.g. for study design, population, theoretical underpinning) and based on the earlier described artificial intelligence-assisted ratings (see Appendix B for full description). In the updated search across five databases 3,888 records were identified. Across both the global database and academic databases, there were 7,588 records screened by the review team after de-duplication. From these, 755 full-text reports were screened for eligibility.

Out of the 346 studies included in global review by Backhaus et al. (2023a, 2023b), a total of 190 papers were screened in full-text, leading to the inclusion of 41 studies. Across the 10 systematic reviews, 64 papers were identified as potentially eligible based on their title and description in the systematic review and were therefore screened in full-text. This led to the inclusion of 17 studies. An additional three papers (n = 3) were identified during the screening of included papers. Across all components we included a total of 131 reports which present findings from 106 trials across 56 programmes. In the flow diagram, the number of papers excluded does not match the number of papers screened and included, due the fact that some papers were screened and included under multiple components of the search. A full reference list of included studies can be found in Appendix F.

A total of 95 trials testing 50 programmes were included in the meta-analysis. Eleven trials were not included in the meta-analysis due to the fact that we could not calculate Cohen's d based on available data, or because the intervention was substantially different due to targeting a specific population (see section below for further details).

Figure 2. PRISMA Flow diagram ([link to long descriptive text](#))

Identification of studies via databases and registers

Identification

Records identified from*:
  Global dataset (n = 20,860)
  Updated search (n = 3,888)
    ASSIA (n = 493)
    Cochrane (n = 608)
    IBSS (n = 206)
    Medline (n = 1,429)
    PsycInfo (n = 1,645)

→ Records removed *before screening*:
  Duplicate records removed (n = 940)
  Records marked as ineligible by automation tools (n = 16,220)

Screening

Records screened:
  Global dataset (n = 4,640)
  Updated search (n = 2,948)

→ Records excluded:
  (n = 6,831)

Reports sought for retrieval:
  Global dataset (n = 582)
  Updated search (n = 175)

→ Reports not retrieved:
  (n = 2)

Reports assessed for eligibility:
  Global dataset (n = 582)
  Updated search (n = 173)

→ Reports excluded:
  Publication type (n= 116)
  Study design (n = 53)
  Comparator (n = 67)
  Context (n = 14)
  Age group (n = 30)
  Intervention (n =61)
  Population (n = 315)
  Outcomes (n = 9)
  Language (n = 1)
  Duplicate (n = 2)

Include

Studies included in review: (n = 106)
Reports of included studies (n = 131)
Studies included in the meta-analysis (n = 95)

Identification of studies via other methods

Records identified from:
  Global review (n = 346)
  Systematic reviews (n = 10)

Reports sought for retrieval:
  Global review (n = 190)
  Systematic reviews (n = 64)

→ Reports not retrieved:
  (n = 0)

Reports assessed for eligibility:
  Global review (n = 190)
  Systematic reviews (n = 64)
  References in included papers (n=3)

→ Reports excluded:
  Global review:
    Publication type (n = 5)
    Population (n = 143)
    Language (n = 1)
  Systematic review
    Study design (n = 1)
    Comparator (n = 12)
    Intervention (n =16)
    Population (n = 18)

40

Characteristics of included studies

Of the included trials (n = 106), over half (n = 58, 54.7%) were conducted in the United States of America, followed by 17 trials in the United Kingdom (16.0%) and seven in Australia (6.6%) (see figure 3 below).

Figure 3. Bar chart showing the countries where trials were conducted
(link to raw data)
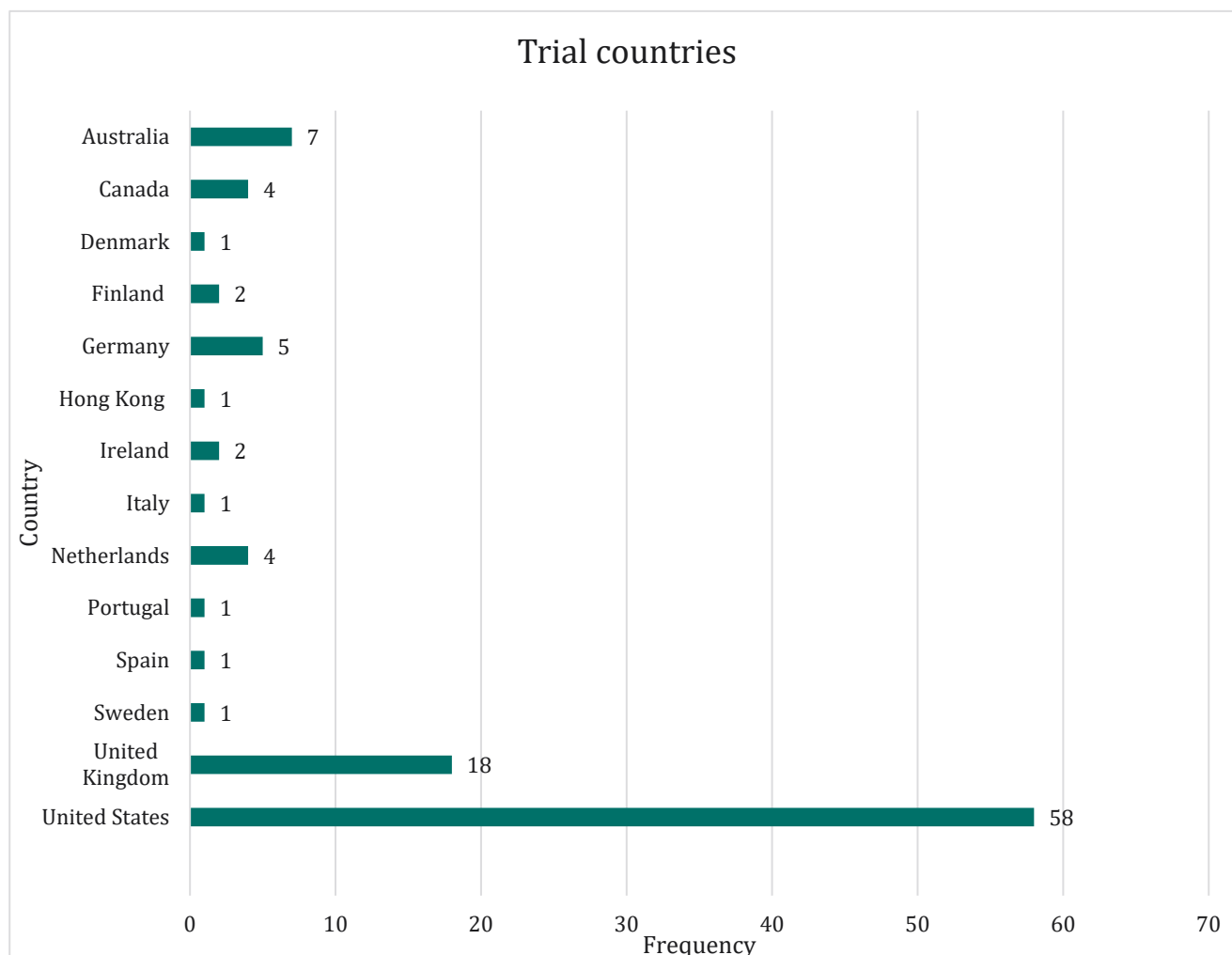
Table 3 presents a summary of study characteristics across the studies included in this review. The majority of studies were published since 2011 (n = 90, 84%). One trial published before 2003 is included (Jouriles et al., 2001) due to the inclusion of a more recent paper reporting on the same trial (McDonald, Jouriles & Skopp, 2006) and relevant outcomes being reported across the two papers.

The majority of studies compared the intervention against service as usual conditions (n = 58, 54.7%), were individual RCTs (n = 100, 94.3%) and used an intent-to-treat approach (n = 68, 64.2%).

Sample sizes ranged widely from 9 to 2,727, with a mean of 191.19, and close to half of trials (n =49, 46.2%) had a sample size of 100 or fewer participants. Among trials that were cluster RCTs, the average cluster size was 10.33, and ranged from 5 to 20 per cluster.

Full details are provided in table H1 in Appendix H.

Table 3. Key characteristics of included trials

Variable	Category	No. of Trials	%
Year of publication	2001–2005	3	2.8%
	2006–2010	14	13.2%
	2011–2015	30	28.3%
	2016–2020	35	33.0%
	2021–2024	24	22.6%
Comparison group	Service as usual	58	54.7%
	Waitlist	31	29.2%
	Minimal intervention	17	16.0%
Type of trial	Individual RCT	100	94.3%
	Cluster RCT	6	5.7%
Intention-To-Treat	Yes	68	64.2%
	No	38	35.8%
Treatment arms	Single	101	95.3%
	Multiple	5	4.7%
		Mean (SD)	**Range**
Sample size		191.19 (323.46)	9 to 2727

Service as usual consisted of the services, care and support that were generally already available to parents and families in the trial. Across trials this included – among others – primary and specialist health care, public health services, community or clinic-based mental health services, child welfare and child protection services, in-home family visitation services and counselling, services for problematic substance use, and social and community programmes and services (e.g. Early Head Start, housing and shelter services, childcare, employment services, support groups, material support). In some trials this involved the standard parent training, counselling or support that was already available to all parents (e.g. Lanier, Dunnigan & Kohl, 2018.; Porter et al., 2015; Barlow et al., 2019; Day et al., 2020; Arruabarrena et al., 2022) or psychological interventions like

individual or family therapy (e.g. Chaffin et al., 2011; Barlow et al., 2019; Vardanian et al., 2020; Villodas et al., 2021; Wittkowski et al., 2022).

What constituted 'minimal intervention' varied between trials. In some trials, the focus was on providing parents with general information or coaching on child development (e.g. feeding, play, sleep) or assessment information about their child's developmental milestones and progress. In several trials this also involved parents in the control group receiving referral services to health and human service agencies or receiving information about services either over the phone or in written form (e.g. a general resource list, personalised information). In the trials by Rosenblum et al. (2017) and Cioffi (2023), parents in the control group had access to parenting resources or curriculum content in the form of written resources received via mailings or a link to a website. Some of the trials with 'minimal intervention' as the comparator replicated the same component structure as in the experimental condition, for instance in terms of the number of sessions or the frequency of contact (e.g. Feil et al., 2020).

The trials jointly tested a total of 56 parenting interventions and programmes. Overall, 31 programmes were evaluated in only one trial, 11 programmes in two trials, and seven programmes in three to five trials. Triple P and Parent-Child Interaction Therapy (PCIT) were both tested in seven trials, and 12 trials evaluated the impact of Incredible Years. The full list of parenting interventions reported on is provided in Appendix I. Adaptations of programmes that delivered the same core content (e.g. the Family-Nurse Partnership and the Nurse-Family Partnership) were categorised as a single programme (i.e. the Nurse-Family Partnership).

Trial population characteristics

Table 4 presents the trial population characteristics including child characteristics (age, percentage of boys) and parents' characteristics (age, percentage of mothers, single parenthood). The mean age of children ranged from 0 to 17 years, with an average across trials of 3.59 years old. On average, boys constituted 58.2% of trials. The average age of parents was 29.2 years old, with 91.7% who were mothers. The average proportion of single parents was 47.9% – though it should be noted that this was defined and reported differently across trials.[6]

Table 4. Trial population demographic characteristics

Variable	Number of trials	Mean	Standard deviation	Range
Child age (year)*	74	3.59	2.62	0.0 to 17.0
Percentage of boys (%)	67	58.2	11.2	33.0 to 100.0

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[6] Where possible based on the data reported, we applied the following definition: parents not in a relationship with the other parent of the child – including divorced, separated, and widowed parents.

Variable	Number of trials	Mean	Standard deviation	Range
Parent age (year)	88	29.2	5.0	17.9 to 41.8
Percentage of mothers (%)	84	91.7	18.2	0.0 to 100.0
Percentage of single parents (%)	76	47.9	25.1	2.0 to 100.0

*Range is taken from finding the lowest of min age and highest of max age. All age <0 has been removed prior to analysis.

In 44.3% of trials (n = 35) that reported information on ethnicity, the majority of participants were from minoritised ethnic groups. Minoritised ethnic groups in these trials included Black/African American, Latino/Hispanic, Asian/Pacific Islander, Native American/Indian American, Asian American, and Caribbean. Information on ethnicity was reported in 74.5% of the trials (n = 79).

In 85.6% of trials (n = 83) that reported information on income, the population could be described as predominately low-income, and in 14.3% (n = 14) of trials as middle- to high-income. Information on income was reported in 91.5% of the trials (n = 97).

Further details are provided in table H2 in Appendix H.

Population risk factors

In the majority of trials, parents were offered an intervention based on risk factors for maltreatment (selective, n = 81, 76.4%), which we describe in more detail below. The remaining trials involved parents who were referred by agencies (e.g. social services) to receive an intervention based on their level of maltreatment (treated, n = 18, 17.0%) or parents who were offered an intervention based on scoring highly on child maltreatment instruments (indicated, n = 7, 6.6%).

As described in the methods section, the review focused on a subset of parents with higher-level needs who were offered an intervention based on risk factors for maltreatment. We distinguished different categories of risk factors based on evidence regarding their association with child maltreatment (see Appendix A for further detail on the eligibility criteria).

- 53.1% (n = 43) of selective trials were with study populations meeting the threshold for a risk factor that is considered to constitute a complex need in itself (parental substance abuse, parental poor mental health, parental incarceration, parental intellectual disability, past or current experience of IPV, parental childhood experience of maltreatment or other adverse childhood experiences).
- 30.9% (n = 25) of selective trials were with study populations meeting the threshold for a risk factor that is considered to constitute a complex need in the presence of another risk factor for a substantial proportion of the study population (children with severe child socio-emotional and conduct problems, highly deprived socio-economic status,

teenage/adolescent parenthood, and traveller, refugee, asylum seeking, or undocumented migrant status).

- 16.0% (n = 13) of selective trials were with study populations with multiple risks at a lower severity or prevalence level than in the previous two categories (three or more risks evidenced or parents scoring moderate or high on a multi-risk assessment).

The most common basis for inclusion of selective trials was parental poor mental health (n = 32, 39.5%). This included trials with mothers with postnatal depression, parents with clinical depression, anxiety disorder, bipolar disorder, or another psychiatric diagnosis. In some trials, the population faced multiple main risks, such as poor mental health and substance abuse, or poor mental health and ACEs.

Both child conduct problems and poverty – with evidence for another risk factor – were a common basis for inclusion (18.5% and 14.8%). The majority of trials in this group were with families living below the poverty line and in receipt of public assistance (e.g. medical insurance, Early Head Start). A small number of trials were with teenage or adolescent parents (n = 5, 6.2%). There were no trials with traveller families, refugees, asylum seekers, or undocumented migrants.

A small number of selective trials were included based on populations scoring moderate or high on a multi-risk assessment measure. Measures include the Kempe Family Stress Checklist (used in e.g. LeCroy 2011, 2017), and the New Baby Questionnaire (used in e.g. Green, 2014, 2017). Other trials in this group were with populations facing multiple risks (e.g. poverty, poor parent mental health, IPV, adolescent parenthood), at a lower severity or prevalence level.

Further details regarding the basis of inclusion of trials is provided in Appendix J.

Trials not included in the meta-analysis

As noted, a small number of studies (n = 5) could not be included because the paper did not report suitable data on our predefined outcomes, and it was not possible to obtain fuller data from authors within the project timeline.

An additional six trials were excluded from the meta-analysis because the interventions evaluated in these trials were substantially different due to targeting specific populations (notably incarcerated parents, parents with intellectual disabilities, and teenage parents from tribal reservation communities). Although interventions for these populations are indeed very relevant to this review, it was our assessment that including these trials would introduce substantial heterogeneity to our analyses. The programmes targeting incarcerated parents that were evaluated in these trials were Incredible Years, New Beginnings, and Parenting Inside Out (n = 3). The trial targeting parents with intellectual disabilities evaluated the effectiveness of VIPP-LD, an adaptation of the VIPP-SD programme developed to meet the specific needs of this target group (n = 1). We excluded one trial evaluating the Family Spirit home visitation programme which was developed to respond to the needs of American Indian teen mothers in tribal reservation communities.

Finally, a trial evaluating 1-2-3 Magic Parenting was excluded because we assessed the programme to be out of line with current research on parenting due to its approach to discipline (e.g. the

programme recommended for parents to place their child in time-out or withdraw privileges without providing explanations).

The excluded trials took place in Australia, the Netherlands, the United Kingdom, and the United States. Sample sizes ranged from 38 to 579 participants. Child mean age ranged from 0 to 9 years. Please refer to Appendix G for details on excluded studies.

From this point onwards the report focuses on the set of trials (N = 95) that was included in the meta-analysis.

Risk of bias in studies

We assessed 36.8% of trials (n = 35) included in the meta-analysis as being at high risk of bias, and 63.2% of trials (n = 60) at low risk of bias. As noted in the Methods section, we did not consider blinding of participants and personnel in the overall risk rating. Given that unlike in some medical fields, it is very hard for parents to not know if they are receiving a particular service or parenting programme, this would lead to an overall high risk bias for every trial. We also did not consider blinding of outcome assessment in the overall risk rating, due to self-report measures such as questionnaires completed by parents being very common in this field. However, there may still be biases from the inability to blind. In 46.3% of trials (n = 44) there was developer involvement.

Table 5 and figure 4 display the results of the RoB-1 assessment by domain and the overall risk rating. For full RoB-1 assessments for individual studies, see Appendix K.

Table 5. Summary of RoB-1 assessments for included trials

Note: N = number; % = percentage

Domain	Low risk		Unclear risk		High risk	
	N	%	N	%	N	%
Random sequence generation	72	75.8%	20	21.1%	3	3.2%
Allocation concealment	51	53.7%	41	43.2%	3	3.2%
Blinding of participants and personnel	1	1.1%	1	1.1%	93	97.9%
Blinding of outcome assessment	38	40.0%	9	9.5%	48	50.5%
Incomplete data assessment	69	72.6%	16	16.8%	10	10.5%
Selective reporting	30	31.6%	60	63.2%	5	5.3%
Other sources of bias	90	94.7%	2	2.1%	3	3.2%
Overall risk of bias	60	63.2%			35	36.8%

Figure 4. Summary of RoB-1 assessments for included trials
([link to raw data](#))

Risk of Bias Assessment (n = 95)
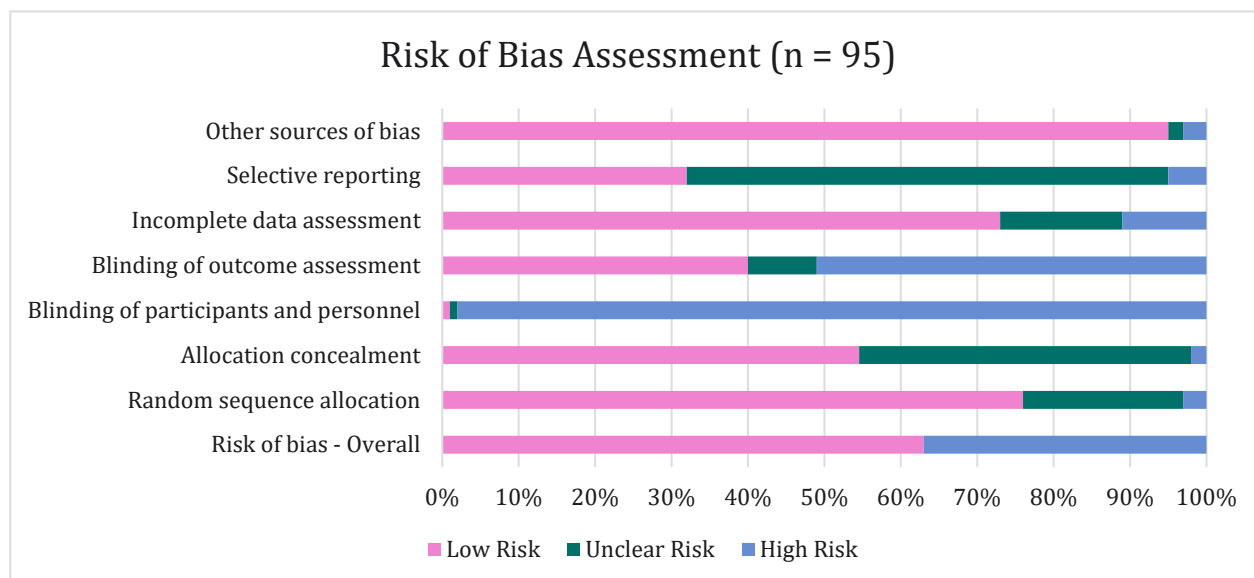
Interventions included in the analysis

Table 6 presents a summary of the intervention characteristics of studies included in the meta-analysis. The majority of the interventions were face-to-face (n = 85, 89.5%), and conducted with individual parents/families (n = 64, 67.4%). The hybrid modality trials (n = 5, 5.3%) included two studies in which intervention delivery was intended to be face-to-face, but this had to be converted to virtual or over the phone delivery due to the Covid pandemic (van Leuven, 2023; Xia, 2023).

Most interventions were directed by practitioners (n = 90, 94.7%), who were largely professional practitioners (n = 81, 85.3%). The practitioners included community health professionals such as therapists, clinicians, nurses, social workers, family support workers, or home visitors who have been trained in the intervention.

Participants were usually referred from service systems, by community health clinics, mental health clinics, hospitals, child protective services, schools, children centres, substance abuse centres, or other social service organisations. A few trials involved self-referral where the study was advertised through flyers and newsletters in clinics or community centres.

In addition to the intervention, participants in most trials continued to receive other services such as their usual (mental) health services and social care support. In some instances, this also involved access to therapy, medication for opioid use disorder, and referrals for other services (e.g. basic needs, domestic violence, etc.).

Table 6. Summary of intervention characteristics

Intervention information	Category	N	%
Modality	Face-to-face	85	89.5%
	Online	5	5.3%
	Hybrid	5	5.3%
Delivery format	Individual	64	67.4%
	Group	25	26.3%
	Self-directed	2	2.1%
	Combination	4	4.2%
Pacing	Directed by practitioner	90	94.7%
	Self-directed by parent	2	2.1%
	Mixed	3	3.2%
Practitioner qualification	Professional	81	85.3%
	Semi-professional	7	7.4%
	NA/unsure*	7	7.4%

*Two trials evaluated interventions that were self-directed and therefore did not involve any practitioners, while five trials did not provide sufficient information about the practitioners.

A variety of theoretical foundations formed the basis for the included programmes. Social learning theory (SLT) was the most common theoretical foundation (38% of the programmes). Other theoretical foundations included attachment theory, psychoeducation, psychotherapeutic approaches, trauma-informed practices, mentalising, and others. Some programmes drew from a combination of theories (e.g. SLT and attachment, SLT and other theoretical foundations).

Figure 5. Distribution of theoretical approaches of included interventions (n = 50) ([link to raw data](#))

Theoretical foundation of intervention

Legend: SLT (38%), SLT + Other(s) (10%), SLT + Attachment (10%), Attachment (14%), Attachment + Other(s) (12%), Other(s) (16%)
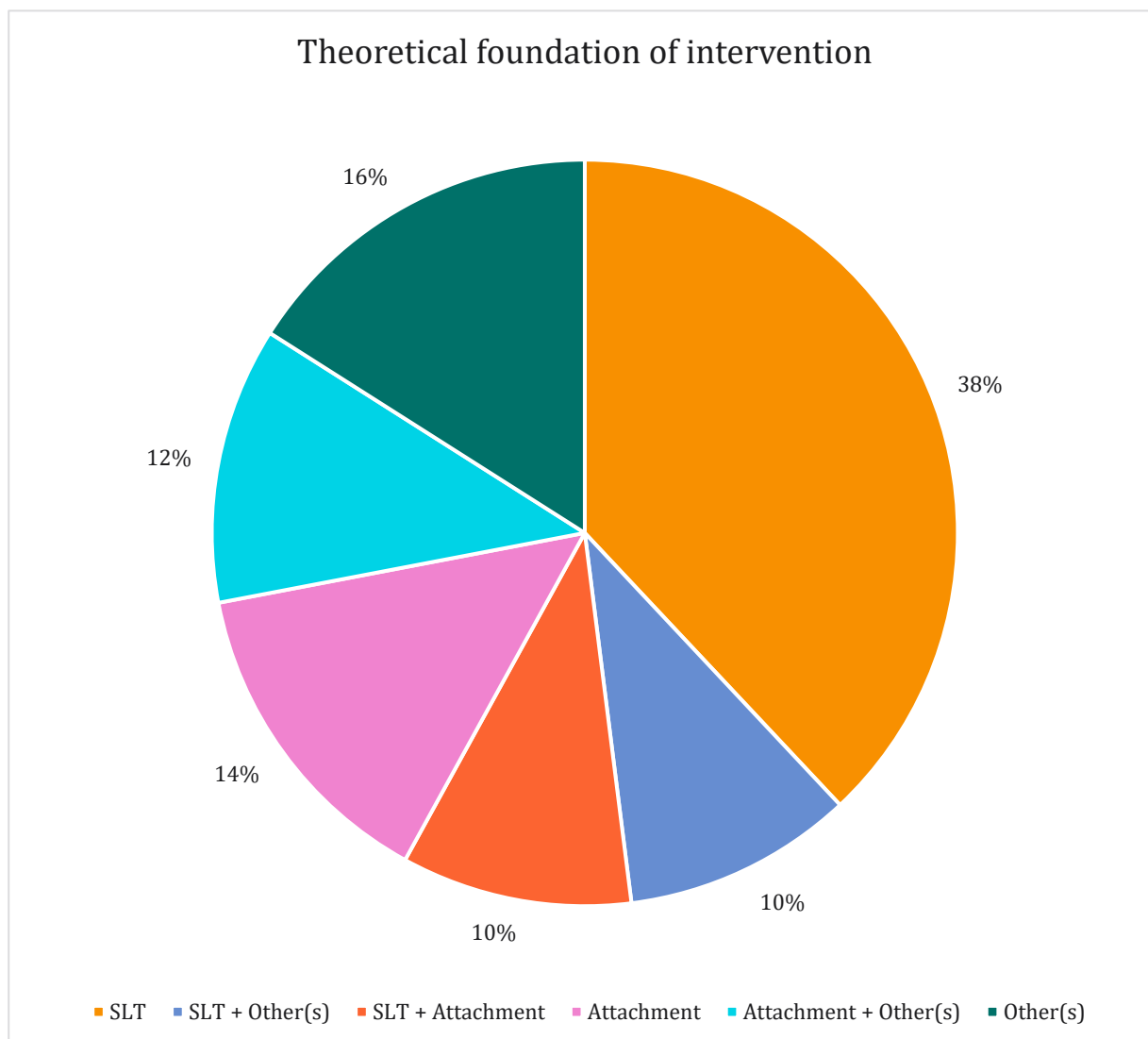
The delivery mode of 29 interventions (56%) could be described as fixed with a standardised set and ordering of sessions/content, and for 21 interventions (44%) as flexible or modular (e.g. in psychotherapeutic interventions where the content of the intervention is tailored to the client's most pressing need, in interventions where the order of sessions does not need to be strictly adhered to and can be switched around depending on client's need). [Appendix L](#) provides further details on the theoretical foundation and delivery mode of the included interventions.

The number of weeks over which interventions were delivered differed significantly, varying between 4 and 130 weeks, with an average duration of 24.8 weeks. In line with this, the number of sessions also varied, ranging between 2 and 77 sessions, and with an average of 13.9 sessions. The average percentage of sessions received by participants was 70%, though it should be noted that this information was not consistently reported across trials.

Table 7. Summary of delivery information

Delivery information	Number of trials	Mean	Standard deviation	Median	Range
Duration of intervention (weeks)	83	24.76	29.63	14.00	4.0 to 130.0
Number of sessions	88	13.91	11.71	12.00	2.0 to 77.0
Session frequency (number of sessions per month)	73	3.77	0.67	4.00	1.6 to 5.0
Percentage of attended sessions	52	70.0	17.5	68.0	11.0 to 100.0

Practice elements of programmes in analysis

Practice elements were coded from the content for each programme. Practice elements were identified within one of 10 general techniques:

- Psychoeducation
- Positive Reinforcement
- Nonviolent Disciplining
- Proactive Parenting
- Relationship Enhancement/Promoting Sensitivity
- Parents' Family-of-Origin (i.e. increase parents' understanding of their family-of-origin and potential impact on their current parenting)
- Skills for Parents Themselves
- Skills Parents Teach/Facilitate In Their Children
- Delivery Method (e.g. home visitation, modelling, coaching)
- Therapist's Approach (to Interaction with Parent in Intervention – e.g. Promotes Therapeutic Relationship, Client-Directed).[7]

Within the Psychoeducation general technique, practice elements that increased parents' knowledge and understanding of various content areas through didactic teaching techniques were coded. These practice elements were coded only when psychoeducation was delivered at specific timepoints during the intervention. We identified and coded 10 practice elements within this general technique. Of these, the three most common elements found across programmes included

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[7] Some examples include having a client-directed approach, goal-directed approach, and an approach focusing on promoting the therapeutic relationship.

in our review were: Explaining Parent–Child Interactions, Teaching Family/Support Network Skills, and Explaining Child Safety.

The Positive Reinforcement general technique consists of practice elements that equip parents with positive parenting skills to respond to appropriate child behaviour with praise and/or rewards. We identified and coded three practice elements within this general technique (i.e. Praise, Tangible Rewards, Intangible Rewards). Of these, the most common practice element found across programmes included in our review was Praise.

The Nonviolent Disciplining general technique consists of practice elements that equip parents with the skills to respond to disruptive or inappropriate child behaviour with nonviolent consequences intended to reduce such behaviour. We identified and coded three practice elements within this general technique (i.e. Calm Down Time/Time-out, Ignore, Natural/Logical Consequences). Of these, the most common practice element found was Ignore.

In the Proactive Parenting general technique, practice elements that equipped parents with skills to proactively prevent the occurrence of disruptive or inappropriate child behaviour were identified. We identified and coded seven practice elements within this general technique. Of these, the three most common practice elements found were: Setting Expectations Through Use of Boundaries and Routines, Direct and Positive Commands, and Fostering Positive Parenting Attitudes.

Practice elements that were used to support parents to increase their caregiver sensitivity for more positive parent–child relationships were coded under the Relationship Enhancement/Promoting Sensitivity general technique. We identified and coded eight practice elements within this general technique. Of these, the three most common practice elements found across programmes were: Improving Communicative Skills of Parents in Interaction with Their Child, Promoting Parent–Child Dyadic Play, and Responding Sensitively.

The Parents' Family-of-Origin general technique consists of one practice element that supports parents to increase their understanding of their family-of-origin and how their own experiences of being parented may have had an impact on their current parenting.

The Skills for Parents Themselves general technique consists of practice elements that equip parents with skills they can use on their own to improve their parental wellbeing. We identified and coded six practice elements within this general technique. Of these, the three most common practice elements were: Emotion Regulation Skills, Problem-Solving Skills, and Reflective Functioning.

The general technique of Skills Parents Teach/Facilitate In Their Children consists of practice elements that equip parents with skills they can teach and facilitate in their children to improve their children's wellbeing. We identified and coded three practice elements within this general technique (i.e. Emotion Regulation Skills, Problem-Solving Skills, Social Skills). Of these, the most common practice element was Emotion Regulation Skills.

Practice elements for practitioners' delivery techniques were coded under the Delivery Method general technique. We identified and coded 13 practice elements within this general technique. Of these, the three most common practice elements were: Home Visitation, Homework, and Live Coaching.

Figure 6. Proportion of programmes with a Delivery Method practice element identified (total number of programmes = 50) ([link to raw data](#))

Types of delivery Method Practice Elements by Proportion of Programmes
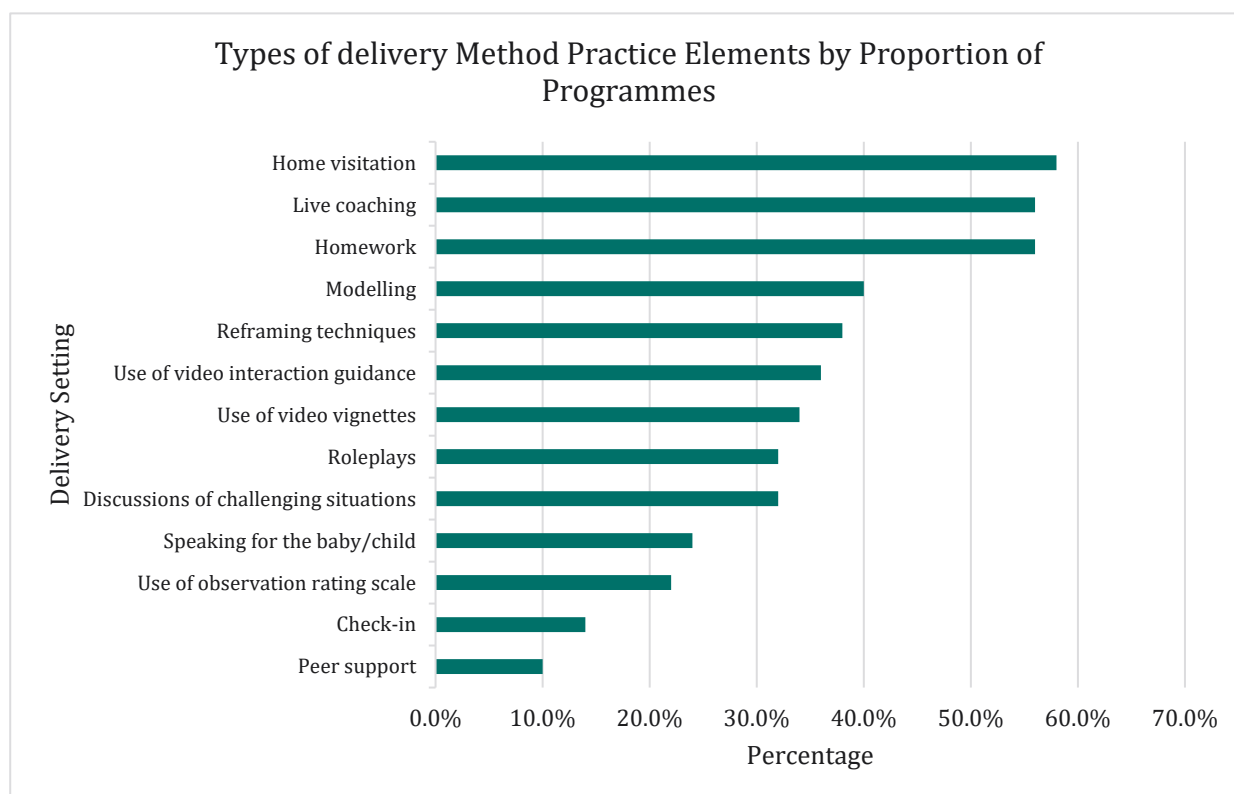
Practice elements describing the practitioners' approach to interaction with the parent were coded under the Therapist's Approach general technique. We identified and coded six practice elements within this general technique. Of these, the three most common practice elements were: Promote Therapeutic Relationship, Goal-Directed, and Client-Directed.

[Appendix M](#) provides a complete overview of the practice elements identified for programmes included in the analysis (N = 50 programmes).

Results of syntheses

Main effects results

This section answers research question 1a:

"Which parenting interventions have strong evidence of their effectiveness in reducing child maltreatment and/or improving child outcomes when delivered to parents experiencing multiple and complex needs, within a context relevant to UK early help and children's social care practice? What are their pooled effects?"

Studies included in the meta-analysis

Ninety-five studies were included in the meta-analysis. The histogram (figure 6) presents the number of effect sizes by measurement time point. Most of the effect sizes included in the meta-analyses were recorded within the first six months after the end of the intervention.

Figure 7. Effect sizes by measurement time point (link to raw data)
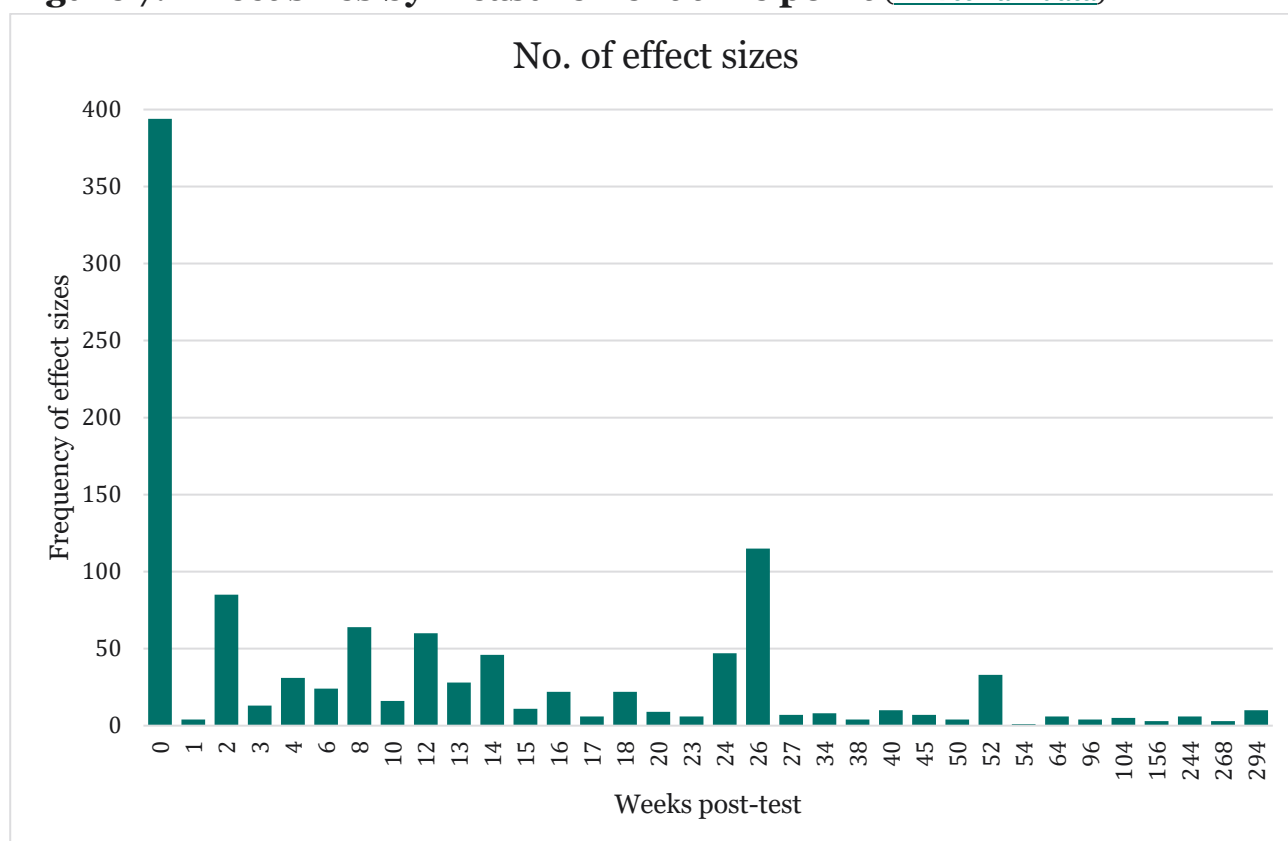
No. of effect sizes

0–6 months post-intervention effects

This section reports the main effect results measured up to six months after the end of the intervention. In total, we extracted 1,001 effect sizes reported at 0–6 months post-test.

Table 8. Main effect results of all outcomes at 0–6 months post-test

Outcome	No. of trials	No. of effect sizes	Effect size (Cohen's d)	Confidence interval of effect size	Hetero-geneity (I²)
Maltreatment including harsh parenting	14	35	-0.20	-0.41, 0.01	67%
Child abuse risk	10	16	-0.17	-0.39, 0.06	63%
Negative parenting	30	78	-0.47***	-0.63, -0.31	77%
Positive parenting	51	135	0.33***	0.24, 0.41	68%
Parent mental health	47	117	-0.17**	-0.28, -0.06	71%
Parenting stress	35	62	-0.19**	-0.31, -0.08	90%
Child behaviour problems overall	47	209	-0.32***	-0.43, -0.22	67%
Externalising child behaviours	42	159	-0.32***	-0.44, -0.21	69%
Internalising child behaviours	18	36	-0.13	-0.27, 0.01	46%
Child wellbeing	8	21	0.30*	0.10, 0.50	42%
Child attachment	11	16	0.44*	0.05, 0.83	80%
Parent–child relationship	23	57	0.34**	0.16, 0.52	76%

Note: p-value ranges: 0.05 – 0.01= *, 0.01 – 0.001= **, <.0001=***,
Colour-coding: green = significant, red = non-significant

Maltreatment including harsh parenting

Box 1. Why do we use this terminology for our key outcome?

Both maltreatment and harsh parenting instruments often include similar, or sometimes identical, items. For instance, maltreatment instruments typically assess physical punishment (e.g. hitting, shoving) and emotional abuse (e.g. shouting, threatening, insulting), which are also key elements in harsh parenting measures. Consequently, parents who score highly on harsh parenting instruments are likely to score highly on maltreatment instruments as well. To ensure a comprehensive assessment of abusive behaviours, we have combined both types of instruments in our main outcome, labelled "Maltreatment including harsh parenting" (table 8).

Relying solely on official reports of maltreatment would significantly limit our ability to synthesise results, as very few trials use official reports. In contrast, parent self-reports, such as those captured in harsh parenting and child maltreatment instruments, are far more common. For this reason, we included harsh parenting instruments with at least 50% of their items focusing on physically and emotionally violent behaviours that can also be found in maltreatment instruments. This approach is supported by the established similarity between the two types of instruments (Backhaus et al., 2022).

We note that for the purpose of the subgroup analyses, in order to have adequate numbers of trials for analysis, and hence increase power, we have combined maltreatment, harsh parenting and other indices of negative parenting (e.g. inconsistent parenting, poor monitoring) in the outcome variable (table 10). We use the term 'Maltreatment & negative parenting' for this outcome variable.

Fourteen trials reported maltreatment and harsh parenting outcomes. Results showed a small but statistically non-significant effect, with considerable heterogeneity (d = -0.20; 95%CI = -0.41, 0.01; I^2 = 67%; see figure 8). We note that the confidence interval is close to 0, that the effect was in the expected negative direction, and that the majority of effect sizes indicated a reduction in maltreatment and harsh parenting practices.

Studies were conducted in the United States (n = 11), Sweden (n = 1), Spain (n = 1), and the United Kingdom (n = 1). Sample sizes ranged from 54 to 1,537 participants. Child mean age ranged from prenatal to 9 years. Twelve programmes were evaluated in the studies: 4rs 2ss Family Strengthening Multiple Family Groups Program, Child First, Early Pathways, Healthy Families, Incredible Years, Nurse-Family Partnership, Parent Aide, Parent-Child Interaction Therapy, Project Support, SafeCare, Safer Kids, and Supporting Father Involvement. Programmes were based on social learning theory (k = 28), social learning theory + attachment (k = 1), social learning theory + other theories (k = 3), and other theories (k = 3).

Out of 35 effect sizes, 19 were derived from studies including parents based on risk factors for maltreatment (selective prevention), four were based on screening high on a child maltreatment instrument (indicated), and 12 based on pre-existing maltreatment in the family (treatment). Out of 35 effect sizes, ten came from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have high risk of bias (66%), with most having high or unclear risk of bias concerning the random sequence generation (57%),

allocation concealment (86%), blinding of outcome assessors (77%), and selective outcome reporting (86%). The remainder of included studies (34%) were assessed to have low risk of bias.

Certainty: Low

The low certainty assessment was based on the confidence interval of the average effect just crossing zero, a fair number of studies, a small average effect size, some underpowered studies with large confidence intervals, high/unclear risk of bias for important criteria, and high heterogeneity.

Figure 8. Forest plot for the 0–6 months effects of parenting interventions on maltreatment

Study ID	First Author	Year	Int. N	Contr. N	Effect (95% CI)
282	Arrubarrena	2022	69	36	-0.05 (-0.45, 0.35)
73	Fung	2014	80	57	-0.46 (-0.81, -0.12)
82	Guterman	2013	57	44	-0.08 (-0.48, 0.31)
82	Guterman	2013	57	44	-0.11 (-0.51, 0.28)
88	Harris	2015	102	97	-0.16 (-0.44, 0.12)
104	Jouriles	2009	32	34	0.01 (-2.28, 2.30)
104	Jouriles	2009	32	34	0.04 (-2.11, 2.19)
104	Jouriles	2009	32	34	-0.32 (-2.47, 1.83)
104	Jouriles	2009	32	34	-0.34 (-2.66, 1.98)
125	Lau	2011	30	20	-0.97 (-1.57, -0.38)
490	LeCroy	2011	85	83	-0.11 (-0.47, 0.25)
490	LeCroy	2011	85	83	-0.91 (-2.60, 0.78)
490	LeCroy	2011	85	83	-0.93 (-2.12, 0.26)
490	LeCroy	2011	85	83	-0.63 (-2.40, 1.14)
490	LeCroy	2011	85	83	-0.14 (-0.49, 0.21)
490	LeCroy	2011	85	97	-1.13 (-1.44, -0.81)
490	LeCroy	2011	85	83	-0.39 (-0.73, -0.05)
490	LeCroy	2011	85	83	-0.40 (-0.74, -0.06)
490	LeCroy	2011	85	83	-0.31 (-1.12, 0.50)
490	LeCroy	2011	85	83	-0.63 (-1.89, 0.63)
201	Pruett	2019	97	31	-0.58 (-0.99, -0.17)
201	Pruett	2019	86	25	0.20 (-0.24, 0.65)
201	Pruett	2019	97	31	0.20 (-0.21, 0.60)
201	Pruett	2019	86	25	0.04 (-0.40, 0.49)
201	Pruett	2019	86	25	-0.06 (-0.51, 0.38)
201	Pruett	2019	97	31	-0.11 (-0.52, 0.29)
201	Pruett	2019	97	31	-0.41 (-0.82, -0.00)
201	Pruett	2019	86	25	-0.13 (-0.57, 0.32)
517	Robling	2015	945	945	0.30 (0.07, 0.53)
337	Vardanian	2020	225	95	-0.29 (-1.37, 0.79)
338	Villodas	2021	12	9	-0.64 (-1.53, 0.24)
400	Whitaker	2020	113	62	-0.15 (-0.46, 0.16)
488	Xia	2023	111	72	-0.35 (-0.71, 0.01)
483	van Leuven	2023	54	56	0.19 (-0.71, 1.09)
483	van Leuven	2023	54	56	0.02 (-0.64, 0.68)
Overall					-0.20 (-0.41, 0.01)

Figure 9. Risk of bias for included trials in 0–6 months main effect analysis on maltreatment ([link to raw data](link))
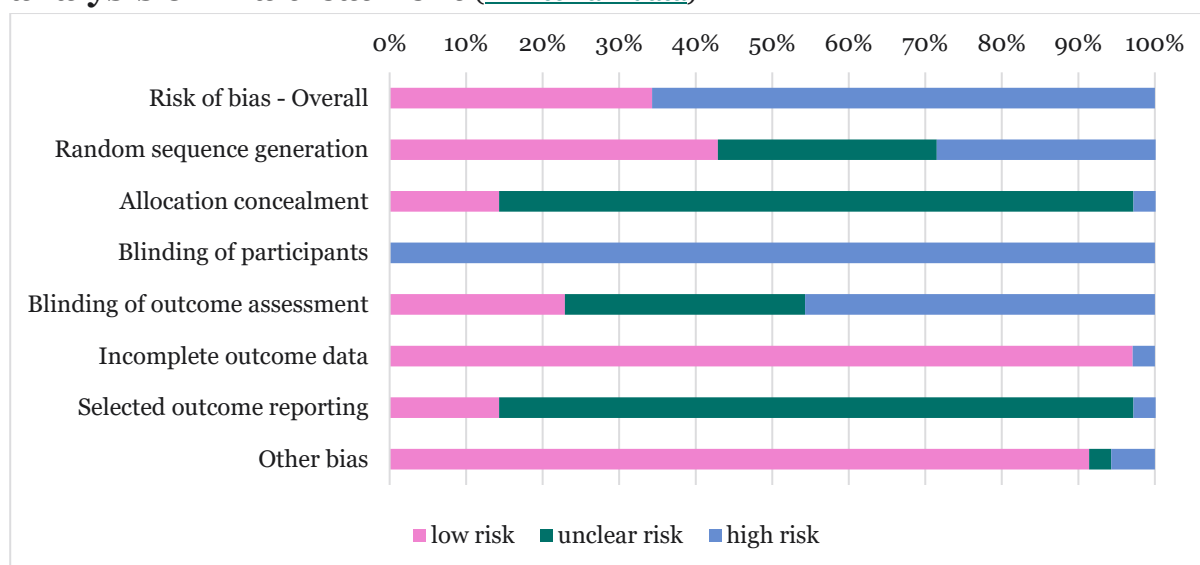
Child abuse risk

Ten trials reported child abuse risk outcomes. Results showed a small non-significant effect, with considerable heterogeneity (d = -0.17; 95%CI = -0.39, 0.06; I^2 = 63%; see figure 10).

Studies were conducted in the United States (n = 3), Australia (n = 2), Germany (n = 1), Netherlands (n = 1), Spain (n = 1), Sweden (n = 1), and the United Kingdom (n = 1). Sample sizes ranged from 20 to 294 participants. Child mean age ranged from 0 to 7 years. Six programmes were evaluated in the ten studies: Incredible Years, Parent-Child Interaction Therapy, Parents under Pressure, SafeCare, Safer Kids, and Step Towards Effective and Enjoyable Parenting (STEEP-B). Programmes were based on social learning theory (k = 10), attachment + other theories (k = 3), attachment (k = 2), or other theories (k = 1).

Out of 16 effect sizes, six were derived from studies including parents based on risk factors for maltreatment (selective prevention), two based on screening high on a child maltreatment instrument, eight based on pre-existing maltreatment in the family (treatment). Out of 16 effect sizes, two came from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (61%) (see figure 11). However, most studies were at high or unclear risk of bias concerning the allocation concealment (56%), blinding of outcome assessors (78%), and selective outcome reporting (50%).

Certainty: Low

The low certainty assessment was based on the confidence interval of the average effect just crossing zero, a small number of studies, a small average effect size, some underpowered studies with large confidence intervals, and high/unclear risk of bias for important criteria.

Figure 10. Forest plot for the 0–6 months effects of parenting interventions on child abuse risk

Study ID	First Author	Year	Int. N	Contr. N		Effect (95% CI)
281	Abrahamse	2021	9	8		-1.50 (-2.57, -0.42)
281	Abrahamse	2021	8	5		-1.45 (-2.70, -0.20)
282	Arrubarrena	2022	69	36		-0.01 (-0.41, 0.39)
411	Barlow	2019	36	39		-0.43 (-0.89, 0.02)
411	Barlow	2019	36	39		-0.40 (-0.85, 0.06)
44	Dawe	2007	20	13		-0.26 (-0.96, 0.44)
508	Firk	2021	20	27		-0.15 (-0.73, 0.42)
508	Firk	2021	21	24		0.23 (-0.35, 0.82)
65	Foley	2016	20	24		-0.86 (-1.48, -0.24)
514	Hubel	2018	162	132		-0.16 (-0.39, 0.07)
514	Hubel	2018	162	132		0.35 (0.12, 0.58)
514	Hubel	2018	162	132		0.34 (0.10, 0.57)
514	Hubel	2018	162	132		-0.15 (-0.38, 0.08)
230	Silovsky	2011	43	45		-0.04 (-0.46, 0.38)
252	Thomas	2011	40	36		0.03 (-0.42, 0.48)
483	van Leuven	2023	54	56		-0.03 (-0.41, 0.34)
Overall						-0.17 (-0.39, 0.06)

Figure 11. Risk of bias for included trials in 0–6 months main effect analysis on child abuse risk (link to raw data)
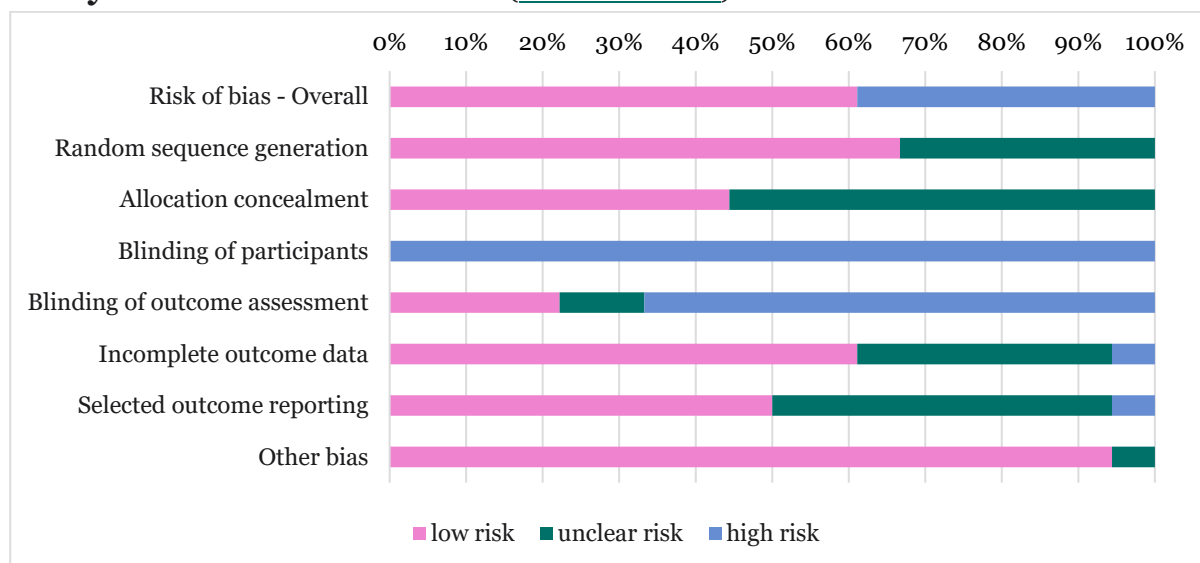
Negative parenting

Thirty trials reported negative parenting outcomes. Results showed a moderate statistically significant effect, with considerable heterogeneity (d = -0.47; 95%CI = -0.63, -0.31; I^2 = 77%; see figure 12).

Studies were conducted in the United States (n = 11), the United Kingdom (n = 10), Australia (n = 3), the Netherlands (n = 1), Ireland (n = 2), Italy (n = 1), Finland (n = 1), and Spain (n = 1). Sample sizes ranged from 9 to 1,537 participants. Child mean age ranged from prenatal to 9 years. Seventeen programmes were evaluated in the studies: 4rs 2ss Family Strengthening Multiple Family Groups Program, Attachment and Biobehavioural Catch-Up (ABC), Circle of Security,

Enhancing Parenting Skills Programme, Fathering in Recovery, Healthy Families, Helping Families Programme (modified), i-Interact, Incredible Years, Mellow Babies, Nurse-Family Partnership, Parent-Child Interaction Therapy, Parent-Child Interaction Therapy – Infant Behavior Program, Project Support, Triple P, Triple P Online + Integrated Bipolar Parenting Program, and VIPP-SD. Programmes were based on social learning theory (k = 59), social learning theory + attachment theory (k = 10), social learning theory + other theories (k = 6), attachment theory + other theories (k = 2), or attachment (k = 1).

Out of 78 effect sizes, 60 were derived from studies that included parents based on their risk factors for maltreatment (selective prevention), 7 based on screening high on a child maltreatment instrument (indicated), and 11 based on pre-existing maltreatment in the family (treatment). Out of 78 effect sizes, 42 were from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (62%) (see figure 13). However, most studies were at high risk or unclear risk of bias concerning the allocation concealment (58%), and selective outcome reporting (67%).

Certainty: High

The high certainty assessment was based on the moderate effect size, a confidence interval of the average effect far away from zero, a large number of studies, expected levels of heterogeneity, and an overarching low risk of bias.

Figure 12. Forest plot for the 0−6 months effects of parenting interventions on negative parenting

Study ID	First Author	Year	Int. N	Contr. N	Effect (95% CI)
281	Abrahamse	2021	8	8	-2.66 (-4.00, -1.31)
281	Abrahamse	2021	8	4	0.16 (-1.04, 1.37)
282	Arrubarrena	2022	69	36	-0.44 (-0.85, -0.03)
282	Arrubarrena	2022	69	36	-0.48 (-0.89, -0.07)
513	Bagner	2016	20	26	-1.17 (-1.80, -0.54)
513	Bagner	2016	20	25	-1.73 (-2.41, -1.04)
513	Bagner	2016	20	28	-1.24 (-1.87, -0.61)
415	Boyd	2017	30	25	-0.87 (-1.42, -0.31)
417	Casonato	2017	7	5	0.14 (-1.01, 1.28)
417	Casonato	2017	7	5	-0.73 (-1.92, 0.45)
417	Casonato	2017	7	5	0.04 (-1.11, 1.18)
418	Cassidy	2017	75	66	-0.37 (-0.70, -0.04)
420	Cioffi	2023	21	20	0.01 (-0.60, 0.62)
420	Cioffi	2023	21	20	-0.46 (-1.08, 0.16)
420	Cioffi	2023	21	20	-0.88 (-1.53, -0.24)
420	Cioffi	2023	21	20	-0.12 (-0.73, 0.49)
46	Day	2020	13	7	0.01 (-0.91, 0.93)
46	Day	2020	18	14	0.00 (-0.70, 0.70)
76	Gardner	2006	39	32	-0.35 (-0.82, 0.12)
76	Gardner	2006	39	32	-0.64 (-1.12, -0.16)
96	Hutchings	2007	104	49	-0.35 (-0.70, -0.01)
96	Hutchings	2007	104	49	-0.91 (-1.26, -0.55)
102	Jones	2014	8	16	-1.49 (-2.43, -0.54)
103	Jones	2017	28	43	-0.18 (-0.65, 0.30)
103	Jones	2017	32	44	-0.15 (-0.61, 0.30)
103	Jones	2017	28	35	-0.18 (-0.68, 0.32)
103	Jones	2017	27	30	0.15 (-0.37, 0.67)
104	Jouriles	2009	32	34	-0.18 (-2.41, 2.05)
104	Jouriles	2009	32	34	-0.63 (-2.83, 1.57)
104	Jouriles	2009	32	34	-0.37 (-2.73, 1.99)
104	Jouriles	2009	32	34	-0.57 (-2.97, 1.83)
106	Karjalainen	2019	49	49	-0.42 (-0.82, -0.02)
106	Karjalainen	2019	49	49	-0.31 (-0.70, 0.09)
106	Karjalainen	2019	49	49	-0.44 (-0.84, -0.04)
490	LeCroy	2011	85	97	-0.03 (-0.32, 0.26)
490	LeCroy	2011	85	97	0.04 (-0.25, 0.33)
490	LeCroy	2011	85	97	0.00 (-0.29, 0.29)
140	Little	2012	110	51	-0.34 (-0.67, -0.00)
140	Little	2012	110	51	-0.33 (-0.66, 0.00)
140	Little	2012	110	51	-0.39 (-0.72, -0.05)
140	Little	2012	73	73	-0.15 (-0.47, 0.18)
140	Little	2012	73	73	0.02 (-0.31, 0.34)
140	Little	2012	73	73	-0.04 (-0.36, 0.28)
151	Mast	2014	4	3	-1.06 (-2.66, 0.53)
151	Mast	2014	4	3	0.49 (-1.03, 2.01)
151	Mast	2014	4	3	-1.11 (-2.72, 0.49)
158	McGilloway	2012	95	42	-0.77 (-1.15, -0.40)
172	Ni Mhaille	2013	19	14	-1.20 (-1.94, -0.45)
172	Ni Mhaille	2013	19	14	-1.09 (-1.83, -0.35)
172	Ni Mhaille	2013	19	14	-0.59 (-1.30, 0.11)
465	Perrone	2021	75	77	-0.04 (-0.35, 0.28)
493	Puckering	2010	10	4	0.58 (-0.60, 1.76)
493	Puckering	2010	10	4	-0.26 (-1.42, 0.91)
493	Puckering	2010	10	4	-1.18 (-2.42, 0.06)
493	Puckering	2010	10	4	-1.37 (-2.64, -0.10)
493	Puckering	2010	10	4	-0.96 (-2.17, 0.25)
493	Puckering	2010	10	4	-1.23 (-2.48, 0.02)
517	Robling	2015	256	252	0.08 (-0.09, 0.25)
222	Scott	2010b	45	38	-0.28 (-0.71, 0.15)
222	Scott	2010b	56	43	-0.49 (-0.89, -0.08)
222	Scott	2010b	45	40	-0.37 (-0.80, 0.06)
474	Skowron	2024	120	84	-0.66 (-0.95, -0.38)
474	Skowron	2024	120	84	-0.20 (-0.47, 0.08)
474	Skowron	2024	120	84	-0.53 (-0.81, -0.24)
474	Skowron	2024	120	84	-0.51 (-0.79, -0.22)
252	Thomas	2011	43	33	-0.61 (-1.08, -0.15)
252	Thomas	2011	43	33	-2.20 (-2.78, -1.63)
255	Turner	2006	12	13	-0.76 (-1.57, 0.05)
255	Turner	2006	12	13	-0.20 (-0.99, 0.58)
255	Turner	2006	12	13	0.43 (-0.36, 1.23)
255	Turner	2006	12	13	-0.53 (-1.33, 0.26)
337	Vardanian	2020	225	95	-0.25 (-0.82, 0.32)
338	Villodas	2021	12	9	-0.63 (-1.52, 0.25)
338	Villodas	2021	12	9	-0.60 (-1.49, 0.28)
271	Williams	2020	19	17	-0.52 (-1.18, 0.15)
271	Williams	2020	19	17	-0.19 (-0.84, 0.47)
271	Williams	2020	19	16	-0.35 (-1.02, 0.32)
489	Zimmer-Gembeck	2022	35	26	-0.36 (-0.88, 0.15)
Overall					-0.47 (-0.63, -0.31)

Figure 13. Risk of bias for included trials in 0–6 months main effect analysis on negative parenting ([link to raw data](#))

Positive parenting

Fifty-one trials reported positive parenting outcomes. Results showed a small-to-moderate statistically significant effect, with considerable heterogeneity (d = 0.33; 95%CI = 0.24, 0.41; I^2 = 68%; see figure 14).

Studies were conducted in the United States (n = 22), the United Kingdom (n = 10), Australia (n = 4), Canada (n = 2), Finland (n = 2), Germany (n = 2), Netherlands (n = 2), Denmark (n = 1), Hong Kong (n = 1), Ireland (n = 1), Italy (n = 1), Portugal (n = 1), Spain (n = 1), and Sweden (n = 1). Sample sizes ranged from 9 to 1,537 participants. Child mean age ranged from prenatal to 9 years. Thirty-two programmes were evaluated in the studies: 4rs 2ss Family Strengthening Multiple Family Groups Program, Attachment and Biobehavioural Catch-up (ABC), Circle of Security, Early Pathways, Enhancing Parenting Skills Programme, Family Partnership Model, Fathering in Recovery, Healthy Families, HUGS, i-Interact, Incredible Years, Infant Massage Parenting Enhancement Program (IMPEP), Mellow Babies, Mindfulness-based Therapeutic Parenting, Minding the Baby, Mom Power, Mother-Baby Intervention, Nurse-Family Partnership, Nurture and Play, Parent-Child Interaction Therapy, Parent-Child Interaction Therapy – Infant Behavior Program, Parent-Infant Psychotherapy, Play and Learning Strategies, Programme en Intervention Relationnelle, Project Support, Promoting First Relationships, SafeCare, Safer Kids, Steps Towards Effective and Enjoyable Parenting (STEEP-B), Triple P, VIPP-PMH, and VIPP-SD. Programmes were based on social learning theory (k = 63), attachment theory (k = 26), social learning theory + attachment theory (k = 19), attachment + other theories (k = 11), social learning theory + other theories (k = 5), and other theories (k = 11).

Out of 135 effect sizes, 91 were derived from studies including parents based on risk factors for maltreatment (selective prevention), 15 based on screening high on a child maltreatment instrument (indicated), and 29 based on pre-existing maltreatment in the family (treatment). Out of 135 effect sizes, 41 came from studies including children based on high or clinical levels of

conduct problems. The majority of included studies were at low risk of bias (59%) (see figure 15). However, most studies were at high risk or unclear risk of bias concerning the allocation concealment (56%), and selective outcome reporting (65%).

Certainty: High

The high certainty assessment was based on the moderate effect size, a confidence interval of the average effect far away from zero, a large number of studies, expected levels of heterogeneity, and an overarching low risk of bias.

Figure 14. Forest plot for the 0–6 months effects of parenting interventions on positive parenting

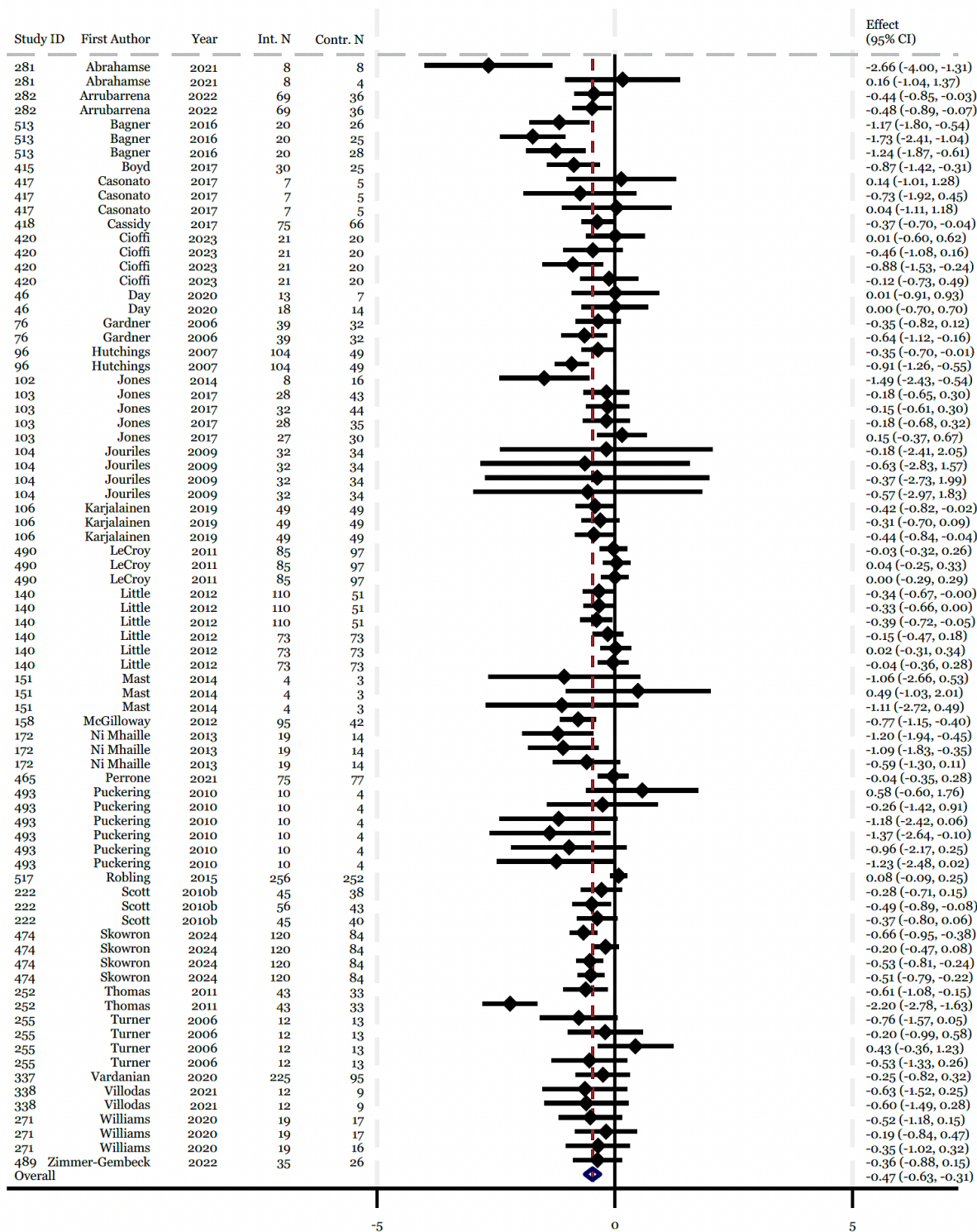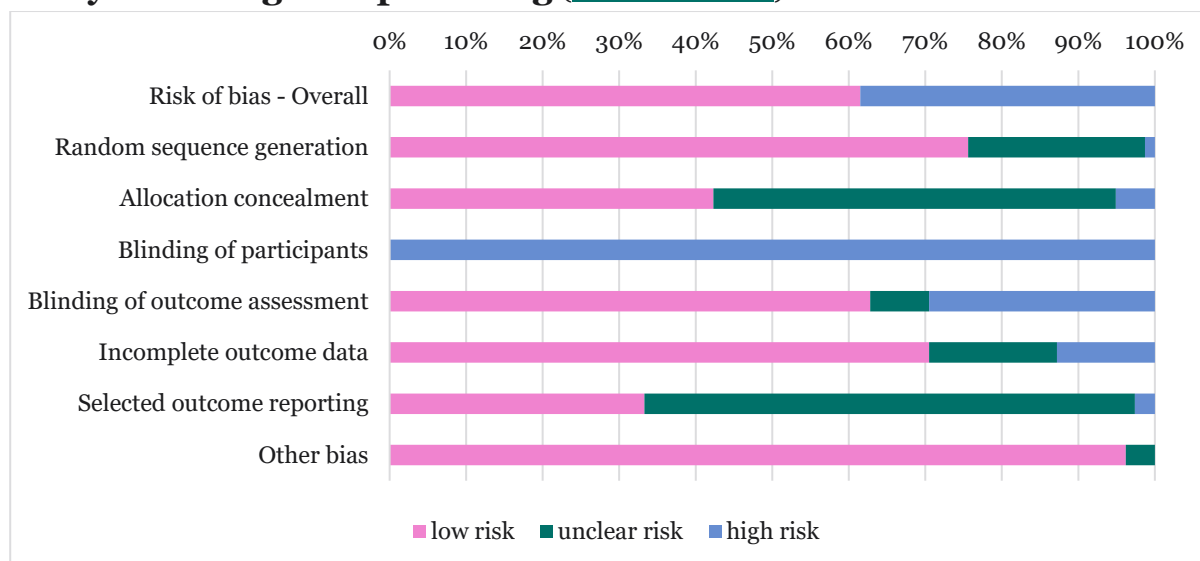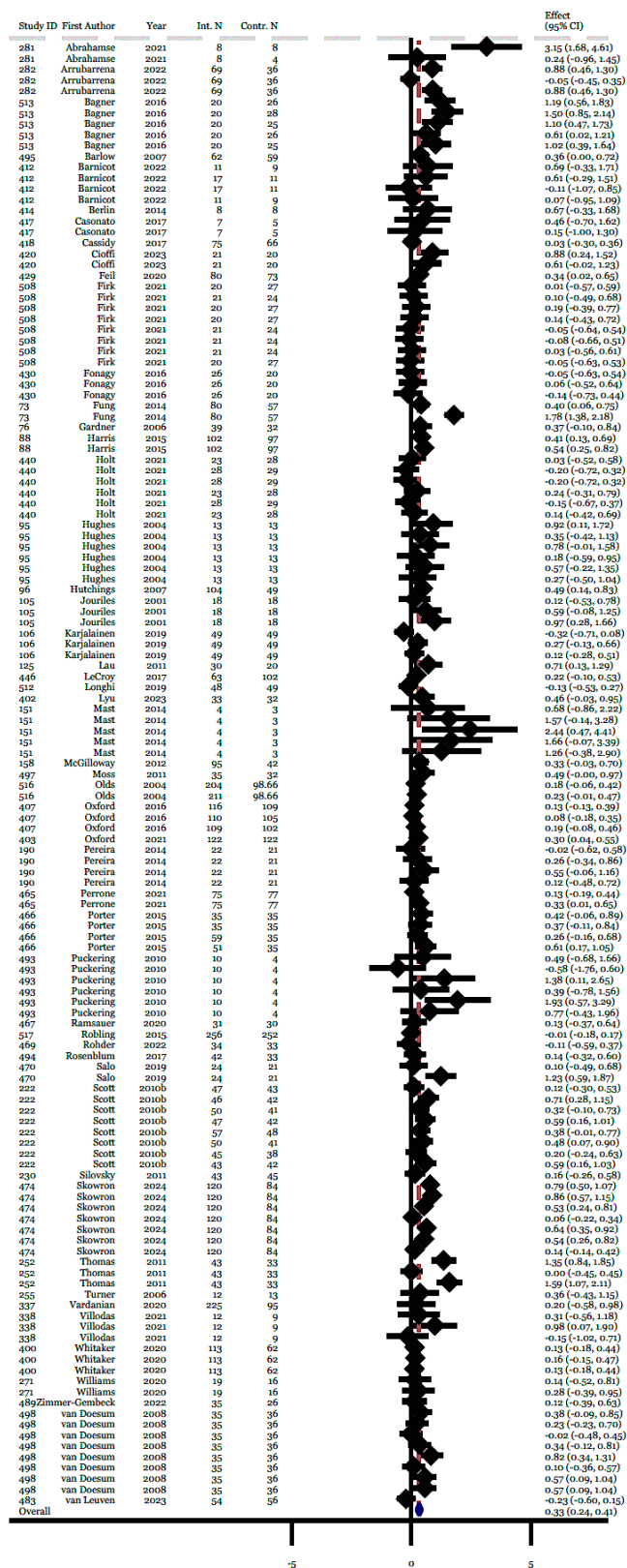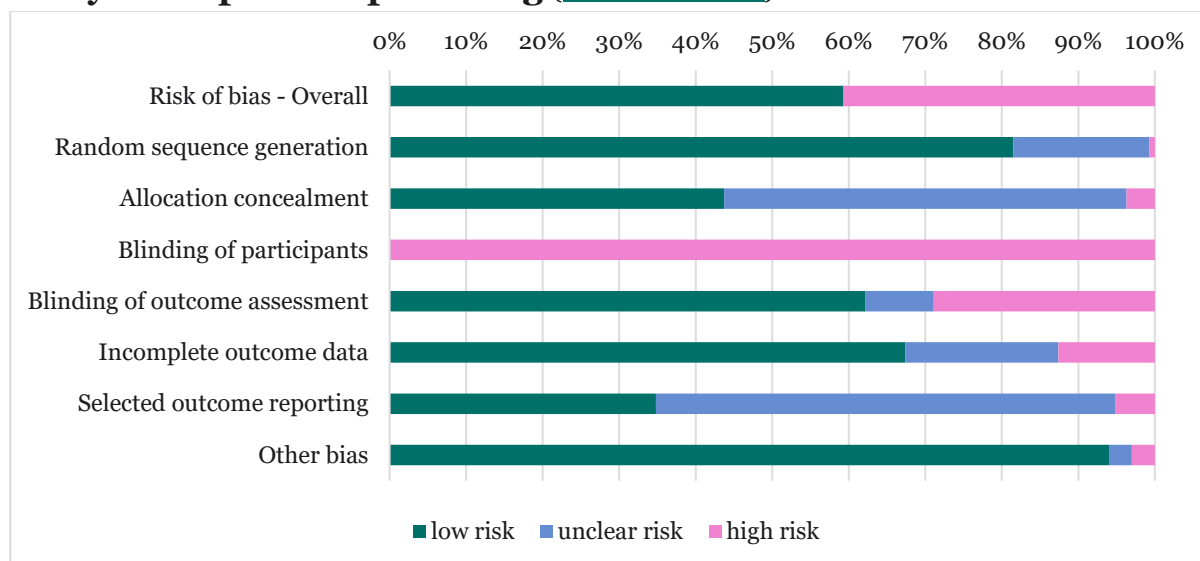| Study ID	First Author	Year	Int. N	Contr. N	Effect (95% CI)
281	Abrahamse	2021	8	8	3.15 (1.68, 4.61)
281	Abrahamse	2021	8	4	0.24 (-0.96, 1.45)
282	Arrubarrena	2022	69	36	0.88 (0.46, 1.30)
282	Arrubarrena	2022	69	36	-0.05 (-0.45, 0.35)
282	Arrubarrena	2022	69	36	0.88 (0.46, 1.30)
513	Bagner	2016	20	26	1.19 (0.56, 1.83)
513	Bagner	2016	20	28	1.50 (0.85, 2.14)
513	Bagner	2016	20	25	1.10 (0.47, 1.73)
513	Bagner	2016	20	26	0.61 (0.02, 1.21)
513	Bagner	2016	20	25	1.02 (0.39, 1.64)
495	Barlow	2007	62	59	0.36 (0.00, 0.72)
412	Barnicot	2022	11	9	0.69 (-0.33, 1.71)
412	Barnicot	2022	17	11	0.61 (-0.29, 1.51)
412	Barnicot	2022	17	11	-0.11 (-1.07, 0.85)
412	Barnicot	2022	11	9	0.07 (-0.95, 1.09)
414	Berlin	2014	8	8	0.67 (-0.33, 1.68)
417	Casonato	2017	7	5	0.46 (-0.70, 1.62)
417	Casonato	2017	7	5	0.15 (-1.00, 1.30)
418	Cassidy	2017	75	66	0.03 (-0.30, 0.36)
420	Cioffi	2023	21	20	0.88 (0.24, 1.52)
420	Cioffi	2023	21	20	0.61 (-0.02, 1.23)
429	Feil	2020	80	73	0.34 (0.02, 0.65)
508	Firk	2021	20	27	0.01 (-0.57, 0.59)
508	Firk	2021	21	24	0.10 (-0.49, 0.68)
508	Firk	2021	20	27	0.19 (-0.39, 0.77)
508	Firk	2021	20	27	0.14 (-0.43, 0.72)
508	Firk	2021	21	24	-0.05 (-0.64, 0.54)
508	Firk	2021	21	24	-0.08 (-0.66, 0.51)
508	Firk	2021	21	24	0.03 (-0.56, 0.61)
508	Firk	2021	20	27	-0.05 (-0.63, 0.53)
430	Fonagy	2016	26	20	-0.05 (-0.63, 0.54)
430	Fonagy	2016	26	20	0.06 (-0.52, 0.64)
430	Fonagy	2016	26	20	-0.14 (-0.73, 0.44)
73	Fung	2014	80	57	0.40 (0.06, 0.75)
73	Fung	2014	80	57	1.78 (1.38, 2.18)
76	Gardner	2006	39	32	0.37 (-0.10, 0.84)
88	Harris	2015	102	97	0.41 (0.13, 0.69)
88	Harris	2015	102	97	0.54 (0.25, 0.82)
440	Holt	2021	23	28	0.03 (-0.52, 0.58)
440	Holt	2021	28	29	-0.20 (-0.72, 0.32)
440	Holt	2021	28	29	-0.20 (-0.72, 0.32)
440	Holt	2021	23	28	0.24 (-0.31, 0.79)
440	Holt	2021	28	29	-0.15 (-0.67, 0.37)
440	Holt	2021	23	28	0.14 (-0.42, 0.69)
95	Hughes	2004	13	13	0.92 (0.11, 1.72)
95	Hughes	2004	13	13	0.35 (-0.42, 1.13)
95	Hughes	2004	13	13	0.78 (-0.01, 1.58)
95	Hughes	2004	13	13	0.18 (-0.59, 0.95)
95	Hughes	2004	13	13	0.57 (-0.22, 1.35)
95	Hughes	2004	13	13	0.27 (-0.50, 1.04)
96	Hutchings	2007	104	49	0.49 (0.14, 0.83)
105	Jouriles	2001	18	18	0.12 (-0.53, 0.78)
105	Jouriles	2001	18	18	0.59 (-0.08, 1.25)
105	Jouriles	2001	18	18	0.97 (0.28, 1.66)
106	Karjalainen	2019	49	49	-0.32 (-0.71, 0.08)
106	Karjalainen	2019	49	49	0.27 (-0.13, 0.66)
106	Karjalainen	2019	49	49	0.12 (-0.28, 0.51)
125	Lau	2011	30	20	0.71 (0.13, 1.29)
446	LeCroy	2017	63	102	0.22 (-0.10, 0.53)
512	Longhi	2019	48	49	-0.13 (-0.53, 0.27)
402	Lyu	2023	33	32	0.46 (-0.03, 0.95)
151	Mast	2014	4	3	0.68 (-0.86, 2.22)
151	Mast	2014	4	3	1.57 (-0.14, 3.28)
151	Mast	2014	4	3	2.44 (0.47, 4.41)
151	Mast	2014	4	3	1.66 (-0.07, 3.39)
151	Mast	2014	4	3	1.26 (-0.38, 2.90)
158	McGilloway	2012	95	42	0.33 (-0.03, 0.70)
497	Moss	2011	35	32	0.49 (-0.00, 0.97)
516	Olds	2004	204	98.66	0.18 (-0.06, 0.42)
516	Olds	2004	211	98.66	0.23 (-0.01, 0.47)
407	Oxford	2016	116	109	0.13 (-0.13, 0.39)
407	Oxford	2016	110	105	0.08 (-0.18, 0.35)
407	Oxford	2016	109	102	0.19 (-0.08, 0.46)
403	Oxford	2021	122	122	0.30 (0.04, 0.55)
190	Pereira	2014	22	21	-0.02 (-0.62, 0.58)
190	Pereira	2014	22	21	0.26 (-0.34, 0.86)
190	Pereira	2014	22	21	0.55 (-0.06, 1.16)
190	Pereira	2014	22	21	0.12 (-0.48, 0.72)
465	Perrone	2021	75	77	0.13 (-0.19, 0.44)
465	Perrone	2021	75	77	0.33 (0.01, 0.65)
466	Porter	2015	35	35	0.42 (-0.06, 0.89)
466	Porter	2015	35	35	0.37 (-0.11, 0.84)
466	Porter	2015	59	35	0.26 (-0.16, 0.68)
466	Porter	2015	51	35	0.61 (0.17, 1.05)
493	Puckering	2010	10	4	0.49 (-0.68, 1.66)
493	Puckering	2010	10	4	-0.58 (-1.76, 0.60)
493	Puckering	2010	10	4	1.38 (0.11, 2.65)
493	Puckering	2010	10	4	0.39 (-0.78, 1.56)
493	Puckering	2010	10	4	1.93 (0.57, 3.29)
493	Puckering	2010	10	4	0.77 (-0.43, 1.96)
467	Ramsauer	2020	31	30	0.13 (-0.37, 0.64)
517	Robling	2015	256	252	-0.01 (-0.18, 0.17)
469	Rohder	2022	34	33	-0.11 (-0.59, 0.37)
494	Rosenblum	2017	42	33	0.14 (-0.32, 0.60)
470	Salo	2019	24	21	0.10 (-0.49, 0.68)
470	Salo	2019	24	21	1.23 (0.59, 1.87)
222	Scott	2010b	47	43	0.12 (-0.30, 0.53)
222	Scott	2010b	46	42	0.71 (0.28, 1.15)
222	Scott	2010b	50	41	0.32 (-0.10, 0.73)
222	Scott	2010b	47	42	0.59 (0.16, 1.01)
222	Scott	2010b	57	48	0.38 (-0.01, 0.77)
222	Scott	2010b	50	41	0.48 (0.07, 0.90)
222	Scott	2010b	45	38	0.20 (-0.24, 0.63)
222	Scott	2010b	43	42	0.59 (0.16, 1.03)
230	Silovsky	2011	43	45	0.16 (-0.26, 0.58)
474	Skowron	2024	120	84	0.79 (0.50, 1.07)
474	Skowron	2024	120	84	0.86 (0.57, 1.15)
474	Skowron	2024	120	84	0.53 (0.24, 0.81)
474	Skowron	2024	120	84	0.06 (-0.22, 0.34)
474	Skowron	2024	120	84	0.64 (0.35, 0.92)
474	Skowron	2024	120	84	0.54 (0.26, 0.82)
474	Skowron	2024	120	84	0.14 (-0.14, 0.42)
252	Thomas	2011	43	33	1.35 (0.84, 1.85)
252	Thomas	2011	43	33	0.00 (-0.45, 0.45)
252	Thomas	2011	43	33	1.59 (1.07, 2.11)
255	Turner	2006	12	13	0.36 (-0.43, 1.15)
337	Vardanian	2020	225	95	0.20 (-0.58, 0.98)
338	Villodas	2021	12	9	0.31 (-0.56, 1.18)
338	Villodas	2021	12	9	0.98 (0.07, 1.90)
338	Villodas	2021	12	9	-0.15 (-1.02, 0.71)
400	Whitaker	2020	113	62	0.13 (-0.18, 0.44)
400	Whitaker	2020	113	62	0.16 (-0.15, 0.47)
400	Whitaker	2020	113	62	0.13 (-0.18, 0.44)
271	Williams	2020	19	16	0.14 (-0.52, 0.81)
271	Williams	2020	19	16	0.28 (-0.39, 0.95)
489	Zimmer-Gembeck	2022	35	26	0.12 (-0.39, 0.63)
498	van Doesum	2008	35	36	0.38 (-0.09, 0.85)
498	van Doesum	2008	35	36	0.23 (-0.23, 0.70)
498	van Doesum	2008	35	36	-0.02 (-0.48, 0.45)
498	van Doesum	2008	35	36	0.34 (-0.12, 0.81)
498	van Doesum	2008	35	36	0.82 (0.34, 1.31)
498	van Doesum	2008	35	36	0.10 (-0.36, 0.57)
498	van Doesum	2008	35	36	0.57 (0.09, 1.04)
498	van Doesum	2008	35	36	0.57 (0.09, 1.04)
483	van Leuven	2023	54	56	-0.23 (-0.60, 0.15)
Overall					0.33 (0.24, 0.41)

Figure 15. Risk of bias for included trials in 0–6 months main effect analysis on positive parenting ([link to raw data](#))

Poor parent mental health

Forty-seven trials reported parent mental health outcomes. Results showed a small statistically significant effect, with considerable heterogeneity (d = -0.17; 95%CI = -0.28, -0.06; I^2 = 71%, see figure 16).

Studies were conducted in the United States (n = 20), the United Kingdom (n = 13), Australia (n = 3), Canada (n = 1), Denmark (n = 1), Finland (n = 2), Germany (n = 2), Hong Kong (n = 1), Ireland (n = 1), Netherlands (n = 1), Spain (n = 1), and Sweden (n = 1). Sample sizes ranged from 17 to 1,537 participants. Child mean age ranged from prenatal to 8 years. Thirty-three programmes were evaluated in the studies: Attachment and Biobehavioural Catch-up (ABC), Child First, Circle of Security, Communicating and Relating Effectively (CARE), Enhancing Parenting Skills Programme, Family Partnership Model, Focused Coparenting Consultation, Healthy Families, Helping Families, HUGS, Incredible Years, Infant Massage Parenting Enhancement Program (IMPEP), Mellow Babies, Mindfulness-based Therapeutic Parenting, Minding the Baby, Mom Power, Mother-Baby Intervention, My Baby's First Teacher, Nurse-Family Partnership, Nurture and Play, Parent Aide, Parent-infant Psychotherapy, Parental Training for Lone Mothers guided by Educators (PALME), Parents as Teachers, Parents under Pressure, Perinatal Dyadic Psychotherapy, Project Support, SafeCare, Safer Kids, Steps Towards Effective and Enjoyable Parenting (STEEP-B), Triple P, Baby Triple P, and VIPP-PMH. Programmes were based on social learning theory (k = 48), attachment theory (k = 16), attachment + other theories (k = 19), social learning theory + attachment theory (k = 6), social learning theory + other theories (k = 3), and other theories (k = 25).

Out of 117 effect sizes, 106 were derived from studies including parents based on risk factors for maltreatment (selective prevention), three based on screening high on a child maltreatment instrument (indicated), and eight based on pre-existing maltreatment in the family (treatment). Out of 117 effect sizes, 22 came from studies including children based on high or clinical levels of

conduct problems. The majority of included studies were assessed to have low risk of bias (67%) (see figure 17). However, most studies were at high risk or unclear risk of bias concerning the blinding of outcome assessors (73%), and selective outcome reporting (55%).

Certainty: Moderate

The moderate certainty assessment was based on a significant small main effect, a large number of included studies, some underpowered studies with some large confidence intervals, overarching low risk of bias, and expected levels of heterogeneity.

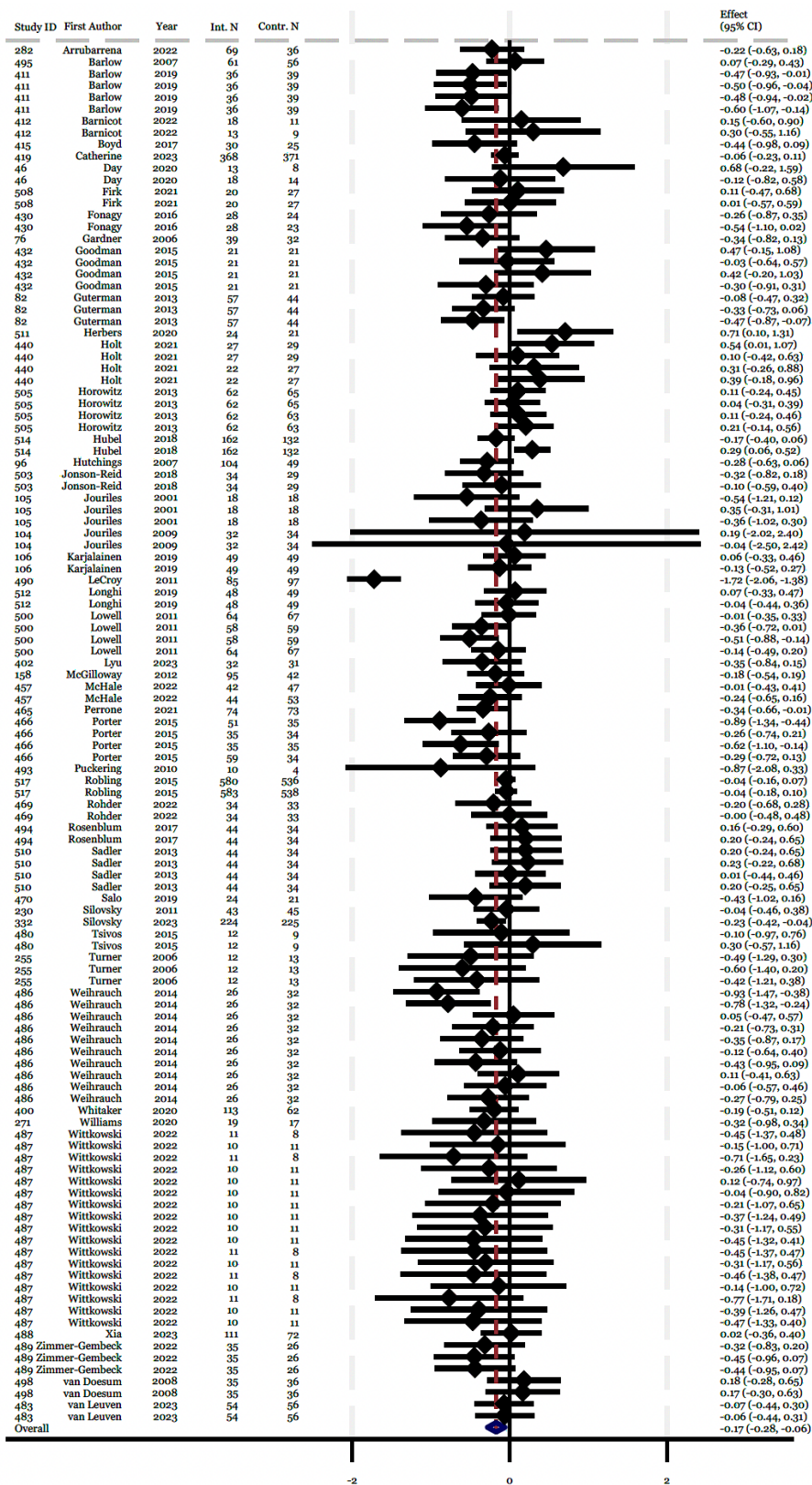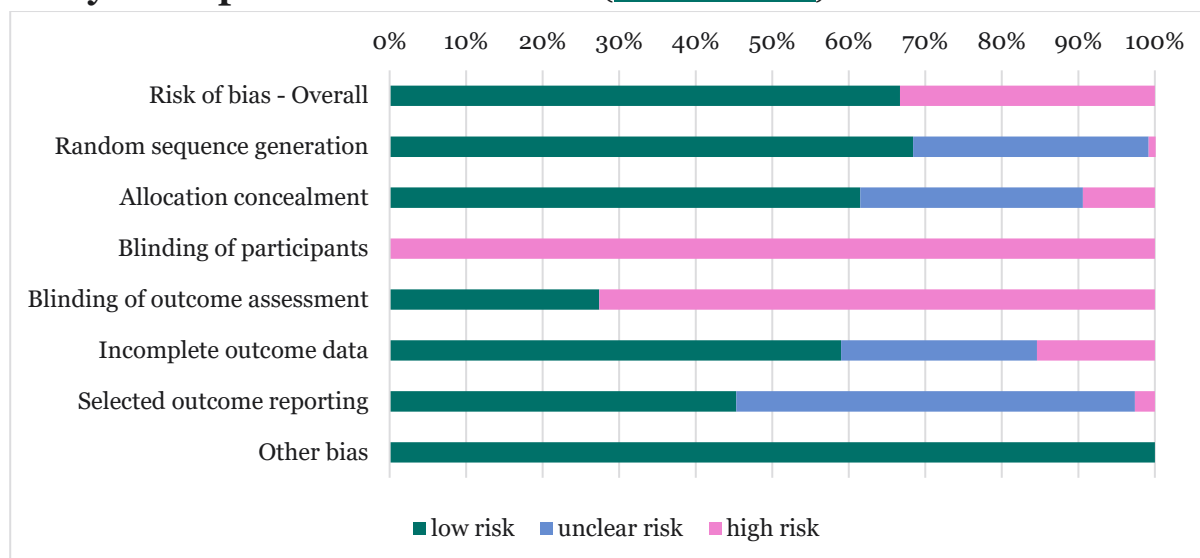## Figure 16. Forest plot for the 0−6 months effects of parenting interventions on parent mental health

Study ID	First Author	Year	Int. N	Contr. N	Effect (95% CI)
282	Arrubarrena	2022	69	36	-0.22 (-0.63, 0.18)
495	Barlow	2007	61	56	0.07 (-0.29, 0.43)
411	Barlow	2019	36	39	-0.47 (-0.93, -0.01)
411	Barlow	2019	36	39	-0.50 (-0.96, -0.04)
411	Barlow	2019	36	39	-0.48 (-0.94, -0.02)
411	Barlow	2019	36	39	-0.60 (-1.07, -0.14)
412	Barnicot	2022	18	11	0.15 (-0.60, 0.90)
412	Barnicot	2022	13	9	0.30 (-0.55, 1.16)
415	Boyd	2017	30	25	-0.44 (-0.98, 0.09)
419	Catherine	2023	368	371	-0.06 (-0.23, 0.11)
46	Day	2020	13	8	0.68 (-0.22, 1.59)
46	Day	2020	18	14	-0.12 (-0.82, 0.58)
508	Firk	2021	20	27	0.11 (-0.47, 0.68)
508	Firk	2021	20	27	0.01 (-0.57, 0.59)
430	Fonagy	2016	28	24	-0.26 (-0.87, 0.35)
430	Fonagy	2016	28	23	-0.54 (-1.10, 0.02)
76	Gardner	2006	39	32	-0.34 (-0.82, 0.13)
432	Goodman	2015	21	21	0.47 (-0.15, 1.08)
432	Goodman	2015	21	21	-0.03 (-0.64, 0.57)
432	Goodman	2015	21	21	0.42 (-0.20, 1.03)
432	Goodman	2015	21	21	-0.30 (-0.91, 0.31)
82	Guterman	2013	57	44	-0.08 (-0.47, 0.32)
82	Guterman	2013	57	44	-0.33 (-0.73, 0.06)
82	Guterman	2013	57	44	-0.47 (-0.87, -0.07)
511	Herbers	2020	24	21	0.71 (0.10, 1.31)
440	Holt	2021	27	29	0.54 (0.01, 1.07)
440	Holt	2021	27	29	0.10 (-0.42, 0.63)
440	Holt	2021	22	27	0.31 (-0.26, 0.88)
440	Holt	2021	22	27	0.39 (-0.18, 0.96)
505	Horowitz	2013	62	65	0.11 (-0.24, 0.45)
505	Horowitz	2013	62	65	0.04 (-0.31, 0.39)
505	Horowitz	2013	62	63	0.11 (-0.24, 0.46)
505	Horowitz	2013	62	63	0.21 (-0.14, 0.56)
514	Hubel	2018	162	132	-0.17 (-0.40, 0.06)
514	Hubel	2018	162	132	0.29 (0.06, 0.52)
96	Hutchings	2007	104	49	-0.28 (-0.63, 0.06)
503	Jonson-Reid	2018	34	29	-0.32 (-0.82, 0.18)
503	Jonson-Reid	2018	34	29	-0.10 (-0.59, 0.40)
105	Jouriles	2001	18	18	-0.54 (-1.21, 0.12)
105	Jouriles	2001	18	18	0.35 (-0.31, 1.01)
105	Jouriles	2001	18	18	-0.36 (-1.02, 0.30)
104	Jouriles	2009	32	34	0.19 (-2.02, 2.40)
104	Jouriles	2009	32	34	-0.04 (-2.50, 2.42)
106	Karjalainen	2019	49	49	0.06 (-0.33, 0.46)
106	Karjalainen	2019	49	49	-0.13 (-0.52, 0.27)
490	LeCroy	2011	85	97	-1.72 (-2.06, -1.38)
512	Longhi	2019	48	49	0.07 (-0.33, 0.47)
512	Longhi	2019	48	49	-0.04 (-0.44, 0.36)
500	Lowell	2011	64	67	-0.01 (-0.35, 0.33)
500	Lowell	2011	58	59	-0.36 (-0.72, 0.01)
500	Lowell	2011	58	59	-0.51 (-0.88, -0.14)
500	Lowell	2011	64	67	-0.14 (-0.49, 0.20)
402	Lyu	2023	32	31	-0.35 (-0.84, 0.15)
158	McGilloway	2012	95	42	-0.18 (-0.54, 0.19)
457	McHale	2022	42	47	-0.01 (-0.43, 0.41)
457	McHale	2022	44	53	-0.24 (-0.65, 0.16)
465	Perrone	2021	74	73	-0.34 (-0.66, -0.01)
466	Porter	2015	51	35	-0.89 (-1.34, -0.44)
466	Porter	2015	35	34	-0.26 (-0.74, 0.21)
466	Porter	2015	35	35	-0.62 (-1.10, -0.14)
466	Porter	2015	59	34	-0.29 (-0.72, 0.13)
493	Puckering	2010	10	4	-0.87 (-2.08, 0.33)
517	Robling	2015	580	536	-0.04 (-0.16, 0.07)
517	Robling	2015	583	538	-0.04 (-0.18, 0.10)
469	Rohder	2022	34	33	-0.20 (-0.68, 0.28)
469	Rohder	2022	34	33	-0.00 (-0.48, 0.48)
494	Rosenblum	2017	44	34	0.16 (-0.29, 0.60)
494	Rosenblum	2017	44	34	0.20 (-0.24, 0.65)
510	Sadler	2013	44	34	0.20 (-0.24, 0.65)
510	Sadler	2013	44	34	0.23 (-0.22, 0.68)
510	Sadler	2013	44	34	0.01 (-0.44, 0.46)
510	Sadler	2013	44	34	0.20 (-0.25, 0.65)
470	Salo	2019	24	21	-0.43 (-1.02, 0.16)
230	Silovsky	2011	43	45	-0.04 (-0.46, 0.38)
332	Silovsky	2023	224	225	-0.23 (-0.42, -0.04)
480	Tsivos	2015	12	9	-0.10 (-0.97, 0.76)
480	Tsivos	2015	12	9	0.30 (-0.57, 1.16)
255	Turner	2006	12	13	-0.49 (-1.29, 0.30)
255	Turner	2006	12	13	-0.60 (-1.40, 0.20)
255	Turner	2006	12	13	-0.42 (-1.21, 0.38)
486	Weihrauch	2014	26	32	-0.93 (-1.47, -0.38)
486	Weihrauch	2014	26	32	-0.78 (-1.32, -0.24)
486	Weihrauch	2014	26	32	0.05 (-0.47, 0.57)
486	Weihrauch	2014	26	32	-0.21 (-0.73, 0.31)
486	Weihrauch	2014	26	32	-0.35 (-0.87, 0.17)
486	Weihrauch	2014	26	32	-0.12 (-0.64, 0.40)
486	Weihrauch	2014	26	32	-0.43 (-0.95, 0.09)
486	Weihrauch	2014	26	32	0.11 (-0.41, 0.63)
486	Weihrauch	2014	26	32	-0.06 (-0.57, 0.46)
486	Weihrauch	2014	26	32	-0.27 (-0.79, 0.25)
400	Whitaker	2020	113	62	-0.19 (-0.51, 0.12)
271	Williams	2020	19	17	-0.32 (-0.98, 0.34)
487	Wittkowski	2022	11	8	-0.45 (-1.37, 0.48)
487	Wittkowski	2022	10	11	-0.15 (-1.00, 0.71)
487	Wittkowski	2022	11	8	-0.71 (-1.65, 0.23)
487	Wittkowski	2022	10	11	-0.26 (-1.12, 0.60)
487	Wittkowski	2022	10	11	0.12 (-0.74, 0.97)
487	Wittkowski	2022	10	11	-0.04 (-0.90, 0.82)
487	Wittkowski	2022	10	11	-0.21 (-1.07, 0.65)
487	Wittkowski	2022	10	11	-0.37 (-1.24, 0.49)
487	Wittkowski	2022	10	11	-0.31 (-1.17, 0.55)
487	Wittkowski	2022	11	8	-0.45 (-1.32, 0.41)
487	Wittkowski	2022	11	8	-0.45 (-1.37, 0.47)
487	Wittkowski	2022	10	11	-0.31 (-1.17, 0.56)
487	Wittkowski	2022	11	8	-0.46 (-1.38, 0.47)
487	Wittkowski	2022	10	11	-0.14 (-1.00, 0.72)
487	Wittkowski	2022	11	8	-0.77 (-1.71, 0.18)
487	Wittkowski	2022	10	11	-0.39 (-1.26, 0.47)
487	Wittkowski	2022	10	11	-0.47 (-1.33, 0.40)
488	Xia	2023	111	72	0.02 (-0.36, 0.40)
489	Zimmer-Gembeck	2022	35	26	-0.32 (-0.83, 0.20)
489	Zimmer-Gembeck	2022	35	26	-0.45 (-0.96, 0.07)
489	Zimmer-Gembeck	2022	35	26	-0.44 (-0.95, 0.07)
498	van Doesum	2008	35	36	0.18 (-0.28, 0.65)
498	van Doesum	2008	35	36	0.17 (-0.30, 0.63)
483	van Leuven	2023	54	56	-0.07 (-0.44, 0.30)
483	van Leuven	2023	54	56	-0.06 (-0.44, 0.31)
Overall					-0.17 (-0.28, -0.06)

Figure 17. Risk of bias for included trials in 0–6 months main effect analysis on parent mental health ([link to raw data](#))

Parenting stress

Thirty-five trials reported parenting stress outcomes. Results showed a small statistically significant effect, with considerable heterogeneity (d = -0.19; 95%CI = -0.31, -0.08; I^2 = 90%, see figure 18).

Studies were conducted in the United States (n = 15), the United Kingdom (n = 6), Australia (n = 5), Denmark (n = 1), Finland (n = 1), Germany (n = 1), Hong Kong (n = 1), Ireland (n = 2), Netherlands (n = 1), Spain (n = 1), and Sweden (n = 1). Sample sizes ranged from 20 to 320 participants. Child mean age ranged from 0 to 9 years.

The following twenty-three programmes were evaluated in the studies: 4rs 2ss Family Strengthening Multiple Family Groups Program, Child First, Circle of Security, HUGS, Incredible Years, Infant Massage Parenting Enhancement Program (IMPEP), Mindfulness-based Therapeutic Parenting, Minding the Baby, Mom Power, My Baby's First Teacher, Parent Aide, Parent-Child Interaction Therapy, Parent-Child Interaction Therapy – Infant Behavior Program, Parent-infant Psychotherapy, Parents as Teachers, Parents under Pressure, Promoting First Relationships, SafeCare, Safer Kids, Step Towards Effective and Enjoyable Parenting (STEEP-B), Supporting Father Involvement, Triple P Online + Integrated Bipolar Parenting Intervention, and VIPP-PMH. Programmes were based on social learning theory (k = 30), attachment theory (k = 5), attachment + other theories (k = 9), social learning theory + attachment theory (k = 2), social learning theory + other theories (k = 6), and other theories (k = 10).

Out of 62 effect sizes, 36 were derived from studies including parents based on risk factors for maltreatment (selective prevention), 6 based on screening high on a child maltreatment instrument (indicated), and 20 based on pre-existing maltreatment in the family (treatment). Out of 62 effect sizes, 20 came from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (60%)

67

(see figure 19). However, most studies were at high risk or unclear risk of bias concerning the blinding of outcome assessors (60%), and selective outcome reporting (63%).

Certainty: Moderate

The moderate certainty assessment was based on a significant small main effect, a large number of included studies, some underpowered studies with some large confidence intervals, overarching low risk of bias, and expected levels of heterogeneity.

Figure 18. Forest plot for the 0–6 months effects of parenting interventions on parenting stress
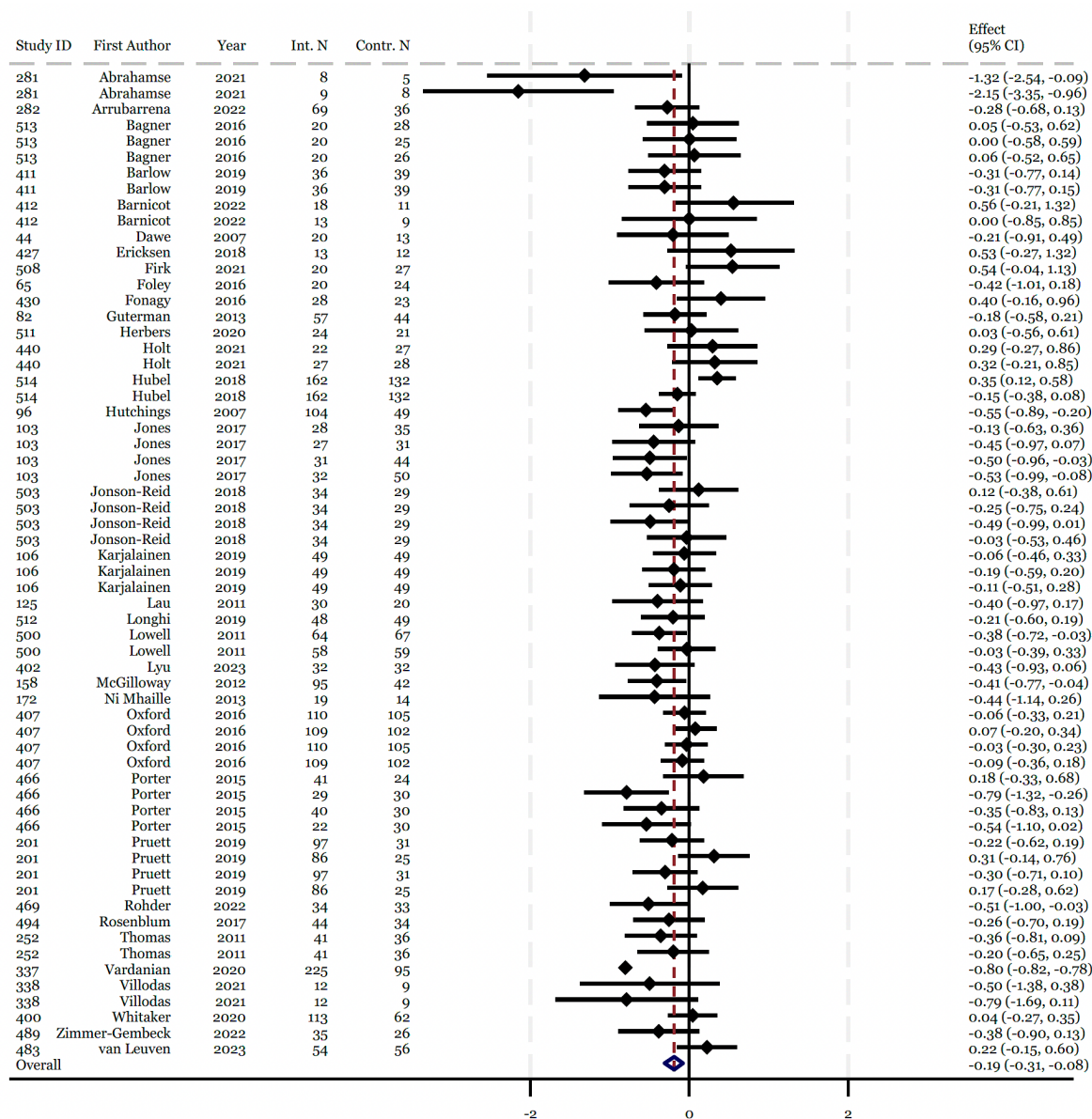
Figure 19. Risk of bias for included trials in 0–6 months main effect analysis on parenting stress ([link to raw data](#))
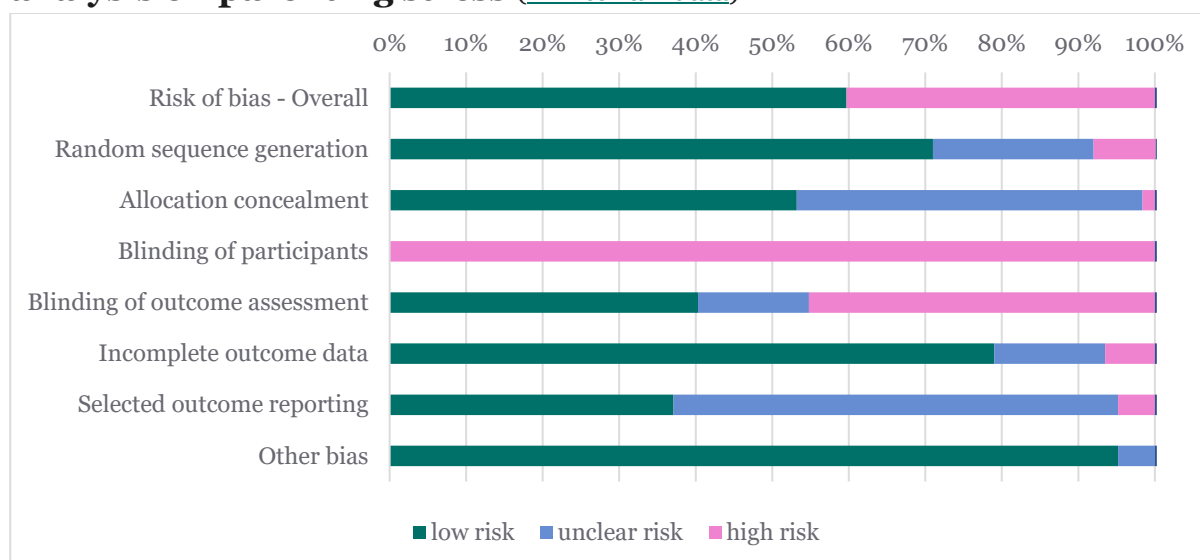
Child behaviour problems overall

Forty-seven trials reported child emotional and behavioural problems overall (combined externalising and internalising behaviours). Results showed a small-to-moderate statistically significant effect, with considerable heterogeneity (d = -0.32; 95%CI = -0.43, -0.22; I^2 = 67%, see figure 20).

Studies were conducted in the United States (n = 22), United Kingdom (n = 10), Australia (n = 5), Canada (n = 2), Finland (n = 1), Germany (n = 1), Ireland (n = 2), Netherlands (n = 2), Spain (n = 1), Sweden (n = 1). Sample sizes ranged from 9 to 739 participants. Child mean age ranged from prenatal to 9 years. Twenty-seven programmes were evaluated in the studies: 4rs 2ss Family Strengthening Multiple Family Groups Program, Child First, Circle of Security, Early Pathways, Enhancing Parenting Skills Programme, Fathering in Recovery, Helping Families Programme, HUGS, i-Interact,Incredible Years, Minding the Baby, Mother-Baby Intervention, Nurse-Family Partnership, Parent-Child Interaction Therapy, Parent-Child Interaction Therapy – Infant Behavior Program, Parental Training for Lone Mothers guided by Educators (PALME), Parents under Pressure, Parent Management Training Oregon (PMTO), PRICARE, Programme en Intervention Relationnelle, Project Support, Promoting First Relationships, Safer Kids, Supporting Father Involvement, Triple P, Triple P Online + Integrated Bipolar Parenting Intervention, and VIPP-PMH. Programmes were based on social learning theory (k = 157), attachment theory (k = 11), attachment + other theories (k = 6), social learning theory + attachment theory (k = 5), social learning theory + other theories (k = 22), and other theories (k = 8).

Out of 209 effect sizes, 166 were derived from studies including parents based on risk factors for maltreatment (selective prevention), ten based on screening high on a child maltreatment instrument (indicated), and 33 based on pre-existing maltreatment in the family (treatment). Out of 209 effect sizes, 137 came from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (58%)

(see figure 21). However, most studies were at high risk or unclear risk of bias concerning allocation concealment (60%), blinding of outcome assessors (50%), and selective outcome reporting (75%).

Certainty: High

The high certainty assessment was based on the small to moderate effect size, a confidence interval of the average effect far away from zero, a large number of studies, expected levels of heterogeneity, and an overarching low risk of bias.

Figure 20. Forest plot for the 0–6 months effects of parenting interventions on child behaviour problems

Figure 21. Risk of bias for included trials in 0–6 months main effect analysis on child behaviour problems ([link to raw data](link))
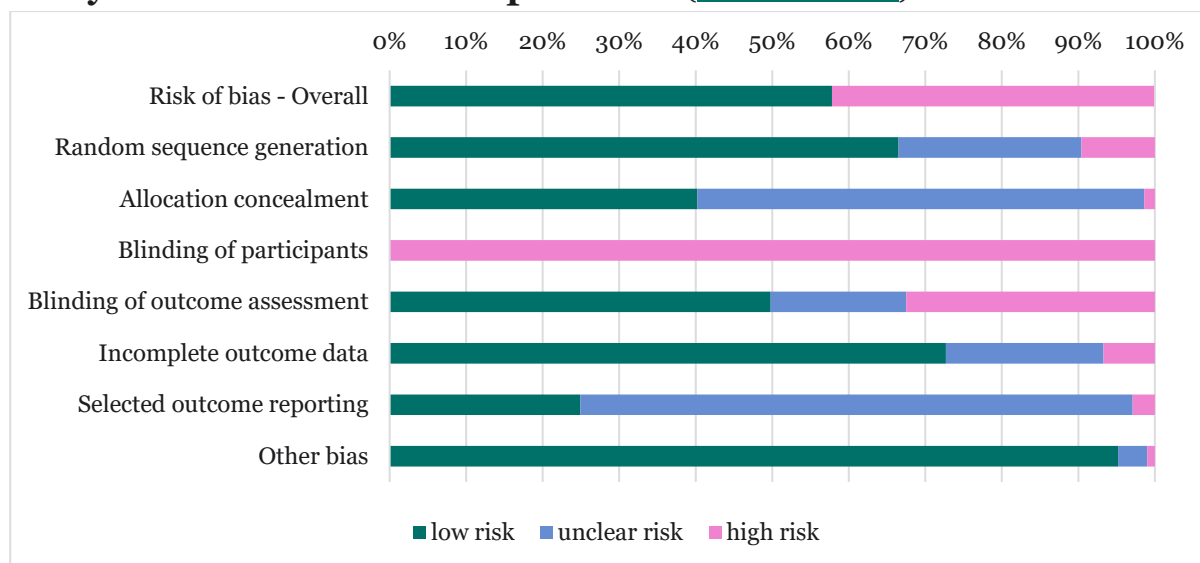
Child externalising behaviours

Forty-two trials reported child externalising behaviour problems. Results showed a small-to-moderate statistically significant effect, with considerable heterogeneity (d = -0.32; 95%CI = 0.44, -0.21; I^2 = 69%, see figure 22).

Studies were conducted in the United States (n = 21), United Kingdom (n = 9), Australia (n = 4), Canada (n = 2), Finland (n = 1), Ireland (n = 2), Netherlands (n = 2), and Spain (n = 1). Sample sizes ranged from 9 to 739 participants. Child mean age ranged from prenatal to 9 years.

The following twenty-three programmes were evaluated in the studies: 4rs 2ss Family Strengthening Multiple Family Groups Program, Child First, Circle of Security, Early Pathways, Enhancing Parenting Skills Programme, Helping Families Programme, HUGS, i-Interact, Incredible Years, Minding the Baby, Mother-Baby Intervention, Nurse-Family Partnership, Parent-Child Interaction Therapy, Parent-Child Interaction Therapy – Infant Behavior Program, Parent Management Training Oregon (PMTO), PRICARE, Programme en Intervention Relationnelle, Project Support, Promoting First Relationships, Supporting Father Involvement, Triple P, Triple P Online + Integrated Bipolar Parenting Intervention, and VIPP-PMH. Programmes were based on social learning theory (k = 127), attachment theory (k = 6), attachment + other theories (k = 3), social learning theory + attachment theory (k = 5), social learning theory + other theories (k = 15), and other theories (k = 3).

Out of 159 effect sizes, 130 were derived from studies including parents based on risk factors for maltreatment (selective prevention), eight based on screening high on a child maltreatment instrument (indicated), and 21 based on pre-existing maltreatment in the family (treatment). Out of 159 effect sizes, 113 came from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (56%) (see figure 23). However, most studies were at high risk or unclear risk of bias concerning allocation concealment (60%), and selective outcome reporting (75%).

Certainty: High

The high certainty assessment was based on the small to moderate effect size, a confidence interval of the average summary effect far away from zero, a large number of studies, expected levels of heterogeneity, and an overarching low risk of bias.

Figure 22. Forest plot for the 0–6 months effects of parenting interventions on child externalising behaviours
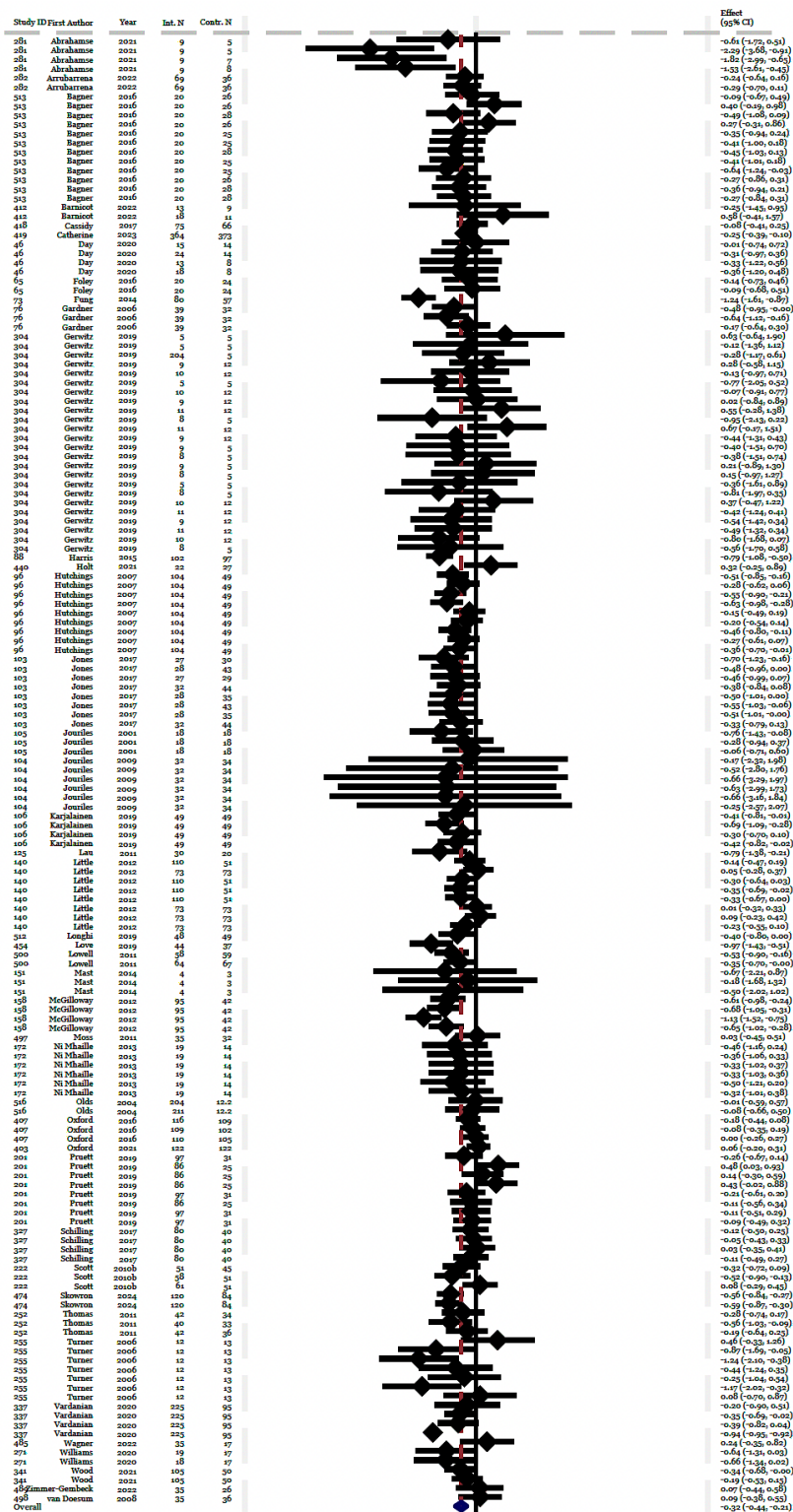
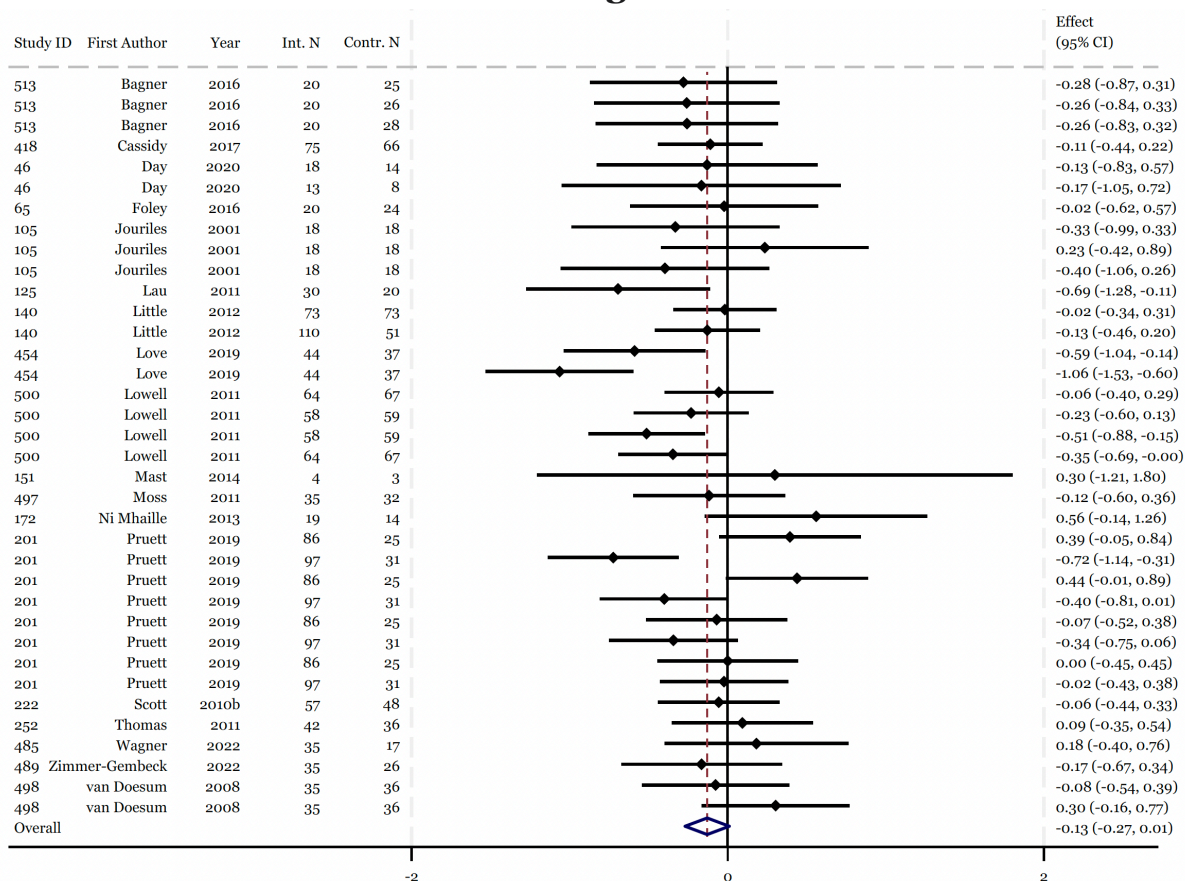## Figure 23. Risk of bias for included trials in 0–6 months main effect analysis on child externalising behaviours (link to raw data)
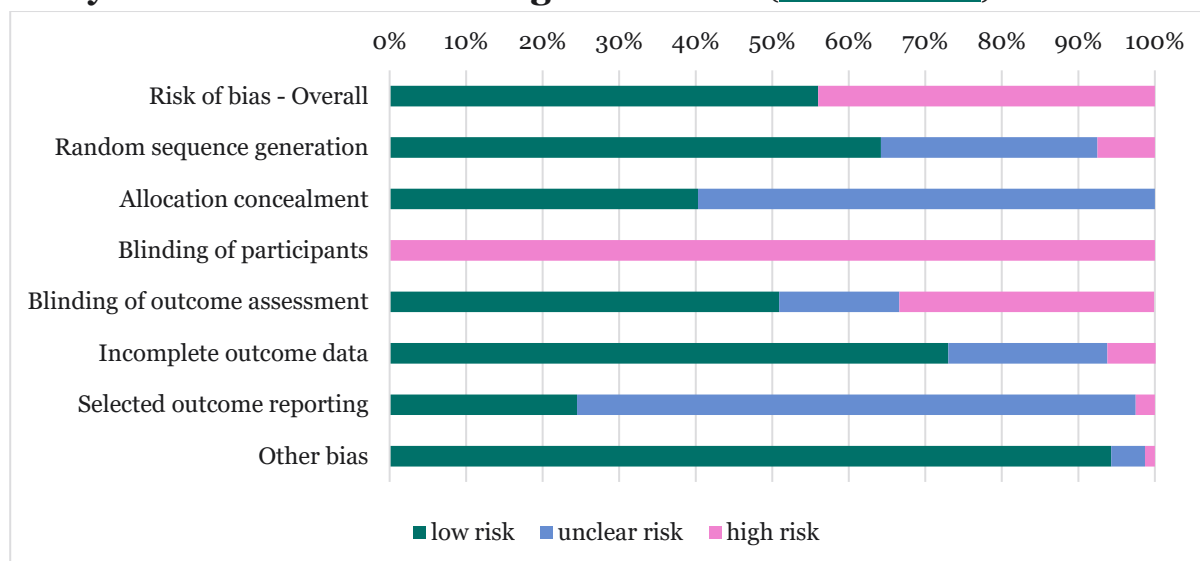
Child internalising behaviours

Eighteen trials reported child externalising behaviour problems. Results showed a small statistically non-significant effect, with moderate levels of heterogeneity (d = -0.13; 95%CI = -0.27, 0.01; I^2 = 46%, see figure 24). We note that the confidence interval is close to 0, and that the summary effect is in the expected direction.

Studies were conducted in the United States (n = 10), United Kingdom (n = 3), Australia (n = 2), Canada (n = 1), Ireland (n = 1), and the Netherlands (n = 1). Sample sizes ranged from 9 to 284 participants. Child mean age ranged from 0 to 8 years. Thirteen programmes were evaluated in the studies: Child First, Circle of Security, Early Pathways, Helping Families Programme, i-Interact, Incredible Years, Mother-Baby Intervention, Parent-Child Interaction Therapy, Parent-Child Interaction Therapy – Infant Behavior Program, Programme en Intervention Relationnelle, Project Support, Supporting Father Involvement, and Triple P. Programmes were based on social learning theory (k = 25), social learning + other theories (k = 2), attachment theory (k = 3), attachment + other theories (k = 2), and other theories (k = 4).

Out of 36 effect sizes, 23 were derived from studies including parents based on risk factors for maltreatment (selective prevention), two based on screening high on a child maltreatment instrument (indicated), and 11 based on pre-existing maltreatment in the family (treatment). Out of 36 effect sizes, 20 came from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (58%) (see figure 25). However, most studies were at high risk or unclear risk of bias concerning allocation concealment (69%), blinding of outcome assessors (58%), and selective outcome reporting (86%).

Certainty: Low

The low certainty assessment was based on the confidence interval of the average effect just crossing zero, a fair number of studies, a small average effect size, some underpowered studies with large confidence intervals, moderate heterogeneity, and high/unclear risk of bias for important criteria.

Figure 24. Forest plot for the 0–6 months effects of parenting interventions on child internalising behaviours

Study ID	First Author	Year	Int. N	Contr. N	Effect (95% CI)
513	Bagner	2016	20	25	-0.28 (-0.87, 0.31)
513	Bagner	2016	20	26	-0.26 (-0.84, 0.33)
513	Bagner	2016	20	28	-0.26 (-0.83, 0.32)
418	Cassidy	2017	75	66	-0.11 (-0.44, 0.22)
46	Day	2020	18	14	-0.13 (-0.83, 0.57)
46	Day	2020	13	8	-0.17 (-1.05, 0.72)
65	Foley	2016	20	24	-0.02 (-0.62, 0.57)
105	Jouriles	2001	18	18	-0.33 (-0.99, 0.33)
105	Jouriles	2001	18	18	0.23 (-0.42, 0.89)
105	Jouriles	2001	18	18	-0.40 (-1.06, 0.26)
125	Lau	2011	30	20	-0.69 (-1.28, -0.11)
140	Little	2012	73	73	-0.02 (-0.34, 0.31)
140	Little	2012	110	51	-0.13 (-0.46, 0.20)
454	Love	2019	44	37	-0.59 (-1.04, -0.14)
454	Love	2019	44	37	-1.06 (-1.53, -0.60)
500	Lowell	2011	64	67	-0.06 (-0.40, 0.29)
500	Lowell	2011	58	59	-0.23 (-0.60, 0.13)
500	Lowell	2011	58	59	-0.51 (-0.88, -0.15)
500	Lowell	2011	64	67	-0.35 (-0.69, -0.00)
151	Mast	2014	4	3	0.30 (-1.21, 1.80)
497	Moss	2011	35	32	-0.12 (-0.60, 0.36)
172	Ni Mhaille	2013	19	14	0.56 (-0.14, 1.26)
201	Pruett	2019	86	25	0.39 (-0.05, 0.84)
201	Pruett	2019	97	31	-0.72 (-1.14, -0.31)
201	Pruett	2019	86	25	0.44 (-0.01, 0.89)
201	Pruett	2019	97	31	-0.40 (-0.81, 0.01)
201	Pruett	2019	86	25	-0.07 (-0.52, 0.38)
201	Pruett	2019	97	31	-0.34 (-0.75, 0.06)
201	Pruett	2019	86	25	0.00 (-0.45, 0.45)
201	Pruett	2019	97	31	-0.02 (-0.43, 0.38)
222	Scott	2010b	57	48	-0.06 (-0.44, 0.33)
252	Thomas	2011	42	36	0.09 (-0.35, 0.54)
485	Wagner	2022	35	17	0.18 (-0.40, 0.76)
489	Zimmer-Gembeck	2022	35	26	-0.17 (-0.67, 0.34)
498	van Doesum	2008	35	36	-0.08 (-0.54, 0.39)
498	van Doesum	2008	35	36	0.30 (-0.16, 0.77)
Overall					-0.13 (-0.27, 0.01)

Figure 25. Risk of bias for included trials in 0–6 months main effect analysis on child internalising behaviours (link to raw data)
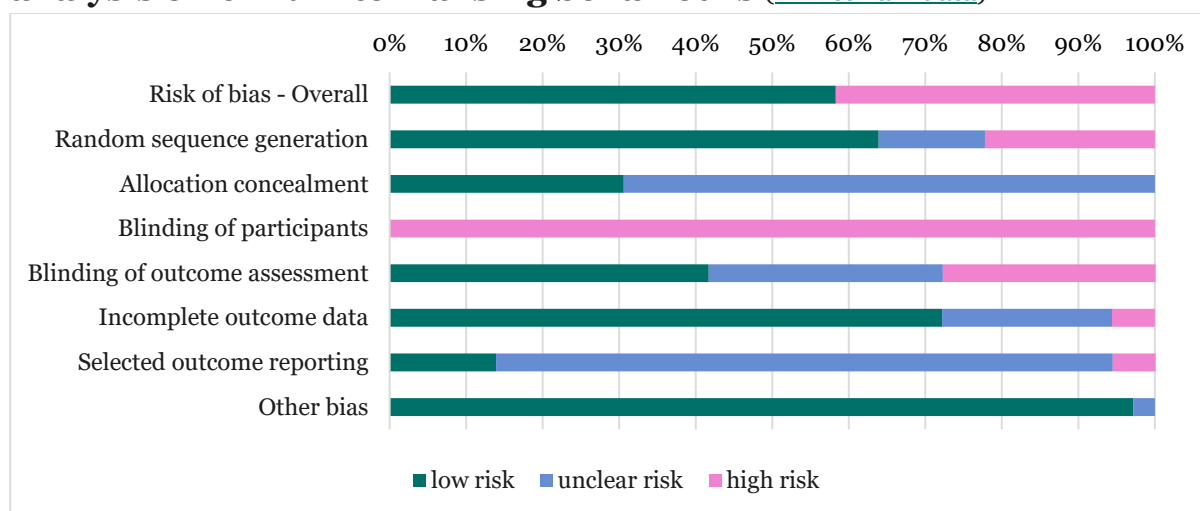
Child wellbeing

Eight trials reported child wellbeing outcomes. Results showed a small-to-moderate statistically significant effect, with moderate levels of heterogeneity (d = 0.30; 95%CI = 0.10, 0.50; I^2 = 42%, see figure 26).

Studies were conducted in the United States (n = 4), Australia (n = 1), Ireland (n = 1), Sweden (n = 1), and United Kingdom (n = 1). Sample sizes ranged from 33 to 288 participants. Child mean age ranged from 2 to 7 years. Six programmes were evaluated in the studies: Early Pathways, Incredible Years, Parents under Pressure, SafeCare, Safer Kids, and Triple P. Programmes were based on social learning theory (k = 17), social learning theory + other theories (k = 2), attachment + other theories (k = 1), and other theories (k = 1).

Out of 21 effect sizes, seven were derived from studies including parents based on risk factors for maltreatment (selective prevention), and 14 based on pre-existing maltreatment in the family (treatment). Out of 21 effect sizes, six came from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (85%) (see figure 27). However, most studies were at high risk or unclear risk of bias concerning random sequence generation (60%), allocation concealment (85%), and blinding of outcome assessors (90%).

Certainty: Low to moderate

The low to moderate certainty assessment was based on a significant small to moderate main effect, a small number of included studies, large confidence intervals around effect sizes, overarching low risk of bias, and low levels of heterogeneity.

Figure 26. Forest plot for the 0−6 months effects of parenting interventions on child wellbeing

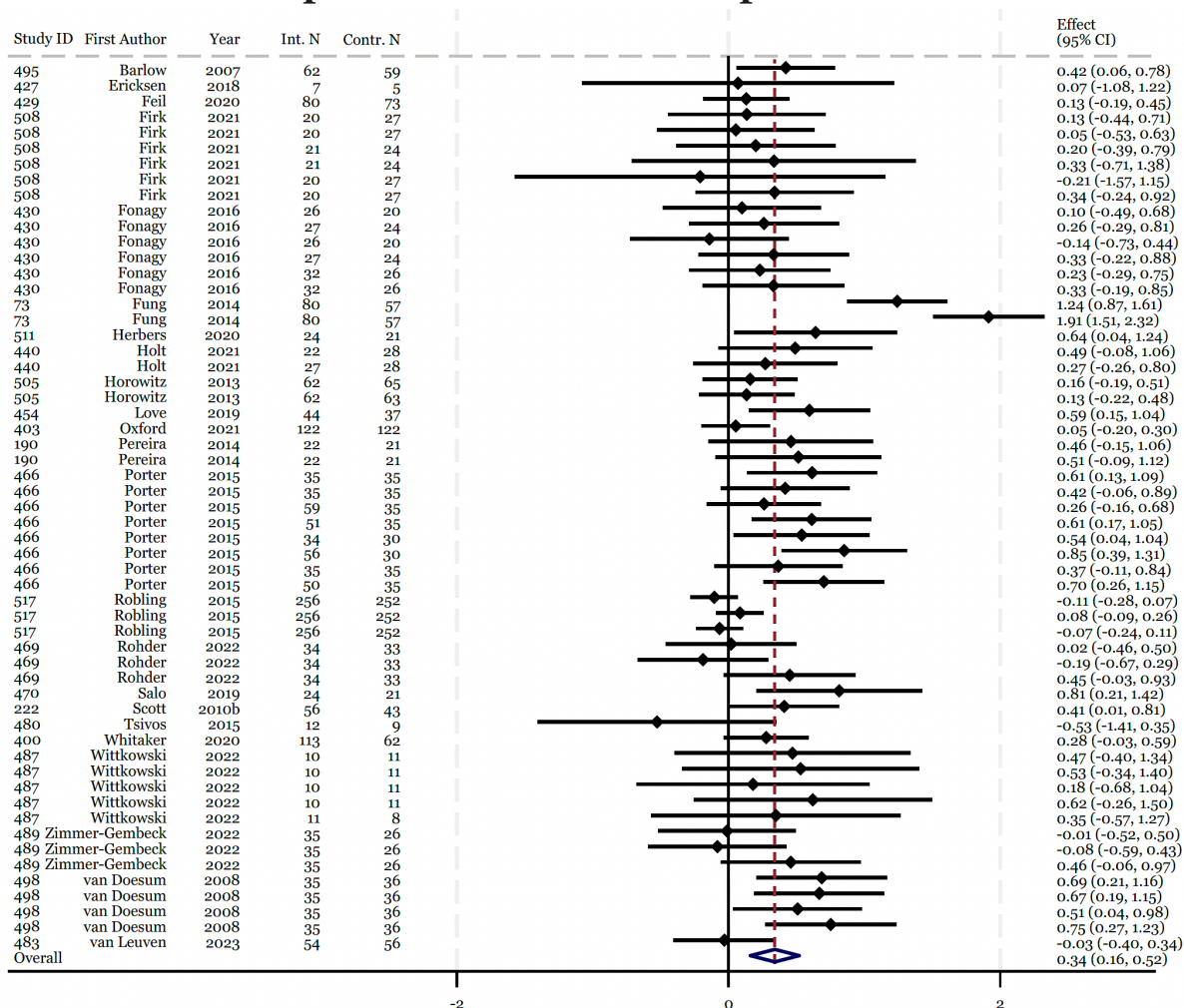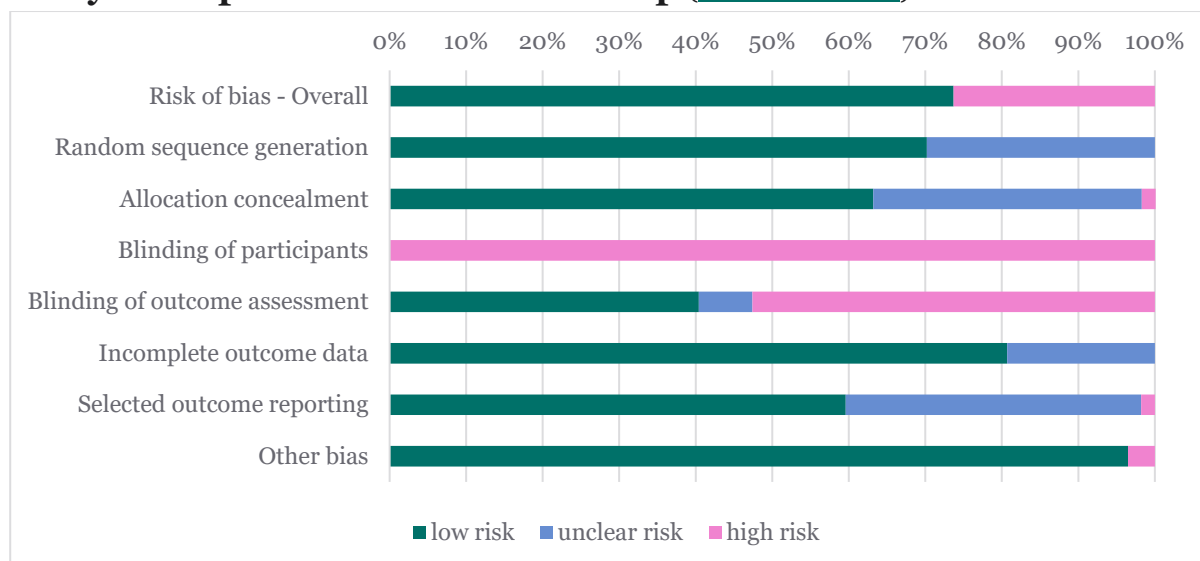| Study ID	First Author	Year	Int. N	Contr. N		Effect (95% CI)
44	Dawe	2007	20	13		0.18 (-0.52, 0.88)
73	Fung	2014	80	57		0.69 (0.34, 1.04)
88	Harris	2015	102	97		0.42 (0.13, 0.70)
123	Lanier	2018	52	62		0.44 (0.07, 0.81)
123	Lanier	2018	43	54		0.29 (-0.12, 0.69)
123	Lanier	2018	52	62		0.29 (-0.08, 0.66)
123	Lanier	2018	43	54		0.16 (-0.24, 0.57)
123	Lanier	2018	43	54		0.59 (0.18, 1.00)
123	Lanier	2018	43	54		0.43 (0.02, 0.84)
123	Lanier	2018	43	54		0.18 (-0.22, 0.59)
123	Lanier	2018	43	54		0.41 (0.01, 0.82)
123	Lanier	2018	52	62		0.16 (-0.21, 0.53)
123	Lanier	2018	52	62		0.07 (-0.30, 0.44)
123	Lanier	2018	52	62		0.37 (-0.00, 0.74)
123	Lanier	2018	52	62		0.38 (0.01, 0.75)
140	Little	2012	73	73		0.12 (-0.21, 0.44)
140	Little	2012	110	51		0.20 (-0.14, 0.53)
172	Ni Mhaille	2013	19	14		0.30 (-0.39, 1.00)
172	Ni Mhaille	2013	19	14		-0.32 (-1.01, 0.38)
400	Whitaker	2020	113	62		0.07 (-0.24, 0.38)
483	van Leuven	2023	54	56		0.30 (-0.07, 0.68)
Overall						0.30 (0.10, 0.50)

Figure 27. Risk of bias for included trials in 0−6 months main effect analysis on child wellbeing ([link to raw data](#))
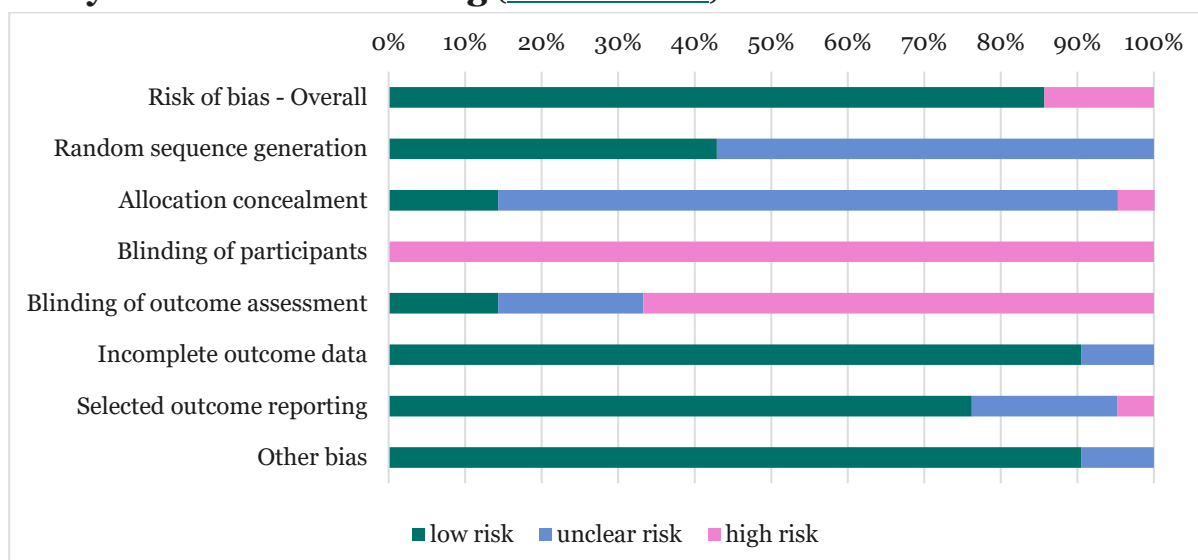
Child attachment

Eleven trials reported child attachment outcomes. Results showed a moderate statistically significant effect, with considerable levels of heterogeneity (d = 0.44, 95%CI = 0.05, 0.83, I^2 = 80%, see figure 28).

Studies were conducted in the United States (n= 5), United Kingdom (n = 2), Germany (n = 2), Canada (n = 1), and the Netherlands (n = 1). Sample sizes ranged from 34 to 288 participants. Child mean age ranged from prenatal to 3 years. The following Eight programmes were evaluated in the studies: Child-Parent Psychotherapy, Circle of Security, Minding the Baby, Mother-Baby Intervention, Parent-Infant Psychotherapy, Programme en Intervention Relationelle, Promoting First Relationships, and SafeCare. Programmes were based on attachment theory (k = 8), attachment + other theories (k = 4), social learning theory (n = 1), and other theories (k = 3).

Out of 16 effect sizes, seven were derived from studies including parents based on risk factors for maltreatment (selective prevention), and nine based on pre-existing maltreatment in the family (treatment). Out of 16 effect sizes, no study included children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (75%) (see figure 29). However, most studies were at high risk or unclear risk of bias concerning allocation concealment (50%), and selective outcome reporting (81%).

Certainty: Low to moderate

The low to moderate certainty assessment was based on a significant moderate main effect, a small number of included studies, large confidence intervals around effect sizes, overarching low risk of bias, and expected levels of heterogeneity.

Figure 28. Forest plot for the 0−6 months effects of parenting interventions on child attachment

Study ID	First Author	Year	Int. N	Contr. N	Effect (95% CI)
418	Cassidy	2017	75	66	-0.01 (-0.34, 0.32)
501	Cicchetti	2006	28	54	2.43 (1.26, 3.60)
430	Fonagy	2016	28	25	0.30 (-0.38, 0.98)
512	Longhi	2019	48	49	0.32 (-0.08, 0.72)
456	Mattheß	2021	4	7	0.38 (-1.33, 2.09)
497	Moss	2011	35	32	0.88 (0.31, 1.45)
407	Oxford	2016	110	105	0.00 (-0.27, 0.27)
407	Oxford	2016	109	102	0.16 (-0.11, 0.43)
407	Oxford	2016	116	109	0.03 (-0.23, 0.29)
407	Oxford	2016	110	105	0.05 (-0.22, 0.32)
407	Oxford	2016	116	109	0.05 (-0.21, 0.31)
407	Oxford	2016	109	102	0.18 (-0.09, 0.45)
467	Ramsauer	2020	33	31	0.13 (-0.43, 0.68)
499	Toth	2006	46	54	1.29 (0.77, 1.81)
400	Whitaker	2020	113	62	-0.14 (-0.45, 0.17)
498	van Doesum	2008	35	36	0.46 (-0.01, 0.93)
Overall					0.44 (0.05, 0.83)

Figure 29. Risk of bias for included trials in 0–6 months main effect analysis on child attachment ([link to raw data](#))
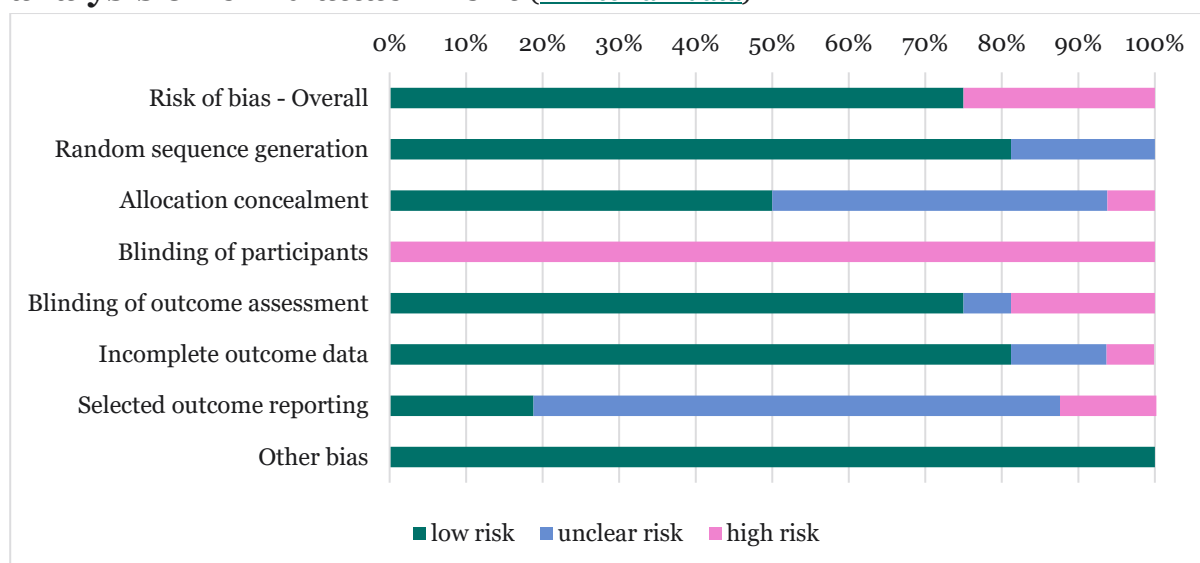
Parent–child relationship

Twenty-three trials reported parent–child relationship outcomes. Results showed a small-to-moderate statistically significant effect, with considerable levels of heterogeneity (d = 0.34; 95%CI = 0.16, 0.52; I^2 = 76%, see figure 30).

Studies were conducted in the United States (n = 8), United Kingdom (n = 6), Australia (n = 3), Denmark (n = 1), Finland (n = 1), Germany (n = 1), Netherlands (n = 1), Portugal (n = 1), and Sweden (n = 1). Sample sizes ranged from 27 to 1,537 participants. Child mean age ranged from prenatal to 7 years.

The following 19 programmes were evaluated in the studies: Circle of Security, Communicating and Relating Effectively (CARE), Early Pathways, Family Partnership Model, HUGS, Incredible Years, Infant Massage Parenting Enhancement Program (IMPEP), Mother-Baby Intervention, My Baby's First Teacher, Nurse-Family Partnership, Nurture and Play, Parent-Infant Psychotherapy, Play and Learning Strategies, Promoting First Relationships, SafeCare, Safer Kids, Step Towards Effective and Enjoyable Parenting (STEEP-B), Baby Triple P, and VIPP-SD. Programmes were based on social learning theory (k = 9), social learning theory + other theories (4), social learning theory + attachment theory (k = 5), attachment theory (k = 12), attachment + other theories (k = 9), and other theories (k = 18).

Out of 57 effect sizes, 53 were derived from studies including parents based on risk factors for maltreatment (selective prevention), two based on screening high on a child maltreatment instrument (indicated), and two based on pre-existing maltreatment in the family (treatment). Out of 57 effect sizes, seven came from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (74%) (see figure 31). However, most studies were at high risk or unclear risk of bias concerning blinding of outcome assessors (60%).

Certainty: Moderate

The moderate certainty assessment was based on a significant small to moderate main effect, a fair number of included studies, large confidence intervals around effect sizes, overarching low risk of bias, and expected levels of heterogeneity.

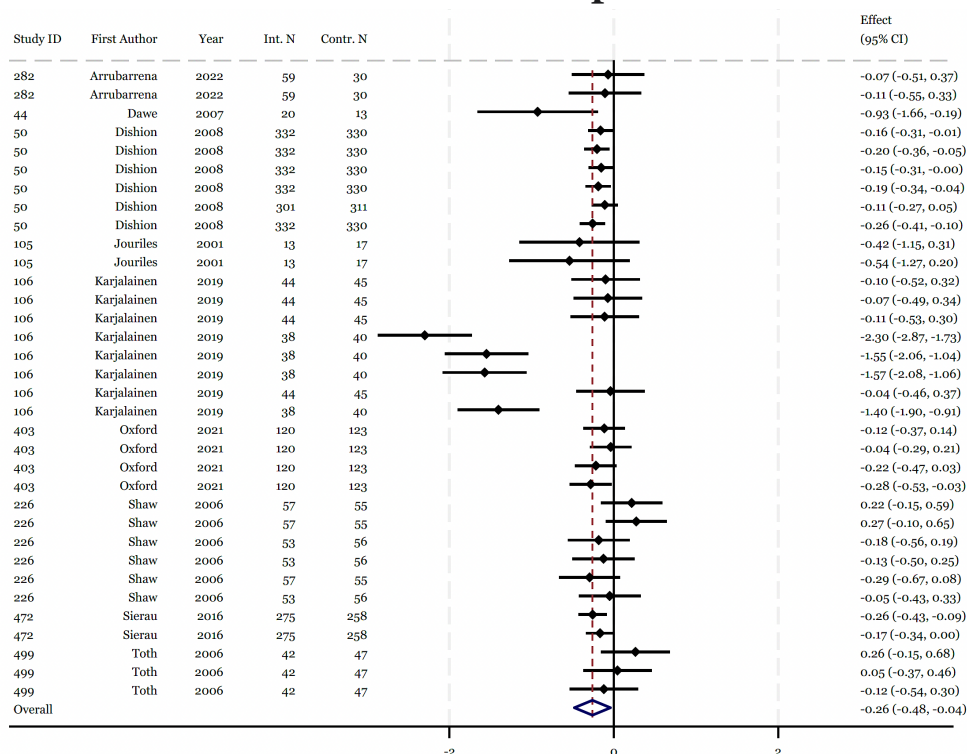## Figure 30. Forest plot for the 0−6 months effects of parenting interventions on parent−child relationship

Study ID	First Author	Year	Int. N	Contr. N	Effect (95% CI)
495	Barlow	2007	62	59	0.42 (0.06, 0.78)
427	Ericksen	2018	7	5	0.07 (-1.08, 1.22)
429	Feil	2020	80	73	0.13 (-0.19, 0.45)
508	Firk	2021	20	27	0.13 (-0.44, 0.71)
508	Firk	2021	20	27	0.05 (-0.53, 0.63)
508	Firk	2021	21	24	0.20 (-0.39, 0.79)
508	Firk	2021	21	24	0.33 (-0.71, 1.38)
508	Firk	2021	20	27	-0.21 (-1.57, 1.15)
508	Firk	2021	20	27	0.34 (-0.24, 0.92)
430	Fonagy	2016	26	20	0.10 (-0.49, 0.68)
430	Fonagy	2016	27	24	0.26 (-0.29, 0.81)
430	Fonagy	2016	26	20	-0.14 (-0.73, 0.44)
430	Fonagy	2016	27	24	0.33 (-0.22, 0.88)
430	Fonagy	2016	32	26	0.23 (-0.29, 0.75)
430	Fonagy	2016	32	26	0.33 (-0.19, 0.85)
73	Fung	2014	80	57	1.24 (0.87, 1.61)
73	Fung	2014	80	57	1.91 (1.51, 2.32)
511	Herbers	2020	24	21	0.64 (0.04, 1.24)
440	Holt	2021	22	28	0.49 (-0.08, 1.06)
440	Holt	2021	27	28	0.27 (-0.26, 0.80)
505	Horowitz	2013	62	65	0.16 (-0.19, 0.51)
505	Horowitz	2013	62	63	0.13 (-0.22, 0.48)
454	Love	2019	44	37	0.59 (0.15, 1.04)
403	Oxford	2021	122	122	0.05 (-0.20, 0.30)
190	Pereira	2014	22	21	0.46 (-0.15, 1.06)
190	Pereira	2014	22	21	0.51 (-0.09, 1.12)
466	Porter	2015	35	35	0.61 (0.13, 1.09)
466	Porter	2015	35	35	0.42 (-0.06, 0.89)
466	Porter	2015	59	35	0.26 (-0.16, 0.68)
466	Porter	2015	51	35	0.61 (0.17, 1.05)
466	Porter	2015	34	30	0.54 (0.04, 1.04)
466	Porter	2015	56	30	0.85 (0.39, 1.31)
466	Porter	2015	35	35	0.37 (-0.11, 0.84)
466	Porter	2015	50	35	0.70 (0.26, 1.15)
517	Robling	2015	256	252	-0.11 (-0.28, 0.07)
517	Robling	2015	256	252	0.08 (-0.09, 0.26)
517	Robling	2015	256	252	-0.07 (-0.24, 0.11)
469	Rohder	2022	34	33	0.02 (-0.46, 0.50)
469	Rohder	2022	34	33	-0.19 (-0.67, 0.29)
469	Rohder	2022	34	33	0.45 (-0.03, 0.93)
470	Salo	2019	24	21	0.81 (0.21, 1.42)
222	Scott	2010b	56	43	0.41 (0.01, 0.81)
480	Tsivos	2015	12	9	-0.53 (-1.41, 0.35)
400	Whitaker	2020	113	62	0.28 (-0.03, 0.59)
487	Wittkowski	2022	10	11	0.47 (-0.40, 1.34)
487	Wittkowski	2022	10	11	0.53 (-0.34, 1.40)
487	Wittkowski	2022	10	11	0.18 (-0.68, 1.04)
487	Wittkowski	2022	10	11	0.62 (-0.26, 1.50)
487	Wittkowski	2022	11	8	0.35 (-0.57, 1.27)
489	Zimmer-Gembeck	2022	35	26	-0.01 (-0.52, 0.50)
489	Zimmer-Gembeck	2022	35	26	-0.08 (-0.59, 0.43)
489	Zimmer-Gembeck	2022	35	26	0.46 (-0.06, 0.97)
498	van Doesum	2008	35	36	0.69 (0.21, 1.16)
498	van Doesum	2008	35	36	0.67 (0.19, 1.15)
498	van Doesum	2008	35	36	0.51 (0.04, 0.98)
498	van Doesum	2008	35	36	0.75 (0.27, 1.23)
483	van Leuven	2023	54	56	-0.03 (-0.40, 0.34)
Overall					0.34 (0.16, 0.52)

Figure 31. Risk of bias for included trials in 0–6 months main effect analysis on parent–child relationship ([link to raw data](#))

Physiological outcomes

Two studies reported on physiological outcomes and their findings are described narratively. These studies found very limited to no evidence of an effect. The pilot study by Tryphonopoulos and Letourneau (2020) tested the effects of a video-feedback interaction guidance intervention (VID-KIDS) on the cortisol patterns of depressed mothers and their infants. The treatment and control groups did not differ on overall concentration of cortisol at the end of the intervention. It should, however, be noted that the study sample size was very small (control n = 6, intervention n = 6), and the study was assessed to be at high risk of bias.

The trial by Porter (2015) evaluated the effects of the Infant Massage Parenting Enhancement Program (IMPEP) on physiological dimensions of parenting stress among recovering substance-addicted mothers. This involved systolic and diastolic blood pressure and waist-to-hip ratio measurements among mothers at 2 and 6 weeks post-intervention. Waist-to-hip ratio was used as an indirect marker of fat deposition related to cortisol stress hormone levels with higher ratios reflecting greater stress levels. No significant between-group differences were found except for waist-to-hip ratio at 2 weeks post-intervention, after which the ratio began to increase again at week 8. The study was assessed to be at high risk of bias.

Educational attendance and attainment

No studies reported 0–6 months post-intervention effects for these outcomes.

Out of home placements and reunification rates

No studies reported 0–6 months post-intervention effects for these outcomes.

Beyond 6 months post-intervention effects

This section reports on the main effect results measured any time after six months following the end of the intervention. A much smaller number of trials assessed outcomes beyond 6 months. In total, we extracted 111 effect sizes from 16 trials reported after six months post-test. The longest follow-up was 73.5 months.

Table 3. Main effect results of all outcomes beyond 6 months post-test

Outcome	No. of trials	No. of effect sizes	Effect size (Cohen's d)	Confidence interval of effect size	Hetero-geneity (I^2)
Maltreatment including harsh parenting	5	8	-0.12	Unreliable	
Child abuse risk	3	3	-0.17	Unreliable	
Negative parenting	4	7	-0.18	Unreliable	
Positive parenting	7	12	0.20	Unreliable	
Parent mental health	5	6	-0.08	Unreliable	
Parenting stress	3	4	-0.30	Unreliable	
Child behaviour problems overall	9	34	-0.26*	-0.48, -0.04	77%
Externalising child behaviours	8	28	-0.23*	-0.42, -0.03	75%
Internalising child behaviours	4	5	-0.12	Unreliable	
Child wellbeing	2	3	-0.16	Unreliable	
Child attachment	1				
Parent-child relationship	2	3	0.15	Unreliable	

Note: p-value ranges: 0.05 – 0.01= *, 0.01 – 0.001= **, <.0001=***
Colour-coding: green = significant, grey = too few studies for reliable estimate

The majority of these main effect results were unreliable due to few trials assessing outcomes after six months following the end of the intervention. These unreliable effect sizes were generally small, with all but one below Cohen's d = 0.20. We describe the two main effect results with reliable analyses: child behaviour problems overall and externalising child behaviours.

Maltreatment including harsh parenting

Five trials reported maltreatment and harsh parenting outcomes; however, results were unreliable due to few trials assessing this outcome after six months following the end of the intervention. The following five programmes were evaluated in the studies: Healthy Families (k = 1), Incredible Years (k = 1), Nurse-Family Partnership (k = 1), Project Support (k = 1), and SafeCare (k = 4). All of the included studies were assessed to have low risk of bias.

Child abuse risk

Three trials reported child abuse risk outcomes; however, results were unreliable due to few trials assessing this outcome after six months following the end of the intervention. The following three programmes were evaluated in the studies: Incredible Years (k = 1), Parents Under Pressure (k = 1), and SafeCare (k = 1). All of the included studies were assessed to have low risk of bias.

Negative parenting

Four trials reported negative parenting outcomes; however, results were unreliable due to few trials assessing this outcome after six months following the end of the intervention. The following four programmes were evaluated in the studies: Child-Parent Psychotherapy (k = 3), Family Check-Up (k = 2), Healthy Families (k = 1), and Incredible Years (k = 1). Two of the included studies were assessed to have low risk of bias while the remaining two were assessed to have high risk of bias.

Positive parenting

Seven trials reported positive parenting outcomes; however, results were unreliable due to few trials assessing this outcome after six months following the end of the intervention. The following six programmes were evaluated in the studies: Child-Parent Psychotherapy (k = 2), Family Check-Up (k = 5), Healthy Families (k = 1), Incredible Years (k = 2), Promoting First Relationships (k = 1), and SafeCare (k = 1). The majority of included studies were assessed to have low risk of bias (71%).

Poor parent mental health

Five trials reported parent mental health outcomes; however, results were unreliable due to few trials assessing this outcome after six months following the end of the intervention. The following four programmes were evaluated in the studies: Focused Coparenting Consultation (k = 2), Healthy Families (k = 1), Incredible Years (k = 1), and SafeCare (k = 2). The majority of included studies were assessed to have low risk of bias (60%).

Parenting stress

Three trials reported parenting stress outcomes; however, results were unreliable due to few trials assessing this outcome after six months following the end of the intervention. The following three programmes were evaluated in the studies: Healthy Families (k = 2), Incredible Years (k = 1), and Parents Under Pressure (k = 1). The majority of included studies were assessed to have low risk of bias (67%).

Child behaviour problems overall

Nine trials reported child emotional and behavioural problems overall (combined externalising and internalising behaviours). Results showed a small statistically significant effect, with considerable heterogeneity (d = -0.26; 95%CI = -0.48, -0.04; I^2 = 77%, see figure 32).

Studies were conducted in the United States (n = 5), Australia (n = 1), Finland (n = 1), Germany (n = 1), and Spain (n = 1). Sample sizes ranged from 36 to 755 participants. Child mean age ranged from 0 to 7 years.

The following seven programmes were evaluated in the studies: Child-Parent Psychotherapy, Family Check-Up, Incredible Years, Nurse-Family Partnership, Parents Under Pressure, Project Support, and Promoting First Relationships. Programmes were based on social learning theory (k = 24), attachment theory (k = 4), attachment + other theories (k = 4), and social learning theory + attachment theory (k = 2).

Out of 34 effect sizes, 32 were derived from studies including parents based on risk factors for maltreatment (selective prevention), and two based on pre-existing maltreatment in the family (treatment). Out of 34 effect sizes, 12 came from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (91%) (see figure 33).

Certainty: Moderate

The moderate certainty assessment was based on a significant small main effect, a fair number of included studies, some underpowered studies with some large confidence intervals, overarching low risk of bias, and expected levels of heterogeneity.

Figure 32. Forest plot for the beyond 6 months effects of parenting interventions on child behaviour problems

Study ID	First Author	Year	Int. N	Contr. N	Effect (95% CI)
282	Arrubarrena	2022	59	30	-0.07 (-0.51, 0.37)
282	Arrubarrena	2022	59	30	-0.11 (-0.55, 0.33)
44	Dawe	2007	20	13	-0.93 (-1.66, -0.19)
50	Dishion	2008	332	330	-0.16 (-0.31, -0.01)
50	Dishion	2008	332	330	-0.20 (-0.36, -0.05)
50	Dishion	2008	332	330	-0.15 (-0.31, -0.00)
50	Dishion	2008	332	330	-0.19 (-0.34, -0.04)
50	Dishion	2008	301	311	-0.11 (-0.27, 0.05)
50	Dishion	2008	332	330	-0.26 (-0.41, -0.10)
105	Jouriles	2001	13	17	-0.42 (-1.15, 0.31)
105	Jouriles	2001	13	17	-0.54 (-1.27, 0.20)
106	Karjalainen	2019	44	45	-0.10 (-0.52, 0.32)
106	Karjalainen	2019	44	45	-0.07 (-0.49, 0.34)
106	Karjalainen	2019	44	45	-0.11 (-0.53, 0.30)
106	Karjalainen	2019	38	40	-2.30 (-2.87, -1.73)
106	Karjalainen	2019	38	40	-1.55 (-2.06, -1.04)
106	Karjalainen	2019	38	40	-1.57 (-2.08, -1.06)
106	Karjalainen	2019	44	45	-0.04 (-0.46, 0.37)
106	Karjalainen	2019	38	40	-1.40 (-1.90, -0.91)
403	Oxford	2021	120	123	-0.12 (-0.37, 0.14)
403	Oxford	2021	120	123	-0.04 (-0.29, 0.21)
403	Oxford	2021	120	123	-0.22 (-0.47, 0.03)
403	Oxford	2021	120	123	-0.28 (-0.53, -0.03)
226	Shaw	2006	57	55	0.22 (-0.15, 0.59)
226	Shaw	2006	57	55	0.27 (-0.10, 0.65)
226	Shaw	2006	53	56	-0.18 (-0.56, 0.19)
226	Shaw	2006	53	56	-0.13 (-0.50, 0.25)
226	Shaw	2006	57	55	-0.29 (-0.67, 0.08)
226	Shaw	2006	53	56	-0.05 (-0.43, 0.33)
472	Sierau	2016	275	258	-0.26 (-0.43, -0.09)
472	Sierau	2016	275	258	-0.17 (-0.34, 0.00)
499	Toth	2006	42	47	0.26 (-0.15, 0.68)
499	Toth	2006	42	47	0.05 (-0.37, 0.46)
499	Toth	2006	42	47	-0.12 (-0.54, 0.30)
Overall					-0.26 (-0.48, -0.04)

Figure 33. Risk of bias for included trials in beyond 6 months main effect analysis on child behaviour problems ([link to raw data](#))
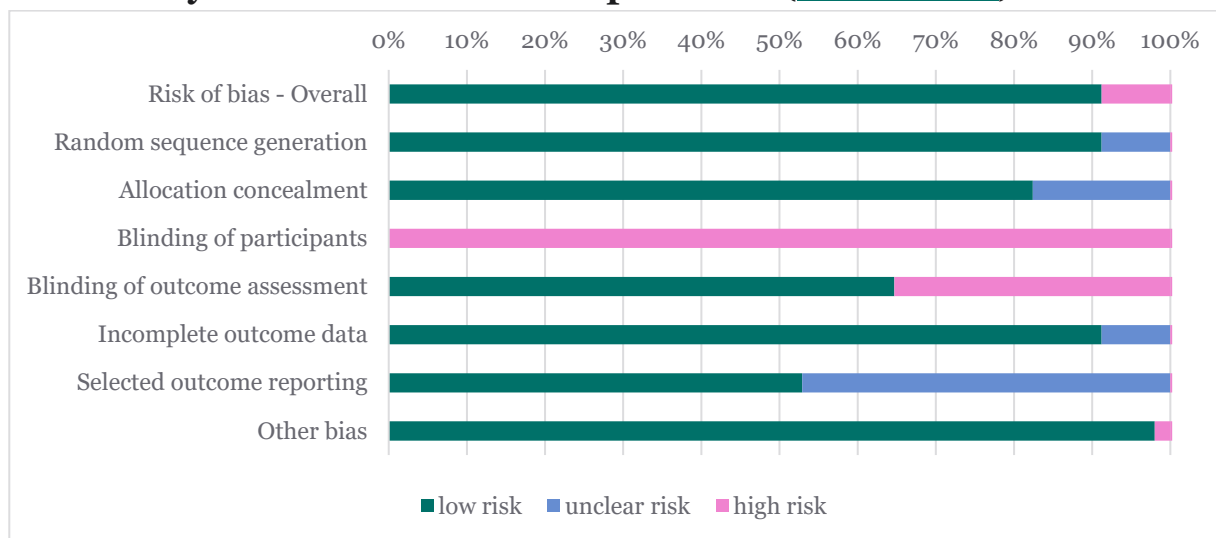
Child externalising behaviours

Eight trials reported child externalising behaviour problems. Results showed a small statistically significant effect, with considerable heterogeneity (d = -0.23; 95%CI = -0.42, -0.03; I^2 = 75%, see figure 34).

Studies were conducted in the United States (n = 5), Finland (n = 1), Germany (n = 1), and Spain (n = 1). Sample sizes ranged from 36 to 755 participants. Child mean age ranged from prenatal to 7 years. The following six programmes were evaluated in the studies: Child-Parent Psychotherapy, Family Check-Up, Incredible Years, Nurse-Family Partnership, Project Support, and Promoting First Relationships. Programmes were based on social learning theory (k = 23), attachment theory (k = 2), attachment + other theories (k = 2), and social learning theory + attachment theory (k = 1).

Out of 28 effect sizes, 26 were derived from studies including parents based on risk factors for maltreatment (selective prevention), and two based on pre-existing maltreatment in the family (treatment). Out of 28 effect sizes, 11 came from studies including children based on high or clinical levels of conduct problems. The majority of included studies were assessed to have low risk of bias (93%). However, most studies were assessed as high risk or unclear risk of bias concerning selective outcome reporting (56%) (see figure 35).

Certainty: Moderate

The moderate certainty assessment was based on a significant small main effect, a fair number of included studies, some underpowered studies with some large confidence intervals, overarching low risk of bias, and expected levels of heterogeneity.

Figure 34. Forest plot for the beyond 6 months effects of parenting interventions on child externalising behaviours

Study ID	First Author	Year	Int. N	Contr. N		Effect (95% CI)
282	Arrubarrena	2022	59	30		-0.07 (-0.51, 0.37)
282	Arrubarrena	2022	59	30		-0.11 (-0.55, 0.33)
50	Dishion	2008	332	330		-0.15 (-0.31, -0.00)
50	Dishion	2008	332	330		-0.20 (-0.36, -0.05)
50	Dishion	2008	301	311		-0.11 (-0.27, 0.05)
50	Dishion	2008	332	330		-0.26 (-0.41, -0.10)
50	Dishion	2008	332	330		-0.19 (-0.34, -0.04)
50	Dishion	2008	332	330		-0.16 (-0.31, -0.01)
105	Jouriles	2001	13	17		-0.42 (-1.15, 0.31)
106	Karjalainen	2019	44	45		-0.10 (-0.52, 0.32)
106	Karjalainen	2019	44	45		-0.04 (-0.46, 0.37)
106	Karjalainen	2019	38	40		-1.57 (-2.08, -1.06)
106	Karjalainen	2019	44	45		-0.11 (-0.53, 0.30)
106	Karjalainen	2019	38	40		-2.30 (-2.87, -1.73)
106	Karjalainen	2019	38	40		-1.40 (-1.90, -0.91)
106	Karjalainen	2019	38	40		-1.55 (-2.06, -1.04)
106	Karjalainen	2019	44	45		-0.07 (-0.49, 0.34)
403	Oxford	2021	120	123		-0.28 (-0.53, -0.03)
403	Oxford	2021	120	123		-0.22 (-0.47, 0.03)
226	Shaw	2006	57	55		-0.29 (-0.67, 0.08)
226	Shaw	2006	53	56		-0.18 (-0.56, 0.19)
226	Shaw	2006	57	55		0.27 (-0.10, 0.65)
226	Shaw	2006	57	55		0.22 (-0.15, 0.59)
226	Shaw	2006	53	56		-0.05 (-0.43, 0.33)
226	Shaw	2006	53	56		-0.13 (-0.50, 0.25)
472	Sierau	2016	275	258		-0.17 (-0.34, 0.00)
499	Toth	2006	42	47		0.05 (-0.37, 0.46)
499	Toth	2006	42	47		-0.12 (-0.54, 0.30)
Overall						-0.23 (-0.42, -0.03)

Figure 35. Risk of bias for included trials in beyond 6 months main effect analysis on child externalising behaviours ([link to raw data](#))
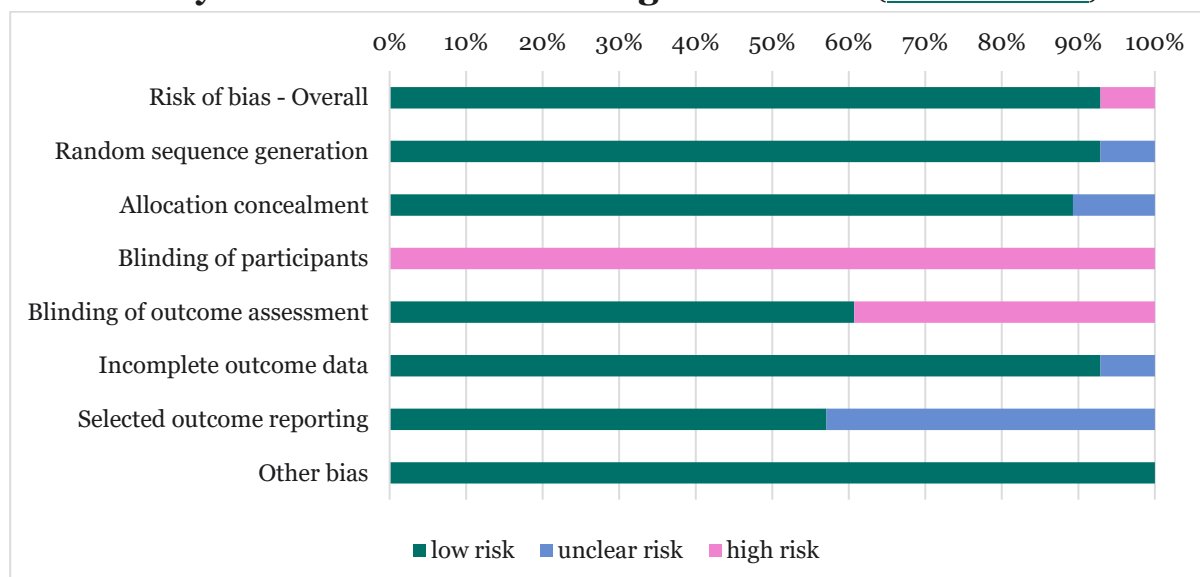
Child internalising behaviours

Four trials reported child internalising behaviour problems; however, results were unreliable due to few trials assessing this outcome after six months following the end of the intervention. The following four programmes were evaluated in the studies: Child-Parent Psychotherapy (k = 1), Nurse-Family Partnership (k = 1), Project Support (k = 1), and Promoting First Relationships (k = 2). The majority of included studies were assessed to have low risk of bias (75%).

Child wellbeing

Two trials reported child wellbeing outcomes; however, results were unreliable due to few trials assessing this outcome after six months following the end of the intervention. The following two programmes were evaluated in the studies: Nurse-Family Partnership (k = 2), and Parents Under Pressure (k = 1). Both studies were assessed to have low risk of bias.

Child attachment

One trial reported child attachment outcomes; however, results were unreliable due to few trials assessing this outcome after six months following the end of the intervention. The following programme was evaluated: Child-Parent Psychotherapy (k = 1). The study was assessed to have high risk of bias.

Parent–child relationship

Two trials reported parent–child relationship outcomes; however, results were unreliable due to few trials assessing this outcome after six months following the end of the intervention. The following two programmes were evaluated in the studies: Child-Parent Psychotherapy (k = 2) and Promoting First Relationships (k = 1). One study was assessed to have low risk of bias while the other was assessed to have high risk of bias.

Educational attendance and attainment

The Nurse-Family Partnership (NFP) trial by Robling et al. (2015) was the only study that measured educational attendance and attainment. It found evidence of an effect on attainment by the end of reception, but this was not maintained. Children of nurse-visited mothers were more likely to reach a good level of development across all five areas of learning by the end of the reception year (p = 0.026, adjusted OR 1.26[8]) and also to achieve a good level of development in all 17 early learning goals (p = 0.043, adjusted OR 1.24) (NFP N = 743, usual care N = 728). For KS1 reading, writing, maths and science assessments (by which time the child would be 7 years old), there was no evidence of differences between arms in the proportion of children reaching the expected standard nor specifically in those working at the expected level or at demonstrating a greater depth of knowledge (NFP N = 740, usual care N = 732). Further, there was no evidence of a

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[8] Analysis adjusted for stratification (site), minimisation variables (gestational age, smoking status at recruitment), and first or preferred language.

difference between arms in early education and school attendance. The study was assessed as low risk of bias.

Out of home placements and reunification rates

Green, Sanders & Tarte (2017) was the only study to measure the impact of a programme (Healthy Families Oregon) on rates of out of home placements using child welfare records. No significant differences were found between the intervention and services-as-usual group in terms of the likelihood of having an out-of-home placement at 2 years post random assignment (p = 0.45, OR 1.71; n = 57, 4.0% of HFO group; n = 44, 3.4% of controls). Further, there was no significant difference between the groups in terms of the likelihood of being reunified with parents at the close of the child welfare case (p = 0.27, OR 1.59). The study was assessed to have low risk of bias. No other trials reported on out of home placements or reunification rates.

Subgroup effects

Definition of outcome variables for subgroup analyses

We examined subgroup effects on the following three key outcomes: child maltreatment (including harsh parenting) and negative parenting, parent mental health, and positive parenting. A combined category of child maltreatment (including harsh parenting) and negative parenting was created, given that the number of papers reporting on child maltreatment was too low to conduct subgroup analysis.

Box 2. Child maltreatment terminology in this section

In this section, reporting subgroup analyses, we have combined child maltreatment, harsh parenting and other indices of negative parenting (e.g. inconsistent parenting, poor monitoring), to have sufficient studies for analysis. We use the term 'Maltreatment & negative parenting' for this outcome variable.

Main effect findings for key outcomes across all time points

We conducted the subgroup analyses on the three key outcomes across all time points. For this, we first established the main effects and levels of heterogeneity including all effect sizes collected at any time after the end of an intervention.

Table 10. Main effects for outcomes included in subgroup analyses

Outcome	No. of trials	No. of effect sizes	Effect size (Cohen's d)	Confidence interval of effect size	Hetero-geneity (I^2)
Maltreatment & negative parenting combined	44	128	-0.37***	-0.48, -0.26	75%
Poor parent mental health	48	123	-0.16**	-0.26, -0.05	72%
Positive parenting	55	147	0.30***	0.22, 0.38	68%

We found significant main effects across all time points for all three key outcomes, with substantial levels of heterogeneity. Notably, the effect on parent mental health is smaller compared to those of maltreatment & negative parenting and positive parenting.

Definition of moderator variables

We conducted planned subgroup analyses, based on practice and contextual elements assessed at trial level. The results from these analyses are shown in tables 11–24, and in Appendix N.

Practice elements

- Theoretical foundation (six subgroups: attachment, attachment + other theoretical foundation, social learning theory, social learning theory + other theoretical foundation, social learning theory + attachment, other theoretical foundation)
    - Due to limited number of studies for some of the outcomes and moderators, we combined in a sensitivity analysis social learning theory & social learning theory + other vs other theories not including social learning theory (attachment, attachment + other, other)
- Delivery mode (two subgroups: trials with flexible delivery of intervention content, fixed delivery of intervention content)
- Proactive parenting: Setting expectations about appropriate boundaries (two subgroups: trials with practice element present vs absent)
- Relationship enhancement/promoting sensitivity: Child-directed interactions (two subgroups: trials with practice element present vs absent)
- Skills for parents themselves: Emotion regulation of parents (two subgroups: trials with practice element present vs absent).

Contextual elements

- Level of prevention from a maltreatment perspective (three subgroups: selective prevention, indicated prevention, or treatment)

- Due to limited number of studies for some of the outcomes and moderators, we combined in a sensitivity analysis indicated & treatment vs selective
- Poor parent mental health at baseline (two subgroups: trials where more than half of parents showed poor mental health vs trials primarily composed of parents without poor mental health)
- Conduct problems at baseline (two subgroups: trials where most children had high levels of conduct problems vs trials primarily composed of children with low or no conduct problems; this was judged based on the level of prevention from a conduct problem perspective)
- Ethnic composition (two subgroups: trials where more than half of parents were from minoritised ethnic groups vs trials primarily composed of parents who were not from minoritised ethnic groups)
- Family income composition (two subgroups: trials where most families had a low-income vs trials primarily composed of medium- to high-income families)
- Teen parenthood (two subgroups: trials with only teen parents included, trials not only with teen parents included)
- Child age (continuous moderator): using child mean age on trial level as a moderator
- Delivery modality (three subgroups: face-to-face, hybrid, fully online)
    - Due to limited number of studies for some of the outcomes and moderators, we combined in a sensitivity analysis hybrid & online vs face-to-face
- Delivery format (four subgroups: group delivery, individual delivery, self-directed delivery, combination of formats)
- Length of programme (continuous moderator): using programme length as a moderator.

Findings relating to practice elements as moderators

This section answers research question 1b:

"To what extent do practice elements and delivery/implementation factors contribute to or detract from the effectiveness of interventions? Have any been observed to be superfluous or contra-indicated (including – where possible – for specific subgroups)?"

Theoretical foundation

Tables 11 and 12 present the subgroup effects for theoretical foundation by the three key outcomes: 1) child maltreatment & negative parenting, 2) parent mental health, and 3) positive parenting.

Most studies (table 11) evaluated programmes based on social learning theory (n = 30, k = 98 for maltreatment & negative parenting; n = 21, k = 52 for parent mental health; n = 25, k = 72 for positive parenting). There were few studies evaluating programmes based on attachment (n = 1, k = 1 for maltreatment & negative parenting; n = 5, k = 16 for parent mental health; n = 8, k = 27 for positive parenting), attachment combined with other theories (n = 3, k = 5 for maltreatment & negative parenting; n = 6, k = 19 for parent mental health; n = 7, k = 13 for positive parenting), other theories (n = 2, k = 3 for maltreatment & negative parenting; n = 10, k = 25 for parent mental health; n = 6, k = 11 for positive parenting), social learning theory combined with attachment theory (n = 3, k = 12 for maltreatment & negative parenting; n = 4, k = 6 for parent mental health; n = 6, k = 19 for positive parenting), and social learning theory with other theories (n = 5, k = 9 for

maltreatment & negative parenting; n = 2, k = 5 for parent mental health; n = 3, k = 5 for positive parenting).

Possible confounders for the effect may be child age, programme length, or sample size.

Table 11. Subgroup effects for theoretical foundation for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Theoretical foundation	Attachment	1	1	/	only one study	
	Attachment + other(s)	3	5	*-0.29*	*unreliable*	3
	Other(s)	2	3	*-0.26*	*unreliable*	2
	SLT	30	98	-0.44***	-0.59	30
	SLT + attachment	3	12	*-0.19*	*unreliable*	3
	SLT + other(s)	5	9	*-0.36*	*unreliable*	5
Parent mental health						
Theoretical foundation	Attachment	5	16	*-0.18*	*unreliable*	*unreliable*
	Attachment + other(s)	6	19	-0.07	-0.44	0.29
	Other(s)	10	25	-0.09	-0.25	0.07
	SLT	21	52	-0.26**	-0.46	-0.05
	SLT + attachment	4	6	*-0.05*	*unreliable*	*unreliable*
	SLT + other(s)	2	5	*0.30*	*unreliable*	*unreliable*
Positive parenting						
Theoretical foundation	Attachment	8	27	0.29**	0.15	0.44
	Attachment + other(s)	7	13	0.06	-0.02	0.14
	Other(s)	6	11	0.13	-0.20	0.47
	SLT	25	72	0.40***	0.28	0.51
	SLT + attachment	6	19	0.12	*unreliable*	*unreliable*
	SLT + other(s)	3	5	0.62	*unreliable*	*unreliable*

Given the small numbers for each group of studies by theory type, we ran a sensitivity analysis and combined social learning theory and social learning theory + other theories into 'Social learning theory + others' vs 'Others' (i.e. all remaining theories). We found the following effect sizes for each subgroup (see table 12), and present associated certainty ratings:

1). For maltreatment & negative parenting outcomes, we observed a significant effect for SLT but not for other theories. SLT programmes showed a significant mean effect size of -0.43 (n = 35, k = 107). Certainty: High – based on a moderate effect size, a confidence interval of the effect far away from zero, and a large number of studies.

'Other' programmes showed a mean effect size of -0.22, but there were not enough studies for a reliable estimate of effects (unreliable, n = 6, k = 9); Certainty: Low – based on a small effect size, and small number of studies, and unreliable analysis.

2). For parent mental health outcomes, we observed a small significant effect for SLT but not for other theories. SLT programmes showed a mean effect size of -0.21 (n = 23, k = 57). <u>Certainty: Moderate – based on a small effect size, which is significant but with confidence interval quite close to zero, and large number of studies.</u>

'Other' programmes showed a non-significant mean effect size of -0.11 (n =21 , k =60); <u>Certainty: Low – based on a small, non-significant effect size, and large number of studies.</u>

3). For positive parenting outcomes, we observed a significant moderate effect for SLT, and a small effect for other theories. SLT programmes showed a significant mean effect size of -0.44 (n = 28, k = 77). <u>Certainty: High – based on a moderate, significant effect size, with confidence interval of the average effect far away from zero, and large number of studies.</u>

'Other' programmes showed a significant mean effect size of -0.17 (n = 21, k = 60); <u>Certainty: Moderate – based on a small, significant average effect size, with confidence interval quite close to zero, and large number of studies.</u>

Table 12. Subgroup effects for theoretical foundation for key outcomes (combined categories)

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Theoretical foundation 2	SLT & SLT +other(s)	35	107	-0.43***	-0.56	-0.29
	Other(s)	6	9	*-0.22*	*unreliable*	*unreliable*
Parent mental health						
Theoretical foundation 2	SLT & SLT +other(s)	23	57	-0.21*	-0.41	-0.01
	Other(s)	21	60	-0.11+	-0.22	0.01
Positive parenting						
Theoretical foundation 2	SLT & SLT +other(s)	28	77	0.44***	0.32	0.56
	Other(s)	21	51	0.17**	0.07	0.27

Delivery mode

We found significant effects on all three key outcomes regardless of whether programmes used a fixed or flexible delivery mode. However, we observed slightly larger effect sizes for fixed delivery for maltreatment & negative parenting (d = -0.53) and positive parenting (d = 0.36) compared to trials that evaluated programmes with a flexible delivery mode (maltreatment & negative parenting: d = -0.12; positive parenting: d = 0.24). Effect sizes for fixed and flexible delivery modes were fairly similar for parent mental health (d = -0.15 vs -0.16).

Possible confounders for the effect may be target group, or theoretical foundation.

Table 13. Subgroup effects for delivery mode for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Delivery mode	Fixed	28	81	-0.53***	-0.69	-0.37
	Flexible	16	47	-0.12*	-0.21	-0.02
Parent mental health						
Delivery mode	Fixed	25	72	-0.15*	-0.26	-0.04
	Flexible	23	51	-0.16*	-0.35	-0.02
Positive parenting						
Delivery mode	Fixed	36	110	0.36***	0.25	0.47
	Flexible	19	37	0.24***	0.12	0.37

Proactive parenting: setting expectations about appropriate and inappropriate behaviour through the use of boundaries and routines

We found significant effects on maltreatment & negative parenting and on positive parenting regardless of whether programmes included the proactive parenting practice element. However, we observed slightly higher effects for programmes with this practice element (maltreatment & negative parenting; present: d = -0.44, absent: d = -0.24; positive parenting; present: d = 0.36, absent: d = 0.22). For parent mental health, we found a significant effect for programmes that included this practice element but not for programmes where this practice element was absent (present: d = -0.13, absent: d = -0.15).

Possible confounders for the effect may be target group, theoretical foundation, or the practice element 'relationship enhancement'.

Table 14. Subgroup effects for proactive parenting practice element of setting expectations about appropriate and inappropriate behaviour through the use of boundaries and routines for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Setting expectations	Yes	28	72	-0.44***	-0.59	-0.29
	No	16	56	-0.24**	-0.41	-0.07
Parent mental health						
Setting expectations	Yes	23	64	-0.13**	-0.21	-0.05
	No	25	59	-0.15	-0.35	0.05
Positive parenting						
Setting expectations	Yes	31	89	0.36***	0.25	0.47
	No	24	58	0.22***	0.11	0.33

Relationship enhancement/promoting sensitivity: equipping parents with the skills to engage in child-directed interactions

We found significant (and marginally significant) effects for all three outcomes regardless of whether programmes included this practice element. However, we observed larger effects for programmes with this practice element on two of the three outcomes (maltreatment & negative parenting; present: d = -0.47, absent: d = -0.15; positive parenting; present: d = 0.33, absent: d = 0.25). For parent mental health, effect sizes were similar between programmes with and without this practice element (present: d = -0.12, absent: d = -0.17).

Possible confounders for the effect may be target group, theoretical foundation, or the practice element 'proactive parenting'.

Table 15. Subgroup effects for relationship enhancement practice element of equipping parents with the skills to engage in child-directed interactions for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Child-directed interactions	Yes	26	59	-0.47***	-0.63	-0.32
	No	19	69	-0.15**	-0.26	-0.05
Parent mental health						
Child-directed interactions	Yes	20	36	-0.12**	-0.21	-0.04
	No	28	87	-0.17+	-0.35	0.02
Positive parenting						
Child-directed interactions	Yes	35	96	0.33***	0.22	0.45
	No	20	51	0.25***	0.15	0.34

Skills for parents themselves: emotion regulation skills

We found significant effects on all outcomes regardless of whether programmes included the emotion regulation skills practice element. We observed similar effect sizes for programmes where it was present and where it was absent. Therefore, it appears that this practice element is not related to the effectiveness of a programme for the three key outcomes.

Possible confounders for the effect may be target group or theoretical foundation.

Table 16. Subgroup effects for practice element of equipping parents with emotion regulation skills for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Emotion regulation	Yes	25	80	-0.37***	-0.54	-0.20
	No	20	48	-0.36***	-0.52	-0.20
Parent mental health						
Emotion regulation	Yes	31	89	-0.17*	-0.32	-0.01
	No	17	34	-0.14*	-0.26	-0.01
Positive parenting						
Emotion regulation	Yes	31	81	0.30***	0.16	0.44
	No	24	66	0.28***	0.20	0.37

Findings relating to contextual moderators

This section answers research question 2:

"What are the family and contextual moderators of effectiveness in parenting interventions (and where possible in practice elements) for this group?"

Level of prevention – child maltreatment perspective

We found significant effects on all three outcomes regardless of level of prevention. However, for maltreatment & negative parenting and positive parenting, we observed larger effect sizes for the indicated/treatment group (maltreatment & negative parenting: d = -0.47; positive parenting: d = 0.44) compared to the selective prevention group (maltreatment & negative parenting: d = -0.33; positive parenting: d = 0.27). We found no evidence that level of prevention influenced parent mental health based on similar effect sizes across subgroups (indicated/treatment: d = -0.12; selective: d = -0.16). We note that relatively few trials used an indicated or treatment prevention strategy and also measured parent mental health as an outcome (6 trials), and one analysis was unreliable. Therefore, more studies are needed to test interventions that target parents who are referred as a result of maltreatment.

Possible confounders for the effect may be other risk factors that might or might not be present in some levels of prevention, or child protection system effects (surveillance bias; differential bias with respect to ethnicity; jurisdictional differences with respect to reporting/investigation/response thresholds).

Table 17. Subgroup effects for level of prevention for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Level of prevention by maltreatment	Selective	32	92	-0.33***	-0.45	-0.21
	Indicated	5	11	*-0.64*	*unreliable*	*unreliable*
	Treatment	7	25	-0.40+	-0.86	0.07
Level of prevention 2 by maltreatment	Selective	32	92	-0.33***	-0.45	-0.21
	Indicated/treatment	12	36	-0.47**	-0.79	-0.16
Parent mental health						
Level of prevention by maltreatment	Selective	42	111	-0.16*	-0.29	-0.03
	Indicated	1	3	/	*only one study*	
	Treatment	5	9	-0.09	*unreliable*	*unreliable*
Level of prevention 2 by maltreatment	Selective	42	111	-0.16*	-0.29	-0.03
	Indicated/treatment	6	12	-0.12	-0.29	0.05
Positive parenting						
Level of prevention by maltreatment	Selective	41	101	0.27***	0.19	0.36
	Indicated	5	15	0.74	*unreliable*	*unreliable*
	Treatment	9	31	0.35*	0.07	0.64
Level of prevention 2 by maltreatment	Selective	41	101	0.27***	0.19	0.36
	Indicated/treatment	14	46	0.44**	0.20	0.67

Parent mental health at baseline

We found significant effects on all two key outcomes regardless of whether trials included primarily parents with poor mental health at baseline or primarily parents without mental health problems. Trials with primarily parents with poor mental health were trials in which at least 50% of parents had been diagnosed or had current mental health issues which met the clinical level, or, where the study population mean was in the clinical range.

For maltreatment & negative parenting, effect sizes were comparable between trials with poor parent mental health at baseline (d = -0.39) and trials without poor parent mental health at baseline (d = -0.35). For positive parenting, we observed slightly larger effect sizes for trials without poor parent mental health at baseline (positive parenting: d = 0.33) compared to those primarily including parents with poor mental health at baseline (positive parenting: d = 0.22). For parent mental health, we observed a significant effect for trials without poor parent mental health at baseline (d = -0.19) and no effect for trials primarily including parents with poor mental health at baseline (d = -0.10). It should, however, be noted that a significant effect on parent mental health does not necessarily mean a clinically significant change.

Possible confounders for the effect are level of prevention, severity (differences in expression of mental health index with respect to parenting), child behavioural problems, or type of intervention (e.g. ones designed for vulnerable groups might also have higher mental health problems).

Table 18. Subgroup effects for parent mental health for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Risk factor: parent poor mental health	Primarily poor mental health	11	34	-0.39*	-0.66	-0.12
	Not primarily poor mental health	32	93	-0.35***	-0.48	-0.22
Parent mental health						
Risk factor: parent poor mental health	Primarily parents with poor mental health	22	72	-0.10	-0.22	0.02
	Not primarily poor mental health	26	51	-0.19*	-0.35	-0.03
Positive parenting						
Risk factor: parent poor mental health	Primarily parents with poor mental health	18	52	0.22**	0.11	0.32
	Not primarily poor mental health	36	94	0.33***	0.23	0.44

Level of conduct problems at baseline

We found significant effects on all outcomes regardless of the level of conduct problems at baseline. For maltreatment & negative parenting and positive parenting, we observed slightly larger effect sizes for trials screening families based on the level of conduct problems at baseline (maltreatment & negative parenting: d = -0.54; positive parenting: d = 0.52) compared to trials that did not (maltreatment & negative parenting: d = -0.21; positive parenting: d = 0.21). For parent mental health, we found similar effects across both subgroups (conduct: d = -0.18, non-conduct: d = -0.15).

Possible confounders for the effect are other risk factors, child age, or theoretical foundation.

Table 19. Subgroup effects for conduct problems for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Conduct problems	High conduct problems	21	55	-0.54***	-0.71	-0.37
	Low or no conduct problems	23	73	-0.21**	-0.33	-0.09
Parent mental health						

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Conduct problems	High conduct problems	12	23	-0.18**	-0.28	-0.08
	Low or no conduct problems	36	100	-0.15*	-0.29	-0.01
Positive parenting						
Conduct problems	High conduct problems	16	43	0.52***	0.33	0.71
	Low or no conduct problems	39	104	0.21***	0.14	0.28

Ethnic composition

We found significant effects on maltreatment & negative parenting and positive parenting regardless of whether trials included largely parents from minoritised ethnic groups or ethnic majority group in the trial country. However, for maltreatment & negative parenting and positive parenting, we observed a tendency towards larger effect sizes for trials including largely parents from minoritised ethnic groups (maltreatment & negative parenting: d = -0.46; positive parenting: d = 0.41) compared to those including primarily parents from an ethnic majority (maltreatment & negative parenting: d = -0.16; positive parenting: d = 0.24). For parent mental health, we found a small non-significant effect for trials with primarily parents from minoritised ethnic groups, and a small marginally significant effect for trials with primarily parents from an ethnic majority.

Possible confounders for the effect are poverty, age, or level of prevention (participants might be included in trials based on ethnicity, while showing lower levels of vulnerability).

Table 20. Subgroup effects for ethnic composition for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Ethnic composition	Primarily minoritised ethnic groups	14	45	-0.46**	-0.69	-0.23
	Primarily ethnic majority group	17	45	-0.16**	-0.26	-0.05
Parent mental health						
Ethnic composition	Primarily minoritised ethnic groups	13	30	-0.23	-0.59	0.14
	Primarily ethnic majority group	22	62	-0.06+	-0.12	0.00
Positive parenting						
Ethnic composition	Primarily minoritised ethnic groups	15	31	0.41***	0.23	0.59
	Primarily ethnic majority group	26	85	0.24***	0.15	0.33

Family-level income composition

Most trials included families with low-income levels. We found significant effects on all outcomes for trials that primarily included low-income families. For trials with primarily high-income families, we found a moderate but unreliable effect for maltreatment & negative parenting (only four studies included in this analysis), a small non-significant effect for parent mental health (only eight studies included), and a small marginally significant effect for positive parenting (only eight studies included). Given that the focus of this review was on parents with multiple and complex needs, and that multiple risk factors are associated with poverty, these analyses may be less relevant to decision-makers.

Table 21. Subgroup effects for family income for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Family income composition	Primarily low income	37	108	-0.33***	-0.44	-0.22
	Primarily high income	4	8	-0.49	*unreliable*	*unreliable*
Parent mental health						
Family income composition	Primarily low income	36	72	-0.18**	-0.31	-0.05
	Primarily high income	8	44	-0.01	-0.21	0.19
Positive parenting						
Family income composition	Primarily low income	43	111	0.30***	0.22	0.38
	Primarily high income	8	22	0.27+	-0.05	0.59

Teenage parenthood

Few studies focused on teenage parents (maltreatment & negative parenting: n = 1; parent mental health: n = 5; positive parenting: n = 3). Therefore, we could not establish a subgroup effect for teenage parent trials for any outcome.

Possible confounders for the effect are other risk factors, child age, poverty, social support, or single parenthood.

Table 22. Subgroup effects for teenage parenthood for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Risk factor: teen parenthood	Teen parents	1	3	/	only one study	
	Non-teen parents	43	125	-0.39***	-0.50	-0.27
Parent mental health						
Risk factor: teen parenthood	Teen parents	5	12	-0.001	unreliable	*unreliable*
	Non-teen parents	43	111	-0.18**	-0.30	-0.06
Positive parenting						
Risk factor: teen parenthood	Teen parents	3	11	0.07	unreliable	*unreliable*
	Non-teen parents	52	136	0.32***	0.24	0.41

Child mean age

We ran a moderation analysis on child age (continuous moderator) for the three key outcomes (see Appendix N).

We found no moderation effect for child age for parent mental health and positive parenting. In other words, trials with a lower or with a higher mean age were not more or less effective in improving parent mental health and positive parenting. For maltreatment & negative parenting, we found a small significant moderation effect: trials with older children had higher effects than trials with younger children (n = 35; change per SD = -0.07, CI -0.12, -0.01; $\tau 2$=0.07). However, we note that this might be confounded by the programmes' theoretical foundation. As we described earlier, we found larger effects for social learning theory programmes, and these programmes often focus on older children (e.g. starting at age 2) whereas programmes based on attachment often focus on very young children.

Delivery modality

Most interventions used a face-to-face delivery modality. Unfortunately, because few studies used a hybrid or online delivery modalities, the subgroup effects for these outcomes were unreliable. For maltreatment & negative parenting, we found a significant subgroup effect for trials evaluating face-to-face interventions. Apart from this, it appears from our analyses that there are no effect size differences across the different delivery modalities. For positive parenting in particular, subgroup

effect sizes are comparable. However, this result should be treated with caution given the few studies of programmes using hybrid or online delivery, and more studies are needed to understand whether interventions that use hybrid and online delivery formats yield equal effects on the three key outcomes.

Possible confounders for the effect are delivery format (individual vs group format), theoretical foundation, or risk factors: income, ethnicity/age.

Table 23. Subgroup effects for delivery modality for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Delivery modality	Face-to-face	37	108	-0.37***	-0.50	-0.25
	Hybrid	4	12	-0.31	unreliable	*unreliable*
	Online	3	8	-0.68	unreliable	*unreliable*
Delivery modality 2	Face-to-face	37	108	-0.37***	-0.50	-0.25
	Hybrid/online	7	20	-0.37*	-0.69	
Parent mental health						
Delivery modality	Face-to-face	43	100	-0.16*	-0.28	-0.04
	Hybrid	4	22	-0.08	unreliable	*unreliable*
	Online	1	1	/	only one study	
Delivery modality 2	Face-to-face	43	100	-0.16*	-0.28	-0.04
	Hybrid/online	5	23	-0.12	unreliable	*unreliable*
Positive parenting						
Delivery modality	Face-to-face	49	132	0.30***	0.22	0.38
	Hybrid	3	8	0.32	unreliable	*unreliable*
	Online	3	7	0.41	unreliable	*unreliable*
Delivery modality 2	Face-to-face	49	132	0.30***	0.22	0.38
	Hybrid/online	6	16	0.38+	-0.06	0.83

Delivery format

Very few studies evaluated programmes with a self-directed delivery format (n = 2), or with a combination of formats (maltreatment & negative parenting: n = 3; parent mental health: n = 2; positive parenting: n = 2). Therefore, we could only establish subgroup effects for group delivery vs individual delivery. We found subgroup effects for both delivery formats. The subgroup effects of group and individual formats were similar for positive parenting. However, for maltreatment & negative parenting, we observed a larger effect for group-based formats (d = -0.54) than individual formats (d = -0.28). For parent mental health, we observed a small but significant effect for individual formats (d = -0.15) but a non-significant effect for group formats (d = -0.18).

Possible confounders for the effect are theoretical foundation, other practice elements, delivery modality, or other risk factors.

Table 24. Subgroup effects for delivery format for key outcomes

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Maltreatment & negative parenting						
Delivery format	Combination	3	11	*-0.26*	*unreliable*	*unreliable*
	Group	12	33	-0.54***	-0.71	-0.36
	Individual	28	79	-0.28**	-0.43	-0.14
	Self-directed	2	5	*-0.73*	*unreliable*	*unreliable*
Parent mental health						
Delivery format	Combination	2	4	*-0.09*	*unreliable*	*unreliable*
	Group	12	28	-0.18	-0.41	0.04
	Individual	34	91	-0.15*	-0.29	-0.01
	Self-directed	0	0	/	*no studies*	
Positive parenting						
Delivery format	Combination	2	8	0.27	*unreliable*	*unreliable*
	Group	15	41	0.33***	0.20	0.46
	Individual	38	98	0.30***	0.19	0.40
	Self-directed	0	0	/	*no studies*	

Length of programme

We ran a moderation analysis on number of sessions (continuous moderator) for the three key outcomes (see Appendix N).

We found no moderation effect for any of the three outcomes. In other words, the effectiveness of programmes for reducing child maltreatment & negative parenting or parent poor mental health and improving positive parenting was not influenced by programme length.

Reporting biases

Reporting biases: Publication bias

We examined the risk of publication bias for the reliable main effect analyses through visual inspection of funnel plots for each analysis. We found that there might be potential for publication bias across various analyses, given we found an absence of small N studies with null effects (see Appendix O).

DISCUSSION

Key findings for the research questions and objectives

The aim of this review was to answer two overarching research questions:

1. What are the practice elements shared by interventions with evidence of effectiveness in reducing child maltreatment and/or improving child outcomes when delivered to parents experiencing complex and multiple needs?
   a. Which parenting interventions have strong evidence of their effectiveness in reducing child maltreatment and/or improving child outcomes when delivered to parents experiencing multiple and complex needs, within a context relevant to UK early help and children's social care practice?
   b. To what extent do practice elements and delivery/implementation factors contribute to or detract from the effectiveness of interventions? Have any been observed to be superfluous or contra-indicated (including – where possible – for specific subgroups)?
2. What are the family and contextual moderators of effectiveness in parenting interventions for this group?

What works? Interventions to reduce child maltreatment and/or improve child outcomes, for parents experiencing complex and multiple needs

Our review identified 131 reports presenting findings from 106 trials of 56 programmes. We included only studies undertaken in high-income countries: over half of the trials were undertaken in the US, and 17 in the UK. The majority of papers were published since 2011. Trials involved disadvantaged and at-risk populations, with a wide range of risk factors represented. The majority of trials were with low-income population groups, and 35 were with populations where most or all parents were from minoritised ethnic groups. Our review looked at a wide range of outcomes including child maltreatment, parenting, parental mental health, child behaviour, and wellbeing.

Parents with complex and multiple needs are frequently dealing with a range of problems that make it harder for them to provide care that their children need. This typically includes, not only issues such as poverty and single parenthood, but additional difficulties such as poor parental mental or physical health, substance dependence, or domestic abuse or difficulties in terms of the child's physical or mental health. The children of these parents include those defined under section 17 of the Children Act 1989 as being unlikely to achieve or maintain a reasonable level of health or development without additional support, and/or under section 47 as are suffering or likely to suffer significant harm. This review identified programmes that are both secondary prevention (i.e. intervening to support parents of children who need additional support which would broadly align with section 17) and also treatment programmes (i.e. supporting parents of children who may be at

risk of removal if the parenting does not improve following support broadly aligned with section 47).

Although we did not systematically extract data on all the risks identified in the studies reviewed, an indication of coverage is that we included 33 papers where parents' poor mental health was a primary risk in selective trials. In addition, in 11 papers intimate partner violence was noted in the description of the target population described by the authors, and substance abuse was noted in 11 papers in the authors' description of the target population. Any of the three characteristics are likely to have been present in study populations in other papers, so these figures are likely to underestimate the prevalence of these risks in the review.

To answer the question about what works for parents experiencing complex and multiple needs, we used quantitative and narrative synthesis methods to determine how effective parenting interventions are for parents experiencing multiple and complex needs across all outcomes of interest. We were able to include in the meta-analysis 95 studies of 50 different parenting programmes.

Pooled effects for different outcomes

We estimated the effects for six outcomes for children, four parenting outcomes and two outcomes for parents. Although we estimated effects separately for 0–6 months after intervention completion and for beyond six months, in most cases the latter analyses were unreliable due to a small number of studies reporting longer-term effects, and the results described below therefore relate to the 0–6 months period unless otherwise indicated.

Beginning with outcomes for children, we found positive impacts of parenting programmes overall on all the child outcomes assessed: a moderate effect on child attachment, and small to moderate effects on child behaviour problems, child externalising behaviour, child wellbeing, and parent–child relationship. For child internalising behaviours we found a non-significant main effect, however, the confidence interval was close to zero. For child behaviour and child externalising behaviour, we found small positive effects beyond six months. These findings are in line with findings from other reviews that have looked at the impact of parenting interventions on child outcomes in at-risk or maltreating populations (Bergsund et al., 2023; Rayce et al., 2017).

The results suggest that parenting programmes are effective in improving key aspects of parenting behaviours among parents with multiple and complex needs. While we found small non-significant effects for maltreatment and harsh parenting and child abuse risk (measured through the child abuse potential inventory), we note that the effects for maltreatment and harsh parenting showed consistent trends in the expected direction. Furthermore, we found small to moderate statistically significant effects on negative parenting and positive parenting. Although our review is the first to explore the impact of a wide range of parenting programmes across the 0–10 age spectrum with multiple high-risk populations, the findings are in line with other evidence pointing to the positive impacts of parenting programmes on child maltreatment (van der Put et al., 2018; Gubbels et al., 2021; Asmussen et al., 2022; Fox et al., 2022; Bergsund et al., 2023).

We also found a small but significant positive effect on parental factors that represent important risks in terms of poor child outcomes: parental mental health and parental stress. Several other

reviews found similar small intervention effects on parental mental health in the short term (Backhaus et al., 2023a; Barrett et al., 2024).

Overall, these findings indicate the value of parenting programmes as an important part of support for parents with multiple and complex needs. However, the scale of impact is modest in many parts of the analysis, and there is high variability. This points to the need to understand better which programme elements are more likely to be effective, and for which parents – the second aim of this review; and for continued development and testing of parenting interventions for this group, in the context of holistic and systemic support with both a preventative and a curative focus.

Our level of confidence in the main effect analyses is supported by a number of factors. First, our PICO eligibility criteria were specific, and limited the included trials to studies directly focused on the types of populations, interventions, comparisons, and outcomes of interest to this review. Second, we assessed the risk of bias as low for the majority of included studies. Third, our advanced statistical analyses (i.e. robust variance estimation meta-analysis) prevented us from presenting effect estimates that were likely to be unreliable, due to limited number of trials or effect sizes. Fourth, most forest plots indicated consistent trends in the expected direction of effect. Finally, although heterogeneity levels were substantial for some analyses, we explored these further through subgroup analyses for three key outcomes.

To what extent do practice elements and delivery/implementation factors contribute to or detract from the effectiveness of interventions?

To answer this sub-question, we used quantitative synthesis methods to identify which practice elements and delivery/implementation factors tended to yield larger subgroup effects. We focused this part of the analysis on three key outcomes: child maltreatment & negative parenting, poor parental mental health, and positive parenting.

We looked at five practice elements, selected because we anticipate these are key considerations for commissioners and service leaders in deciding which programmes to fund or use. Two of these practice elements relate to programme approaches:

- Theoretical foundations: comparing programmes based on or including social learning theory with programmes based on theories not including social learning theory
- Delivery mode: comparing trials of programmes with flexible delivery of content against those with fixed content delivery

and three relate to specific programme content:

- Setting expectations about appropriate boundaries
- Child-directed interactions
- Emotional regulation of parents.

Practice elements relating to programme approaches

We found significant positive effects for all three of our main outcomes for programmes based solely or partly on social learning theory, with a moderate effect on maltreatment & negative parenting and on positive parenting, and a small effect on parent mental health. Generally, the effect sizes were smaller, around half as large, for programmes with foundations <u>not</u> including social learning theory. It should be noted, however, that there were too few trials for a reliable estimate of effect on maltreatment & negative parenting or on positive parenting, and the effect on parent mental health outcomes was only marginally significant.

This means that we can be confident about the value of programmes based on social learning theory for parents experiencing complex and multiple needs, and we have both stronger and more reliable evidence about their effects than for programmes with other theoretical foundations. Specifically, this is based on finding positive effects of social learning theory-based programmes across a larger number of trials, with a consistent tendency towards higher effect sizes and narrower confidence intervals across all our key outcomes, compared to programmes based on other approaches.

Given the relatively small number of trials of programmes (six) in our non-social learning theory group, more testing of programmes based on attachment and other theories with this population of parents is needed, along with continued programme development. Individual studies in our review were effective on one or more of our three main outcomes for our study group, and reviews of attachment-based programmes (e.g. Grube & Liming, 2018; O'Byrne, McCusker & McSweeney, 2022) point to the effectiveness of those programmes for other populations of at-risk parents, but continued work to develop and test such programmes is needed.

We found significant positive effects on all three outcomes regardless of whether programmes used a fixed or flexible programme model, although programmes with a fixed delivery model tended to yield larger effect sizes for maltreatment & negative parenting outcomes. It may be that a fixed delivery model facilitates more consistent high-quality implementation, and the findings reflect the preponderance of programmes based on social learning theory which are effective, and tend to have fixed models and stronger effects. Our conclusion is that both fixed and flexible delivery models can be effective for parents facing complex and multiple difficulties, albeit with evidence tending to be more robust for fixed models.

Practice elements relating to programme content

We found some evidence of a differential impact for two of the three practice elements relating to programme content. We observed higher effects for programmes that included practices related to the setting of expectations about appropriate boundaries on outcomes of child maltreatment & negative parenting and on mental health (where the effect size was small) than for programmes where it was absent. Programmes that included activities to equip parents with skills in child-directed interactions also yielded higher effects on maltreatment & negative parenting outcomes.

We found similar effect sizes for trials that supported the emotion regulation of parents compared to those lacking this element, suggesting that this practice element may not add to the effectiveness of parenting programmes for our study population in relation to the three key outcomes. The fact

that we observed similar summary effects on maltreatment & negative parenting between trials that supported child-directed interactions and those without this practice element, suggests that strategies that help parents to regulate their emotions and manage their responses to feelings in the context of parent–child interactions may potentially be more effective than strategies that calm parents outside the context of the parent–child relationship.

What are the family and contextual moderators of effectiveness in parenting interventions for this group of parents?

Family characteristics

We also conducted subgroup analyses to identify which family and contextual moderators yield larger subgroup effects, focusing on the same three key outcomes. We looked at seven family moderators:

- **The level of prevention (from a maltreatment perspective):** comparing trials of selective programmes with indicated and treatment trials
- **Parental mental health:** comparing trials that included mainly parents with poor mental health with trials that included parents mainly without poor mental health at baseline
- **Ethnicity:** comparing trials that included mainly parents from minoritised ethnic groups with trials that included parents mainly from an ethnic majority
- **Family income level:** comparing trials that included mainly low-income parents with trials that mainly included parents not on low incomes
- **Teenage parenthood:** comparing trials that focused on teenage parents with trials that did not
- **Conduct problems:** comparing trials that included children based on elevated levels of conduct problems with trials that did not
- **Child age:** continuous moderator.

We observed significant effects on all three outcomes regardless of the level of prevention, but slightly larger effect sizes for indicated/treatment groups in relation to maltreatment & negative parenting, and positive parenting. This may indicate that these programmes work particularly well for parents most in need based on their levels of risk in relation to poor parenting, and, possibly, a higher level of motivation on the part of parents as a result of this. Overall, it signals the value of parenting programmes both at lower levels of risk within this study population, and after problems have escalated.

We observed similar summary effects on maltreatment & negative parenting and positive parenting for trials which included primarily parents with poor mental health at baseline and for these primarily with parents without poor mental health. Again, this provides important reassurance about the value of parenting programmes even where parents are experiencing moderate poor mental health. For mental health outcomes, we observed a significant effect for trials involving primarily parents *without* poor mental health at baseline, and no effect for trials where parents predominantly had poor mental health. It is perhaps unsurprising that parenting programmes are

insufficient on their own, to address parental mental health despite their positive effects on parenting, although it is also important to note that most of the trials used a screening questionnaire rather than clinical assessment to measure outcomes.

We found higher effect sizes for both maltreatment & negative parenting outcomes, and positive parenting outcomes in trials with primarily parents from minoritised ethnic groups. For parent mental health outcomes, we found a small marginally significant effect for trials with primarily ethnic *majority* populations, and a small non-significant effect for those with primarily parents from minoritised ethnic backgrounds. Previous meta-analyses reached different conclusions in relation to whether parents from minoritised ethnic backgrounds benefit more or less from parenting interventions (Backhaus et al., 2023b; Gardner et al., 2019; Gubbels et al., 2021). Our findings suggest that programmes may have been appropriately adapted to different cultural groups in terms of programme design and/or delivery, and provide important evidence of the effectiveness of parenting programmes for parents from minoritised ethnic groups. The different trend in relation to mental health may reflect cultural differences in the social construction of mental health and associated stigma, and suggests a need for continued programme development and testing.

For family income level, we again observed effects that suggest the value of parenting programmes for families in poverty. We observed significant and higher effects on all three outcomes for trials that primarily included low-income families – although the number of trials with primarily higher-income families was very small.

For child age, we found higher effect sizes for maltreatment & negative parenting and positive parenting in trials with older children, but not for parent mental health. Some (e.g. Fox et al., 2022) but not all reviews have similarly found larger effects for studies targeting or including older children (Euser et al., 2015; Schoemaker et al., 2020; Bergsund et al., 2023). This may indicate that parents are more open to change when they are more settled in parenting roles (Bakermans-Kranenburg, Van IJzendoorn & Juffer, 2005), that there are more opportunities for change when children are more verbal (Bergsund et al., 2023) and that parent–child interactions create a greater urgency and focus for change as children are older. It may also reflect the higher effect sizes for programmes based on social learning theory, given that this is often the foundational theory for programmes targeting parents of older children.

We found significant effects on all outcomes regardless of the presence or absence of child conduct problems at baseline, and higher effect sizes for maltreatment & negative parenting and for positive parenting where trials were conducted with children with high conduct problems. This is an important finding given that these parents experience acute pressures on parenting and experience high levels of need, with children's outcomes often very poor. If problems are not addressed early, intensive and costly service intervention later may be needed.

We were not able to look at how teenage parenthood influenced programme effectiveness, due to the small number of trials with this group.

Overall, our findings indicate the wide applicability of parenting programmes for the study population that was the focus of this review.

Programme characteristics

Finally, we also ran subgroup analyses on:

- Length of programmes
- Delivery format: comparing programmes using group and individual delivery
- Delivery modality: comparing parents using face-to-face delivery with those using online or hybrid modes.

We found no difference in the effect sizes for any of our three key outcomes by programme length. In other words, the data does not support the view that parents with more complex needs require longer programmes. This is in line with findings from other reviews (Bakermans-Kranenburg, van IJzendoorn & Juffer, 2003; van der Put et al., 2018; Gubbels et al., 2021; Bergsund et al., 2023) . It may indicate that key messages or learning can get lost in longer programmes, higher attrition as parents dealing with multiple challenges find it difficult to stay in the programme, or that longer duration is not necessary to reinforce learning and change, and is in line with the suggestion that 'less is more' (Bakermans-Kranenburg, van IJzendoorn & Juffer, 2003).

For delivery format, we found stronger effects for group delivery for maltreatment & negative parenting (which may reflect the dominance of programmes based on social learning theory, which often adopt group models) but otherwise no differences, with the results pointing to the value of both group and individual programmes.

For delivery modality, face-to-face delivery was effective for all three outcomes, but there were too few hybrid or online programmes for reliable analyses.

LIMITATIONS

Strength and limitations of the review methods

This was a full systematic review, with 7,842 records screened, of which 1,012 full-text papers were screened. Predetermined eligibility criteria and review methods were followed and any deviations from the protocol were noted. Our study builds on previous reviews and adds to the literature with its explicit focus on rigorous evaluations of a wide range of parenting interventions across the 0–10 age spectrum with high-risk populations. Robust meta-analytical methods were applied preventing the reporting of unreliable effect estimates resulting from limited number of trials.

With the available time and resources, the search could not be exhaustive and there may be relevant studies that were not identified by our search. One specific limitation is that our approach used existing reviews which targeted subgroups relevant to our study population (the global dataset supplemented with systematic reviews to identify trials of interventions targeting parents of children aged 0–2 years old that were published before 2014). It is possible that a new search targeted to our study population across all years and child ages might have identified articles we did not identify. Despite these limitations, we used transparent review methods that aimed to maximise our yield of eligible studies within the available time and resources.

Screening, extraction and risk of bias assessment was done by a single reviewer which may have introduced bias. The inclusion criteria for population were complex and at times challenging to apply on the basis of the information reported in papers, even for our experienced reviewers with content expertise. Regular weekly group supervision was conducted with the research team to clarify questions and minimise errors. Given the short timeline for the review, it was not feasible to contact trial authors to obtain any missing data for the risk of bias assessment.

Due to the wide scope of the review, there was high heterogeneity in terms of the included populations, interventions, and outcome measures. This indicates that some characteristics associated with the population, intervention, or measures might be related to stronger or smaller effects. This was in part explored in the subgroup analyses. Given the large number of programmes included in the review, and limited number of trials and effect sizes per programme, it was not possible to identify programmes that were more or less effective through moderator analysis. Instead, we presented pooled effects of parenting interventions targeting parents with multiple and complex needs, and reported on features they shared.

The results of differential tests between subgroups could not be presented because of the small number of trials assessing the same key outcome in each subgroup, and the potential for various differential effects to be highly confounded by other factors (i.e. there are other variables that explain the effect). For example, a finding that attachment-based programmes are more or less effective than social learning theory-based programmes might be confounded by the target age group of children (i.e. attachment-based programmes are often delivered to very young children vs social learning theory programmes that are often delivered to preschool and primary school age children). This is clearly stated in the Results sections and potential confounders are suggested.

Furthermore, a limitation inherent to subgroup analysis in meta-analyses is that it can only indicate whether the trial composition is associated with the effectiveness of these interventions and not the individual family differences. For example, we could only compare whether trials that primarily included parents from minoritised ethnic backgrounds are similarly effective to trials that primarily included parents from ethnic majorities rather than comparing effects on these two population groups directly. However, it was not possible to check whether parents from minoritised ethnic backgrounds indeed had equal benefits as those from ethnic majorities. This limitation of analysing effects on average trial level can only be overcome by harmonising individual participant data from individual studies (known as individual participant data [IPD] meta-analysis, e.g. Gardner et al. (2019)), which was beyond the scope of this review. One limitation of IPD meta-analysis is that it often lacks generalisability due to the high amount of labour devoted to obtaining and harmonising individual raw data from a selected number of eligible studies.

We were limited in our ability to identify practice elements that contribute to or detract from the effectiveness of interventions, and were only able to consider their impact on three outcomes. A large number of practice elements were coded from the included programmes, however, running multiple moderator analyses could have amplified the probability of false-positive findings (i.e. alpha error rate), often referred to as multiplicity issues (Wang & Ware, 2013).

Strengths and limitations of available evidence

Our review identified sufficient numbers of randomised controlled trials and cluster-randomised controlled trials to run planned analyses on main effects, of which 63% were assessed to be at low risk of bias.

A key limitation is that there were too few studies available in some subgroupings to maintain statistical power resulting in some unreliable findings. Unfortunately, this was unavoidable and we made every effort to express this lack of certainty in the results and discussion sections. This meta-analysis primarily relied on parent or caregiver report outcomes (71% of included effect sizes), and observational data may have shown different results on some of the outcomes. There were some gaps in the data extracted, and a few studies could not be included in the meta-analysis due to data not being available in the required format. Moreover, descriptions of trial populations and interventions were not consistently comprehensive across reports, and key information regarding child or parent demographics were not always available. For a significant number of trials, no judgement could be made based on the information provided in the paper regarding allocation concealment (43.2%) and selective outcome reporting (63.2%).

Due to the scope of this review focusing on parents with multiple and complex needs, we included a range of different populations and programmes. This is reflected in the heterogeneity estimates and could only be explored to some extent in our subgroup analyses.

Lastly, longer-term effects remain partly unanswered due to an insufficient number of studies exploring effects beyond 6 months after the end of an intervention (n =16, 16.8% of trials included in the meta-analysis).

RECOMMENDATIONS AND NEXT STEPS

Policy and practice recommendations and next steps

Our findings provide a clear endorsement of the role of parenting programmes for parents experiencing complex and multiple needs, with evidence of positive effects on maltreatment, parenting, parental mental health, and child outcomes. Our analysis shows that a range of different programme types are effective with this group and does not point to a need to use only more resource-intensive programmes such as individual rather than group-based or longer programmes.

Although all kinds of programmes can be effective, our subgroup analyses show that we can have greater confidence about the effectiveness of programmes based on social learning theory for parents experiencing complex and multiple needs, as we have both stronger and more reliable evidence about their effects than for programmes with other theoretical foundations. Typically, effect sizes were twice as large for each outcome for social learning theory programmes, compared to others. We also found several key elements of programmes in which we can have particularly strong confidence, including fixed (vs flexible) session delivery, group-based modality, and use of rule-setting and child-directed interactions as practice elements. Not surprisingly, these tend to be elements often found in social learning theory programmes (and thus might be confounded), although they can also be found in other types of programmes.

Our analysis also has very important equity-related findings. Most significantly, the findings suggest that parenting programmes are particularly effective for parents from minoritised ethnic groups, at least for child maltreatment & negative parenting and for positive parenting. They are also effective for parents in low-income groups and with mental health problems. These findings are in keeping with other equity-related reviews and analyses of parenting interventions (Gardner et al., 2019; Hope et al., 2021) , but importantly this is the first evidence focused on highly vulnerable groups and for these outcomes.

These findings suggest that parenting programmes should be a central part of service provision for parents facing the types of complex and multiple problems described in this review with children in the study age group (0–10). We highlight a number of programmes that are effective in addressing key outcomes and feasible to implement in the UK context, most of which are currently being used in the UK. Policymakers, commissioners and service leaders should support their wider adoption, and invest in supporting high-quality implementation at scale.

At the same time, we need continued development and refinement of parenting programmes for these parents. The scale of impact is often modest, and although the changes involved may be very meaningful for individual families, continued investment is needed to strengthen the effects of programmes and secure more benefits for more of the participating parents and children. Some of the programmes identified as effective for parents with multiple and complex needs have not yet been delivered and tested in the UK. There would be value in identifying those most likely to fit the UK social and service contexts, assessing their fit, making necessary adaptations, and testing them here. There is also a need to develop and test more programmes using online or hybrid delivery

models, self-directed approaches, based on attachment and other theories, and that involve the use of modules that can be delivered flexibly to families based on need.

We have identified the practice elements used in effective programmes, but we have only begun the process of testing the extent to which individual practice elements contribute to the effectiveness of parenting programmes for this population group. There would be value in more investment in efforts to assess their role in programme effectiveness and to consider the feasibility, acceptability and effectiveness of the practices associated with programme effectiveness outside a full manualised programme package. The aim here would not be to replace evidence-based programmes, but rather to test whether routine practice might be strengthened by incorporating some of the practice elements of effective programmes in wider case work and support for families. This approach would also be relevant where effective programmes cannot be delivered or are unavailable, or for parents who cannot be engaged to attend, where the delivery of core components from effective parenting programmes might help to improve outcomes.

National and local policy-level effort also needs to be directed at tackling the socio-economic contexts that underpin the complex and multiple needs that parents face. Issues like poverty, unemployment, homelessness and poor housing conditions, declining investment in communities, inequality, and race and gender discrimination are at the heart of many of these problems. To achieve radical improvement in outcome for the most vulnerable children, the provision of evidence-based interventions must be supported by national efforts to address the structural and material contexts of family adversity. Parenting programmes can help to strengthen families' response and resilience in the face of these challenges, but families also need holistic, systemic, and material support, including early preventative community-based support and specialist support for issues such as poor mental health and substance abuse, that can be widely accessed without stigma or shame. These need to be part of local service provision, supported by a national effort to address the structural and material contexts of family adversity. It is this combination of policies and practices, wrapped around high-quality implementation of effective parenting programmes, that is needed for radical improvement in the experiences and outcomes of the most vulnerable children.

Research recommendations

First, more research is needed to test the programme features and family and contextual circumstances that influence the effectiveness of parenting programmes. Mediation, moderation, and subgroup analyses of specific problems, populations, theoretical approaches, and modalities are needed in current and future primary studies. More decomposition and other studies are needed testing specific practice elements and/or describing the timing, dose, and quality of specific components, so they can be disentangled and tested individually and in combination, considering using network meta-analyses to ascertain effect sizes and use case. Future research might also include the use of various research methods to better identify what works for whom, under which circumstances, and also to identify the wider sources of support needed by different groups of parents. This would include qualitative research addressing parents' perceptions about their needs and the benefits of different types of programme, or realist methods. More testing of programmes based on attachment and other theories with this population of parents is needed, and also with younger children.

There is a need for more studies that utilise objective measures of outcome related to child maltreatment rather than the parent-report and proxy measures that are currently predominant, and studies that involve longer follow-up periods. There would also be value in more head-to-head trials comparing the effectiveness of different programmes.

Research is also needed to assess whether programme effects sustain over time, and if not, how the benefits of these programmes can be sustained or boosted with this group of parents. Only a small number of trials included in the meta-analysis (n = 16, 16.8%) assessed outcomes beyond 6 months after intervention completion.

We also need more studies of implementation, testing specific implementation strategies across contexts, scale-up, and sustainability.

Finally, there is a need for investment in publicly available living reviews, where studies can be quickly and efficiently added to enhance what we know.

Lessons learned

There is a need to improve the quality of trial design and conduct. Our assessments identified risks of bias particularly in random sequence generation, allocation concealment, incomplete data, developer involvement, and from other sources. Studies need to better describe treatment as usual. More trials with follow-up beyond six months after intervention completion are needed, to capture potential changes in effects over time of parenting programmes. More consistent use of a key set of outcome measures would also aid synthesis and aggregation.

Programme developers and evaluators also need to provide more information about the implementation requirements of programmes. Although some resources will be commercially sensitive and kept behind paywalls, service leaders and commissioners need better information to be able to assess the potential feasibility of programmes in their contexts, including information about the workforce requirements, training requirements, and the implementation support available, as well as whether and where they have been used in the UK.

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APPENDICES

Appendix A: Risk factors

Eligible for inclusion were studies with parents:

- Who were referred by agencies (e.g. social services) to receive an intervention based on their levels of maltreatment (treated)
- Who were offered an intervention based on scoring highly on child maltreatment instruments (indicated)
- With higher-level needs who are offered an intervention based on risk factors for maltreatment (selective).

Three categories of selective trials were eligible for inclusion under the third category of parents with higher level needs who were offered an intervention based on risk factors for maltreatment.

Category 1) A study was eligible if any of the following risk criteria (and cut-offs) was met:

Risk factor	Definition	Cut-off as primary risk
Parental substance abuse	Father or mother with current problematic substance misuse, including substitute programmes (e.g. methadone).	At least 50% of study population.
Parental poor mental health	Evidence of current poor mental health which meets clinical level or is diagnosed. *(This excludes studies where mental health is assessed using a scale that does not indicate a clinical level.)*	i) At least 50% of study population meets the clinical level; or ii) At least 50% of study population is diagnosed; or iii) The study population mean is within clinical level.
Parents with intellectual disability	Parents with an intellectual disability defined as moderate impairments in intellectual functioning and adaptive behaviour.	We will only include trials that target parents with intellectual disability, i.e. had parental intellectual disability as inclusion criteria (100% of study sample).
Parental incarceration	Father or mother currently incarcerated (with some child contact) or exited within 2 years prior.	We will only include trials that had parental incarceration as inclusion criteria (100% of study sample).
Intimate Partner Violence	Parents experiencing/have experienced IPV.	We will only include trials that had parental IPV as inclusion criteria (100% of study sample).

| **Parental childhood experience of maltreatment or other adverse childhood experiences (ACEs)** | ACEs we will include are:
• Physical abuse
• Sexual Abuse
• Emotional Abuse
• Living with someone who abused drugs
• Living with someone who abused alcohol
• Exposure to domestic violence
• Living with someone who has gone to prison
• Living with someone with serious mental illness.
We will not include: Losing a parent through divorce, death or abandonment. | Include if
i) at least 50% of study sample experienced some form of maltreatment or other ACE; or
ii) trial targets parents with one or more ACE, with 100% of study sample falling into this category. |

Category 2) A study is eligible if any of the following risk criteria are met plus presence of a second risk factor (with lower cut off)

Risk factor	Indicator / measure	Cut-off	Second risk criteria: must also be met
Children with severe child socio-emotional and conduct problems	The intervention is offered to parents of children diagnosed or referred for clinically significant levels of conduct problems *(treated)*. The intervention is offered to parents based on reporting that their child scores highly on a behaviour problem inventory *(indicated)*.	We will only include trials that target these groups, with 100% of study sample falling into this category.	c. Using definitions as stated above with lower cut-offs: d. 25% prevalence parental substance abuse e. 25% prevalence poor mental health / or mean falls within the moderate category (or higher) f. At least 50% parents with intellectual disability g. At least 50% with incarcerated parents h. At least 50% of parents with ACE i. At least 50% teenage parents j. At least 50% traveller families, refugees, asylum-seekers or undocumented migrants k. At least 35% meeting SES cut off (see below).

Highly deprived socio-economic status (SES)	i) Based on a specific income-based SES measure or index of deprivation e.g. SES decile or federal poverty line. The Hollingshead Four Factor Index of Socioeconomic Status or covering similar factors will not be included. ii) Income: Mean household income below half of median income for that country/state. iii) Eligible for/receiving public assistance or financial support .	i) At least 70% of study population or mean of study population below specific line or cut-off (e.g. federal poverty line). ii) At least 70% of study population or mean below half median household income of the population for the specific country/state at the time of data collection.[9] iii) At least 70% of study participants.	As per above -a) – g) or l. least 50% treated or indicated based on child conduct problems (see above).
Teenage/adolescent parenthood	Parents aged under 20 at birth of first child or target child.	We will only include trials that had teenage parenthood as inclusion criteria (100% of study sample).	As per above a) – i)
Traveller families, refugees, asylum seekers, undocumented migrants		We will only include trials that target these groups, with 100% of study sample falling into this category.	As per above a) – i)

Category 3) A study is eligible when there is evidence of multiple risk factors (but not meeting criteria and cut-offs of categories 1 and 2)

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[9] In case time of data collection is not reported, then we will base time of data collection on publication year minus 5.5 years. This is based on the average in trials included in Backhaus et al. (2023), that reported this information.

Risk factor	Indicator/measure	Cut-off
Risk factors listed above, i.e. • parental substance abuse • parental poor mental health • teen parenthood • parental intellectual disability • parental incarceration • IPV • parental experience of ACEs • traveller/refugee/asylum seeker undocumented migrant • low SES • child conduct problems.	As described under categories 1 and 2	• 3 or more risks evidenced for a significant proportion of the study population (e.g. 50% +) – or mean number of risks is 3+; or • Eligibility for the trial is based on scoring moderate or high on a multi-risk assessment measure.

Appendix B: Search strategy global dataset (Component 2)

Steps	No. of articles removed	No. of articles remaining
1. Filter IN only RCTs using keywords (e.g. randomized, controlled trial, randomized controlled trial, randomly, randomly assigned, randomised, randomised controlled trial, RCT, randomly allocated)	11,032	9,828
2. Filter IN using parent-related terms (i.e. Parent, parents, parenting, parent-led, parents-led, parenting-led, father, fathers, father-led, dad, dads, mother, mothers, mom, moms, mother-led, family, families, family-led, care, carer, carers, caregiver, caregivers)	2,120	7,708
3. Detect duplicates	155	7,553
4. Filter OUT studies related to animals (e.g. animal, fish, animals, mouse, mice, rodents, rodent, rats, equine, rabbit, rat, cadaver, canine)	78	7,475
5. Establish inter-rater reliability: 3 sets of 20 articles for each pair of researchers – screen in Excel until reach inter-rater reliability of 85%		
6. In the 'Component 2: Final Dataset for Screening 18Dec2023' dataset, each researcher to start screening using non-SLT keywords: a. Select all the related keywords to one non-SLT domain to INCLUDE. [see the list below] b. Start screening.		
7. After team has screened a total of 500 articles for each non-SLT domain, run the AI Assistant which will give us a rating of how relevant each article is based on the articles we have included/excluded.		
8. Team to continue screening their non-SLT domain but sort articles by their ratings.		
9. Team to continue screening using additional key words: • Video feedback • Video-feedback • Home visit • Home visitation • Home visitor • Home visitors • Home visiting • Positive parenting • Incredible Years • SafeCare		

Steps	No. of articles removed	No. of articles remaining
• Reflective • Parenting program • Parenting programme • Parenting intervention.		
10. Search for key words linked to risk factors (Parental substance abuse, parental mental health etc) [see the list below].		

Theoretical approach	Keywords applied
Attachment	Proximity-seeking, Proximity seeking, Safe haven, Secure bond, Secure bonding, Secure attachment, Attachment security, Insecure attachment, Attachment insecurity, Disorganised attachment, Anxious attachment, Ambivalent attachment, Avoidant attachment, Attachment avoidance, Attachment ambivalence, Attachment anxiety, Attachment theory, Attachment behavior, Attachment behaviour, Attachment behaviors, Attachment behaviours, Attachment-based, Bowlby, Circle of Security, Mellow Parenting, Mellow Babies Attachment and Biobehavioural Catch-up, Attachment and Biobehavioral Catch-up, ABC
Sensitivity/ responsiveness	Caregiver sensitivity, Parental sensitivity, Parenting sensitivity, Sensitive parenting, Maternal sensitivity, Sensitive caregiving, Sensitive parent, Sensitive caregiver, Co-regulation, Coregulation, Attunement, Parental warmth, Parental acceptance, Parental responsiveness, Caregiver responsiveness, Parental responsivity, Caregiver responsivity, Responsive parenting, Responsive caregiving, Maternal-infant interaction, Maternal-infant, Responsiveness, Parent-infant interaction
Mentalisation	Theory of Mind, TOM, Mindfulness, Mentalisation, Mentalization, MBT
Psychotherapeutic	Psychotherapy, Psychotherapeutic, Therapy, Therapeutic, Transference, Countertransference, Psychodynamic, Theraplay, Filial therapy
Family systems	Family system, Family systems, Family subsystem, Family subsystems, Family sub-system, Family sub-systems, Family dynamic, Family dynamics, Familial boundary, Familial boundaries, Coalitions, Coalition, Alliances, Alliance, Triangulation, Enmeshment, Enmeshed, Multisystemic Therapy

Risk factor	Keywords applied
Parental substance abuse	Substance abuse, Substance use, Substance misuse, Addicted, Addiction, Methadone, Substance-exposed
Parental mental health	Mental illness, Depressed, Schizophrenia, Bipolar, Psychosis, Anxiety disorder, Stress disorder, PTSD, Parental Depression
Parents with intellectual disability	Intellectual Disability, Intellectually disabled, Intellectual disabilities
Parental incarceration	Incarceration, Incarcerated, Prison
Intimate Partner Violence	Intimate Partner Violence, IPV
Other adverse childhood experiences	ACE, Adverse childhood experience, Child abuse, Neglect, Child maltreatment

Appendix C: List of screened systematic reviews

Armstrong, E., Eggins, E., Reid, N., Harnett, P. & Dawe, S. (2018) Parenting interventions for incarcerated parents to improve parenting knowledge and skills, parent well-being, and quality of the parent–child relationship: A systematic review and meta-analysis. *Journal of Experimental Criminology*. 14 (3), 279–317. https://doi.org/10.1007/s11292-017-9290-6

Barlow, J., Smailagic, N., Bennett, C., Huband, N., Jones, H. & Coren, E. (2011) Individual and group based parenting programmes for improving psychosocial outcomes for teenage parents and their children. *Cochrane Database of Systematic Reviews*. https://doi.org/10.1002/14651858.CD002964.pub2

Byrne, G., Murphy, S. & Connon, G. (2020) Mentalization-based treatments with children and families: A systematic review of the literature. *Clinical Child Psychology and Psychiatry*. 25 (4), 1022–1048. https://doi.org/10.1177/1359104520920689

Coren, E., Ramsbotham, K. & Gschwandtner, M. (2018) Parent training interventions for parents with intellectual disability. *Cochrane Database of Systematic Reviews*. https://doi.org/10.1002/14651858.CD007987.pub3

Gubbels, J., van der Put, C. E., Stams, G. J. J., Prinzie, P. J. & Assink, M. (2021) Components associated with the effect of home visiting programs on child maltreatment: A meta-analytic review. *Child Abuse & Neglect*. 114, 104981. https://doi.org/10.1016/j.chiabu.2021.104981

Jones, K. A., Freijah, I., Brennan, S. E., McKenzie, J. E., Bright, T. M., Fiolet, R., ... & Chamberlain, C. (2023) Interventions from pregnancy to two years after birth for parents experiencing complex post-traumatic stress disorder and/or with childhood experience of maltreatment. *Cochrane Database Of Systematic Reviews*. https://doi.org/10.1002/14651858.CD014874.pub2

Jugovac, S., O'Kearney, R., Hawes, D. J. & Pasalich, D. S. (2022) Attachment-and emotion-focused parenting interventions for child and adolescent externalizing and internalizing behaviors: A meta-analysis. *Clinical Child and Family Psychology Review*. 25 (4), 754–773. https://doi.org/10.1007/s10567-022-00401-8

Lavallee, A., Pang, L., Warmingham, J. M., Atwood, G. D., Ahmed, I., Lanoff, M. R., ... & Dumitriu, D. (2022) Dyadic parent/caregiver-infant interventions initiated in the first 6 months of life to support early relational health: A meta-analysis. *medRxiv*. 2022-10. https://doi.org/10.1101/2022.10.29.22281681

Levey, E. J., Gelaye, B., Bain, P., Rondon, M. B., Borba, C. P. C., Henderson, D. C. & Williams, M. A. (2017) A systematic review of randomized controlled trials of interventions designed to decrease child abuse in high-risk families. *Child Abuse & Neglect*. 65, 48–57. https://doi.org/10.1016/j.chiabu.2017.01.004

Warren, J. M., Halpin, S. A., Hanstock, T. L., Hood, C. & Hunt, S. A. (2022) Outcomes of Parent-Child Interaction Therapy (PCIT) for families presenting with child maltreatment: A systematic review. *Child Abuse & Neglect*. 134, 105942. https://doi.org/10.1016/j.chiabu.2022.105942

Appendix D: Example search

Database:
APA PsycInfo <1806 to January Week 2 2024>

#	Query	Results from 21 Jan 2024
1	((parent$ or famil$) adj (program$ or intervention$ or training or education)).tw.	21,724
2	behavio#r therapy/ or cognitive therapy/	29,027
3	(behavio#r adj3 (train$ or intervention$ or therap$ or program$)).tw.	6,003
4	(cbt or cognitive behavio#ral therapy).tw.	20,259
5	(cognitive adj3 (therap$ or intervention$ or train$ or program$)).tw.	58,499
6	(triple p or positive parenting program).tw.	530
7	incredible years.tw.	356
8	PCIT.mp. or (Parent-child adj interaction adj therap$).tw.	727
9	PMT.mp. or (parent adj management adj training).tw. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh word]	885
10	(family adj check-up).tw.	172
11	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10	101,742
12	conduct disorder$.mp.	12,321
13	(oppositional adj3 (defiant$ or disorder$)).mp.	4,551
14	(conduct adj3 (difficult$ or disorder$ or problem$)).mp.	16,487
15	(behavio#ral adj3 (problem$ or difficult$ or disorder$)).mp.	5,412
16	aggressive behavio#r$.mp.	2,566
17	(emotional adj1 (behavio#r or problem$)).mp.	8,626
18	(child$ adj3 behavio#r$ disorder$).mp.	231
19	behavio#r$ disorder$.mp.	1,926
20	((antisocial or externali$ or internali$ or disruptive) adj (behavio#r or problem$ or difficult$)).mp.	10,417
21	((child adj abus$) or maltreat$ or (physical adj (abuse or violence)) or (psychologi$ adj (aggression or violence)) or neglect or (corporal adj punish$)).mp.	76,692
22	exp parenting skills/ or exp disciplin$/ or exp emotion regulation/ or exp warmth/ or exp parenting/ or exp Child Disciplin$/ or ((mother or father or parent) and Child Relation$).mp. or ((Parent or mother or father) and Child Communicati$).mp. or exp child rearing/ or exp family functioning/ or exp family conflict/ or ((maternal or paternal or parental) and behavio#r*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures, mesh word]	158,657
23	12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22	261,536
24	11 and 23	13,313
25	limit 24 to yr="2022 -Current"	1,186
26	((Parent$ or father$ or mother$ or paternal or maternal) adj (sensitiv* or responsive* or co?regulation)).tw.	3,333
27	((Parent$ or father$ or mother$ or paternal or maternal or family or families) adj3 (mind?minded* or "theory of mind" or mindful* or mentali$ation or MBT or "reflective function")).tw.	807
28	((secur* or insecur* or disorder* or disorgani$ed or anxi* or ambivalen* or avoid* or behav* or intervention) adj attachment).tw.	7,650

29	attachment-based.tw.	1,145
30	28 or 29	8,617
31	(Parent$ or father$ or mother$).tw.	424,079
32	30 and 31	3,415
33	(("maternal-infant" or "mother-infant" or "paternal-infant" or "father-infant" or "parent-infant" or "parent-child" or "mother-child" or "father-child") adj interaction).tw.	7,037
34	((Parent$ or father$ or mother$ or family or families) adj (psycho?therap* or therapy)).tw.	19,949
35	26 or 27 or 32 or 33 or 34	33,344
36	(therap* or intervention$ or treatment$ or program$ or programme$ or training or support or education or group$ or workshop$ or facilit*).tw.	2,925,339
37	35 and 36	27,903
38	("circle of security" or "mellow parenting" or "mellow babies" or "Bio?behavio?ral Catch?up" or theraplay or "filial therapy" or "multi?systemic therapy").tw.	1,067
39	37 or 38	28,698
40	39 and 23	8,911
41	limit 40 to yr="2022 -Current"	645
42	25 or 41	1,645

Appendix E: Practice element coding framework

Type of Element	General Technique	Description of General Technique	Specific Operationalisation (Level 2 Practice Element)	Definition
Content	Psychoeducation	Parents' knowledge and understanding of various areas are increased through didactic teaching techniques and time was dedicated at certain timepoints during the intervention to educate/teach parents about the topic.	Explaining child development	Parents are informed about typical and atypical child development
			Explaining parent–child interactions	Parents are informed about how parents and children shape each other's behaviour in everyday interactions
			Explaining child's communication skills	Parents are informed about the various ways children communicate at various stages of development
			Explaining life skills	Parents are informed about necessary life skills that promote children's development
			Teaching family/support network skills	Parents are taught about the importance of having a good support network
			Explaining child safety	Parents are informed about keeping children safe physically
			Explaining the impacts of abuse, corporal punishment and trauma	Parents are informed about the impacts of child abuse and/or neglect and/or corporal punishment and trauma
			Explaining the impact of parent's wellbeing on child	Parents are informed about the impact of their wellbeing (e.g. physical health, psychological distress) on their children's development

Type of Element	General Technique	Description of General Technique	Specific Operationalisation (Level 2 Practice Element)	Definition
			Explaining parenting styles	Parents are informed about the various parenting styles (e.g. authoritative, dismissing, authoritarian)
			Explaining the various parenting roles	Parents are informed about the potentially different parenting roles each parent might play (e.g. fathers, mothers)
Content	Positive reinforcement	Parents are equipped with positive parenting skills to respond to positive child behaviour with praise and/or rewards	Praise	Verbally praise positive child behaviour
			Tangible rewards	Reward positive child behaviour with tangible rewards (e.g. stickers)
			Intangible rewards	Reward positive child behaviour with social/intangible rewards (e.g. hugs, kisses)
Content	Nonviolent disciplining	Parents are equipped with skills to respond to disruptive/ inappropriate child behaviour with nonviolent consequences that is intended to reduce the behaviour	Time-out/Calm down time	React to disruptive child behaviour with a time-out procedure or time to calm down on their own (i.e. without parent)
			Ignore	Ignore disruptive attention seeking or demanding child behaviour
			Natural/logical consequences	React to disruptive child behaviour with natural and/or logical consequences (e.g. take a toy away when the child plays too rough with it) including providing explanations for inappropriate behaviour

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Type of Element	General Technique	Description of General Technique	Specific Operationalisation (Level 2 Practice Element)	Definition
Content	Proactive parenting	Parents are equipped with skills to proactively prevent the occurrence of disruptive/ inappropriate child behaviour	Direct and positive commands	Give children direct and positive commands (e.g. instruct rather than ask or beg, and tell children to 'do' something rather than 'not to do' something)
			Setting expectations through use of boundaries and routines	Set expectations about appropriate and inappropriate behaviour through use of boundaries and routines (e.g. so children know what activities to expect next)
			Monitoring	Invest in knowing what the child does and whom s/he plays with
			Fostering positive parenting attitudes	Fosters more positive parenting attitudes and beliefs
			Distraction	Distract the child with or redirect the child to another alternative (e.g. toy, activity)
			Pre-empting	Pre-empt the child about a desired behaviour (e.g. pre-empt about an upcoming change in activity/routine so child knows what to expect, prompt them about how they should behave before a situation)
			Empowering the child	Empower the child by giving them some agency/choice through specific roles or tasks or responsibilities so that they have some ownership of their behaviour

Type of Element	General Technique	Description of General Technique	Specific Operationalisation (Level 2 Practice Element)	Definition
Content	Relationship enhancement/ promoting sensitivity	Parents are supported to increase their caregiver sensitivity to build more positive parent–child relationships	Parent–child play / promoting dyadic play	Have daily play sessions with the child
			Empathy	Understand what the child feels in different situations
			Physical touch and affection	Encourage caregiver to demonstrate physical affection and touch with their child
			Encouraging watch, wait & wonder	Equip caregiver with watch, wait and wonder strategies
			Improving communicative skills of parents in interaction with their child	Improve parents' ability to communicate effectively with their child (e.g. delighting in the child by smiling, having eye contact, etc.)
			Active listening	Concentrate on what the child says, and show that s/he is listened to
			Child-directed interactions	Equip parent with the skills to engage in child-directed interactions
			Responding sensitively	Equip parent with the skills to recognise child's cues promptly, understand them accurately and in turn, respond sensitively and appropriately
Content	Parents' family-of-origin	Parents are supported to increase their understanding of their family-of-origin and how their own	Reflections on parents' family-of-origin	Improve parents' understanding of their own family-of-origin issues and how it may affect the way they parent

Type of Element	General Technique	Description of General Technique	Specific Operationalisation (Level 2 Practice Element)	Definition
		experiences of being parented may impact on their current parenting		
Content	Skills for parents themselves	Parents are equipped with skills they can use on their own to improve their parental wellbeing	Emotion regulation skills	Recognise and regulate your own feelings as a parent (e.g. use relaxation techniques, mindfulness techniques)
			Problem-solving skills	Generate and implement solutions to difficult parenting situations
			Partner support for parenting	Improve partner relationships and co-parenting
			Reflective functioning	Foster parents' ability to reflect about their behaviours and interactions with their child
			Communication skills	Fosters parents' communication skills with their partner, family members, etc. (not the child)
			Social support	Equips parents with skills to increase their social support network
Content	Skills parents teach / facilitate in their children	Parents are equipped with skills they can teach/ facilitate in their children to improve their child's wellbeing	Emotion regulation skills	Teaching the child how to have words for emotions and how to regulate them (e.g. time-in strategies)
			Problem-solving skills	Teaching the child how to solve everyday problems (e.g. how to overcome unhelpful cognitions that the child may have)

Type of Element	General Technique	Description of General Technique	Specific Operationalisation (Level 2 Practice Element)	Definition
			Social skills	Teaching the child how to interact with other children
Process	Delivery method	Practitioners' delivery techniques	Use of video interaction guidance	Observe video recordings of the target parent–child interaction; providing strengths-based feedback; exploring what is happening and what the child might be feeling
			Use of video vignettes	Observe video recordings of generic parent–child dyads
			Reframing techniques	Practitioner helps parent to reframe their perceptions of their child's behaviours
			Discussions of challenging situations	Practitioner discusses challenging situations that caregiver brings up
			Speaking for the baby/child	Practitioner narrates child's behaviour and possible emotions and intentions to parent
			Roleplays	Parent participates in roleplay with practitioner and/or other parents around parenting
			Modelling	Practitioner models technique for parent to learn or uses peers as models for learning
			Homework	Parents are provided with homework they are expected to complete in between sessions
			Peer support	Parents are encouraged to reach out and connect with

Type of Element	General Technique	Description of General Technique	Specific Operationalisation (Level 2 Practice Element)	Definition
				peers (in their parenting group or in the same programme)
			Home visitation	Practitioner delivers intervention in the parent's home setting
			Check-in	Practitioner checks in formally at the start or end of a group intervention session about how parents are feeling, whether there are any questions, whether parents have had any challenges since last session/foresee any difficulties before next session
			Live coaching	Practitioner provides direct feedback and coaching to the parent during an observation of parent–child interactions and parenting behaviours (either in-person or through a wireless earphone, video recording or other technology)
			Use of observation rating scale	Practitioner observes the parent–child interaction and rates it using a checklist/scale and uses this to inform the implementation of the intervention
Process	Therapist's approach	Practitioners' approach with parent	Promote therapeutic relationship	Includes building rapport and trust in practitioner–client relationship, addressing rupture in the therapeutic relationship and repair

Type of Element	General Technique	Description of General Technique	Specific Operationalisation (Level 2 Practice Element)	Definition
			Client-directed	Practitioner facilitates conversation/discussion rather than directs the content for discussion
			Recognising parent as experts	Practitioner explicitly recognises and involves parent as experts on their own child
			Goal-directed	Practitioner and parent work out goals at the start of the intervention and work towards those goals together
			Motivational interviewing	Practitioner uses motivational interviewing techniques during intervention
			Psychodynamic	Practitioner makes meaning of parent–child interactions in light of parent's unconscious processes (e.g. their preoccupation, current/past experiences, relational models)

Appendix F: Reference list of reports of included studies

1. Abrahamse, M. E., Tsang, V. M. W. & Lindauer, R. J. L. 2021. Home-based parent–child interaction therapy to prevent child maltreatment: A randomized controlled trial. *International Journal of Environmental Research and Public Health*. 18 (16). https://doi.org/10.3390/ijerph18168244

2. Arruabarrena, I., Rivas, G. R., Cañas, M. & de Paúl, J. (2022) The Incredible Years Parenting and Child Treatment Programs: A randomized controlled trial in a child welfare setting in Spain. *Psychosocial Intervention*. 31 (1), 43–58. https://doi.org/10.5093/PI2022A2

3. Bagner, D. M., Coxe, S., Hungerford, G. M., Garcia, D., Barroso, N. E., Hernandez, J. & Rosa-Olivares, J. (2016) Behavioral parent training in infancy: A window of opportunity for high-risk families. *Journal of Abnormal Child Psychology*. 44 (5), 901–912. https://doi.org/10.1007/s10802-015-0089-5

a. Heflin, B. H., Heymann, P., Coxe, S. & Bagner, D. M. 2020. Impact of Parenting Intervention on Observed Aggressive Behaviors in At-Risk Infants. *Journal of Child and Family Studies*. 29 (8), 2234–2245. https://doi.org/10.1007/s10826-020-01744-y

b. Lorenzo, N. E. & Bagner, D. M. (2022) Impact of a behavioral parenting intervention in infancy on maternal emotion socialization. *Child Psychiatry & Human Development*. 53 (3), 469–478. https://doi.org/10.1007/s10578-021-01142-5

c. Neuman, K. J. & Bagner, D. M. (2024) A pilot trial of a home-based parenting intervention for high-risk infants: Effects on and moderating role of effortful control. *Behavior Therapy*. 55 (1), 42–54. https://doi.org/10.1016/j.beth.2023.05.003

4. Barlow, A., Mullany, B., Neault, N., Compton, S., Carter, A., Hastings, R., Billy, T., Coho-Mescal, V., Lorenzo, S. & Walkup, J. T. (2013) Effect of a paraprofessional home-visiting intervention on American Indian teen mothers' and infants' behavioral risks: A randomized controlled trial. In *American Journal of Psychiatry*. 170 (1). https://doi.org/10.1176/appi.ajp.2012.12010121

a. Barlow, A., Mullany, B., Neault, N., Goklish, N., Billy, T., Hastings, R., Lorenzo, S., Kee, C., Lake, K., Redmond, C., Carter, A. & Walkup, J. T. (2015) Paraprofessional-delivered home-visiting intervention for American Indian teen mothers and children: 3-year outcomes from a randomized controlled trial. *American Journal of Psychiatry*. 172(2), 154–162. https://doi.org/10.1176/appi.ajp.2014.14030332

5. Barlow, J., Davis, H., McIntosh, E., Jarrett, P., Mockford, C. & Stewart-Brown, S. (2007) Role of home visiting in improving parenting and health in families at risk of abuse and neglect: Results of a multicentre randomised controlled trial and economic evaluation. *Archives of Disease in Childhood*. 92 (3), 229–233. https://doi.org/10.1136/adc.2006.095117

6. Barlow, J., Sembi, S., Parsons, H., Kim, S., Petrou, S., Harnett, P. & Dawe, S. (2019) A randomized controlled trial and economic evaluation of the Parents Under Pressure program for parents in substance abuse treatment. *Drug and Alcohol Dependence*. 194, 184–194. https://doi.org/10.1016/j.drugalcdep.2018.08.044

a. Dawe, S., Harnett, P., Gullo, M. J., Eggins, E. & Barlow, J. (2021) Moderators and mediators of outcomes of parents with substance use problems: Further evaluation

of the Parents under Pressure programme. *Addiction.* 116 (11), 3206–3218. https://doi.org/10.1111/add.15579

7. Barnicot, K., Welsh, M., Kalwarowsky, S., Stevens, E., Iles, J., Parker, J., Miele, M., Lawn, T., O'Hanlon, L., Sundaresh, S., Ajala, O., Bassett, P., Jones, C., Ramchandani, P. & Crawford, M. (2022) Video feedback parent-infant intervention for mothers experiencing enduring difficulties in managing emotions and relationships: A randomised controlled feasibility trial. *British Journal of Clinical Psychology.* 61 (4), 1188–1210. https://doi.org/10.1111/bjc.12388

8. Berlin, L. J., Shanahan, M. & Appleyard Carmody, K. (2014) Promoting supportive parenting in new mothers with substance-use problems: A pilot randomized trial of residential treatment plus an attachment-based parenting program. *Infant Mental Health Journal.* 35 (1), 81–85. https://doi.org/10.1002/imhj.21427

9. Boyd, R. C., Gerdes, M., Rothman, B., Dougherty, S. L., Localio, R. & Guevara, J. P. (2017) A toddler parenting intervention in primary care for caregivers with depression symptoms. *Journal of Primary Prevention.* 38 (5), 465–480. https://doi.org/10.1007/s10935-017-0481-8

10. Casonato, M., Nazzari, S. & Frigerio, A. (2017). Feasibility and efficacy of an attachment-based intervention in a maltreatment sample in residential care: A pilot study. *Clinical Child Psychology and Psychiatry.* 22 (4), 561–571. https://doi.org/10.1177/1359104517719115

    a. Negrão, M., Pereira, M., Soares, I. & Mesman, J. (2014). Enhancing positive parent-child interactions and family functioning in a poverty sample: A randomized control trial. *Attachment and Human Development.* 16 (4), 315–328. https://doi.org/10.1080/14616734.2014.912485

11. Cassidy, J., Brett, B. E., Gross, J. T., Stern, J. A., Martin, D. R., Mohr, J. J. & Woodhouse, S. S. (2017) Circle of Security-Parenting: A randomized controlled trial in Head Start. *Development and Psychopathology.* 29 (2), 651–673. https://doi.org/10.1017/S0954579417000244

12. Catherine, N. L. A., MacMillan, H., Cullen, A., Zheng, Y., Xie, H., Boyle, M., Sheehan, D., Lever, R., Jack, S. M., Gonzalez, A., Gafni, A., Tonmyr, L., Barr, R., Marcellus, L., Varcoe, C. & Waddell, C. (2023). Effectiveness of nurse-home visiting in improving child and maternal outcomes prenatally to age two years: A randomised controlled trial (British Columbia Healthy Connections Project). *Journal of Child Psychology and Psychiatry and Allied Disciplines.* https://doi.org/10.1111/jc13846

    a. Catherine, N. L. A., Lever, R., Sheehan, D., Zheng, Y., Boyle, M. H., McCandless, L., Gafni, A., Gonzalez, A., Jack, S. M., Tonmyr, L., Varcoe, C., MacMillan, H. L. & Waddell, C. (2019). The British Columbia Healthy Connections Project: Findings on socioeconomic disadvantage in early pregnancy. *BMC Public Health.* 19 (1). https://doi.org/10.1186/s12889-019-7479-5

    b. Catherine, N. L. A., Boyle, M., Zheng, Y., McCandless, L., Xie, H., Lever, R., Sheehan, D., Gonzalez, A., Jack, S. M., Gafni, A., Tonmyr, L., Marcellus, L., Varcoe, C., Cullen, A., Hjertaas, K., Riebe, C., Rikert, N., Sunthoram, A., Barr, R., … Waddell, C. (2020) Nurse home visiting and prenatal substance use in a socioeconomically disadvantaged population in British Columbia: Analysis of prenatal secondary

outcomes in an ongoing randomized controlled trial. *CMAJ Open*. 8 (4), E667–E675. https://doi.org/10.9778/cmajo.20200063

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Appendix G: List of studies excluded from the meta-analysis

Author	Year	Trial country	Programme	Level of prevention (maltreatement)	Mean age	Sample size	Reason for exclusion
Chaffin	2011	United States	Parent-Child Interaction Therapy (PCIT)	Treatment	Not reported	192	Missing data
Barlow	2013	United States	Family Spirit intervention	Selective	Prenatal	322	Targeting teenage parents from rural reservation communities
Flaherty	2010	Australia	1-2-3 Magic Parenting	Treatment	Not reported	38	Programme content judged no longer to be in line with current parenting research
Hodes	2018	Netherlands	VIPP-LD	Selective	3.1	85	Parents with mild intellectual disabilities
Eddy	2013	United States	Parenting Inside Out	Selective	9	359	Targeting incarcerated parents
Julian	2023	United States	Infant Mental Health Home Visiting (Michigan Model)	Selective	0.93	73	Missing data

Author	Year	Trial country	Programme	Level of prevention (maltreatement)	Mean age	Sample size	Reason for exclusion
Menting	2014	Netherlands	Incredible Years	Selective	6.4	133	Targeting incarcerated and recently released mothers
Hastings	2019	United States	Promoting First Relationships	Treatment	2.3	59	Missing data
Ondersma	2017	United States	Healthy Families Indiana + e-Parenting Program (ePP)	Indicated	-	579	Missing data
Sleed	2013	United Kingdom	New Beginnings	Selective	4.65	163	Targeting incarcerated mothers
Small	2015	United States	4Rs 2Ss Family Strengthening Multiple Family Groups Program	Selective	9	321	Missing data

Appendix H: Key study and population characteristics of trials

Table H1. Key characteristics of included trials (n = 106)

Author	year	Control	Design	Intention-to- treat	Treatment arms	Total sample	Follow-up timepoints (post-intervention)	Name intervention
Abrahamse	2021	Waitlist	Individual	Yes	1	20	6, 14 weeks	Parent-Child Interaction Therapy (PCIT)
Arrubarrena	2022	TAU	Individual	Yes	1	146	26, 52 weeks	Incredible Years
Bagner	2016	TAU	Individual	Yes	1	60	2, 12, 24 weeks	Parent-Child Interaction Therapy (PCIT)
Barlow	2007	TAU	Individual	Yes	1	131	post-intervention	Family Partnership Model
Barlow	2013	TAU	Individual	Yes	1	322	post-intervention	Family Spirit intervention
Barlow	2019	TAU	Individual	Yes	1	100	26 weeks	Parents Under Pressure
Barnicot	2022	TAU	Individual	No	1	34	10, 23 weeks	VIPP-PMH
Berlin	2014	Minimal intervention	Individual	Yes	1	21	2 weeks	Attachment and Biobehavioural Catch-up
Boyd	2017	Waitlist	Individual	Yes	1	61	post-intervention	Incredible Years
Casonato	2017	Minimal intervention	Individual	No	1	13	2 weeks	VIPP-SD

Author	year	Control	Design	Intention-to-treat	Treatment arms	Total sample	Follow-up timepoints (post-intervention)	Name intervention
Cassidy	2017	Waitlist	Individual	Yes	1	141	post-intervention	Circle of Security (Parenting & Intensive)
Catherine	2023	TAU	Individual	Yes	1	739	6 weeks	Nurse-Family Partnership
Chaffin	2011	TAU	Individual	No	1	192	N/A	Parent-Child Interaction Therapy (PCIT)
Cicchetti	2006	TAU	Individual	Yes	1	113	2, 54 weeks	Child-Parent Psychotherapy
Cioffi	2023	Minimal intervention	Individual	Yes	1	41	6, 16 weeks	Fathering in Recovery (FIR)
Dawe	2007	TAU	Individual	Yes	2	64	post-intervention, 38 weeks	Parents Under Pressure
Day	2020	TAU	Individual	No	1	48	post-intervention, 20 weeks	Helping Families Programme – Modified
Dishion	2008	TAU	Individual	No	1	731	52, 104, 156 weeks	Family Check-up
Eddy	2013	TAU	Individual	No	1	359	N/A	Parenting Inside Out
Ericksen	2018	Waitlist	Individual	Yes	1	31	post-intervention	HUGS
Feil	2020	Minimal intervention	Individual	Yes	1	164	8 weeks	Play and Learning Strategies – Internet adaptation (ePALS)

Author	year	Control	Design	Intention-to- treat	Treatment arms	Total sample	Follow-up timepoints (post-intervention)	Name intervention
Firk	2021	TAU	Individual	Yes	1	56	post-intervention, 24 weeks	Step Towards Effective and Enjoyable Parenting – adaptation for adolescent mothers (STEEP-b)
Flaherty	2010	Waitlist	Individual	No	1	38	post-intervention	1-2-3 Magic Parenting
Foley	2016	TAU	Individual	Yes	1	44	post-intervention	Parent-Child Interaction Therapy (PCIT)
Fonagy	2016	TAU	Individual	Yes	1	76	post-intervention	Parent-Infant Psychotherapy
Fung	2014	Waitlist	Individual	Yes	1	137	post-intervention	Early Pathways
Gardner	2006	Waitlist	Individual	No	1	76	12 weeks	Incredible Years
Gerwitz	2019	TAU	Individual	Yes	2	129	post-intervention, 26 weeks	PMTO
Goodman	2015	Minimal intervention	Individual	No	1	42	post-intervention, 12 weeks	Perinatal Dyadic Psychotherapy
Green	2014	TAU	Individual	Yes	1	803	27 weeks	Healthy Families
Green	2017	TAU	Individual	Yes	1	2727	45 weeks	Healthy Families
Guterman	2013	TAU	Individual	No	1	138	26 weeks	Parent Aide

Author	year	Control	Design	Intention-to-treat	Treatment arms	Total sample	Follow-up timepoints (post-intervention)	Name intervention
Harris	2015	Waitlist	Individual	Yes	1	199	post-intervention	Early Pathways
Hastings	2019	Minimal intervention	Individual	No	1	59	29 weeks	Promoting First Relationships
Herbers	2020	Waitlist	Individual	Yes	1	45	3 weeks	My Baby's First Teacher
Hodes	2018	TAU	Individual	Yes	1	85	post-intervention, 12 weeks	VIPP-LD
Holt	2021	Minimal intervention	Individual	Yes	1	77	post-intervention, 26 weeks	HUGS
Horowitz	2013	TAU	Individual	No	1	144	post-intervention, 13 weeks	Communicating and Relating Effectively (CARE)
Hubel	2018	TAU	Cluster	No	1	294	post-intervention, 24 weeks	SafeCare
Hughes	2004	Waitlist	Individual	No	1	26	3 weeks	Incredible Years
Hutchings	2007	Waitlist	Individual	Yes	1	153	14 weeks	Incredible Years
Jones	2014	Waitlist	Individual	No	1	39	post-intervention	Triple P
Jones	2017	Waitlist	Individual	No	1	97	post-intervention	Triple P

Author	year	Control	Design	Intention-to-treat	Treatment arms	Total sample	Follow-up timepoints (post-intervention)	Name intervention
Jonson-Reid	2018	TAU	Individual	No	1	141	17 weeks	Parents as Teachers (PAT)
Jouriles	2001	TAU	Individual	No	1	36	1, 10, 50 weeks	Project Support
Jouriles	2009	TAU	Individual	Yes	1	66	post-intervention	Project Support
Julian	2023	Minimal intervention	Individual	No	1	73	post-intervention	Infant Mental Health Home Visiting (Michigan Model)
Karjalainen	2019	Waitlist	Individual	Yes	1	102	12, 52 weeks	Incredible Years
Lanier	2018	TAU	Individual	No	1	144	post-intervention	Triple P
Lau	2011	Waitlist	Individual	Yes	1	54	post-intervention	Incredible Years
LeCroy	2017	Minimal intervention	Individual	Yes	1	245	26 weeks	Healthy Families
LeCroy	2011	Minimal intervention	Individual	Yes	1	195	post-intervention	Healthy Families
van Leuven	2023	TAU	Individual	Yes	1	112	30 weeks	Safer Kids
Little	2012	Waitlist	Individual	Yes	2	146	14, 26 weeks	Triple P
Longhl	2019	TAU	Individual	Yes	1	148	post-intervention	Minding the Baby

Author	year	Control	Design	Intention-to-treat	Treatment arms	Total sample	Follow-up timepoints (post-intervention)	Name intervention
Love	2019	Waitlist	Individual	Yes	1	81	post-intervention	Early Pathways
Lowell	2011	TAU	Individual	Yes	1	157	2 weeks	Child First
Lyu	2023	Waitlist	Individual	Yes	1	78	post-intervention	Mindfulness-based therapeutic parenting
Mast	2014	Minimal intervention	Individual	No	1	9	13 weeks	I-InTERACT
Mattheß	2021	Waitlist	Individual	Yes	1	34	post-intervention	Parent-Infant Psychotherapy
McGilloway	2012	Waitlist	Individual	Yes	1	149	12 weeks	Incredible Years
McHale	2022	TAU	Individual	Yes	1	276	12, 52 weeks	Focused coparenting consultation
Menting	2014	TAU	Individual	Yes	1	133	post-intervention	Incredible Years
Moss	2011	TAU	Individual	No	1	79	2 weeks	Programme en intervention relationnelle
Ni Mhaille	2013	Waitlist	Individual	Yes	1	33	26 weeks	Incredible Years
Olds DL	2002	Minimal intervention	Individual	No	2	500	post-intervention	Nurse-Family Partnership
Ondersma	2017	TAU	Individual	Yes	1	579	N/A	Healthy Families

Author	year	Control	Design	Intention-to- treat	Treatment arms	Total sample	Follow-up timepoints (post-intervention)	Name intervention
Oxford	2016	Minimal intervention	Individual	Yes	1	247	post-intervention, 13, 26 weeks	Promoting First Relationships
Oxford	2021	TAU	Individual	Yes	1	252	8, 34 weeks	Promoting First Relationships
Pereira	2014	Minimal intervention	Individual	No	1	55	4 weeks	VIPP-SD
Perrone	2021	Waitlist	Individual	Yes	1	200	15 weeks	Attachment and Biobehavioural Catch-up (ABC)
Porter	2015	TAU	Individual	Yes	2	138	2, 8 weeks	Infant Massage Parenting Enhancement Program (IMPEP)
Pruett	2019	Waitlist	Individual	Yes	1	284	8 weeks	Supporting Father Involvement
Puckering	2010	Waitlist	Individual	No	1	17	post-intervention	Mellow Babies
Ramsauer	2020	TAU	Individual	Yes	1	86	post-intervention	Circle of Security (Parenting & Intensive)
Robling	2015	TAU	Individual	Yes	1	1537	post-intervention, 268 weeks (7y)	Nurse-Family Partnership
Rohder	2022	TAU	Individual	Yes	1	78	12 weeks	Circle of Security (Parenting & Intensive)

Author	year	Control	Design	Intention-to- treat	Treatment arms	Total sample	Follow-up timepoints (post-intervention)	Name intervention
Rosenblum	2017	Minimal intervention	Individual	Yes	1	122	post-intervention	Mom Power
Sadler	2013	TAU	Cluster	No	1	105	post-intervention	Minding the Baby
Salo	2019	TAU	Individual	No	1	45	post-intervention	Nurture and Play
Schilling	2017	Waitlist	Individual	Yes	1	120	3, 10 weeks	PriCARE
Scott	2010	Minimal intervention	Cluster	No	1	112	16 weeks	Incredible Years
Shaw	2006	TAU	Individual	No	1	120	52, 104 weeks	Family Check-up
Sierau	2016	TAU	Individual	No	1	755	244 weeks	Nurse-Family Partnership
Silovsky	2011	TAU	Individual	Yes	1	105	4, 64, 96 weeks	SafeCare
Silovsky	2023	TAU	Individual	Yes	1	562	4, 40 weeks	SafeCare
Skowron	2024	TAU	Individual	Yes	1	204	post-intervention	Parent-Child Interaction Therapy (PCIT)
Sleed	2013	TAU	Cluster	Yes	1	163	post-intervention	New Beginnings
Small	2015	TAU	Individual	No	1	321	post-intervention	4Rs 2Ss Family Strengthening Multiple Family Groups Program

Author	year	Control	Design	Intention-to-treat	Treatment arms	Total sample	Follow-up timepoints (post-intervention)	Name intervention
Thomas	2011	Waitlist	Individual	No	1	150	post-intervention	Parent-Child Interaction Therapy (PCIT)
Thorpe	2022	Waitlist	Individual	Yes	1	200	15 weeks	Attachment and Biobehavioural Catch-up (ABC)
Toth	2006	TAU	Individual	No	1	130	6, 294 weeks	Child-Parent Psychotherapy
Tryphonopoulos	2020	TAU	Individual	Yes	1	12	post-intervention	VID-KIDS (Video-feedback intervention)
Tsivos	2015	TAU	Individual	Yes	1	27	post-intervention, 4 weeks	Triple P
Turner	2006	Waitlist	Individual	Yes	1	30	post-intervention	Triple P
van Doesum	2008	Minimal intervention	Individual	No	1	85	2, 24 weeks	Mother-baby intervention: Home visitation intervention
Vardanian	2020	TAU	Individual	No	1	320	post-intervention	4Rs 2Ss Family Strengthening Multiple Family Groups Program
Villodas	2021	TAU	Individual	Yes	1	55	post-intervention	Parent-Child Interaction Therapy (PCIT)
Wagner	2022	TAU	Cluster	No	1	90	post-intervention	Incredible Years

Author	year	Control	Design	Intention-to- treat	Treatment arms	Total sample	Follow-up timepoints (post-intervention)	Name intervention
Weihrauch	2014	Waitlist	Individual	No	1	88	post-intervention, 24 weeks	PArental training for Lone Mothers guided by Educators (PALME)
Whitaker	2020	TAU	Cluster	No	1	288	6 weeks	SafeCare
Williams	2020	TAU	Individual	Yes	1	58	14 weeks	Enhancing Parenting Skills Programme
Wittkowski	2022	TAU	Individual	Yes	1	35	2, 18 weeks	Triple P
Wood	2021	Waitlist	Individual	Yes	1	174	14 weeks	PriCARE
Xia	2023	TAU	Individual	Yes	1	226	15 weeks	Child First
Zimmer-Gembeck	2022	Waitlist	Individual	Yes	1	85	post-intervention	Circle of Security (Parenting & Intensive)

Table H2. Trial population: demographic characteristics (n = 106)

Author	year	Child age (mean)	Child age (min to max in yr)	Percentage of boys	Parent mean age (yr)	Percentage of mothers
Abrahamse	2021	5.7	3 to 7	70.0%		100.0%
Arrubarrena	2022	6.6	4 to 8	66.0%	38.20	73.0%
Bagner	2016	1.13	1 to 1.25	55.0%	29.57	100.0%
Barlow	2007	-1	Prenatal			100.0%

Author	year	Child age (mean)	Child age (min to max in yr)	Percentage of boys	Parent mean age (yr)	Percentage of mothers
Barlow	2013	-1.00	Prenatal		18.10	100.0%
Barlow	2019	0.77		60.0%	30.80	96.0%
Barnicot	2022		0.5 to 3			100.0%
Berlin	2014	0.80	0 to 1.67	62.0%	33.00	100.0%
Boyd	2017		1 to 2.5	36.0%		98.0%
Casonato	2017	1.63	0.83 to 3	33.0%	26.83	100.0%
Cassidy	2017	0.98		42.0%		
Catherine	2023	-1.00	Prenatal		19.76	100.0%
Chaffin	2011		2.5 to 12		29.00	75.0%
Cicchetti	2006	1.11	1 to 1	55.0%	27.50	100.0%
Cioffi	2023	6.5	4 to 10	62.0%	35.00	0.0%
Dawe	2007	3.82	2 to 8	61.0%	30.33	84.0%
Day	2020	7.80		54.0%	34.90	98.0%
Dishion	2008	2.50	2 to 4	51.0%		
Eddy	2013	9	1 to 16			55.0%
Ericksen	2018	0.46	0 to 1		31.52	100.0%

Author	year	Child age (mean)	Child age (min to max in yr)	Percentage of boys	Parent mean age (yr)	Percentage of mothers
Feil	2020	0.37	0.29 to 5.96	44.2%	27.23	100.0%
Firk	2021	0.44	0 to 1	52.0%	18.55	100.0%
Flaherty	2010		2 to 16		39.50	
Foley	2016	6.45	1 to 11	66.0%	30.28	82.0%
Fonagy	2016	0.32	0.04 to 0.92	63.0%	31.10	100.0%
Fung	2014	3.90	0 to 6	73.0%	28.77	94.0%
Gardner	2006	5.90	2 to 9	73.0%	30.50	
Gerwitz	2019	7.69		65.0%	32.78	98.0%
Goodman	2015		4-6 weeks postpartum		30.69	100.0%
Green	2014		0.25		22.50	100.0%
Green	2017	0.02			22.00	100.0%
Guterman	2013		0 to 12		29.60	
Harris	2015	2.88	1 to 5	70.4%	28.16	95.0%
Hastings	2019	2.30		54.0%	27.05	92.0%
Herbers	2020	6.07	0 to 10	62.0%	28.00	100.0%
Hodes	2018	3.10	1 to 7	48.0%	30.30	98.0%

Author	year	Child age (mean)	Child age (min to max in yr)	Percentage of boys	Parent mean age (yr)	Percentage of mothers
Holt	2021	0.29			32.73	100.0%
Horowitz	2013	0.14			31.00	100.0%
Hubel	2018		Preschool aged		19.60	98.0%
Hughes	2004	5.25	3 to 8	61.5%	31.50	75.0%
Hutchings	2007	4.20	3 to 4.9	58.0%		
Jones	2014	6.95	4 to 10	66.0%	37.17	97.0%
Jones	2017		3 to 10		36.65	
Jonson-Reid	2018		0 to 3		26.00	
Jouriles	2001	5.67	4 to 9	72.0%	27.97	100.0%
Jouriles	2009		4 to 9	50.0%	29.45	
Julian	2023	0.93	0 to 2		31.91	100.0%
Karjalainen	2019	5.30	3 to 7	63.0%		96.0%
Lanier	2018	7.30	5 to 11	57.0%	32.43	92.0%
Lau	2011	8.40	5 to 12	61.7%	41.80	
LeCroy	2017		Prenatal		26.35	
LeCroy	2011		Prenatal		24.45	

Author	year	Child age (mean)	Child age (min to max in yr)	Percentage of boys	Parent mean age (yr)	Percentage of mothers
van Leuven	2023	7.47		63.0%	39.20	69.0%
Little	2012	6.80	4 to 9	72.0%		
Longhl	2019	-1	Prenatal			100.0%
Love	2019	3.25		69.0%	31.53	69.0%
Lowell	2011	1.58	0.45 to 2.99	44.0%	27.70	100.0%
Lyu	2023	6.75	1 to 17		37.69	94.6%
Mast	2014		3 to 9			71.0%
Mattheß	2021	0.30			21.82	100.0%
McGilloway	2012	5.00	2.7 to 7.3	63.0%	22.90	
McHale	2022		Prenatal		25.31	50.0%
Menting	2014	6.40	2 to 10	48.9%		
Moss	2011	3.35	1 to 5	61.0%	27.82	94.0%
Ni Mhaille	2013	4.75	3 to 7	76.0%	24.40	
Olds DL	2002				19.79	100.0%
Ondersma	2017		Prenatal		23.60	100.0%
Oxford	2016	1.36	0.83 to 2	58.0%	26.73	91.0%

Author	year	Child age (mean)	Child age (min to max in yr)	Percentage of boys	Parent mean age (yr)	Percentage of mothers
Oxford	2021	0.15		52.0%	28.05	100.0%
Pereira	2014	2.40	1 to 4	52.0%	29.89	100.0%
Perrone	2021	0.99	0.5 to 1.66	49.0%	29.85	96.0%
Porter	2015		0.08 to 0.33	46.0%	27.80	100.0%
Pruett	2019	2.90	0 to 12		31.50	
Puckering	2010		<1			100.0%
Ramsauer	2020	0.53	0.33 to 0.5	53.0%	32.21	100.0%
Robling	2015	-1.00	Prenatal	51.0%	17.90	100.0%
Rohder	2022		Prenatal		30.80	100.0%
Rosenblum	2017	1.38	0 to 5		24.00	100.0%
Sadler	2013		Prenatal	48.0%	19.60	100.0%
Salo	2019		Prenatal			100.0%
Schilling	2017	3.93	2 to 6	63.0%	30.20	99.0%
Scott	2010	5.21	5 to 6	70.5%		0.0%
Shaw	2006	2.01	1.4 to 2.25	100.0%	27.20	100.0%
Sierau	2016		Prenatal		21.40	100.0%

Author	year	Child age (mean)	Child age (min to max in yr)	Percentage of boys	Parent mean age (yr)	Percentage of mothers
Silovsky	2011		Below 5		27.00	99.0%
Silovsky	2023		0 to 5		25.50	
Skowron	2024	4.80	3 to 7	54.0%	32.30	88.2%
Sleed	2013	4.65		39.0%	26.90	100.0%
Small	2015	9.00	7 to 11		37.00	
Thomas	2011	5.00	2 to 8	71.0%	33.50	100.0%
Thorpe	2022	0.97	0.5 to 1.66	49.0%	29.52	96.0%
Toth	2006	1.70		52.8%	31.68	100.0%
Tryphonopoulos	2020	0.53		42.0%	29.30	100.0%
Tsivos	2015	6.20		44.0%	28.40	
Turner	2006	3.35	2 to 6	53.0%	34.15	97.0%
van Doesum	2008	0.45	0.08 to 1	62.0%	30.40	100.0%
Vardanian	2020	8.87	7 to 11	68.0%		
Villodas	2021	4.78	1.5 to 7	62.0%	28.56	98.0%
Wagner	2022					
Weihrauch	2014		4 to 6		36.60	100.0%

Author	year	Child age (mean)	Child age (min to max in yr)	Percentage of boys	Parent mean age (yr)	Percentage of mothers
Whitaker	2020	2.31			29.50	87.0%
Williams	2020	3.46	3 to 5	76.0%	30.55	98.3%
Wittkowski	2022	0.28		45.0%	29.30	55.0%
Wood	2021	3.4	2 to 6	57.0%	29.45	97.0%
Xia	2023	3.66		64.5%	34.48	73.0%
Zimmer-Gembeck	2022	3.45	1.1 to 7.9	53.0%	35.00	85.0%

Table H3. Trial population: target characteristics (n = 106)

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Abrahamse	2021	Indicated	Treatment	Families referred for mental health treatment due to child's disruptive behaviours and history of maltreatment.
Arrubarrena	2022	Treatment	Indicated	Families recruited from Child Welfare and Child Protection Services.
Bagner	2016	Selective	Indicated	Parents of children above 75th percentile on socio-emotional problems. Majority of families living below poverty line.
Barlow	2007	Selective	Universal	Mothers with multiple risks including substance abuse, poor mental health, IPV, low socio-economic status, teen parenthood.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Barlow	2013	Selective	Selective	Teenage mothers from rural reservation communities. Majority of the sample scored at risk for depression.
Barlow	2019	Selective	Universal	Parents of children under 2.5 years old, at community-based treatment for substance abuse.
Barnicot	2022	Selective	Selective	Mothers attending community perinatal mental health and personality disorder services. 50% experienced childhood sexual and/or physical violence trauma.
Berlin	2014	Selective	Selective	Mothers receiving residential substance abuse treatment. Majority scored above cut-off for clinical depression and had a history of ACEs.
Boyd	2017	Selective	Selective	Parents from economically disadvantaged communities, who scored positive for depression symptoms.
Casonato	2017	Treatment	Selective	Mothers and their children at residential care settings receiving protective services for issues related to child maltreatment.
Cassidy	2017	Selective	Selective	Parents living below the poverty line and scoring, on average, above cut-off for depression.
Catherine	2023	Selective	Selective	Mothers with multiple risks including poor mental health, teenage parenthood, and majority of the sample experiencing 4+ forms of adversity.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Chaffin	2011	Treatment	Selective	Maltreating biological parents, stepparents, or primary caregivers referred for parenting services at a child welfare agency.
Cicchetti	2006	Treatment	Selective	Mothers of infants who have been maltreated and/or who were living in maltreating families.
Cioffi	2023	Selective	Universal	Fathers with a recent history of substance abuse.
Dawe	2007	Selective	Selective	Parents receiving community-based treatment for substance abuse.
Day	2020	Selective	indicated	Majority of parents had received a psychiatric diagnosis, including personality disorders. Majority of their children had behavioural problems scoring above clinical cut-off.
Dishion	2008	Selective	Selective	Parents and their children scoring above average on behaviour problems, family problems (maternal depression, daily parenting challenges, substance use problems, teen parent status), and socio-demographic risk (low education achievement and low family income).
Eddy	2013	Selective	Selective	Imprisoned parents of children between 3 and 11 years old who have less than 9 months remaining before the end of their prison sentence.
Ericksen	2018	Selective	Selective	Mothers with depression or experiencing mental health difficulties.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Feil	2020	Selective	Selective	Mothers from low-income environments; sample's average score was above clinical cut-off for depression.
Firk	2021	Selective	Universal	Teenage mothers and their children receiving support from the welfare system.
Flaherty	2010	Treatment	Selective	Parents referred from child protection services. Low socio-economic background, substantiated child abuse, and poor mental health cases among the sample.
Foley	2016	Treatment	Selective	Families with substantiated child abuse and neglect reports or identified as significantly at risk for abuse and neglect.
Fonagy	2016	Selective	Selective	Parents met psychiatric case criteria. Demographically diverse, urban, with areas of high levels of socio-economic deprivation.
Fung	2014	Selective	indicated	Families met federal poverty line; children had severe behaviour problems.
Gardner	2006	Selective	treatment	Parents of children scoring above clinical cut-off for behaviour problems; from low-income households; 43% parents in the sample experiencing depression.
Gerwitz	2019	Selective	Treatment	Parents of children with externalising problems; households with low-income.
Goodman	2015	Selective	Universal	Mothers experiencing elevated postpartum depression symptoms.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Green	2014	Selective	Selective	Families experiencing multiple risks including depression, teenage parenthood, low-income households.
Green	2017	Selective	Selective	Families experiencing multiple risks including depression, teenage parenthood, low-income households.
Guterman	2013	Indicated	Selective	Families deemed at high risk for abuse/neglect by Child Protection Services.
Harris	2015	Selective	treatment	Children with high scores for disruptive behaviours, from families living below the poverty line.
Hastings	2019	Treatment	Indicated	Families in which there has been neglect or abuse.
Herbers	2020	Selective	Selective	Parents with a history of ACEs, living in emergency shelters.
Hodes	2018	Selective	Selective	Parents with mild intellectual disabilities.
Holt	2021	Selective	Universal	Mothers diagnosed with depressive disorder.
Horowitz	2013	Selective	Universal	Mothers scoring high for postpartum depression.
Hubel	2018	Treatment	Selective	Teen parents, scoring on average above cut-off for moderate depression, who were referred to community-based agencies under contract with the child welfare system.
Hughes	2004	Treatment	Selective	Families referred by Child Protection Agency. Majority of mothers in the sample with high risk of depression.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Hutchings	2007	Selective	indicated	Children scoring above clinical cut-off for behaviour problems, with parents scoring on average above clinical cut-off for depression, from disadvantaged areas.
Jones	2014	Selective	Selective	Parents with bipolar disorder.
Jones	2017	Selective	Selective	Parents with bipolar disorder.
Jonson-Reid	2018	Treatment	Selective	Teenage parents who had been reported to the Child Protection Service, with majority of sample scoring above clinical cut-off for depression.
Jouriles	2001	Selective	treatment	Mothers in domestic violence shelters with psychopathological symptoms and at least one child in the family with diagnosed oppositional defiant disorder or conduct disorder.
Jouriles	2009	Selective	treatment	Mothers in domestic violence shelters with psychopathological symptoms and their children with clinical levels of conduct problems.
Julian	2023	Selective	Selective	Eligible for public benefits, reported parenting challenges and/or perceptions of their child as difficult, majority of sample endorsed high experiences of adversity during childhood.
Karjalainen	2019	Selective	treatment	Children with behavioural problems and their parents, involved with Child Protection Services or Social services, and indicated to need supporting in parenting.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Lanier	2018	Treatment	Selective	Parents receiving standard or intensive in-home services following child welfare services investigation due to child maltreatment.
Lau	2011	Indicated	Selective	Parents referred for concerns about parental discipline or child behaviour problems.
LeCroy	2017	Selective	Selective	Families identified as 'at-risk' scoring above cut-off for family stress.
LeCroy	2011	Selective	Selective	Families identified as 'at-risk' scoring above cut-off for family stress.
van Leuven	2023	Treatment	Selective	Parents at risk of depression.
Little	2012	Selective	indicated	Parents of children at risk of social-behavioural disorder, primarily from low-income households.
Longhl	2019	Selective	Selective	Sample with multiple risks including depressive symptoms, low-income and teenage parenthood.
Love	2019	Selective	Treatment	Parents of children with behavioural and emotional problems (PTSD symptoms), living in poverty.
Lowell	2011	Selective	Indicated	Parents living in poverty. Majority of sample with clinically significant depression symptoms.
Lyu	2023	Selective	Selective	Parents with a history of ACEs.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Mast	2014	Indicated	Selective	Parents and their children with a history of abuse.
Mattheß	2021	Selective	Selective	Parent-infant dyads living in mother-child facilities.
McGilloway	2012	Selective	treatment	Families experiencing multiple difficulties (i.e. socio-economic disadvantage, mental health issues, substance misuse, community conflict, domestic violence).
McHale	2022	Selective	Selective	Majority of sample from low-income households, who have experienced IPV.
Menting	2014	Selective	Selective	Incarcerated and recently released mothers.
Moss	2011	Treatment	Selective	Parent-child dyads involved with child welfare or community services.
Ni Mhaille	2013	Selective	treatment	Parents of children scoring above clinical cutoff for emotional and behavioural difficulties, living in socially disadvantaged areas with most parents having a history of depression.
Olds DL	2002	Selective	Universal	Teen mothers from low-income households.
Ondersma	2017	Indicated	Selective	Majority of the sample receiving public assistance (Healthy Families).
Oxford	2016	Treatment	Selective	Parents who had a recent, open Child Protective Services investigation of child maltreatment, from low-income households.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Oxford	2021	Selective	Selective	Parents from low-income households with poor mental health (depression, anxiety).
Pereira	2014	Indicated	Selective	Severely deprived mothers of young children screened for their problematic caregiving environment.
Perrone	2021	Selective	Selective	Parents living in poverty and involved in the child welfare system.
Porter	2015	Selective	Universal	Recovering substance abuse mothers and their infants predominantly from low-income households.
Pruett	2019	Treatment	Selective	Fathers previously reported to the Child Welfare System who were not currently engaging in child abuse, neglect, or domestic violence.
Puckering	2010	Selective	Selective	Mothers scoring above the clinical threshold for post-natal depression.
Ramsauer	2020	Selective	Selective	Mothers with clinically diagnosed post-partum depression.
Robling	2015	Selective	Selective	Teenage mothers scoring above average for multiple deprivation.
Rohder	2022	Selective	Selective	Majority of sample receiving psychiatric or psychological treatment.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Rosenblum	2017	Selective	Universal	Population screening on average for post-partum depression; majority of parents reporting exposure to IPV during their childhood.
Sadler	2013	Selective	Universal	Majority of mothers were teenagers, scoring above cut-off for depression, and living below the poverty line.
Salo	2019	Selective	Universal	Women screened for clinical depression during pregnancy.
Schilling	2017	Selective	Treatment	Majority of parents experiencing multiple risks (e.g. clinically significant psychological symptoms, IPV, low-income household) with children scoring above cut-off for behavioural problems.
Scott	2010	Selective	indicated	Parents of children scoring above cut-off for behavioural problems from vulnerable families (low-income status, 30% mothers with poor mental health).
Shaw	2006	Selective	Selective	Mothers from low-income households, scoring above average for depressive symptoms.
Sierau	2016	Selective	Selective	Families experiencing multiple risks (e.g. IPV, history of adverse childhood experiences, low-income).
Silovsky	2011	Selective	Selective	Parents experiencing poor mental health, IPV or problematic substance use.
Silovsky	2023	Selective	Selective	Families met at least one of the following risk factors: parental problematic substance use, mental health issues, or IPV.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Skowron	2024	Treatment	Selective	Parents involved in the child welfare system, mainly from low household income, with significant exposures to adverse childhood experiences, and substance abuse.
Sleed	2013	Selective	Selective	Mothers and their babies in prison Mother-Baby Units.
Small	2015	Selective	Treatment	Participants were from a deprived background and had children with clinical levels of conduct problems.
Thomas	2011	Treatment	Indicated	Mothers with a history of or high risk of child maltreatment, referred by Child Protection Services, Health Services, education and non-governmental social service organisations.
Thorpe	2022	Selective	Selective	Low-income communities and families involved in the child welfare system. Majority of parents were living below poverty line and 48% had a history of ACEs.
Toth	2006	Selective	Selective	Mothers met criteria for major depression.
Tryphonopoulos	2020	Selective	Universal	Mothers diagnosed and receiving treatment for post-partum depression.
Tsivos	2015	Selective	Selective	Mothers diagnosed with post-partum depression.
Turner	2006	Selective	Selective	Parents experiencing multiple risks (i.e. poor mental health, children with behavioural problems, financial difficulties).
van Doesum	2008	Selective	Selective	Mothers diagnosed and receiving treatment for depression.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Vardanian	2020	Selective	Treatment	Parents from socio-economically disadvantaged communities with a child with symptoms for conduct problems.
Villodas	2021	Indicated	Indicated	At-risk families referred to services following a child protective investigation.
Wagner	2022	Selective	Selective	Teenage parents and participants from low-income backgrounds.
Weihrauch	2014	Selective	Selective	Mothers met cut-off values in Anxiety or Depression scales.
Whitaker	2020	Treatment	Selective	Parents referred to Child Welfare System due to substantiated or suspected physical abuse or neglect.
Williams	2020	Selective	treatment	Majority of parents scored above cut-off for depression, with children scoring above cut-off for behaviour problems, living in poverty.
Wittkowski	2022	Selective	Selective	Mothers with severe mental health problems and their babies, in a Mother-Baby Unit.
Wood	2021	Selective	Treatment	Families facing multiple risks (including poor mental health, IPV, low-income, children with behavioural problems).
Xia	2023	Selective	Treatment	Families experiencing challenges with caregiver mental health or child development and behaviour problems. Majority was previously or currently involved with Child Protection Services and were from low-income households.

Author	year	Level of prevention (maltreatment risk)	Level of prevention (conduct problem)	Population description
Zimmer-Gembeck	2022	Selective	Treatment	Caregivers from low-income households reporting depressive symptoms and with a child scoring above cut-off for behavioural problems.

Appendix I: List of parenting interventions tested

Programmes that are not included in the meta-analysis are indicated with an Asterix*. This table includes target population details for each programme. These were drawn from official manuals or websites, evidence-based repositories or, if unavailable elsewhere, information from included papers. Target children's age was grouped according to developmental phases across infancy and childhood: Babies (0 – 1 years old); Infant/Toddler (1 – 3 years old); Preschool (3 – 5 years old); and Middle childhood (6 – 12 years old), to identify which age groups are covered by each programme.

Nr.	Name intervention	No. of Trials	Target Population	Babies	Infant/ Toddler	Preschool	Middle childhood
1	1-2-3 Magic Parenting*	1	Parents of children aged 2 to 12 years old.		•	•	•
2	4Rs 2Ss Family Strengthening Multiple Family Groups Program	2	Parents of children aged 7 to 11 years old who are diagnosed with oppositional defiant disorder or conduct disorder.				•
3	Attachment and Biobehavioural Catch-up (ABC)	3	Parents of children 6-24 months who experienced early maltreatment and/or disruptions in care.	•			
4	Child First	2	Parents of children 0-5 years at risk of emotional problems, developmental delay, abuse or neglect.	•	•	•	
5	Child-Parent Psychotherapy	2	Mother and child (infant, toddler, pre-schooler) dyads that show difficulties in their relationship and may be at risk of an insecure attachment.		•	•	

Nr.	Name intervention	No. of Trials	Target Population	Age Group			
				Babies	Infant/ Toddler	Prescho -ol	Middle childh- ood
6	Circle of Security (Parenting & Intensive)	4	COS-P: Parents of children 4 months-6 years who have perinatal depression or substance abuse issues. COS-I: Parents of children with an identified attachment issue in the relationship.	●	●	●	
7	Communicating and Relating Effectively (CARE)	1	Mothers with postpartum depression.	●			
8	Early Pathways	3	Parents of children aged 0-6 years from families living in poverty.	●	●	●	
9	Enhancing Parenting Skills Programme	1	Parents of young children (up to 5 years old) with behavioural challenges.		●	●	
10	Family Check-up	2	Parents of children 2-17 years at risk for conduct problems.		●	●	●
11	Family Partnership Model	1	Parents with complex needs (e.g. parenting difficulties, parent learning disability or mental health difficulties, child disability or mental health difficulties).				
12	Family Spirit intervention*	1	Teen mothers of children from pregnancy to age 5 from Indigenous populations.	●	●	●	
13	Fathering in Recovery (FIR)	1	Fathers with substance use disorder, with children 3-16 years.			●	●
14	Focused coparenting consultation	1	Parents of young children. Included trials targeted Black/African American low-income couples expecting a first baby together.		●	●	

Nr.	Name intervention	No. of Trials	Target Population	Age Group			
				Babies	Infant/ Toddler	Prescho -ol	Middle childh- ood
15	Healthy Families	5	Parents of children 0–5 years from families with histories of trauma, intimate partner violence, mental health issues, substance use disorder.	●	●	●	
16	Helping Families Programme – Modified	1	Parents of children with severe behavioural problems from families experiencing multiple stressors.				
17	HUGS	2	Women who are recovering from depression postnatally and their infants.	●			
18	I-InTERACT	1	Parents of children 3–9 years who sustained a moderate or severe traumatic brain injury.			●	●
19	Incredible Years	12	Parents of children aged 3–8 years with conduct problems.			●	●
20	Infant Massage Parenting Enhancement Program (IMPEP)	1	Mothers actively engaged in outpatient rehabilitation for substance addiction, with infant-aged children.		●		
21	Infant Mental Health Home Visiting (Michigan Model)*	1	Parents and their infants/toddlers ages 0 (during pregnancy) to 36 months who present with challenges to the parent–child relationship, or are at risk for developmental delays.	●	●		
22	Mellow Babies	1	Parents of infants 0–18 months who are teenagers, have mental health problems, child protection or substance abuse issues, or are living in poverty.	●	●		

Nr.	Name intervention	No. of Trials	Target Population	Age Group			
				Babies	Infant/ Toddler	Prescho -ol	Middle childh- ood
23	Mindfulness-based therapeutic parenting	1	Parents of children aged 1–17, with history of Adverse Childhood Experiences.		•	•	•
24	Minding the Baby	2	Mothers of infants ages 0 (from pregnancy) to 2 years old, from vulnerable families experiencing multiple and complex socio-economic, health, attachment, and mental health issues.	•	•		
25	Mom Power	1	Mothers of children ages 0 (from pregnancy) to 6 years old.	•	•	•	
26	Mother-baby intervention: Home visitation intervention	1	Mothers with psychiatric problems with babies up to 12 months.	•			
27	My Baby's First Teacher	1	Mothers of children aged 0 (from pregnancy) to 1 years old.	•			
28	New Beginnings Programme*	1	Parents of children aged 3 to 18 years old.			•	•
29	Nurse-Family Partnership	4	Mothers of infants aged 0 (from pregnancy) to 2 years old.	•	•		
30	Nurture and Play	1	Mothers with depression from pregnancy to 7 months after birth.	•			
31	Parent Aide	1	Parents of children up to 17 years, at risk for child maltreatment.	•	•	•	•
32	PArental training for Lone Mothers guided by Educators (PALME)	1	Psychosocially impaired single mothers with children between 3–6 years old.			•	

Nr.	Name intervention	No. of Trials	Target Population	Age Group			
				Babies	Infant/ Toddler	Prescho -ol	Middle childh- ood
33	Parent-Child Interaction Therapy (PCIT)	6	Parents and their young children, aged 2 to 6 years old, with emotional and behavioural disorders.		•	•	
34	Parent-Child Interaction Therapy (PCIT) – Infant Behavior Program	1	Parents and their infants between 12–15 months from low-income families, with symptoms predictive of later disorder onset.	•	•		
35	Parent-Infant Psychotherapy	2	Parent-infant dyads from vulnerable families facing problems that could impact their relationship.		•		
36	Parenting Inside Out*	1	Parents involved with the criminal justice system, with children aged 0 to 19 years old who may be at risk for, or presenting with behaviour problems.	•	•	•	•
37	Parents as Teachers (PAT)	1	Parents of children aged 0 (from pregnancy) to 5 years old.	•	•	•	
38	Parents Under Pressure	2	Families with complex and multiple difficulties (e.g. mental health challenges, substance misuse, financial challenges, family conflict, potential or current involvement in the child protection system).				
39	Perinatal Dyadic Psychotherapy	1	Mothers with postpartum depression.	•			
40	Play and Learning Strategies – Internet adaptation (ePALS)	1	Parents of infants 18–36 months.		•		

Nr.	Name intervention	No. of Trials	Target Population	Age Group			
				Babies	Infant/ Toddler	Prescho -ol	Middle childh- ood
41	Parent Management Training Oregon (PMTO)	1	Parents of children aged 5 to 12 years old with externalising problems.			•	•
42	PriCARE	2	Parents of children aged 2 to 6 years old.		•	•	
43	Programme en intervention relationnelle	1	Parents of children aged 0–5 with conduct problems or experienced maltreatment or negligence.	•	•	•	
44	Project Support	2	Parents of children aged 4–9 with conduct problems, from families with domestic violence issues.			•	•
45	Promoting First Relationships	3	Parents of children 0–5 years.	•	•	•	
46	SafeCare	4	Parents of children 0–5 years who are experiencing or at risk of child neglect or physical abuse.	•	•	•	
47	Safer Kids	1	Parents of children aged 3 to 12 years old, reported for child abuse.			•	•
48	Step Towards Effective and Enjoyable Parenting – adaptation for adolescent mothers (STEEP-b)	1	Pregnant women living in high-risk situations and their children until 1 year of age.	•			
49	Supporting Father Involvement	1	Parents of children aged 1 to 12 years old.		•	•	•

Nr.	Name intervention	No. of Trials	Target Population	Age Group			
				Babies	Infant/ Toddler	Prescho -ol	Middle childh- ood
50	Triple P	3	Parents of children 0–16 years with behavioural and emotional problems.	•	•	•	•
51	Triple P – Baby Triple P	2	Parents since pregnancy or with a baby until 12 months.	•			
52	Triple P Online + Integrated bipolar parenting intervention IBPI	2	Parents with bipolar disorder.				
53	VID-KIDS (Video-feedback intervention)	1	Mothers with postpartum depression and their babies.	•			
54	Video feedback Intervention for Positive Parenting-Learning Difficulties (VIPP-LD)*	1	Parents with mild intellectual disability, with a child between 1 to 7 years old.		•	•	•
55	Video feedback Intervention for Positive Parenting adapted for perinatal mental health (VIPP-PMH)	1	Mothers experiencing perinatal mental health difficulties and their babies aged 2 to 6 months old.	•			
56	Video Feedback Intervention for Positive Parenting and Sensitive Discipline (VIPP-SD)	2	Parents of children aged <1–6, with caregiver-child relationship problems and/or increased risk of child behavioural problems.	•	•	•	

Appendix J: Population risk factors

Tables J1 and J2 outline the population risk factors on the basis of which trials were included in the review. Please refer to Appendix A for further details on the criteria and cut-offs.

Table J1. Risk factors for study inclusion

Basis for inclusion	Category	N	%
Level of prevention (Maltreatment)	Treated	18	17.0%
	Indicated	7	6.6%
	Selective	81	76.4%
Risk category for selective trials	Group 1 (main risk factors)	43	53.1%
	Group 2 (secondary risk factors)	25	30.9%
	Group 3 (multiple risk factors)	13	16.0%

It is important to note that criteria were applied in hierarchy. We would first assess whether a trial met the relevant criteria and cut-offs for any of the main risks in group 1. In case not, then we would assess whether it met the criteria and cut-offs for the group 2 secondary risks, and subsequently did the same against group 3 criteria. This means that the group categorisations presented in table J2 are solely those that formed the basis for inclusion of trials. For instance, it may be that a trial that was included based on parental substance abuse in at least 50% of the study sample was also socio-economically deprived or facing multiple risks – but this is not captured in the data in table J2. We selected all risk factors that applied within each category (e.g. highly deprived socio-economic status and teenage parenthood).

Table J2. Population risk factors that formed the basis for inclusion of selective trials (n = 81)

Category	Risk factors	N	%
Group 1 – Main risks	Parental substance abuse (at least 50% of study sample)	7	8.6%
	Current clinical parent mental health problems (at least 50% of study population)	32	39.5%
	Parental incarceration (whole study sample)	3	3.7%
	Parental intellectual disability (whole study sample)	1	1.2%
	Past or current experience of IPV (whole study sample)	4	4.9%
	Parental childhood experience of maltreatment or other adverse childhood experiences (whole study sample)	4	4.9%
Group 2 – Secondary risks	Clinical level child conduct problems (whole study sample)	15	18.5%
	Highly deprived socio-economic status (at least 70% of study population)	12	14.8%
	Adolescent / teenage parenthood (whole study sample)	5	6.2%
Group 3 – Multiple risks	Multiple risks	13	16.0%

Appendix K: Risk of bias assessments for studies included in meta-analysis – ROB-1

Author	Year	Randomisation sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias	Developer involvement	Total risk of bias
Abrahamse	2021	Low	Unclear	High	High	Unclear	Low	Low	No	Low
Arrubarrena	2022	Low	Low	High	High	Low	Unclear	Low	No	Low
Bagner	2016	Low	Unclear	High	Low	Unclear	Unclear	Low	Yes	High
Barlow	2019	Low	Low	High	High	High	Low	Low	Yes	High
Barlow	2007	Unclear	Low	High	High	Unclear	Unclear	Low	Yes	High
Barnicot	2022	Low	Low	High	High	High	Low	Low	No	High
Berlin	2014	Unclear	Unclear	High	Low	Unclear	Unclear	Low	No	High
Boyd	2017	Low	Low	High	High	Low	Low	Low	No	Low
Casonato	2017	Low	Unclear	High	Low	Low	Unclear	Low	No	Low
Cassidy	2017	Low	Unclear	High	High	Low	Unclear	Low	No	Low
Catherine	2023	Low	Low	High	High	Low	Low	Low	No	Low
Cicchetti	2006	Unclear	Unclear	High	Unclear	Low	Unclear	Low	No	High
Cioffi	2023	Low	High	High	High	Low	Low	Low	Yes	High
Dawe	2007	Low	Unclear	High	Low	Low	Unclear	Low	Yes	Low

Author	Year	Randomisation sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias	Developer involvement	Total risk of bias
Day	2020	Unclear	Unclear	Unclear	Low	Low	Low	Low	Yes	Low
Dishion	2008	Low	Low	High	Low	Low	Low	Low	Yes	Low
Ericksen	2018	Low	Low	High	High	Low	Low	Low	Yes	Low
Feil	2020	Unclear	Unclear	High	Low	Low	Unclear	Low	Yes	High
Firk	2021	Low	Low	High	Low	Low	Low	Low	Yes	Low
Foley	2016	Unclear	Unclear	High	Unclear	Low	Unclear	Low	No	High
Fonagy	2016	Low	Low	High	High	Low	Low	Low	No	Low
Fung	2014	Low	Unclear	High	Unclear	Low	Low	High	Yes	High
Gardner	2006	Low	Low	High	Low	Low	Low	Low	No	Low
Gerwitz	2019	Unclear	Unclear	High	High	Low	Unclear	Low	No	High
Goodman	2015	Low	Low	High	High	Unclear	Unclear	Low	Yes	Low
Green	2014	Low	Low	High	High	Low	Unclear	High	No	High
Green	2017	Low	Low	High	Low	Low	Unclear	Low	No	Low
Guterman	2013	Low	Unclear	High	Low	Low	Unclear	Low	No	Low
Harris	2015	Low	Unclear	High	Unclear	Low	Unclear	High	Yes	High

Author	Year	Randomisation sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias	Developer involvement	Total risk of bias
Herbers	2020	Low	Low	High	High	Low	Unclear	Low	Yes	Low
Holt	2021	Low	Low	Low	Low	Low	Low	Low	Yes	Low
Horowitz	2013	Unclear	Unclear	High	High	Low	Unclear	Low	Yes	High
Hubel	2018	Unclear	Unclear	High	High	Unclear	Unclear	Low	No	High
Hughes	2004	Low	Unclear	High	Low	Unclear	Unclear	Low	No	High
Hutchings	2007	Low	Low	High	Low	Low	Unclear	Low	No	Low
Jones	2014	Low	Low	High	High	Unclear	Low	Low	Yes	Low
Jones	2017	Low	Low	High	Low	Low	Low	Low	Yes	Low
Jonson-Reid	2018	Unclear	Unclear	High	High	Low	Unclear	Low	No	High
Jouriles	2009	Low	Unclear	High	Low	Low	Unclear	Low	Yes	Low
Jouriles	2001	Low	Unclear	High	Low	Low	Unclear	Low	Yes	Low
Karjalainen	2019	Low	Low	High	High	Low	Low	Low	No	Low
Lanier	2018	Unclear	Unclear	High	High	Low	Low	Low	No	Low
Lau	2011	Low	Unclear	High	Low	Low	Unclear	Low	unclean	Low
LeCroy	2017	Low	Low	High	High	Low	Unclear	Low	No	Low

Author	Year	Randomisation sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias	Developer involvement	Total risk of bias
LeCroy	2011	Unclear	Unclear	High	High	Low	Unclear	Low	No	High
Little	2012	Low	Low	High	Low	Low	Unclear	Low	Yes	Low
Longhi	2019	Low	Unclear	High	High	Low	Low	Low	No	Low
Love	2019	Low	Low	High	High	Unclear	Unclear	Low	Yes	Low
Lowell	2011	Low	Low	High	High	Low	Unclear	Low	No	Low
Lyu	2023	Low	Low	High	High	Unclear	Unclear	Low	No	Low
Mast	2014	Unclear	Unclear	High	High	High	Unclear	Low	No	High
Mattheß	2021	Low	Low	High	Low	Low	Unclear	Low	No	Low
McGilloway	2012	Low	Low	High	Low	Low	Unclear	Low	No	Low
McHale	2022	Low	Low	High	High	Low	High	Low	Yes	High
Moss	2011	Low	Unclear	High	Low	Low	Unclear	Low	No	Low
Ni Mhaille	2013	Low	Unclear	High	Unclear	Unclear	Low	Low	No	Low
Olds	2004	Low	Low	High	Low	Unclear	Unclear	Low	Yes	Low
Oxford	2021	Low	Low	High	Low	Low	Low	Low	Yes	Low
Oxford	2016	Low	Low	High	Low	Low	Unclear	Low	Yes	Low

Author	Year	Randomisation sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias	Developer involvement	Total risk of bias
Pereira	2014	Low	Unclear	High	Unclear	Low	Unclear	Low	No	Low
Perrone	2021	Low	Low	High	High	Low	Unclear	Low	Yes	Low
Porter	2015	Unclear	Unclear	High	Low	Low	Unclear	Low	No	High
Pruett	2019	High	Unclear	High	Unclear	Low	Unclear	Low	Yes	High
Puckering	2010	Low	Unclear	High	Low	High	Unclear	Low	Yes	High
Ramsauer	2020	Unclear	Unclear	High	Low	High	High	Low	No	High
Robling	2015	Low	Low	High	High	Low	Low	Low	No	Low
Rohder	2022	Low	Low	High	High	Low	Low	Low	No	Low
Rosenblum	2017	Low	Low	High	High	Low	Low	Low	Yes	Low
Sadler	2013	Low	Low	High	High	High	Unclear	Low	Yes	High
Salo	2019	Low	Unclear	High	High	Low	Unclear	Low	Yes	Low
Schilling	2017	Low	Low	High	High	Low	Unclear	Low	Yes	Low
Scott	2010	Low	Low	High	Low	Low	Unclear	Low	Yes	Low
Shaw	2006	Low	Low	High	Low	Low	Unclear	Low	Yes	Low
Sierau	2016	Low	Low	High	High	Low	Unclear	Low	No	Low

Author	Year	Randomisation sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias	Developer involvement	Total risk of bias
Silovsky	2011	Low	Unclear	High	Low	Low	Unclear	Low	Yes	Low
Silovsky	2023	Low	Low	High	Low	Low	Low	Low	No	Low
Skowron	2024	Unclear	Unclear	High	Low	Low	Unclear	Low	No	High
Thomas	2011	Unclear	Unclear	High	Unclear	Low	High	Unclear	No	High
Thorpe	2022	Low	Low	High	High	Low	Unclear	Low	Yes	Low
Toth	2006	Unclear	Unclear	High	Low	Unclear	Unclear	Low	Yes	High
Tryphonopoulos	2020	Low	Low	High	High	High	Unclear	Low	Yes	High
Tsivos	2015	Low	Low	High	High	Low	Unclear	Low	Yes	Low
Turner	2006	Unclear	Unclear	High	Low	Unclear	Unclear	Low	No	High
van Doesum	2008	Low	Unclear	High	Low	Unclear	Low	Low	Yes	Low
van Leuven	2023	Low	Low	High	High	Low	Low	Low	Yes	Low
Vardanian	2020	High	Unclear	High	Unclear	High	Unclear	Unclear	No	High
Villodas	2021	Low	Low	High	Low	Low	Unclear	Low	No	Low
Wagner	2022	Low	Low	High	High	High	High	Low	No	High
Weihrauch	2014	Low	High	High	High	High	Unclear	Low	Yes	High

Author	Year	Randomisation sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias	Developer involvement	Total risk of bias
Whitaker	2020	Low	High	High	High	Low	High	Low	No	High
Williams	2020	Low	Low	High	Low	Low	Low	Low	Yes	Low
Wittkowski	2022	Unclear	Low	High	High	Unclear	Low	Low	No	Low
Wood	2021	Low	Low	High	High	Low	Unclear	Low	Yes	Low
Xia	2023	High	Unclear	High	High	Low	Low	Low	No	High
Zimmer-Gembeck	2022	Low	Low	High	High	Low	Unclear	Low	No	Low

Appendix L: Theoretical foundation and delivery mode

Intervention	Theoretical Foundation	Delivery Mode
4Rs 2Ss Family Strengthening Multiple Family Groups Program	SLT + Other(s)	Fixed
Attachment and Biobehavioural Catch-up (ABC)	Attachment	Fixed
Child First	Other(s)	Flexible/modular
Child-Parent Psychotherapy	Attachment + Other(s)	Flexible/modular
Circle of Security (Parenting & Intensive)	Attachment + Other(s)	Fixed
Communicating and Relating Effectively (CARE)	Other(s)	Flexible/modular
Early Pathways	SLT + Other(s)	Flexible/modular
Enhancing Parenting Skills Programme	SLT	Flexible/modular
Family Check-up	SLT	Flexible/modular
Family Partnership Model	Other(s)	Flexible/modular
Fathering in Recovery (FIR)	SLT	Fixed
Focused coparenting consultation	SLT + Other(s)	Fixed
Healthy Families	SLT	Flexible/modular
Helping Families Programme – Modified	SLT	Flexible/modular
HUGS	Attachment + Other(s)	Fixed
I-InTERACT	SLT	Fixed
Incredible Years	SLT	Fixed
Infant Massage Parenting Enhancement Program (IMPEP)	Other(s)	Fixed
Mellow Babies	SLT + Attachment	Fixed
Mindfulness-based therapeutic parenting	Other(s)	Fixed
Minding the Baby	Other(s)	Flexible/modular
Mom Power	Attachment + Other(s)	Fixed
Mother-baby intervention: Home visitation intervention	Attachment	Fixed
My Baby's First Teacher	SLT + Other(s)	Fixed
Nurse-Family Partnership	SLT + Attachment	Flexible/modular
Nurture and Play	Attachment	Fixed
Parent Aide	SLT	Flexible/modular
PArental training for Lone Mothers guided by Educators (PALME)	Attachment	Fixed
Parent-Infant Psychotherapy	Other(s)	Flexible/modular
Parents as Teachers (PAT)	SLT	Flexible/modular
Parents Under Pressure	Attachment + Other(s)	Flexible/modular
Parent-Child Interaction Therapy (PCIT)	SLT	Fixed

Parent-Child Interaction Therapy (PCIT) – Infant Behavior Program	SLT	Fixed
Perinatal Dyadic Psychotherapy	Attachment + Other(s)	Flexible/modular
Play and Learning Strategies – Internet adaptation (ePALS)	SLT	Fixed
Parent Management Training Oregon (PMTO)	SLT	Fixed
PriCARE	SLT	Fixed
Programme en intervention relationnelle	Attachment	Flexible/modular
Project Support	SLT	Flexible/modular
Promoting First Relationships	Attachment	Flexible/modular
SafeCare	SLT	Flexible/modular
Safer Kids	Other(s)	Fixed
Step Towards Effective and Enjoyable Parenting – adaptation for adolescent mothers (STEEP-b)	Attachment	Fixed
Supporting Father Involvement	SLT	Fixed
Triple P	SLT	Fixed
Triple P – Baby Triple P	SLT	Fixed
Triple P Online + Integrated bipolar parenting intervention IBPI	SLT + Other(s)	Fixed
VID-KIDS (Video-feedback intervention)	SLT + Attachment	Flexible/modular
VIPP-SD	SLT + Attachment	Fixed
VIPP-PMH	SLT + Attachment	Fixed

Appendix M: List of practice elements of programmes included in analysis

The table below lists the practice elements identified for all programmes included in the meta-analysis (total n = 50 programmes).

Practice elements identified for programmes included in the analysis (total n = 50 programmes)

Practice Element	No. of Programmes	%
Psychoeducation	43	86.0%
Explaining parent–child interactions	27	54.0%
Teaching family/support network skills	15	30.0%
Explaining child safety	14	28.0%
Explaining the impact of parent's wellbeing on child	14	28.0%
Explaining child's communication skills	13	26.0%
Explaining the impacts of abuse, corporal punishment and trauma	7	14.0%
Explaining the various parenting roles	7	14.0%
Explaining life skills	5	10.0%
Explaining parenting styles	2	4.0%
Positive Reinforcement	22	44.0%
Praise	22	44.0%
Tangible rewards	13	26.0%
Intangible rewards	6	12.0%
Nonviolent Disciplining	19	38.0%
Ignore	14	28.0%
Natural/logical consequences	12	24.0%
Time-out	11	22.0%
Proactive Parenting	34	68.0%
Setting expectations through use of boundaries and routines	23	46.0%
Direct and positive commands	18	36.0%
Fostering positive parenting attitudes	11	22.0%
Distraction	10	20.0%
Monitoring	7	14.0%
Pre-empting	7	14.0%
Empowering the child	6	12.0%
Relationship Enhancement/Promoting Sensitivity	45	90.0%
Improving communicative skills of parents in interaction with their child	30	60.0%
Parent-child play/promoting dyadic play	29	58.0%
Responding sensitively	29	58.0%
Physical touch and affection	20	40.0%
Child-directed interactions	19	38.0%
Empathy	18	36.0%

Practice Element	No. of Programmes	%
Active listening	12	24.0%
Encouraging watch, wait & wonder	6	12.0%
Parents' Family-of-Origin: Reflections on parents' family-of-origin	18	36.0%
Skills for Parents Themselves	40	80.0%
Emotion regulation skills	33	66.0%
Problem-solving skills	20	40.0%
Reflective functioning	20	40.0%
Social support	14	28.0%
Partner support for parenting	12	24.0%
Communication skills	10	20.0%
Skills Parents Teach/Facilitate In Their Children	17	34.0%
Emotion regulation skills	14	28.0%
Problem-solving skills	5	10.0%
Social skills	5	10.0%
Delivery Method	49	98.0%
Home visitation	29	58.0%
Homework	28	56.0%
Live coaching	28	56.0%
Modelling	20	40.0%
Reframing techniques	19	38.0%
Use of video interaction guidance	18	36.0%
Use of video vignettes	17	34.0%
Discussions of challenging situations	16	32.0%
Roleplays	16	32.0%
Speaking for the baby/child	12	24.0%
Use of observation rating scale	11	22.0%
Check-in	7	14.0%
Peer support	5	10.0%
Therapist's Approach	31	62.0%
Promote therapeutic relationship	22	44.0%
Goal-directed	14	28.0%
Client-directed	12	24.0%
Recognising parent as experts	9	18.0%
Motivational interviewing	6	12.0%
Psychodynamic	4	8.0%

Appendix N: Subgroup analysis

Table N1. Subgroup effects on outcome: <u>maltreatment and negative parenting combined</u>

Categorial moderators:

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Theoretical foundation	Attachment	1	1	/	only one study	
	Attachment + other(s)	3	5	*-0.29*	*unreliable*	*unreliable*
	Other(s)	2	3	*-0.26*	*unreliable*	*unreliable*
	SLT	30	98	-0.44***	-0.59	-0.29
	SLT + attachment	3	12	*-0.19*	*unreliable*	*unreliable*
	SLT + other(s)	5	9	*-0.36*	*unreliable*	*unreliable*
Theoretical foundation 2	SLT & SLT +other(s)	35	107	-0.43***	-0.56	-0.29
	Other(s)	6	9	*-0.22*	*unreliable*	*unreliable*
Delivery mode	Fixed	28	81	-0.53***	-0.69	-0.37
	Flexible	16	47	-0.12*	-0.21	-0.02
Setting expectations about appropriate boundaries	Yes	28	72	-0.44***	-0.59	-0.29
	No	16	56	-0.24**	-0.41	-0.07
Child-directed interactions	Yes	26	59	-0.47***	-0.63	-0.32
	No	19	69	-0.15**	-0.26	-0.05
Emotion regulation	Yes	25	80	-0.37***	-0.54	-0.20
	No	20	48	-0.36***	-0.52	-0.20
Level of prevention by maltreatment	Selective	32	92	-0.33***	-0.45	-0.21
	Indicated	5	11	*-0.64*	*unreliable*	*unreliable*
	Treatment	7	25	-0.40+	-0.86	0.07
	Selective	32	92	-0.33***	-0.45	-0.21

Level of prevention 2 by maltreatment	Indicated/treatment	12	36	-0.47**	-0.79	-0.16
Risk factor: parent mental health	Primarily poor mental health	11	34	-0.39*	-0.66	-0.12
	Not primarily poor mental health	32	93	-0.35***	-0.48	-0.22
Conduct problems	High conduct problems	21	55	-0.54***	-0.71	-0.37
	Low or no conduct problems	23	73	-0.21**	-0.33	-0.09
Ethnic composition	Primarily minoritised ethnic groups	14	45	-0.46**	-0.69	-0.23
	Primarily ethnic majority group	17	45	-0.16**	-0.26	-0.05
Family income composition	Primarily low income	37	108	-0.33***	-0.44	-0.22
	Primarily high income	4	8	-0.49	*unreliable*	*unreliable*
Risk factor: teen parenthood	Teen parents	1	3	/	*only one study*	
	Non-teen parents	43	125	-0.39***	-0.50	-0.27
Delivery modality	Face-to-face	37	108	-0.37***	-0.50	-0.25
	Hybrid	4	12	*-0.31*	*unreliable*	*unreliable*
	Online	3	8	*-0.68*	*unreliable*	*unreliable*
Delivery modality 2	Face-to-face	37	108	-0.37***	-0.50	-0.25
	Hybrid/online	7	20	-0.37*	-0.69	-0.04
Delivery format	Combination	3	11	*-0.26*	*unreliable*	*unreliable*
	Group	12	33	-0.54***	-0.71	-0.36
	Individual	28	79	-0.28**	-0.43	-0.14
	Self-directed	2	5	*-0.73*	*unreliable*	*unreliable*

Continuous moderators:
Child age (trial mean):
Analyses were significant: the older the children the higher the improvement in maltreatment & negative parenting
Note: this might be confounded by SLT
(n = 35; change per SD = -0.07, CI -0.12, -0.01; τ2=0.07)
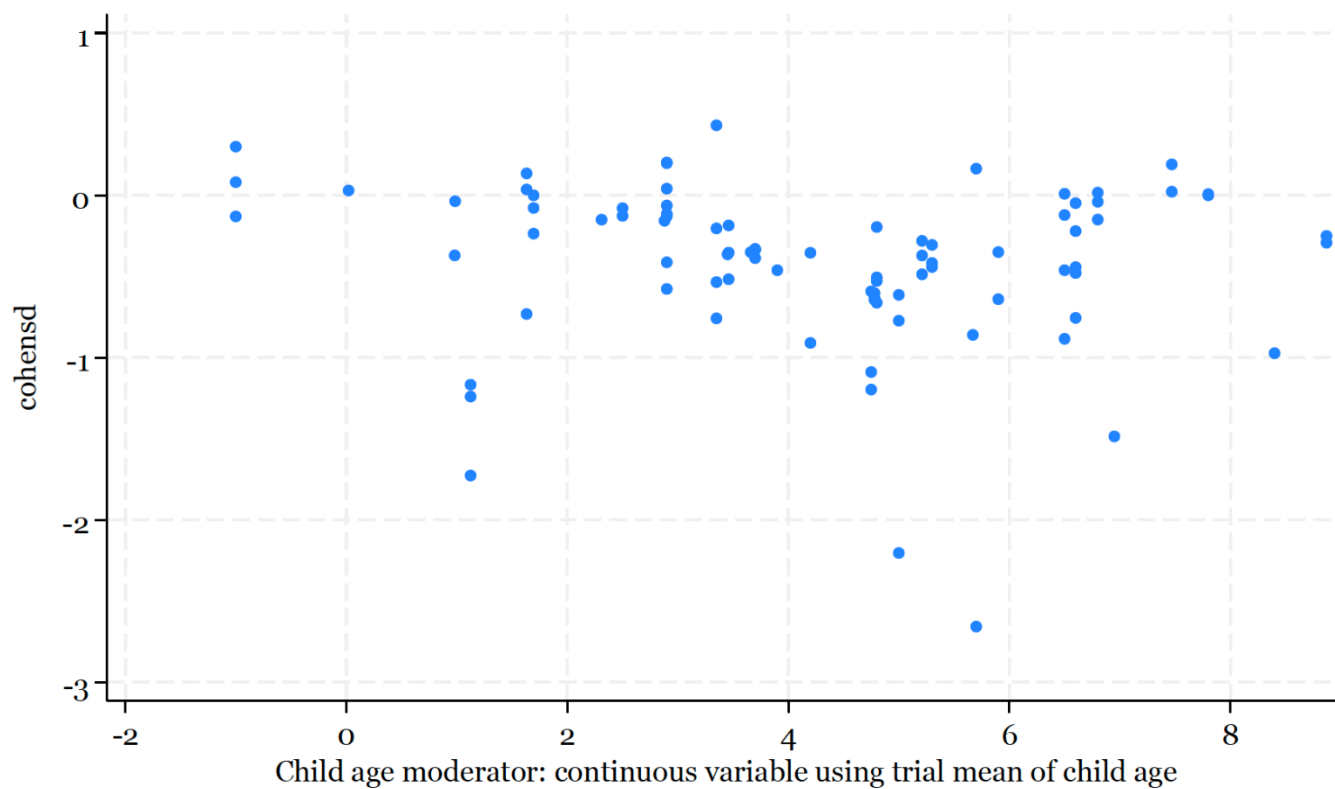
Session length:

Analyses were non-significant: thus there was no evidence that greater numbers of sessions is associated with stronger effects of parenting interventions on maltreatment & negative parenting

(n = 43; change per SD = 0.01, CI -0.004, 0.02; τ2=0.08)
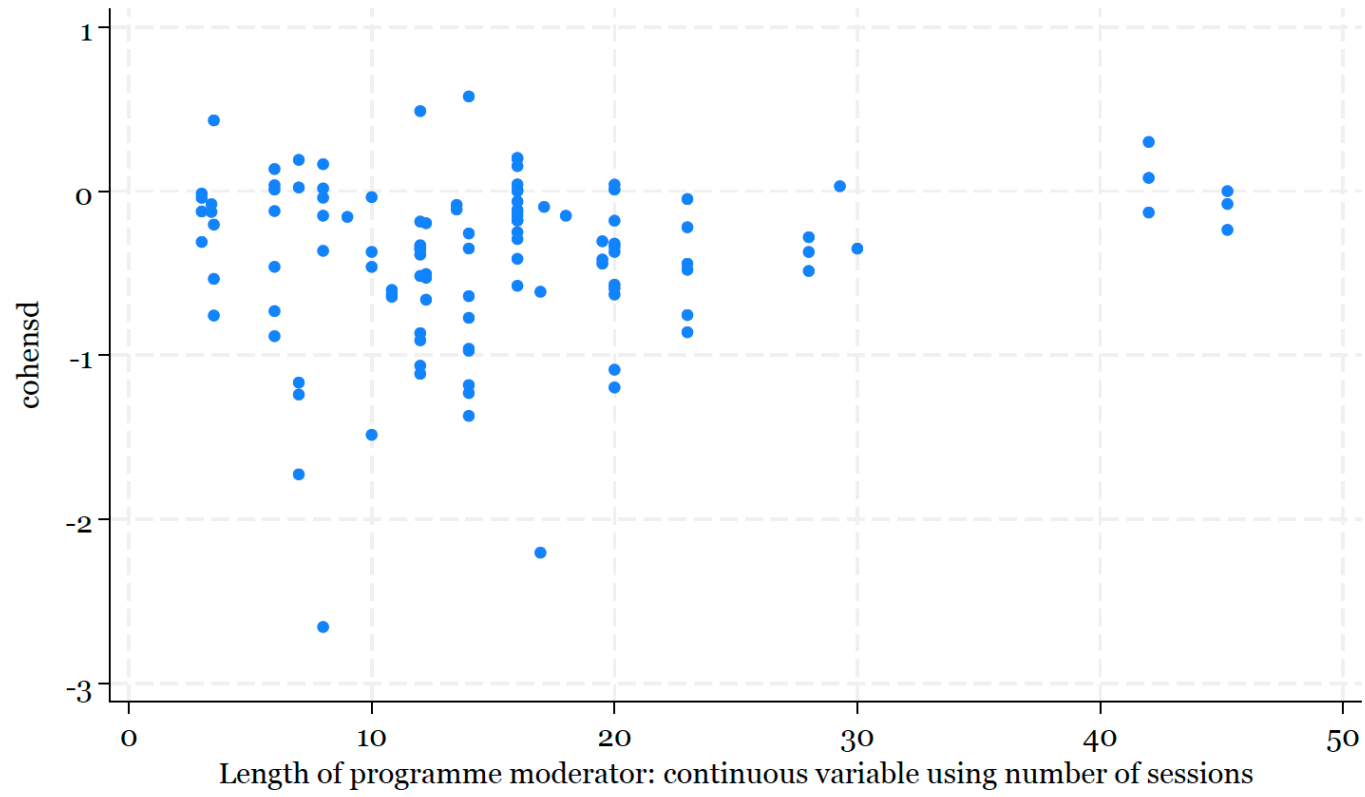
Table N2. Subgroup effects on outcome: <u>parent poor mental health</u>

Categorical moderators:

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Theoretical foundation	Attachment	5	16	*-0.18*	*unreliable*	*unreliable*
	Attachment + other(s)	6	19	-0.07	-0.44	0.29
	Other(s)	10	25	-0.09	-0.25	0.07
	SLT	21	52	-0.26**	-0.46	-0.05
	SLT + attachment	4	6	*-0.05*	*unreliable*	*unreliable*
	SLT + other(s)	2	5	*0.30*	*unreliable*	*unreliable*
Theoretical foundation2	SLT & SLT +other(s)	23	57	-0.21*	-0.41	-0.01
	Other(s)	21	60	-0.11+	-0.22	0.01
Delivery mode	Fixed	25	72	-0.15*	-0.26	-0.04
	Flexible	23	51	-0.16*	-0.35	-0.02
Setting expectations about appropriate boundaries	Yes	23	64	-0.13**	-0.21	-0.05
	No	25	59	-0.15	-0.35	0.05
Child-directed interactions	Yes	20	36	-0.12**	-0.21	-0.04
	No	28	87	-0.17+	-0.35	0.02
Emotion regulation	Yes	31	89	-0.17*	-0.32	-0.01
	No	17	34	-0.14*	-0.26	-0.01
Level of prevention by maltreatment	Selective	42	111	-0.16*	-0.29	-0.03
	Indicated	1	3	/	*only one study*	
	Treatment	5	9	-0.09	*unreliable*	*unreliable*
Level of prevention 2 by maltreatment	Selective	42	111	-0.16*	-0.29	-0.03
	Indicated/treatment	6	12	-0.12	-0.29	0.05
Risk factor: parent poor mental health	Primarily parents with poor mental health	22	72	-0.10	-0.22	0.02

	Not primarily parents with poor mental health	26	51	-0.19*	-0.35	-0.03
Conduct problems	High conduct problems	12	23	-0.18**	-0.28	-0.08
	Low or no conduct problems	36	100	-0.15*	-0.29	-0.01
Ethnic composition	Primarily minoritised ethnic groups	13	30	-0.23	-0.59	0.14
	Primarily ethnic majority group	22	62	-0.06+	-0.12	0.00
Family income composition	Primarily low income	36	72	-0.18**	-0.31	-0.05
	Primarily high income	8	44	-0.01	-0.21	0.19
Risk factor: teen parenthood	Teen parents	5	12	*-0.001*	*unreliable*	*unreliable*
	Non-teen parents	43	111	-0.18**	-0.30	-0.06
Delivery modality	Face-to-face	43	100	-0.16*	-0.28	-0.04
	Hybrid	4	22	*-0.08*	*unreliable*	*unreliable*
	Online	1	1	/	*only one study*	
Delivery modality 2	Face-to-face	43	100	-0.16*	-0.28	-0.04
	Hybrid/online	5	23	*-0.12*	*unreliable*	*unreliable*
Delivery format	Combination	2	4	*-0.09*	*unreliable*	*unreliable*
	Group	12	28	-0.18	-0.41	0.04
	Individual	34	91	-0.15*	-0.29	-0.01
	Self-directed	0	0	/	*no studies*	

Continuous moderators:
Child age (trial mean):
Analyses were non-significant: so no effect of child age on the effects of parenting interventions on parent mental health
(n = 34; change per SD = -0.02, CI -0.04, -0.002; τ2=0.006)
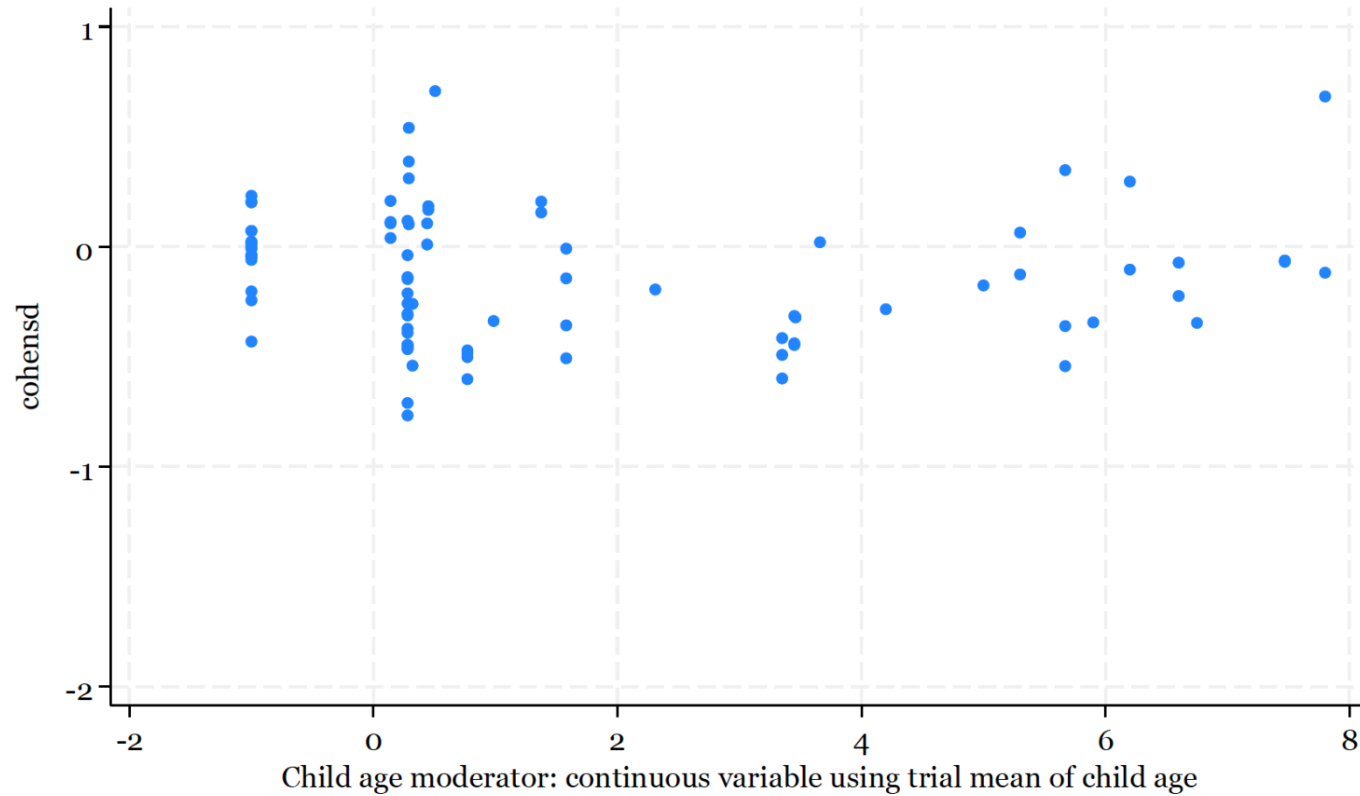
Session length:

Analyses were non-significant but also non-reliable: so no effect of session length on the effects of parenting interventions on parent mental health

(n = 44; change per SD = 0.002, unreliable; τ2=0.01)
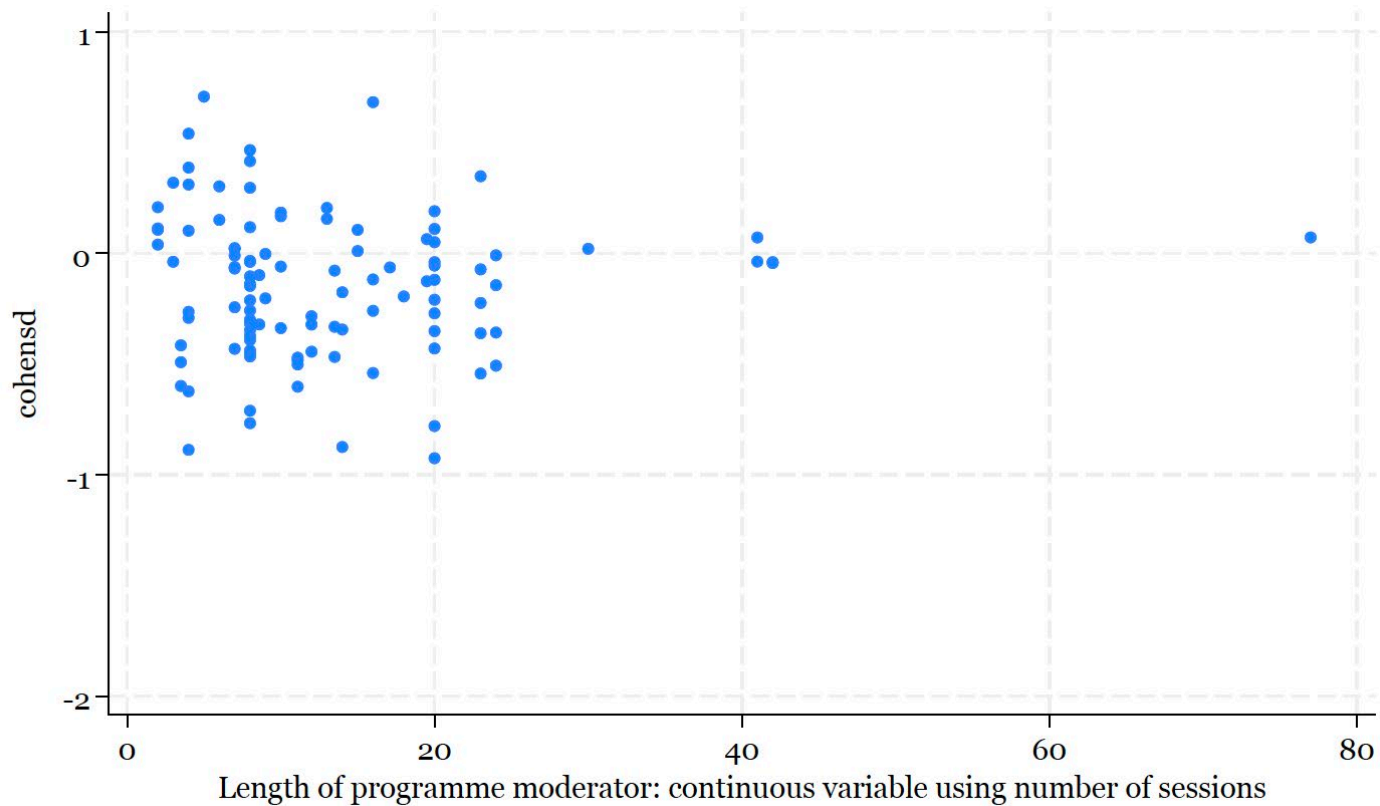
Table N3. Subgroup effects on outcome: <u>positive parenting</u>

Categorial moderators:

Moderator	Subgroup	Number of studies	Number of effect sizes	d	Lower CI	Upper CI
Theoretical foundation	Attachment	8	27	0.29**	0.15	0.44
	Attachment + other(s)	7	13	0.06	-0.02	0.14
	Other(s)	6	11	0.13	-0.20	0.47
	SLT	25	72	0.40***	0.28	0.51
	SLT + attachment	6	19	0.12	*unreliable*	*unreliable*
	SLT + other(s)	3	5	0.62	*unreliable*	*unreliable*
Theoretical foundation2	SLT & SLT +other(s)	28	77	0.44***	0.32	0.56
	Other(s)	21	51	0.17**	0.07	0.27
Delivery mode	Fixed	36	110	0.36***	0.25	0.47
	Flexible	19	37	0.24***	0.12	0.37
Setting expectations about appropriate boundaries	Yes	31	89	0.36***	0.25	0.47
	No	24	58	0.22***	0.11	0.33
Child-directed interactions	Yes	35	96	0.33***	0.22	0.45
	No	20	51	0.25***	0.15	0.34
Emotion regulation	Yes	31	81	0.30***	0.16	0.44
	No	24	66	0.28***	0.20	0.37
Level of prevention by maltreatment	Selective	41	101	0.27***	0.19	0.36
	Indicated	5	15	0.74	*unreliable*	*unreliable*
	Treatment	9	31	0.35*	0.07	0.64
Level of prevention 2 by maltreatment	Selective	41	101	0.27***	0.19	0.36
	Indicated/treatment	14	46	0.44**	0.20	0.67

Risk factor: parent poor mental health	Primarily parents with poor mental health	18	52	0.22**	0.11	0.32
	Not primarily parents with poor mental health	36	94	0.33***	0.23	0.44
Conduct problems	High conduct problems	16	43	0.52***	0.33	0.71
	Low or no conduct problems	39	104	0.21***	0.14	0.28
Ethnic composition	Primarily minoritised ethnic groups	15	31	0.41***	0.23	0.59
	Primarily ethnic majority group	26	85	0.24***	0.15	0.33
Family income composition	Primarily low income	43	111	0.30***	0.22	0.38
	Primarily high income	8	22	0.27+	-0.05	0.59
Risk factor: teen parenthood	Teen parents	3	11	0.07	*unreliable*	*unreliable*
	Non-teen parents	52	136	0.32***	0.24	0.41
Delivery modality	Face-to-face	49	132	0.30***	0.22	0.38
	Hybrid	3	8	0.32	*unreliable*	*unreliable*
	Online	3	7	0.41	*unreliable*	*unreliable*
Delivery modality 2	Face-to-face	49	132	0.30***	0.22	0.38
	Hybrid/online	6	16	0.38+	-0.06	0.83
Delivery format	Combination	2	8	0.27	*unreliable*	*unreliable*
	Group	15	41	0.33***	0.20	0.46
	Individual	38	98	0.30***	0.19	0.40
	Self-directed	0	0	/	*no studies*	

Continuous moderators:

Child age (trial mean):

Analyses were significant: the older the children the higher the improvement in positive parenting (n = 48, change per SD = 0.04, CI 0.001, 0.08, τ2=0.06)
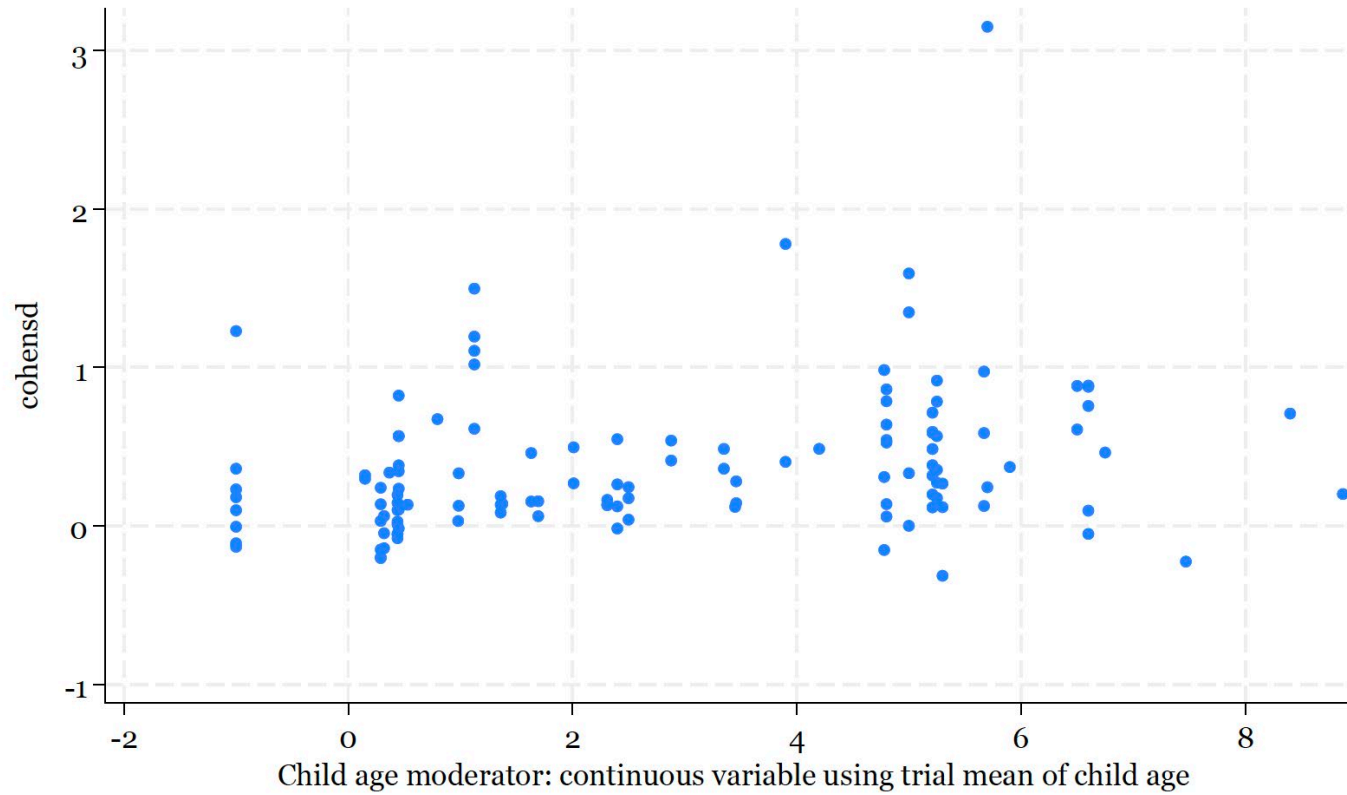
Session length:
Analyses were non-significant but also non-reliable: so no effect of session length on the effects of parenting interventions on positive parenting
(n = 54; change per SD = -0.003, CI -0.01, 0.01; τ2=0.06)
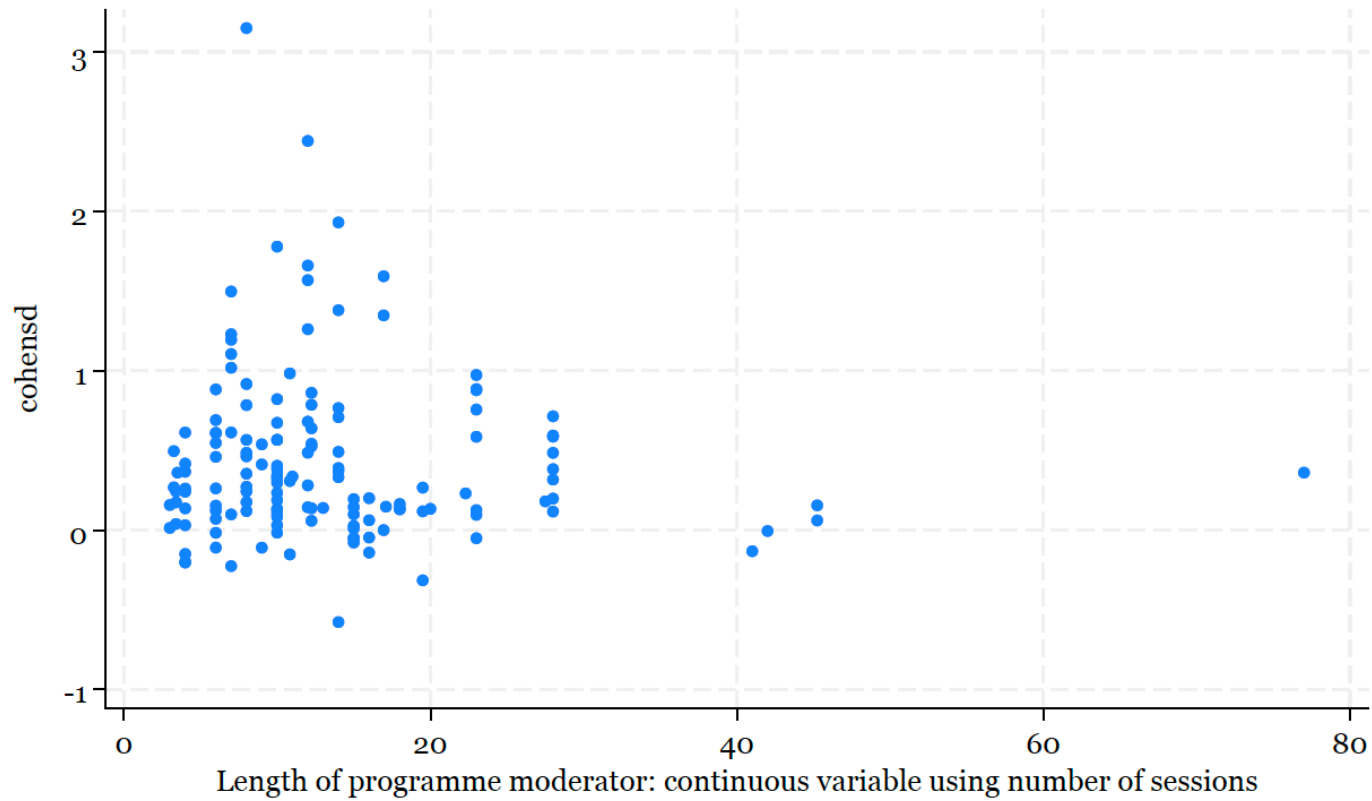
Appendix O: Reporting biases: Publication bias

The following graphs present funnel plots for each main effect analysis divided by 0−6 months and beyond 6 months.

0−6 months post-intervention effects

Maltreatment including harsh parenting
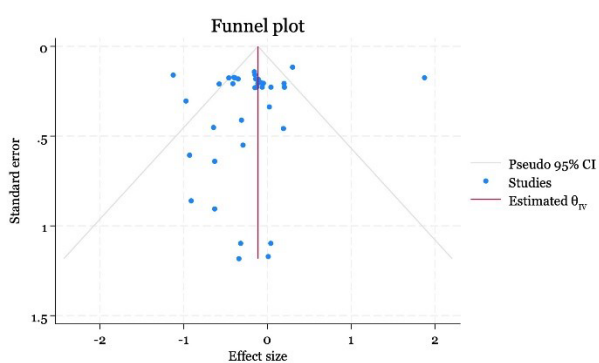
Publication bias possible: yes

Child abuse risk
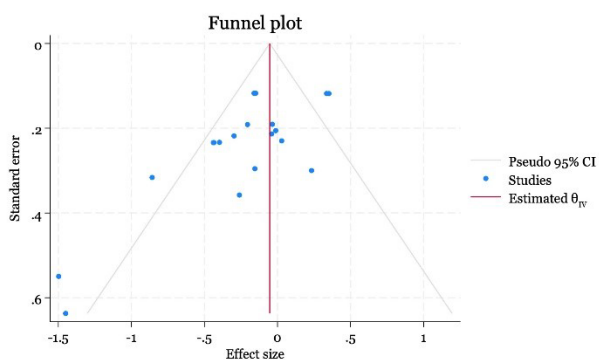
Publication bias possible: yes

Negative parenting

Funnel plot
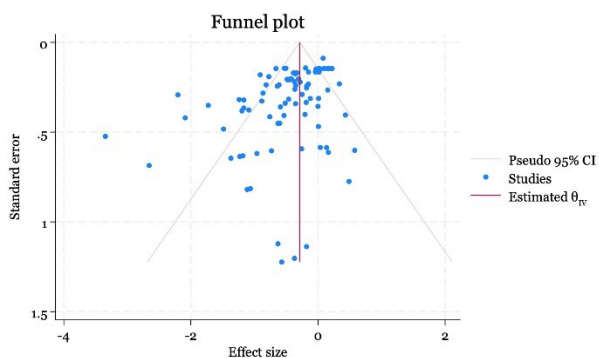
Publication bias possible: yes

Positive parenting

Funnel plot
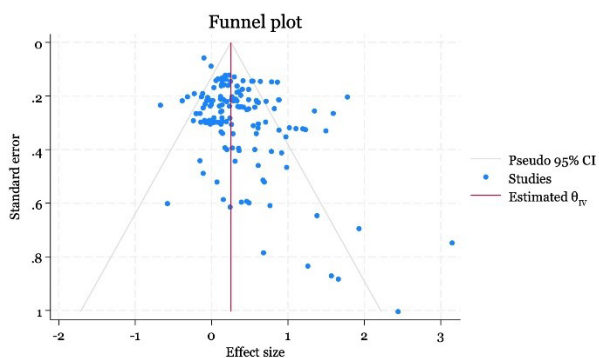
Publication bias possible: yes

Parent mental health

Funnel plot
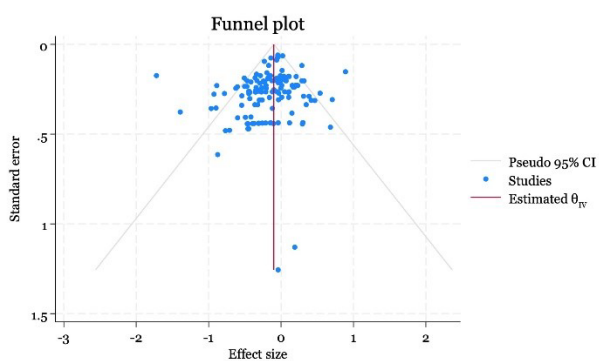
Publication bias possible: yes

Parenting stress

Funnel plot
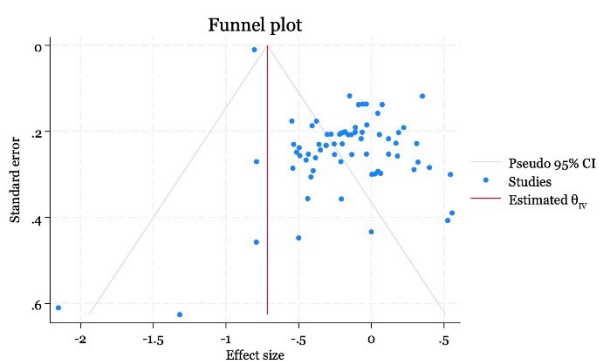
Publication bias possible: unlikely

Child behaviour problems overall

Funnel plot
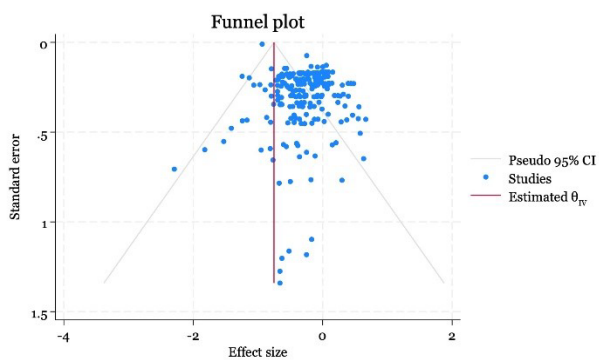
Publication bias possible: unlikely

Child externalising behaviours

Funnel plot
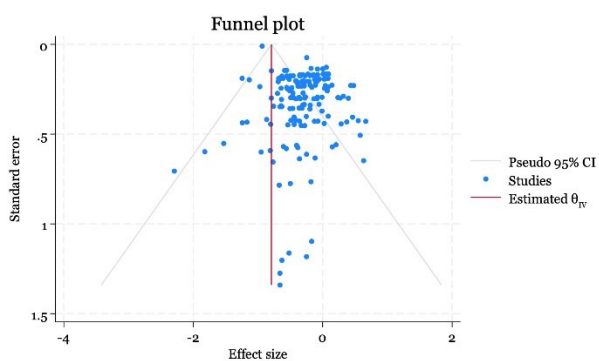
Publication bias possible: unlikely

Child internalising behaviours
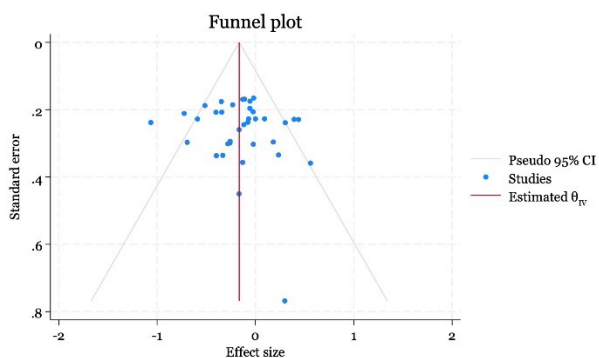
Publication bias possible: unlikely

Child wellbeing
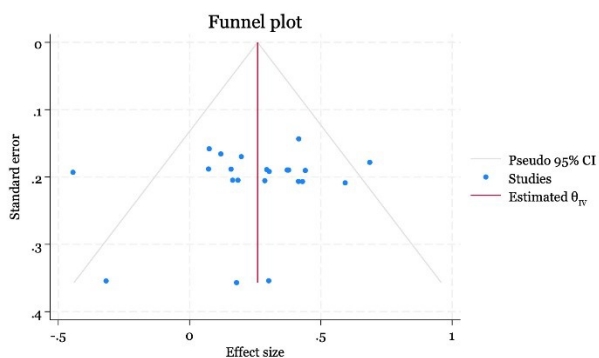
Publication bias possible: unlikely

Child attachment
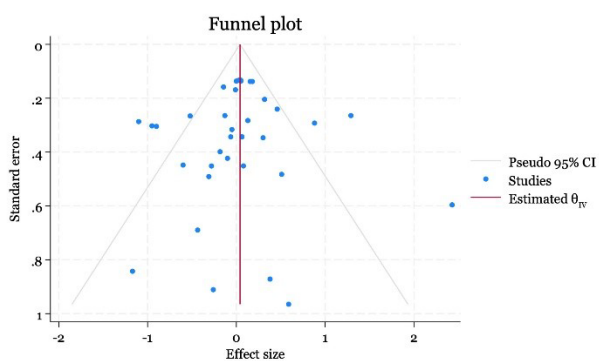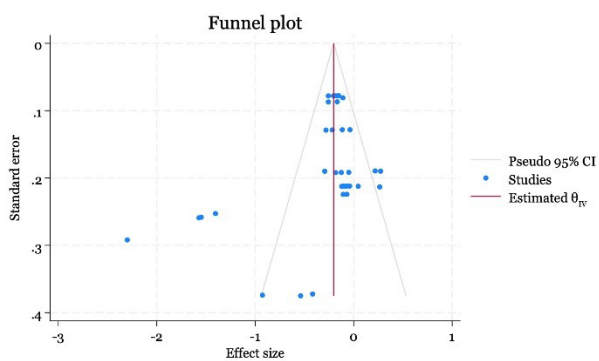

Publication bias possible: unlikely

Parent–child relationship
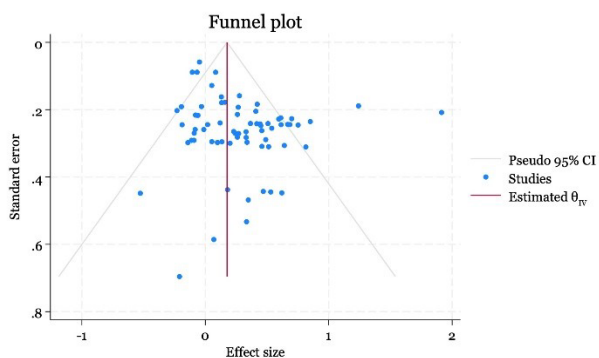
Publication bias possible: yes
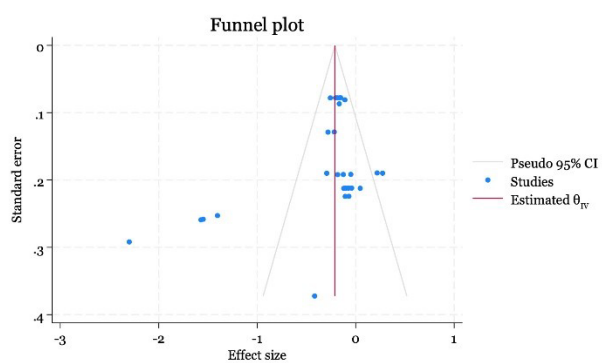
Beyond 6 months post-intervention effects

Child behaviour problems overall

Publication bias possible: yes

Child externalising behaviours

Funnel plot

Publication bias possible: yes

Appendix P: Accessibility text

Figure 2. PRISMA flow diagram – Long descriptive text

The image is a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram, depicting the process of identifying, screening, and including studies in a systematic review. The PRISMA flowchart systematically tracks the progression from identification to final inclusion. It shows two main identification pathways: studies from databases and academic resources (left pathway) and studies identified via other methods (right pathway):

Left Pathway: Identification of studies via databases and registers

1. Identification

Records identified from: Global dataset: 20,680; Updated search: 3,888

- ASSIA: 493
- Cochrane: 608
- IBSS: 206
- Medline: 1,429
- Psychinfo: 1,645
- Records removed before screening:
- Duplicate records removed: 940
- Records marked as ineligible by automation tools: 16,220

2. Screening:

- Records screened
- Global dataset: 4,640
- Updated search: 2,948
- Records excluded: 6,831
- Reports sought for retrieval
- Global dataset: 582
- Updated search: 175
- Reported not retrieved: 2
- Reports assessed for eligibility
- Global dataset: 582
- Updated search: 173
- Reports excluded
- Publication type: 116
- Study design: 53
- Comparator: 67
- Context: 14
- Intervention: 61
- Population: 315

- Outcomes: 9
- Language: 1
- Duplicate: 2

3. Included:

- Studies included in review: 106
- Reports of included studies: 131
- Studies included in the meta-analysis: 95

Right Pathway: Identification of studies via other methods

1. Identification

Records identified from: Global dataset: 346; Systematic reviews: 10

2. Screening:

- Reports sought for retrieval
- Global review: 190
- Systematic reviews: 64
- Reported not retrieved: 0
- Reports assessed for eligibility
- Global review: 190
- Systematic review: 64
- References in included papers: 3
- Reports excluded
- Global review:
- Publication type: 5
- Population: 143
- Language: 1
- Systematic review:
- Study design: 1
- Comparator: 12
- Intervention: 16
- Population: 18

[Click here to return to the main text](#).