Effects of Parenting Program Components on Parental Stress: A Systematic Review and Component Network Meta-Analysis

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Abbreviations

PE: psychoeducation	RCTs: Randomized Control Trials
BM: behavior management	IYPT: Incredible Years parent training
RE: relationship enhancement	ITT: Intent To Treat
SM: parental self-management	SMD: Standardized Mean Difference
PC: Parent as a coach	95%-CIs: 95% Confidence Intervals
PMA: Pairwise Meta-Analysis	95%-PIs: 95% Prediction Intervals
NMA: Network Meta-Analysis	RoB: Risk of Bias
CNMA: Component Network Meta-analysis	SE: Standard Errors
PCIT: Parent-Child Interaction Therapy	SDs: standard deviations
Triple P: Positive Parenting Program	M: Mean
IY: Incredible Years	N: sample size
PMT: Parent Management Training	GRADE: Grading of Recommendations Assessment, Development, and Evaluation ratings
PSI: Parenting Stress Index	SIDE: Separate Indirect from Direct Evidence
PSI-SF: Parenting Stress Index–Short Form	CINeMA: Confidence in Network Meta-analysis
PSI-PD: Parenting Stress Index–Parent Domain	SCL- Distress Domain: Symptom Check List-Distress Domain
PSI- Parental Distress Domain: Parenting Stress Index–Parental Distress Domain	ADHD: Attention-Deficit/Hyperactivity Disorder
DASS-Stress Domain: Depression Anxiety Stress Scale-Stress Domain	

S1. Literature Review on Secondary Studies

Over the past three decades, several systematic reviews and meta-analyses have been carried out to address inconsistencies in primary studies regarding the efficacy of parenting programs. Coates et al. (2015) evaluated the effectiveness of parent-administered behavioral interventions on parental stress for families having children with ADHD. The meta-analytic findings showed that parenting interventions had no significant effect on reducing parental stress (Standardized Mean Difference [SMD] = 0.50, 95% Confidence Intervals [95%-CIs] = -0.12 to 1.12). Despite this, numerous meta-analyses have found that parenting programs are beneficial in lowering parental stress and enhancing mental health in general. In this regard, Serketich and Dumas (1996) supported the short-term effectiveness of behavioral parent training to improve parental adjustment (involving stress, anxiety, depression, marital satisfaction, and irritability). In this study, the effect size was positive, indicating that parents who participated in behavioral parent training were better adjusted on measures of adjustment than parents who did not (Glass effect size = 0.44; Standard Deviations [SD]=0.30). Lundahl et al. (2006) evaluated the ability of parent training programs to modify disruptive child behaviors, parent behavior, and parental perceptions (including parent-related stress and confidence in parenting). By employing 48 effect sizes, this study provided evidence for the effectiveness of parent training programs on parental perceptions (SMD = 0.53; 95%-CIs [0.44, 0.61]). Nowak and Heinrichs (2008), based on 55 studies, indicated that Triple P causes positive changes in parental well-being (overall effect size = 0.17). In this meta-analysis, the most commonly employed primary measure for parental Well-Being was the Depression Anxiety Stress Scale (DASS). Lundahl et al. (2008), based on 11 studies, provided evidence that the effect of parent training on parenting perceptions (including parenting stress, parenting sense of competence, and parental locus of control) for mothers (SMD =0.68, *p-value* < 0.05) and fathers (SMD =0.37, *p-value* < 0.05) are significant. Lee et al. (2012), based on 20 studies, supported that behavioral parent training is an effective intervention in parenting perception (including parenting stress and competence) having children with ADHD.

Cooley et al. (2014), based on 11 studies included, aimed to explore the effectiveness of PCIT on child behavior and parenting stress. In this meta-analysis, parent stress was measured by the Parenting Stress Index (PSI), with three subsets of parental distress, parent-child dysfunctional interaction, and difficult child. The results revealed that PCIT significantly reduced parental distress (SMD = –0.73); 95%-CIs [–0.97, –0.48]), parent-child dysfunctional interaction (SMD = –0.94); 95%-CIs [–1.23, –0.65]), and difficult child (SMD= –0.80); 95%-CIs [–1.32, –0.27]). Furthermore, Thomas et al. (2017) found that in PCIT compared to control groups, there were greater decreases in parent-related stress (Mean Difference [MD] = −6.98, 95%-CIs [−11.69, −2.27]; the number of studies= 8), child-related stress (MD= −9.87, 95%-CIs [−13.64, −6.09]; the number of studies= 9), and total stress (MD= −12.17, 95%-CIs

[−19.27, −5.08]; the number of studies= 8). Li et al. (2021), based on 14 studies, revealed that the experimental and control groups had different scores for parental stress (SMD = −0.582; 95%-CIs [−1.055, −0.108]), indicating that Triple P can significantly decrease the level of parental stress.

S2. Advantages of Network Meta-Analysis and Additive Component Network Meta-Analysis Over Pairwise (or Conventional) Meta-Analysis

Table S2

Advantages of Network Meta-Analysis and Additive Component Network Meta-Analysis Over Pairwise (or Conventional) Meta-Analysis

	Pairwise Meta-Analysis	Network Meta-Analysis	Additive Component Network Meta-Analysis
Questions can be answered	Allows researchers to answer questions as to whether specific types of interventions work better than control conditions or specific alternative approaches (Antoniou et al., 2019; Molloy et al., 2018; Salanti, 2012).	NMA allows researchers to answer the following questions: (1) Is the intervention effective? (2) What is the comparative effectiveness of two interventions that have not been directly compared? (3) What kind of intervention is the most effective? (Antoniou et al., 2019; Molloy et al., 2018; Salanti, 2012).	The CNMA model has been developed as an extension of the standard NMA model for multi-component interventions, in which the effect of each composite intervention is dismantled after modeling component-specific effects (Pompoli et al., 2018; Welton et al., 2009). If there are treatments that are composed of common components, the additive model for CNMA allows researchers to answer the following questions: (1) “Are certain components of treatments more effective than others?” (Fong et al., 2021; Pompoli et al., 2018) (2) “Are certain combinations of treatment components more effective than others?” (Fong et al., 2021; Pompoli et al., 2018) or “are the treatment effects, as additive combinations of the components, effective compared to a reference group?” (Rücker et al., 2020) (3) “Are the data adequately explained by the additive model?” or “is the additivity assumption supported by comparing treatment estimates from the standard NMA model with the additive CNMA model?” (Rücker et al., 2020) .

Assumptions	(1) Homogeneity (Higgins et al., 2003).	(1) Homogeneity (Higgins et al., 2003; Schwarzer et al., 2015) (2) Transitivity (Schwingshackl et al., 2019) (3) Consistency (Dias et al., 2010; Jackson et al., 2014; Schwarzer et al., 2015).	The additive CNMA model adds the assumption that the effects of combined treatments are additive sums of their components (Allen et al., 2022; Chu et al., 2021; Miklowitz et al., 2021; Pompoli et al., 2018; Rücker et al., 2020).
Type and nature of comparisons	Compares two interventions at a time. (Antoniou et al., 2019).	Compares multiple interventions (Molloy et al., 2018).	Compares the effects of complex treatments, as additive combinations of the components, and their components to a reference group (Rücker et al., 2020).
	Comparisons are simply based upon direct evidence. PMA compares interventions only where head-to-head comparisons are readily available (Antoniou et al., 2019; Molloy et al., 2018).	Comparisons are based on both direct and indirect evidence. NMA compares indirect comparison of interventions sharing a common comparator, even where the interventions of interest have never been directly compared (Antoniou et al., 2019; Petropoulou et al., 2017).	Additive CNMA used a "components and dismantling" approach that sought to disentangle the common components of different treatments to identify and compare their contribution to the effect of the combined intervention (Rücker et al., 2020).
Outputs of comparisons	Based on direct comparisons, PMA allows researchers to: (1) Estimate the summary of the intervention effect. (2) Perform the different kinds of sensitivity analyses. (3) Conduct various types of publication bias.	Compared with PMA employed direct evidence alone, NMA based on both direct and indirect comparisons allows researchers to: (1) Calculate the summary of the intervention effect. (2) Test the assumptions of NMA (Dias et al., 2010; Schwarzer et al., 2015; Schwingshackl et al., 2019) (3) Conduct the different kinds of sensitivity analyses (Hennessy et al., 2019). (4) Perform various types of publication bias (Chaimani et al., 2013; Chaimani & Salanti, 2012; Egger et al., 1997). (5) Rank multiple interventions for the outcome of interest (Antoniou et al., 2019; Molloy et al., 2018; Rücker & Schwarzer, 2015). (6) Increase the precision of the effect size for an intervention (Antoniou et al., 2019; Mavridis et al., 2015)	The additive CNMA model allows researchers to: (1) Estimate the net effects of the components compared to a reference treatment. (2) Calculate the treatment effects, which are described as additive combinations of the components, compared to the reference treatment. (3) Evaluate all possible comparisons in the network based on the network structure. (4) Assess the models that add the interaction terms. (5) Compare the estimations and model fit between models by providing a statistical test using likelihood ratio statistics for the additive or interaction model. (6) Estimate disconnected networks. A distinguishing characteristic of the CNMA model is its capacity to connect a disconnected network, provided that the

	(7) Produce more strong evidence that can reach robust conclusions (Antoniou et al., 2019; Hennessy et al., 2019; Nikolakopoulou et al., 2018). (8) Optimize the use of available evidence (Antoniou et al., 2019; Molloy et al., 2018; Nikolakopoulou et al., 2018) (9) Show cost-effective intervention for the given individuals and conditions and contribute to reducing research waste (Molloy et al., 2018; Nikolakopoulou et al., 2018). (10) Facilitate timely recommendations (Nikolakopoulou et al., 2018). (11) Elevate both the science and practices of researchers and practitioners and also make better-informed decisions (Molloy et al., 2018). (12) Highlight future directions for confirmatory research (Molloy et al., 2018).	additivity assumption is satisfied and the subnetworks share at least one common treatment component. (7) Calculate the model that is superior to the standard NMA model since CNMA models produce more powerful results with fewer parameters to estimate (i.e., the number of components instead of the number of observed combinations of components). (8) Estimate the model that is better than the standard NMA model because CNMA models enable the borrowing of strength from research with common components for combinations investigated in a few or small trials (Rücker et al., 2020).

S3. Scopus Search

(TITLE-ABS ("Parent Training") OR TITLE-ABS ("Parenting") OR TITLE-ABS ("Parent Child Relation*") OR TITLE-ABS ("Parenting Skills") OR TITLE-ABS ("Child Neglect") OR TITLE-ABS ("Mother Child Communication*") OR TITLE-ABS ("Parents") OR TITLE-ABS ("Family Relations") OR TITLE-ABS ("Child Abuse") OR TITLE-ABS ("Child Discipline") OR TITLE-ABS ("Father Child Relation*") OR TITLE-ABS ("Mother Child Relation*") OR TITLE-ABS ("parental involvement") OR TITLE-ABS ("caregivers") OR TITLE-ABS ("parental attitudes") OR TITLE-ABS ("child raising") OR TITLE-ABS ("childraising") OR TITLE-ABS ("parental expectations") OR TITLE-ABS ("parenting style") OR TITLE-ABS ("child rearing") OR TITLE-ABS ("parent child interaction*") OR TITLE-ABS ("childrearing") OR TITLE-ABS ("Parent Child Communication*")) AND (TITLE-ABS ("Depress*") OR TITLE-ABS ("dysphori*") OR TITLE-ABS ("dysthym*") OR TITLE-ABS ("stress*") OR TITLE-ABS ("distress*") OR TITLE-ABS ("well-being") OR TITLE-ABS ("wellbeing") OR TITLE-ABS ("well being") OR TITLE-ABS ("mental disorder*") TITLE-ABS ("mental health") OR TITLE-ABS ("mental* ill*") OR TITLE-ABS ("affective disorder*") OR TITLE-ABS ("Affective symptom*") OR TITLE-ABS ("anxi*") OR TITLE-ABS ("fear*") OR TITLE-ABS ("fright*")) AND (TITLE-ABS ("Early Childhood ") OR TITLE-ABS ("Middle Childhood ") OR TITLE-ABS ("preschool*") OR TITLE-ABS ("toddler*") OR TITLE-ABS ("school

age") OR TITLE-ABS ("baby*") OR TITLE-ABS ("infancy") OR TITLE-ABS ("infan*") OR TITLE-ABS ("babies") OR TITLE-ABS ("pre-school") OR TITLE-ABS ("child*") OR TITLE-ABS ("kid") OR TITLE-ABS ("prepubescen") OR TITLE-ABS ("prepuber*") OR TITLE-ABS ("kids")) AND (TITLE-ABS ("treatment outcome") OR TITLE-ABS ("group comparison") OR TITLE-ABS ("control group") OR TITLE-ABS ("comparison") OR TITLE-ABS ("Program Evaluation") OR TITLE-ABS ("random assignment") OR TITLE-ABS ("randomized") OR TITLE-ABS ("randomised") OR TITLE-ABS ("control condition") OR TITLE-ABS ("Effectiveness") OR TITLE-ABS ("Efficacious") OR TITLE-ABS ("Effective") OR TITLE-ABS ("Efficacy") OR TITLE-ABS ("followup studies") OR TITLE-ABS ("follow-up studies") OR TITLE-ABS ("early intervention*") OR TITLE-ABS ("parent training") OR TITLE-ABS ("parent* management training") OR TITLE-ABS ("triple P") OR TITLE-ABS ("group intervention*") OR TITLE-ABS ("incredible years") OR TITLE-ABS ("parent child interaction therapy") OR TITLE-ABS ("family intervention*") OR TITLE-ABS ("parent* effect* training"))

S4. Journals were Searched Manually.

1. Journal of Child Psychology and Psychiatry
2. Journal of the American Academy of Child & Adolescent Psychiatry
3. Clinical Psychology Review

S5. PICOS Element of Inclusion and Exclusion Criteria

In evidence-based practice, the PICO framework is employed to frame trial questions (Huang et al., 2006). The PICO structure can also be used to formulate literature search strategies within systematic reviews (Schardt et al., 2007). In the PICO framework, P represents population; I stands for intervention; C indicates comparison, control, or comparator; and O refers to the outcome(s) (Richardson et al., 1995). Further elements, such as study design, length of time studied, setting, and publications, have been recommended by some researchers (Das et al., 2019).

Table S5

PICOS Framework

PICOS element	Inclusion Criteria	Exclusion Criteria
Population	This review included studies that recruited families who had children exhibiting disruptive behaviors with a mean age of 2–10 years at the start of the intervention. We covered primary studies with participants from various demographic characteristics, such as ethnicity, gender, and national culture. Families who have children	We excluded studies carried out for children with a mean age of fewer than two years and more than ten years since, at different developmental stages, infants and adolescents may need different parenting program contents. We excluded treatments aimed at parents of special child populations that were not identified by child conduct problems, such as (but not

	with attention deficit hyperactivity disorder (ADHD) were included because conduct problems and hyperactivity-impulsivity often co-occur in young children.	restricted to) children with severe mental illness, severe learning disabilities, children in foster care, and children with problems in the autistic spectrum. Parents with mental problems were excluded. Studies that did not provide any data regarding the number of participants in either the intervention or control groups were eliminated.
Interventions	Research involving parenting programs that aimed to reduce parent problems regarding their children's behavioral disorders was included. This research includes components of parenting programs delivered in treatment settings (including the indicated prevention approach concentrated on parents of children with emerging disruptive behaviors and the treatment approach focused on families in outpatient clinics for children's mental and behavioral problems). Parenting programs that taught parents skills based on social learning perspectives were included. This meta-analysis covered programs in which more than 50% of program sessions were dedicated to parenting. The individual, group, and self-directed parent training programs were covered. In order to ensure the generalizability of the findings, individual and combined components of interventions pertaining to parenting programs that were examined in more than two primary studies were included.	Studies were excluded if they provided a broad range of services to families but did not focus exclusively on the effects of parenting intervention. Parenting programs performed in preventative settings were excluded (including universal and selective prevention programs). Programs targeting the general community participants are universal prevention programs. Universal prevention represents the absence of any selection criterion. Selective prevention implies that families are selected on the basis of recognized risk factors for the emergence of disruptive behavior in children, such as parenting difficulties or socioeconomic disadvantage. If a study compared two or more eligible parenting programs for which the combinations of components were identical, we excluded the intervention with the smaller sample size.
Comparators	Eligible studies involved comparison conditions of no intervention, a wait-list control, some form of routine treatment as usual (i.e., services the participants would have received even in the absence of the brief intervention), and minimal intervention (there was a minimal intervention when none of the active components were adequately used). Studies that compared more than two types of interventions were eligible. Multi-arm trials were included.	We excluded studies without the comparison group.

Outcomes	Eligible studies were required to assess intervention effects on the outcome of parental stress. If multiple follow-up points were reported in a single study, the first post-treatment measurement was employed in the analysis. Consistent with the procedure used in the previous NMA (Caldwell et al., 2019), the present study applied a prespecified hierarchy to select the most appropriate outcome. The current research defined this hierarchy based on the most commonly reported measurements across studies. By reviewing the previous meta-analysis (Dekkers et al., 2021) and data collected in the current study, the most commonly used measurements were identified. This procedure allowed testing the assumption of transitivity on measurement differences. The decision rule for choosing between multiple-report measurements from the same construct (i.e., parental stress) is as follows: First. Parenting Stress Index (PSI) Second. Parenting Stress Index–Short Form (PSI-SF) Third. Depression Anxiety Stress Scale-Stress Domain (DASS-Stress Domain) Fourth. Symptom Check List-Distress Domain (SCL- Distress Domain) Fifth. Other measurements. Regarding other measurements, the present meta-analysis incorporated scales measured parental stress. To identify the relevant outcomes, we included measurements reported by parents. It was relatively common for some studies to report the measurement of parental stress for both mothers and fathers. In such cases, we entered the mother reports. This procedure permitted testing the assumption of transitivity on sources of observations (i.e., mother report versus both mother and father report). For studies that reported parental mental health by measuring several subscales, only parental stress was included. For instance, the DASS encompassed the domains of	The measurements that reported overall parental mental health but did not report parental stress in their subscales were excluded. The outcome measures of observed and teacher-rated were excluded. We did not include measures of parental stress to analyze for long-term effects (i.e., follow-up after the first post-treatment was excluded).

	depression, anxiety, and stress. In this study, we only included the domain of stress for parents. Concerning measures of the PSI, if a study reported the parent and child domains separately, we, consistent with Dekkers et al. (2021), included the parent domain. Likewise, if a study reported subscales of parental distress, parent-child dysfunctional interaction, and difficult child separately but did not provide an overall score for the PSI, parental distress was included.	
Length of time studied	This review included outcomes for parental stress at the first post-treatment measurement.	We did not include outcomes with long-term effects (i.e., follow-up after the first post-treatment was excluded).
Setting	We took into account research performed in treatment settings. Consistent with previous meta-analyses (Leijten et al., 2021; Leijten et al., 2018), the current study coded programs as being applied in treatment settings if they used an indicated prevention or treatment approach. This study defined a program that would be an indicated prevention if it targeted parents whose children showed emerging disruptive behaviors. The program was identified as a treatment approach when it focused on families who were referred or self-referred to outpatient clinics for problems related to their children's mental and behavioral disorders.	This review excluded parenting programs performed in preventative settings (including universal and selective prevention).
Date of publication	We included studies from the beginning until June 29, 2022.	
Study Design	The eligible research design was randomized trials that provided enough information to estimate effect size regarding differences between groups on relevant outcomes. Randomized trials were included if comparison conditions involved either the control group (no intervention, wait-list control, care as usual, and minimal intervention) or other eligible parenting programs.	Studies without the comparison group(s) were excluded.
Publications	We covered eligible studies in all languages and countries. Studies published in peer-reviewed journals were included.	We excluded unpublished studies.

S6. Components of the Parenting Program

Table S6.
Components of the Parenting Program

Codes	Components [a]	Description
1	Psychoeducation and child development knowledge (Kaminski et al., 2008; Leijten et al., 2021; Van der Put et al., 2018)	Parents are informed about the importance of parent-child interactions and how parents and children affect one another's behavior in routine interactions. In this component, child development knowledge among parents regarding typical and atypical child problems is improved.
2	Behavior management: (Kaminski et al., 2008; Leijten et al., 2021)	Positive reinforcement: Positive reinforcement for a child's good conduct includes verbal praise and/or the provision of social and/or practical rewards.
		Negative reinforcement (discipline without the use of violence): To discourage unpleasant child behaviors, respond to inappropriate behavior with a nonviolent consequence such as time-out, planned ignoring, and/or reasonable consequences.
		Proactive parenting and disciplinary communication: Providing clear and developmentally appropriate directions and proactively preventing disruptive child behavior. This component entails providing direct and positive instructions to children, establishing boundaries and rules for acceptable and unacceptable interaction, and monitoring or supervising activities based on an investment in understanding what the children do and with whom they play.
3	Relationship enhancement: Improving parent-child emotional relationships (Kaminski et al., 2008; Leijten et al., 2021; Van der Put et al., 2018)	Invest time and resources into developing an emotional parent-child relationship by understanding what the child feels in different situations, responding sensitively to the child's emotional needs, providing appropriate affection, giving importance to the child's desires, moods, and speech, and conveying the feeling that he or she is being understood, accepted and loved.
4	Parental self-management: Improving personal skills and abilities for parents (Kaminski et al., 2008; Leijten et al., 2021; Van der Put et al., 2018)	Enhancing parents' own abilities are goals achieved by recognizing and regulating parental feelings, generating and implementing solutions to difficult parenting situations, focusing on improving relationships between parents, enhancing co-parenting, striving to strengthen partner social/emotional support, promoting motivation, providing stress relief education, increasing parents' understanding and belief system about the cause of the problems to deal with them effectively, and developing self-management skills by the use of methods, discussions, or activities that encourage the individual to be constructive, positive, consistent, authoritative, and tolerable.
5	Parent as a coach: Educating parents to teach skills to their children (Kaminski et al., 2008; Leijten et al., 2021; Van der Put et al., 2018)	Educating parents on how to teach children to enhance their socio-emotional development, identify and regulate emotions, solve everyday problems, employ appropriate manners in challenging situations, collaborate with siblings and adults, and share, cooperate, and interact with other children.

Note.
[a]. In order to shed light on the program content that contributes to program effectiveness, this study categorized program components according to the classification provided by (Kaminski et al., 2008; Leijten et al., 2019; Leijten et al., 2021; Leijten et al., 2018; Van der Put et al., 2018).

S7. Risk of Bias in the Included Studies

In light of some suggestions provided in previous meta-analyses (Hua & Leijten, 2022; Leijten et al., 2019; Leijten et al., 2016; Leijten et al., 2021; Leijten et al., 2018; Piquero et al., 2009; Van Aar et al., 2017), the modified version of the Cochrane Risk of Bias (RoB) tool to assess the methodological quality of included studies was used (Higgins et al., 2011). The following domains regarding the risk of potential bias were considered for each included study.

The first domain is selection bias, which applies to sequence generation and allocation sequence concealment. Sequence generation was deemed acceptable if parents were randomly assigned to intervention conditions stating a randomization procedure that ensured that similarity of groups at baseline was warranted (e.g., computerized random sequence generation). The purpose of allocation concealment would be determined if allocation was adequately concealed. If both related categories (sequence generation and concealment of allocation) were classified as "low," the risk of selection bias was rated as "low." The risk of selection bias was considered "high" if a category was labeled "high." In any other case, we judged the study as having a "moderate" or "unclear" the risk of selection bias.

The present research did not assess the domain of performance bias, which refers to the blinding of participants and the blinding of personnel. As pointed out in previous meta-analyses (Leijten et al., 2019; Leijten et al., 2021; Leijten et al., 2018), participant blindness was not possible in any of the included trials because parents actively participated in the programs.

Detection bias (blinding of outcome assessment) is the second domain that refers to the risk of how the evaluation of the outcome bias affects. Blinding of outcome assessors reduces detection bias. Outcome assessors (e.g., students working as research assistants) who are aware of the actual treatment may unconsciously or intentionally alter their assessment. The risk of detection bias was rated "high" if outcome assessors knew which treatment a participant was assigned to.

Attrition bias is the third domain, which refers to incomplete outcome data. Attrition bias is defined by the completeness of outcome data for each major outcome, containing attrition and exclusions from the analysis. The risk of attrition bias was estimated as "high" when missing outcome data altered largely across conditions, and analyses were not performed based on the Intent-To-Treat (ITT) principle.

The fourth domain is bias reporting, which corresponds to the selective reporting outcome. The risk of reporting bias was deemed "high" if outcome reporting did not cover all pre-defined outcomes or data for effect size generation was insufficient. When relevant information on any quality criterion was not reported, or if the reported information was insufficient for a clear "high" or "low" rating, we coded the respective criterion as "unclear."

The fifth domain includes other sources of bias, which are identified as other risks of bias. Other risks of bias explain any crucial concerns about bias not incorporated in the other domains in this tool. In

accordance with prior meta-analyses (Hua & Leijten, 2022; Van Aar et al., 2017), if in baseline comparability, a study showed no significant differences between baseline conditions, we considered it as a low risk of bias. If a study showed a substantial difference between groups, we rated it as a high risk of bias.

For the combination of the individual RoB categories to one overall RoB rating, we used the recommendations by Guyatt et al. (2011). This review rated a study as "high" regarding overall RoB if three or more of the five criteria were rated with "high" RoB. We determined a study as "low" concerning overall RoB if at least four criteria were classified as "low," and the maximum one criterion was considered as "unclear." In any other case, we judged the study as having a "moderate" RoB.

S8. Coded Characteristics of Potential Categorical and Continuous Moderators Used to Test Transitivity Assumption

Several potential modifiers pertaining to participants, interventions, comparators, and methodological characteristics of included studies were coded in the following. We also tested the role of some variables as potential moderators (e.g., country) to ensure the similarity assumption.

Table S8

Coded Characteristics of Potential Categorical and Continuous Moderators Used to Test Transitivity Assumption.

Potential moderators	Coded as	Used to
Study origin (country)	A categorical variable (i.e., USA versus non-USA)	Subgroup analysis
Type of control condition	A categorical variable (no intervention, wait-list control, care as usual, and minimal intervention)	Subgroup analysis [a]
Measurements of outcomes	A categorical variable (i.e., PSI, PSI-SF, DASS-Stress Domain, and others).	Subgroup analysis
Developmental stage of the children	A categorical variable (early childhood versus middle childhood). Studies recruiting children with an average age of 2–5 years (24–60 months) in the intervention and comparison groups have been classified as early childhood research[1]. Studies involving children whose mean age is more than 5 to 10 years old (61–120 months) in the intervention and comparison groups have been classified as middle childhood research.	Subgroup analysis
Method of intervention delivery	A categorical variable (i.e., individual, group, and self-directed)	Subgroup analysis

[1] Previous meta-analyses of the effect of parenting training programs on preventing child behavior problems in families with children in early childhood were focused primarily on families with children under the age of five or on samples with a mean age of approximately five years (Piquero et al., 2009; Piquero et al., 2016).

Sources of observations	A categorical variable (i.e., mother report and both mother and father report).	Subgroup analysis
Targeted population	A categorical variable (i.e., indicated prevention approach versus treatment approach). Indicated prevention approach concentrated on families with emerging disruptive child behavior and the treatment approach focused on families in outpatient clinics for children's mental and behavioral disorders)	Subgroup analysis
Studies with sample size less than 100	A categorical variable (i.e., yes versus no)	Subgroup analysis
Booster sessions	A categorical variable (i.e., yes versus no)	Subgroup analysis
Mean age of the parent in intervention groups	A continuous variable (years)	Meta-regression
Mean age of the parent in comparison groups	A continuous variable (years)	Meta-regression
Percentage of mothers in intervention groups	A continuous variable (proportion of mothers)	Meta-regression
Percentage of mothers in comparison groups	A continuous variable (proportion of mothers)	Meta-regression
Percentage of single parents in intervention groups	A continuous variable (proportion of single parents)	Meta-regression
Percentage of single parents in comparison groups	A continuous variable (proportion of single parents)	Meta-regression
Percentage of girls in intervention groups	A continuous variable (proportion of girls)	Meta-regression
Percentage of girls in comparison groups	A continuous variable (proportion of girls)	Meta-regression
White percentage of intervention groups	A continuous variable	Meta-regression
White percentage of comparison groups	A continuous variable	Meta-regression

Note. [a] Subgroups with less than two studies were not included in the subgroup analysis.

S9. Detection of Small-Study Effects and Publication Bias (Dissemination Bias)

The comparison-adjusted funnel plot has been used to estimate small study effects as a proxy for assessing possible publication bias. A funnel plot is a scatter plot of the study-specific intervention effect estimates and their Standard Errors (SE) in a conventional meta-analysis. By convention, SE, in the vertical axis, is reported in reverse so that studies with smaller SEs would be seen at the top of the plot. Comparison-adjusted funnel plots follow the same convention but are adjusted to allow for multiple interventions and multiple comparisons. The x-axis shows the difference of each study's estimate (y_{iXY}) from the direct summary effect for each comparison ($y_{iXY} - \mu_{XY}$), and the y axis reports the SE of y_{iXY}. The vertical line in the center of the funnel plot displays the null hypothesis that the comparison-specific combined effect estimates do not differ from the study-specific effect sizes. In the absence of small-study effects, all points should be symmetric around the null (Chaimani et al., 2013; Chaimani & Salanti, 2012).

The trim-and-fill method was also exercised to determine the symmetry of the effect size distributions in the funnel plot (Duval & Tweedie, 2000). This analysis assesses the number of missing studies according to the most extreme findings in the meta-analysis. Also, it recalculates the estimated effect size to establish the funnel plot more symmetrical. Publication bias occurs when the estimated effect size differs significantly after employing the trim-and-fill method.

When one or more studies were imputed by the trim-and-fill method, we compared the 95%-CIs regarding pooled effect sized before and after imputation. If neither of 95%-CIs covered the average effect size for another stratum (non-overlapping), the two strata (levels) were considered distinct. In this regard, the pattern shows that the average estimates probability came from different populations. On the contrary, overlapping 95%-CIs indicated that when one or more studies imputed using the trim-and-fill method, the interpretation of the pooled effect size did not significantly change. The trim-and-fill analysis is performed on the direct pairwise comparison between the parenting program components and the control group, which has been evaluated in more than two trials.

S10. Outliers and Influential Cases.

Outlier and influential case analyses were recognized by determining Studentized Deleted Residuals (SDRs)[2] for each primary research (Viechtbauer & Cheung, 2010). SDRs represent the deviation of the effect size of a single sample from the weighted mean effect size of all other samples. Additionally, this study evaluated outlier and influential case analyses using DFFITS, Cook's distance, and DFBETAS. The DFFITS value essentially indicates how many standard deviations the predicted (average) effect or outcome for the *i*th case changes after excluding the *i*th case from the model fitting. Cook's distance can be interpreted as the Mahalanobis distance between the entire set of predicted values once with the *i*th case included and once with the *i*th case excluded from the model fitting. The DFBETAS value(s) indicate(s) how many standard deviations the estimated coefficient(s) change(s) after excluding the *i*th case from the model fitting. This study also provided the diagonal elements of the hat matrix and the weights (in %) given to the observed effect sizes or outcomes during the model fitting.

A case may also be considered to be 'influential' based on the following criteria: The absolute DFFITS value is larger than $3\times\sqrt{(p/(k-p))}$, where p is the number of model coefficients and k the number of cases. The lower tail area of a chi-square distribution with p degrees of freedom cut off by the Cook's distance is larger than 50%. Any DFBETAS value is larger than 1. The hat value is larger than $3 \times (p/k)$. The R package metafor makes it possible to detect and show outlier and influential cases.

Outliers and influential case analyses were conducted for each direct pairwise comparison between parenting program components against the control group. To show robustness, we compared

[2] SDRs is also known as standardized deleted residuals or rstudents.

SMDs and 95%-CIs based on the meta-analytic results of direct pairwise comparisons with and without outliers. For direct pairwise comparisons involving more than three studies, outlier and influential case analyses were conducted.

S11. GRADE Rating for Each Network [Confidence in Network Meta-analysis (CINeMA)]

Using the Grading of Recommendations Assessment, Development, and Evaluation ratings (GRADE) (Salanti et al., 2014) as well as the recently developed web application to apply this framework (Nikolakopoulou et al., 2020; Papakonstantinou et al., 2020; Social & Preventive Medicine, 2017), the current meta-analysis estimated the credibility of the evidence for the network outcome according to the following criteria:

Within study bias (Study limitations)

Within-study bias shows weaknesses in the design or conduct of primary research, leading to an estimated relative intervention effect that systematically is different from the truth (Nikolakopoulou et al., 2020; Papakonstantinou et al., 2020). As previously pointed out, this study used the modified version of the Cochrane Risk of Bias tool (Higgins et al., 2011). Likewise, we employed the suggestions of Guyatt et al. (2011) to combine the individual RoB categories into one overall RoB (Guyatt et al., 2011; Hennessy et al., 2019; Higgins et al., 2011).

While assessing the impact of within-study biases in PMA (Guyatt et al., 2011) is straightforward, it is more complicated in NMA. In accordance with the procedure suggested by CINeMA, we used the contribution matrix to calculate the percentage of contribution of each study (see Table S11, (Nikolakopoulou et al., 2020; Papakonstantinou et al., 2020). Then, we assessed the study limitation for each network estimate based on the weighted average RoB regarding the contributing studies.

Table S11

The percentage of Contribution from each Study Regarding Network Meta-Analysis Conducted for Parental Stress

	First author	BM+RE+SM vs. Control Group	BM+RE vs. Control Group	BM+SM vs. Control Group	PE+BM vs. Control Group	PE+BM+RE+SM+PC vs. Control Group	PE+BM+SM+PC vs. Control Group
1	(Stattin et al., 2015)	35.4143	0	0.769	0	12.2845	0
2	(McCabe & Yeh, 2009)	0	9.0945	0	0	0	0
3	(Anastopoulos et al., 1993)	0	8.4803	0	0	0	0
4	(Au et al., 2014)	0.1308	0	2.1051	0	0.0076	0
5	(Bagner et al., 2010)	0	7.039	0	0	0	0
6	(Braet et al., 2009)	0.5851	0	0.0152	0	5.1321	0
7	(Connell et al., 1997)	0.1756	0	2.8261	0	0.0101	0
8	(Eyberg et al., 1995)	0	5.4215	0	0	0	0
9	(Gallart & Matthey, 2005)	0.2224	0	3.5787	0	0.0128	0
10	(Gross et al., 1995)	0.2911	0	0.0076	0	2.553	0

11	(Hoath & Sanders, 2002)	0.1532	0	2.4646	0	0.0088	0
12	(Hutchings et al., 2007)	0.9111	0	0.0237	0	7.9912	0
13	(Jouriles et al., 2001)	0.2408	0	3.8744	0	0.0139	0
14	(Kleefman et al., 2014)	0.4144	0	6.6683	0	0.0239	0
15	(Larsson et al., 2009)	0.7184	0	0.0187	0	6.301	0
16	(Leckey et al., 2019)	0.4763	0	0.0124	0	4.1775	0
17	(Markie-Dadds & Sanders, 2006 a)	0.1869	0	3.0076	0	0.0108	0
18	(Markie-Dadds & Sanders, 2006 b)	0.2618	0	4.2131	0	0.0151	0
19	(Matos et al., 2009)	0	8.0526	0	0	0	0
20	(McGilloway et al., 2012)	0.8816	0	0.023	0	7.733	0
21	(Nixon et al., 2003)	0	8.7725	0	0	0	0
22	(Patterson et al., 2002)	0.8341	0	0.0217	0	7.3164	0
23	(Sanders et al., 2012)	0.3853	0	6.2007	0	0.0223	0
24	(Schappin et al., 2013)	0.3191	0	5.1348	0	0.0184	0
25	(Schuhmann et al., 1998)	0	9.5736	0	0	0	0
26	(Webster-Stratton et al., 1988)	0.6637	0	0.0173	0	5.8213	0
27	(Webster-Stratton, 1990)	0.4512	0	0.0118	0	3.9578	0
28	(Webster-Stratton, 1992)	0.8378	0	0.0218	0	7.3488	0
29	(Webster-Stratton & Hammond, 1997)	0.5826	0	0.0152	0	5.1097	0
30	(Shimabukuro et al., 2020)	0	0	0	0	0	25.1412
31	(Abrahamse et al., 2021)	0	3.8416	0	0	0	0
32	(Salmon et al., 2014)	6	0	1.5867	0	0.3467	0
33	(Arruabarrena et al., 2021)	0.8124	0	0.0212	0	7.1254	0
34	(Aliakbari Dehkordi et al., 2014)	0.1276	0	2.0527	0	0.0074	0
35	(Momeni & Taziki, 2017)	0.1609	0	2.5886	0	0.0093	0
36	(Lange et al., 2018)	0	0	0	0	0	40.0766
37	(Somech & Elizur, 2012)	22.0253	0	0.4322	0	0.9584	0
38	(Leung et al., 2015)	0	14.3009	0	0	0	0
39	(Karjalainen et al., 2019)	0.8407	0	0.0219	0	7.3743	0
40	(Franke et al., 2020)	0.2705	0	4.3535	0	0.0156	0
41	(Hoang et al., 2022)	0.3644	0	5.8641	0	0.0211	0
42	(Stewart-Brown et al., 2004)	0.8226	0	0.0214	0	7.2148	0
43	(Day & Sanders, 2018)	0.365	0	5.8735	0	0.0211	0
44	(Keown et al., 2018)	0.3026	0	4.8699	0	0.0175	0
45	(Baker et al., 2017)	0.4413	0	7.1006	0	0.0255	0
46	(Tully & Hunt, 2017)	0.2498	0	4.0189	0	0.0144	0
47	(Leung et al., 2017)	0	10.8584	0	0	0	0
48	(Sourander et al., 2016)	0.4918	0	7.9139	0	0.0284	0

49	(Sheeber & Johnson, 1994)	0	0	0	27.2289	0	0
50	(Abikoff et al., 2015)	0	0	0	0	0	34.7822
51	(Van Den Hoofdakker et al., 2007)	0	0	0	40.2287	0	0
52	(Thomas & Zimmer-Gembeck, 2012)	0	14.5649	0	0	0	0
53	(Chesterfield et al., 2021)	0	0	0	32.5424	0	0
54	(Aghebati et al., 2014)	0.1349	0	2.17	0	0.0078	0
55	(Shahrivar, 2008)	0.2636	0	4.2417	0	0.0152	0
56	(Kjøbli et al., 2013)	20.8517	0	0.4092	0	0.9073	0
57	(Leung et al., 2013)	0.3374	0	5.4292	0	0.0195	0

Note. PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the Parent as a coach.

Reporting Bias (Publication Bias)

Reporting bias (or across studies bias) arises when the results included in the systematic review and meta-analysis are not an accurate representative sample of the results generated by studies undertaken (Nikolakopoulou et al., 2020; Papakonstantinou et al., 2020). Because there is currently no concrete technique for determining reporting bias (publication bias) in NMA, a comparison-adjusted funnel plot with accompanying Begg-Mazumdar test for asymmetry were performed. We also used trim-and-fill method (Duval & Tweedie, 2000) for each direct pairwise comparison between parenting program components against control group to demonstrate the probable small study effect. The trim-and-fill analysis assessed the number of missing studies according to the most extreme findings in the meta-analysis. This method recalculates the estimated effect size to establish the funnel plot more symmetrical. Publication bias occurs when the estimated effect size differs significantly after employing the trim-and-fill method.

Indirectness

Evidence might be indirect in one of the four following ways. First, participants can sometimes differ from those of interest (the term applicability is mostly used for this form of indirectness). Secondly, the intervention tested may be different from the intervention of interest. Decisions concerning the indirectness of participants and interventions rely on an understanding of whether social or biological factors are sufficiently different that one might expect considerable differences in the magnitude of the effect. Third, outcomes might differ from those of primary interest. The last form of indirectness (i.e., indirect comparisons) emerges when there is no direct (i.e., head-to-head) comparison between two or more interventions of interest (Guyatt et al., 2011).

This study rated the indirectness of the available evidence as recommended by Guyatt et al. (2011). We determined whether a study varied from the studies of interest in respect of, first, the relevant

study population, second, applied intervention, third, evaluated outcomes, and, fourth, whether a study provided direct evidence of at least one of the comparisons of interest.

Overall indirectness was rated "low" if at least three items were classified as "low" and the maximum of one item was considered "unclear." Overall indirectness was regarded as "high" when at least two items were classified as "high." All other combinations were considered to be "moderate" (Guyatt et al., 2011; Merz et al., 2019).

According to the procedure recommended by CINeMA, we used the contribution matrix to calculate the percentage of contribution of each study (Nikolakopoulou et al., 2020; Papakonstantinou et al., 2020). In this regard, this study assessed indirectness for each network estimate based on the average indirectness of the contributing studies. Indirectness was independently rated by two authors (HDT, SY).

Imprecision

A major benefit of NMA compared with PMA is the enhancement in precision by adding indirect evidence to direct evidence (Antoniou et al., 2019; Caldwell et al., 2005; Mavridis et al., 2015; Nikolakopoulou et al., 2018). In order to determine the imprecision, it is necessary to define the relative intervention effect that represents an important difference (Nikolakopoulou et al., 2020; Papakonstantinou et al., 2020). Based on the suggestion of Cohen (1988), we identified the non-negligible effect size when the Standardized Mean Difference (SMD) was below-0.200 and above 0.200.

CINeMA identified imprecision as a "major concern" when the 95% Confidence Intervals (95%-CIs) of SMD stretch to below -0.200 and above 0.200 in both directions. Imprecision was described as "some concern" when the 95%-CIs of SMD extends into below -0.200 or above 0.200 in one direction. CINeMA classified imprecision as "no concern" when the 95%-CIs of SMD could not cross -0.200 and 0.200 in both directions.

Assessment of Heterogeneity in Light of CINeMA Approach (Based on Comparing Confidence and Prediction Intervals)

There are several methods to measure heterogeneity. The CINeMA approach to displaying heterogeneity examines both the 95%-CIs (which do not explain heterogeneity) and 95% Prediction Intervals (95%-PIs) (which do show heterogeneity). Heterogeneity is remarkable if a 95%-PIs includes values that lead to a different conclusion than an assessment based on the 95%-CIs. When 95%-CIs and 95%-PIs lead to the same conclusions, there are "no concerns" about heterogeneity. When the 95%-CIs and the 95%-PIs result in conclusions that are somewhat different but with less influence on decision-making, CINeMA concludes that there are "some concerns" about heterogeneity (Nikolakopoulou et al., 2020; Papakonstantinou et al., 2020).

Incoherence (Inconsistency)

For quantifying incoherence, the local approach can be used. This approach assessed the agreement between direct and indirect evidence for comparisons in the NMA (Nikolakopoulou et al., 2020; Papakonstantinou et al., 2020). The local approach using Separate Indirect from Direct Evidence (SIDE) (or 'node splitting') compares the direct and indirect evidence for comparisons to estimate an inconsistency factor with a confidence interval (Dias et al., 2010; Dias et al., 2013). This method can only be applied to comparisons that are informed by both direct and indirect evidence.

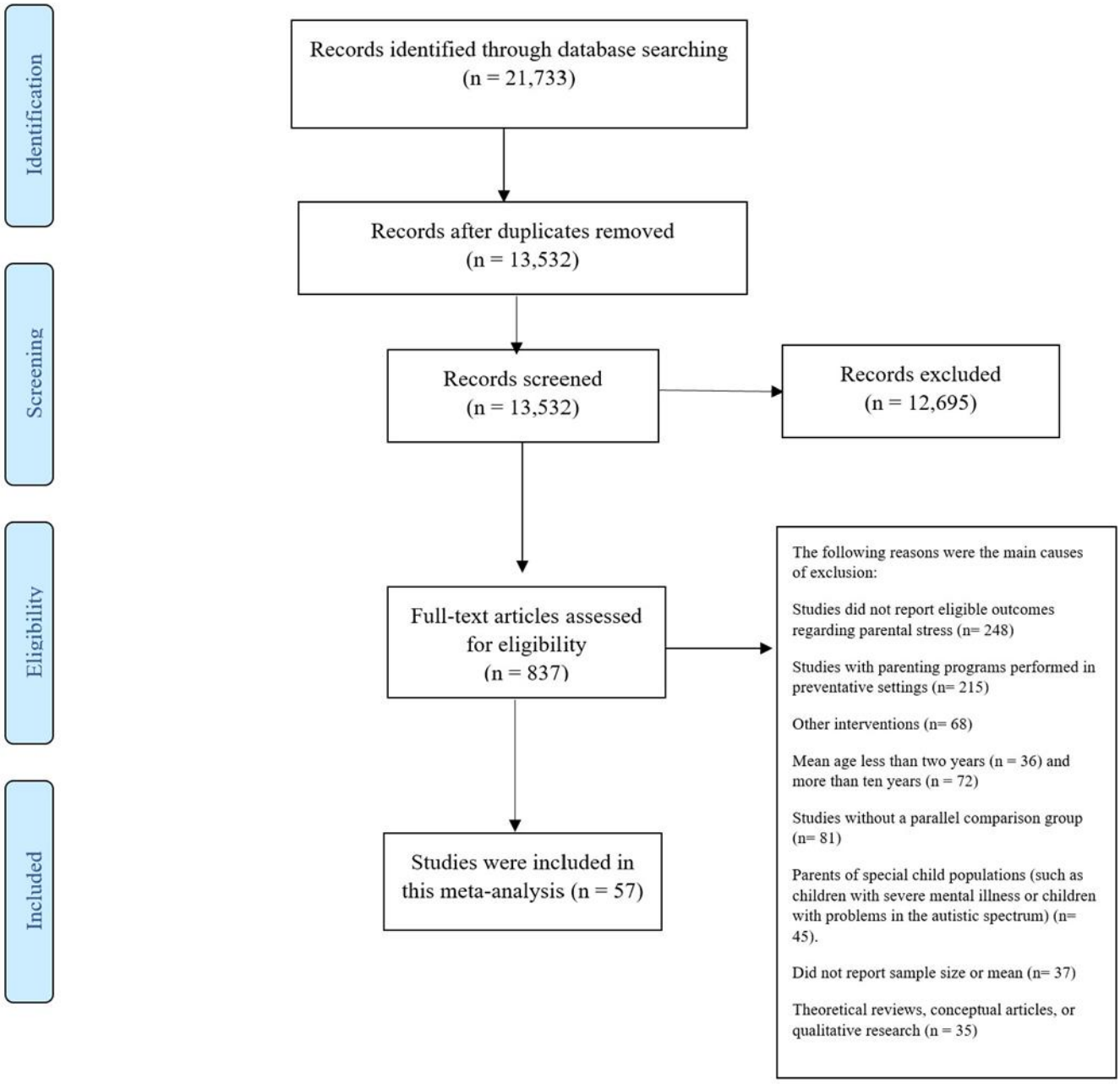
The global approach is an alternative procedure to quantifying incoherence. It models all intervention effects and all possible inconsistency factors simultaneously, resulting in an 'omnibus test' of incoherence in the whole network (Higgins et al., 2012; White et al., 2012).

Summarizing Judgments Across the Six Domains

CINeMA's final output is a table with the level of concern for each of the six domains. The reviewers then choose to summarize judgments across domains using the four confidence levels of the GRADE approach: very low, low, moderate, or high (Puhan et al., 2014). To this end, we summarize judgments across domains as suggested by Nikolakopoulou et al. (2020). In this regard, Nikolakopoulou et al. (2020) recommended that researchers could begin with "high confidence" and reduce the level of confidence by one step for each domain with "some concerns" and by two levels for each domain with "major concerns." However, it is essential to know that domains are interconnected: factors that may reduce confidence in the intervention effect may affect more than one domain. Indirectness includes considerations of intransitivity, which are demonstrated in the data as statistical incoherence. Heterogeneity will lead to increasing the imprecision in intervention effects and may also be related to the variability in the presence of reporting bias or within-study bias. In addition, the ability to detect considerable incoherence will decrease in the presence of heterogeneity. Therefore, the six CINeMA domains should be regarded together rather than in isolation, avoiding the reduction of the overall level of confidence more than once for related concerns (Nikolakopoulou et al., 2020; Papakonstantinou et al., 2020).

S12. PRISMA Flow Diagram

Flow Diagram Showing the Study Selection Process



S13. Summary of Characteristics of the Included Studies in the Component Network Meta-Analyses

Table S13

Characteristics of Included Studies in the Component Network Meta-Analyses

(Author name) country	Intervention	PPC	TCC	Developmental stage of children	Mage PIG [Mage PCG]	Perc GIG [Perc GCG]	Perc MIG [Perc MCG]	Perc SPIG [Perc SPC]	Perc WIG [Perc WCG]	Measurements of outcomes	MID (IND, GR, SD)	SOO (MR, BMFR)	TP (IND/TREAT)	Overall RoB	Indi
(Au et al., 2014) Hong Kong	Triple P	BM+SM	Wait-list	Middle children	39.5 [40.55]	0 [11.11]	87.5 [66.66]			SNQS	Group	Moth-Fath-R	Treat-ap	MROB	Low
(Bagner et al., 2010) USA	PCIT	BM+RE	Wait-list	Early childhood		28.6 [28.6]	100 [100]		64.3 [78.6]	PSI- PD	Individual	Moth-R	Treat-ap	LROB	Low
(Hoath & Sanders, 2002) Australia	Triple P	BM+SM	Wait-list	Middle children	38.5 [38.9]	22.22 [18.18]		66.67 [18.18]		DASS-SD	Group	Moth-Fath-R	Treat-ap	MROB	Low
(Larsson et al., 2009) Norway	Incredible Years	PE+BM+RE+SM+PC	Wait-list	Middle children	33.7 [34.9]	19.14 [21.42]	100 [100]			PSI	Group	Moth-R	Treat-ap	HROB	Low
(Leung et al., 2013) Australia	Triple P	BM+SM	Wait-list	Early childhood		28.6 [30.8]	88.1 [89.7]	2.4 [7.9]		PSS	Group	Moth-Fath-R	Treat-ap	MROB	Low
(Leung et al., 2015) Hong Kong	PCIT	BM+RE	Wait-list	Early childhood	36.55 [36.24]	29.6 [22.8]	85.2 [89.5]	9.3 [5.3]		PSI-SF	Individual	Moth-Fath-R	Treat-ap	LROB	Low
(McCabe & Yeh, 2009) USA	PCIT	BM+RE	Care-as-usual	Early childhood	32.42	23.8 [26.3]	92	23.8 [36.8]		PSI	Individual	Moth-Fath-R	Treat-ap	LROB	Low
(Schuhmann et al., 1998) USA	PCIT	BM+RE	Wait-list	Early childhood	33.2 [31.7]	19 [19]			77	PSI-PD	Individual	Moth_R	Treat-ap	HROB	Low
(Abikoff et al., 2015) USA	NFPP	PE+BM+SM+PC	Wait-list	Early childhood		23.8 [29.4]			69.4 [78.1]	PSI-SF	Individual	Moth-R	Treat-ap	LROB	Low
(Webster-Stratton et al., 1988) USA	Incredible Years	PE+BM+RE+SM+PC	Wait-list	Early childhood	33.74	30.7	91.7	30.7		PSI-PD	Group	Moth-R	Treat-ap	LROB	Low
(Webster-Stratton, 1990) USA	Incredible Years	PE+BM+RE+SM+PC	Wait-list	Early childhood	34.8	20.93	100 [100]	39.5		PSI-PD	Self-directed	Moth-R	Treat-ap	LROB	Low
(Webster-Stratton, 1992) USA	Incredible Years	PE+BM+RE+SM+PC	Wait-list	Early childhood	33.7	28	100 [100]	34		PSI-PD	Individual	Moth-R	Treat-ap	LROB	Low
(Webster-Stratton & Hammond, 1997) USA	Incredible Years	PE+BM+RE+SM+PC	Wait-list	Middle children	35.96 [34.45]	19.2 [31.8]	100 [100]	32	84.6 [86.4]	PSI	Group	Moth-R	Treat-ap	LROB	Low
(Braet et al., 2009) Belgium	PMT	PE+BM+RE+SM+PC	Wait-list	Middle children		36	88			PSI-SF	Group	Moth-Fath-R	Ind-ap	HROB	Low
(Connell et al., 1997) Australia	Triple P	BM+SM	Wait-list	Early childhood	32.42 [31.45]	41.66 [72.72]	50 [50]	8.3 [0]		DASS-SD	Self-directed	Moth-Fath-R	Ind-ap	MROB	Low
(Hutchings et al., 2007) UK	Incredible Years	PE+BM+RE+SM+PC	Wait-list	Early childhood		43 [34]		44 [34]		PSI-SF	Group	Moth-Fath-R	Ind-ap	LROB	Low
(Jouriles et al., 2001) USA	PS	BM+SM	Care-as-usual	Middle children	27.97	27.78	100 [100]		27	SCL- DD	Individual	Moth-R	Ind-ap	MROB	Low
(Kleefman et al., 2014) Netherlands	Triple P	BM+SM	Care-as-usual	Middle children		42.3 [41.8]		30.9 [35.7]		PSI-SF	Individual	Moth-Fath-R	Ind-ap	MROB	Low
(Leckey et al., 2019) Ireland	Incredible Years	PE+BM+RE+SM+PC	Wait-list	Early childhood	24.6 [24.2]	29 [21]	93.33	21 [43]		PSI-SF	Group	Moth-Fath-R	Ind-ap	LROB	Low
(Markie-Dadds & Sanders, 2006 a) Australia	Triple P	BM+SM	Wait-list	Early childhood	35 [32]	28.57 [33.33]	100 [100]	14.29 [8.33]		DASS-SD	Self-directed	Moth-R	Ind-ap	MROB	Low
(Markie-Dadds & Sanders, 2006 b) Australia	Triple P	BM+SM	Wait-list	Early childhood	33 [32]	37.5 [35.5]	100 [100]	12.5 [19.3]	63	DASS-SD	Self-directed	Moth-R	Ind-ap	MROB	Low
(Matos et al., 2009) USA	PCIT	BM+RE	Wait-list					35 [33]		FEISE	Individual	Moth-Fath-R	Ind-ap	HROB	Low
(McGilloway et al., 2012) Ireland	Incredible Years	PE+BM+RE+SM+PC	Wait-list	Early childhood	25 [25]	42.6 [26.2]	95.97 [95.97]	39 [36]		PSI-SF	Group	Moth-Fath-R	Ind-ap	LROB	Low
(Nixon et al., 2003) Australia	PCIT	BM+RE	Wait-list	Early childhood	36	17.64		23.52		PSI	Individual	Moth-Fath-R	Ind-ap	MROB	Low
(Sanders et al., 2012) Australia	Triple P	BM+SM	No-Int	Early childhood	37.37	30 [36]	90 [93]	12 [9]		DASS-SD	Self-directed	Moth-Fath-R	Ind-ap	LROB	Low
(Schappin et al., 2013) Netherlands	Triple P	BM+SM	Wait-list	Early childhood	34.1 [32.2]	53 [27]	94 [100]	3 [9]		PSI-SF	Individual	Moth-Fath-R	Ind-ap	LROB	Low
(Somech & Elizur, 2012) Israel	Hitkashrut	BM+RE+SM	Minimal-intervention	Early childhood	34.7 [35.53]	23.6 [18.8]		12.9 [14.5]		PSI-SF	Group	Moth-Fath-R	Ind-ap	LROB	Low

(Stattin et al., 2015) Sweden	Incredible Years	PE+BM+RE+SM+PC	Wait-list	Middle children	37.7	0 [0]	85 [86.1]	26		CSQ-S	Group	Moth-Fath-R	Ind-ap	LROB	Low
	Incredible Years	BM+RE+SM	Wait-list	Middle children	37.7	0	85	26		CSQ-S	Group	Moth-Fath-R	Ind-ap	LROB	Low
(Thomas & Zimmer-Gembeck, 2012) Australia	PCIT	BM+RE	Wait-list	Early childhood	33.9	29.6	100 [100]			PSI-PD	Individual	Moth-R	Ind-ap	LROB	Low
(Kjøbli et al., 2013) Norway	PMTO	BM+RE+SM	No-Int	Middle children	37.42	36.5		36.5		SCL- DD	Group	Moth-Fath-R	Ind-ap	LROB	Low
(Abrahamse et al., 2021) Netherlands	PCIT	BM+RE	Wait-list	Middle children		40 [20]	100 [100]	30 [50]		DPSQ	Group	Moth-R	Ind-ap	MROB	Low
(Karjalainen et al., 2021) Finland	Incredible Years	PE+BM+RE+SM+PC	Care as usual	Middle children				46.1		PSI-SF	Group	Moth-Fath-R	Ind-ap	LROB	Low
(Arruabarrena et al., 2021) Spain	Incredible Years	PE+BM+RE+SM+PC	No-Int	Middle children	38.16 [38.59]	39.28 [28.94]	74 [72]	8.9 [0]		PSI-SF	Group	Moth-Fath-R	Ind-ap	MROB	Low
(Gallart & Matthey, 2005) Australia	Triple P	BM+SM	Wait-list	Middle children		25	93.87			DASS-SD	Group	Moth-Fath-R	Ind-ap	MROB	Low
(Eyberg et al., 1995) USA	PCIT	BM+RE	Wait-list	Early childhood		20	100 [100]		80	PSI	Individual	Moth-R	Treat-ap	MROB	Low
(Anastopoulos et al., 1993)USA	BPT	BM+ RE	Wait-list	Middle children		26.47 [26.47]	100 [100]			PSI-PD	Individual	Moth-R	Treat-ap	MROB	Low
(Gross et al., 1995)USA	Incredible Years	PE+BM+RE+SM+PC	No-Int	Early childhood	32.5	17.0	52.94		78.0	PSI-PD	Group	Moth-Fath-R	Ind-ap	MROB	Low
(Patterson et al., 2002) UK	Incredible Years	PE+BM+RE+SM+PC	No-Int							PSI-SF	Group	Moth-Fath-R	Ind-ap	LROB	Low
(Shimabukuro et al., 2020)Japan	NFPP	PE+BM+SM+PC	Wait-list	Middle children	40.59 [42.1]	22.22 [9.52]	100 [100]	22.22 [19.05]		PSI-PD	Group	Moth-R	Treat-ap	LROB	Low
(Salmon et al., 2014) New Zealand	Triple P	BM+SM	BM+RE+SM	Early childhood	34.87 [38.84]	43.0 [42.0]		22.22 [11.0]	83.0 [74.0]	DASS-SD	Group	Moth-Fath-R	Treat-ap	MROB	Low
(Aliakbari Dehkordi et al., 2014) Iran	Triple P	BM+SM	No-Int	childhood		0 [0]	100 [100]			PSI	Group	Moth-R	Treat-ap	HROB	Low
(Momeni & Taziki, 2017) Iran	Triple P	BM+SM	No-Int	Early childhood			100 [100]			PSI	Group	Moth-R	Treat-ap	HROB	Low
(Lange et al., 2018) Denmark	NFPP	PE+BM+SM+PC	Care as usual							FSI	Individual	Moth-Fath-R	Treat-ap	LROB	Low
(Franke et al., 2020) New Zealand	Triple P	BM+SM	Wait-list	Early childhood	36.5	28.3	18.86			DASS-SD	Combination	Moth-Fath-R	Treat-ap	LROB	Low
(Hoang et al., 2022) New Zealand	Triple P	BM+SM	Wait-list	Early childhood	33.56 [33.04]	40.0 [46.0]	88.0 [94.0]	2.0 [4.0]		DASS-SD	Group	Moth-R	Ind-ap	LROB	Low
(Stewart-Brown et al., 2004) UK	Incredible Years	PE+BM+RE+SM+PC	No-Int	Early childhood			91.7			PSI-SF	Group	Moth-Fath-R	Ind-ap	MROB	Low
(Day & Sanders, 2018) Australia	Triple P	BM+SM	Wait-list	Early childhood	34.81 [34.5]	57.9 [45.0]	94.7 [98.3]	10.5 [8.3]	91.2 [100]	DASS-SD	Individual	Moth-Fath-R	Ind-ap	LROB	Low
(Keown et al., 2018) New Zealand	Te Whānau Pou Toru	BM+SM	Wait-list	Early childhood	35.4 [35.4]	37.0 [37.0]	80.0 [80.0]			DASS-SD	Group	Moth-Fath-R	Ind-ap	LROB	Low
(Baker et al., 2017) Australia	Triple P	BM+SM	Wait-list	Early childhood	35.7 [35.7]	92.0 [92.0]	92.0 [92.0]	13.0 [13.0]		DASS-SD	Self-directed	Moth-Fath-R	Ind-ap	LROB	Low
(Tully & Hunt, 2017) Australia	Triple P	BM+SM	Wait-list	Early childhood	37.0 [37.0]	30.4 [30.4]	100.0 [100.0]	5.8 [5.8]		DASS-SD	Group	Moth-R	Ind-ap	LROB	Low
(Leung et al., 2017) Hong Kong	PCIT	BM+RE	Wait-list	Middle children	37.52 [37.13]	12.5 [21.9]	90.6 [87.5]	12.5 [12.5]		PSI-SF	Individual	Moth-Fath-R	Treat-ap	LROB	Low
(Sourander et al., 2016) Finland	Strongest Families	BM+RE	Minimal_intervention	Early childhood	31.85 [30.6]	38.8 [37.5]				DASS-SD	Combination	Moth-Fath-R	Ind-ap	MROB	Low
(Sheeber & Johnson, 1994) USA	TBPT	BM+SM	Wait-list	Early childhood	34.0	33.34 [47.36]	100 [100]			PSI	Group	Moth-R	Ind-ap	MROB	Low
(Van Den Hoofdakker et al., 2007) Netherlands	BPT	PE+BM	Care as usual	Middle children		19.1		10.6		PSI-PD	Group	Moth-Fath-R	Treat-ap	MROB	Low
(Chesterfield et al., 2021) Australia	1 2 3 Magic	PE+BM	Wait-list	Middle children	42.6 [43.2]	39.3 [20.7]	82.1 [82.8]	7.1 [6.9]		PSI-SF	Group	Moth-Fath-R	Treat-ap	LROB	Low
(Aghebati et al., 2014) Iran	Triple P	BM+SM	Wait-list	Middle children	33.21 [34.46]	35.7 [46.2]	100 [100]			DASS-SD	Group	Moth-R	Treat-ap	HROB	Low
(Shahrivar, 2008) Iran	Triple P	BM+SM	Wait-list	Middle children	35.53 [37.19]					DASS-SD	Group	Moth-Fath-R	Treat-ap	MROB	Low

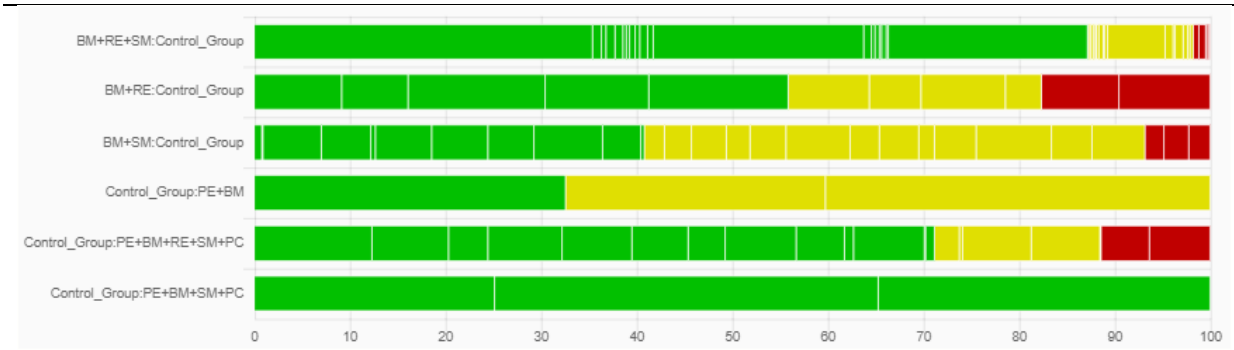
Note. PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the Parent as a coach; TCC refers to the type of control condition; No-Int is No-Intervention; PPC is parenting program components; Mage PIG shows the mean age of

the parent in intervention groups; Mage PCG is the mean age of the parent in comparison groups; Perc GIG is the percentage of girls in intervention groups; Perc GCG is the percentage of girls in comparison groups; Perc MIG is the percentage of mothers in intervention groups; Perc MCG is the percentage of mothers in comparison groups; Perc SPIG shows the percentage of single parents in intervention groups; Perc SPCG is the percentage of single parents in comparison groups; Perc WIG refers to the white percentage of intervention groups; Perc WCG is the white percentage of comparison groups; MID (IND, GR, SD) is the methods of intervention delivery (individual, group, and self-directed); SOO (MR and BMFR) represents sources of observations (mother report and both mother and father report); TP (IND/TREAT) shows targeted population (indicate/ treatment populations); Treat-ap refers to Treatment-approach; Ind-ap represents Indicated-approach; PSI is Parenting Stress Index; PSI-SF is Parenting Stress Index–Short Form; PSI-PD is Parenting Stress Index–Parent Domain; DASS-SD is Depression Anxiety Stress Scale-Stress Domain; SCL- DD is Symptom Check List-Distress Domain; CSQ-S is Caregiver Strain Questionnaire-Stress; DPSQ is Dutch Parenting Stress Questionnaire; FSI is Family Strain Index; PSS is Parental Stress Scale; SNQS is Service Needs Questionnaire Stress; FEISE is Family Experiences Inventory stressful experiences; Indi is the indirectness; Moth-Fath-R refers to both mother and father's report; Moth-R refers to mother's report; MROB indicates moderate-risk-of-bias; LROB is low-risk-of-bias; HROB stands for high-risk-of-bias; Triple P is Positive Parenting Program; Incredible Years is Incredible Years parent training; PCIT is Parent-Child Interaction Therapy; ; PMT is Parent Management Training; PS is Project Support; PMTO is Parent Management Training-The Oregon Mode; BPT is Behavioural Parent Training; TBPT is Temperament-Based Parent-Training; ; NFPP is New Forest Parenting Programme.

S14. Summary of Risk of Bias Assessment

Figure S14

Risk of Bias Contributions.

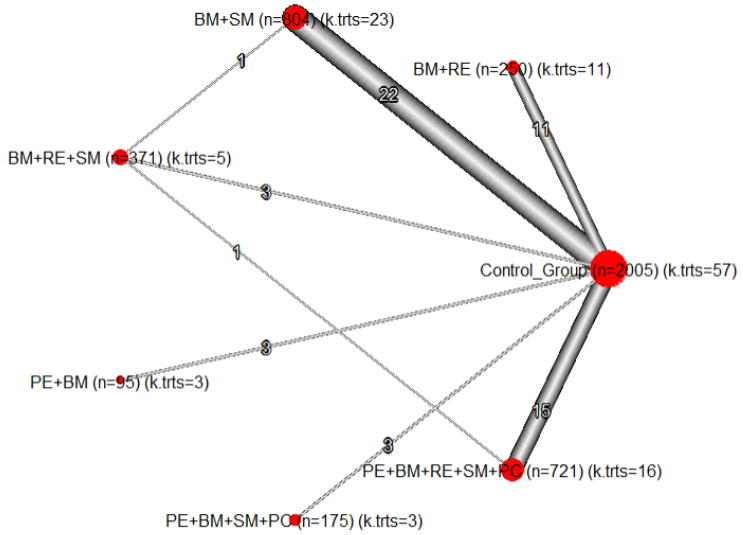


Note. Risk of bias contributions of eligible comparisons for the network meta-analyses on parental stress; PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the Parent as a coach.

S15. Network Graphs

Figure S15

Network Graphs



Note. Network graphs of eligible comparisons for the CNMAs on parental stress; the size of the nodes (circles) showed proportional to the sample size of each intervention (larger = more sample size), and the thickness of the edges (lines) proportional to the number of studies available (thicker = more studies); the bold number on each edge (K) revealed the number of pairwise comparisons between different intervention and control group; k.trts was the number of comparisons between different intervention and comparison groups (including the control group and other intervention groups); n indicated the number of observations receiving an intervention; PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach.

S16. League Table

Another common approach for presenting NMA results is the league table, which shows all pairwise network comparisons in a square matrix. Generally, different information is provided in the lower and upper triangles (Schwingshackl et al., 2019).

Table S.16

The League Tables with Pooled Estimations of Pairwise Meta-Analysis (Available Direct Pairwise Comparisons) and Network Meta-Analysis.

BM+RE	.	.	.	.	.	-0.86 (-1.13 to -0.59)
-0.30 (-0.63 to 0.02)	BM+SM	.	.	0.28 (-0.61 to 1.17)	.	-0.58 (-0.76 to -0.40)
-0.33 (-0.84 to 0.19)	-0.03 (-0.50 to 0.45)	PE+BM+SM+PC	.	.	.	-0.53 (-0.97 to -0.10)
-0.52 (-1.06 to 0.02)	-0.22 (-0.72 to 0.27)	-0.19 (-0.83 to 0.44)	PE+BM	.	.	-0.34 (-0.80 to 0.12)
-0.52 (-0.96 to -0.08)	-0.22 (-0.59 to 0.16)	-0.19 (-0.75 to 0.37)	0.00 (-0.57 to 0.58)	BM+RE+SM	-0.33 (-1.00 to 0.33)	-0.17 (-0.56 to 0.23)
-0.52 (-0.86 to -0.18)	-0.22 (-0.48 to 0.05)	-0.19 (-0.67 to 0.29)	0.01 (-0.50 to 0.51)	0.00 (-0.38 to 0.39)	PE+BM+RE+SM+PC	-0.35 (-0.56 to -0.15)
-0.86 (-1.13 to -0.59)	-0.56 (-0.74 to -0.38)	-0.53 (-0.97 to -0.10)	-0.34 (-0.80 to 0.12)	-0.34 (-0.69 to 0.01)	-0.34 (-0.54 to -0.14)	Control Group

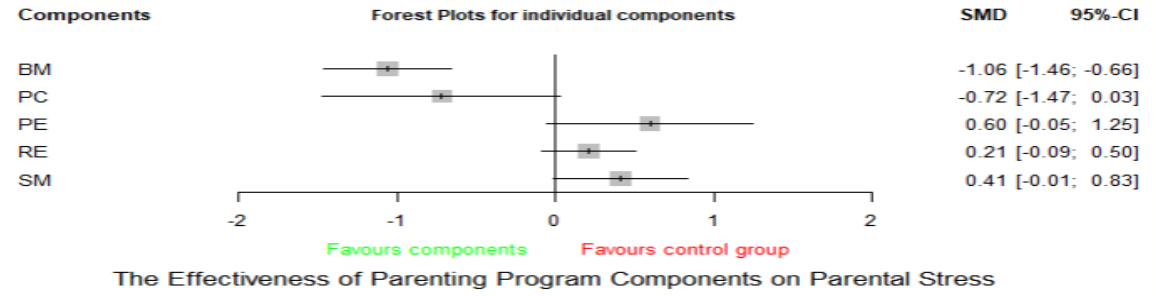
Note. The league tables with network and direct intervention estimate to determine the pooled relative effectiveness of parenting program components compared with the control group in reducing parental stress at the first post-treatment measurement for families who have children displaying disruptive behaviors; network estimates (SMD; Cohen's d) are shown in the lower triangle comparing the intervention in the column with that in

the row; the pairwise meta-analysis (SMD; Cohen's d) was presented in the upper triangle (intervention in the row compared with the column); the numbers in parentheses show 95% confidence intervals; PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach.

S17. Forest Plots for Individual Components Compared with control group

Figure S.17

Forest Plots to Show the Effects of Individual Components Compared with the Control Group in Reducing Parental Stress



Note. The results of individual components compared with the control group in reducing parental stress at the first post-treatment measurement for families who have children displaying disruptive behaviours; PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the Parent as a coach; 95%-CIs is 95% confidence intervals; additive CNMA used the random-effects model to display the effects of individual components of parenting programs compared with control group based on the standardized mean difference (Cohen's d) in treatment settings.

S18. Inconsistency

Table S18

Local Approach (side-splitting method) to Test Inconsistency Assumption Regarding Network Meta-Analysis on the Effectiveness of Parenting Program Components Compared with Control Group in Reducing Parental Stress

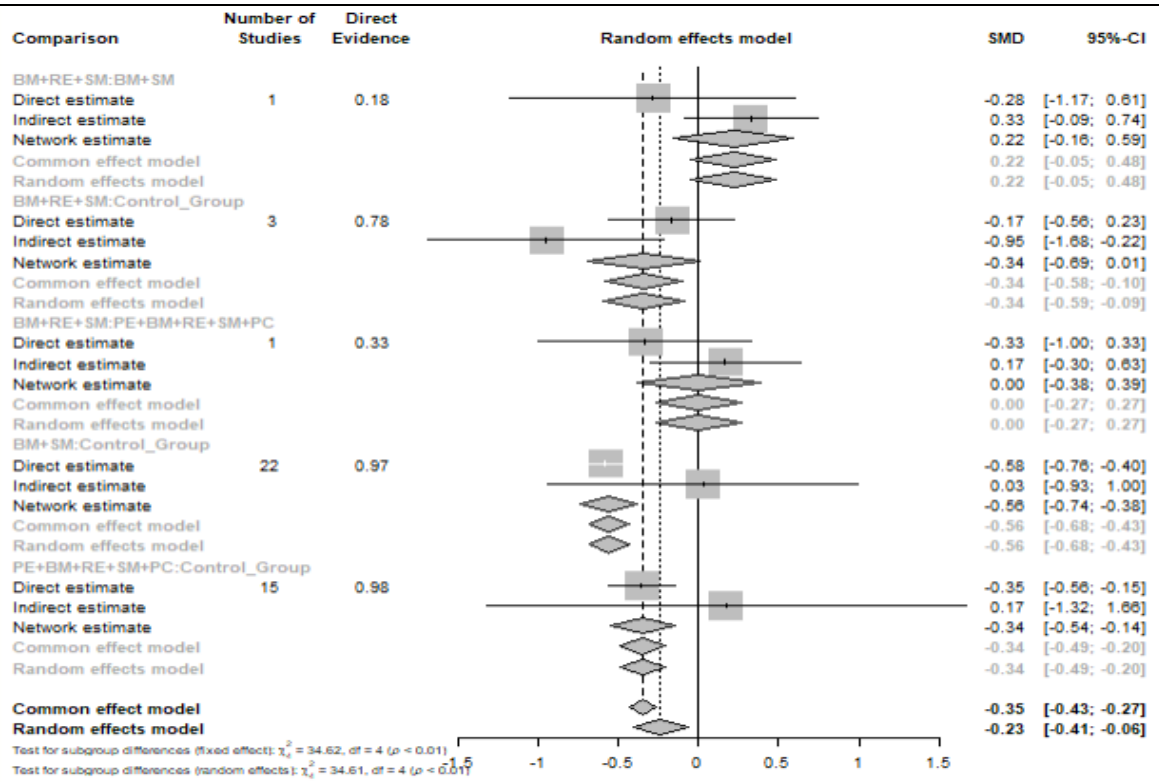
Comparison	K	Prop	NMA	Direct	Indir	Diff	Z	P-value
BM+RE:BM+RE+SM	0	0	-0.52	.	-0.52	.	.	.
BM+RE:BM+SM	0	0	-0.30	.	-0.30	.	.	.
BM+RE: Control Group	11	1.00	-0.86	-0.86	.	.	.	.
BM+RE:PE+BM	0	0	-0.52	.	-0.52	.	.	.
BM+RE:PE+BM+RE+SM+PC	0	0	-0.52	.	-0.52	.	.	.
BM+RE:PE+BM+SM+PC	0	0	-0.33	.	-0.33	.	.	.
BM+RE+SM:BM+SM	1	0.18	0.22	-0.28	0.33	-0.61	-1.22	0.2237
BM+RE+SM: Control Group	3	0.78	-0.34	-0.17	-0.95	0.78	1.85	0.0647
BM+RE+SM:PE+BM	0	0	-0.00	.	-0.00	.	.	.
BM+RE+SM:PE+BM+RE+SM+PC	1	0.33	0.00	-0.33	0.17	-0.50	-1.20	0.2289
BM+RE+SM:PE+BM+SM+PC	0	0	0.19	.	0.19	.	.	.
BM+SM: Control Group	22	0.97	-0.56	-0.58	0.03	-0.61	-1.22	0.2237
BM+SM:PE+BM	0	0	-0.22	.	-0.22	.	.	.
BM+SM:PE+BM+RE+SM+PC	0	0	-0.22	.	-0.22	.	.	.
BM+SM:PE+BM+SM+PC	0	0	-0.03	.	-0.03	.	.	.
PE+BM: Control Group	3	1.00	-0.34	-0.34	.	.	.	.
PE+BM+RE+SM+PC: Control Group	15	0.98	-0.34	-0.35	0.17	-0.52	-0.68	0.4954
PE+BM+SM+PC: Control Group	3	1.00	-0.53	-0.53	.	.	.	.

PE+BM:PE+BM+RE+SM+PC	0	0	0.01	.	0.01	.	.	.
PE+BM:PE+BM+SM+PC	0	0	0.19	.	0.19	.	.	.
PE+BM+RE+SM+PC:PE+BM+SM+PC	0	0	0.19	.	0.19	.	.	.

Note. Comparison showed intervention comparison; K indicated the number of studies providing direct evidence; Prop displayed direct evidence proportion; NMA showed estimated intervention effect (SMD; Cohen's d) in network meta-analysis; Direct indicated estimated intervention effect (SMD; Cohen's d) derived from direct evidence; Indir displayed estimated intervention effect (SMD; Cohen's d) derived from indirect evidence; Diff showed the difference between direct and indirect intervention estimates; Z indicated the z-value of the test for disagreement (direct versus indirect); P-value showed the p-value of the test for disagreement (direct versus indirect).

Figure S18

Forest Plot to Show Direct and Indirect Evidence in Network Meta-Analysis (Local Approach).



Note. Forest plot to show direct and indirect evidence to determine the effectiveness of parenting program components compared with the control group in reducing parental stress; 95%-CI shows 95% Confidence Intervals; Direct Evidence indicates the absolute contribution of direct effect estimates combined for two-arm and multi-arm studies to one network estimate.

S19. Transitivity

To investigate the transitivity assumption using available pairwise comparisons, we employed subgroup analyses to determine whether the parenting program components compared to the control group varied in terms of possible categorical modifiers. Except for one categorical moderator (i.e., the source of observations concerning the contrast between BM+SM and the control group), all categorical

moderator analyses revealed that the 95%-CIs for subgroups overlapped, and the test's *p-value* for subgroup differences did not reach statistical significance (see Figure S19).

Additionally, meta-regression using available pairwise comparisons was employed to investigate if potential continuous modifiers had an effect on the parenting program components compared to the control group in reducing parental stress. All meta-regression analyses, with the exception of one continuous moderator (i.e., the percentage of girls in intervention groups regarding the contrast between BM+SM and control group), revealed no significant difference in the effect of continuous moderators (see Table S19).

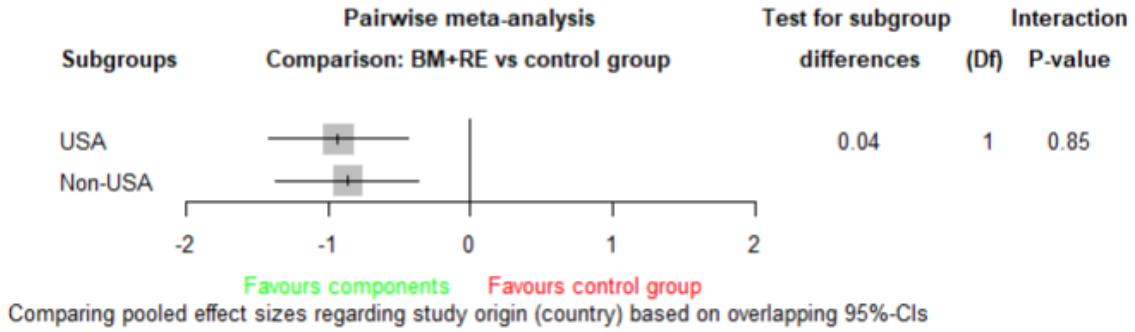
Overall, the findings regarding categorical and continuous moderators indicated that there was insufficient evidence to reject the transitivity assumption. However, we failed to conduct subgroup analysis and meta-regression for some potential moderators because of insufficient data. Thus, the following figure and table does not include them. The transitivity assumption was tested for the categorical moderator in which the number of studies in at least two subgroups was more than two.

Figure S19.

Subgroup Analyses for Categorical Moderators to Test Transitivity Assumptions Regarding Different Combinations of Parenting Program Components Compared with the Control Group in Reducing Parental Stress

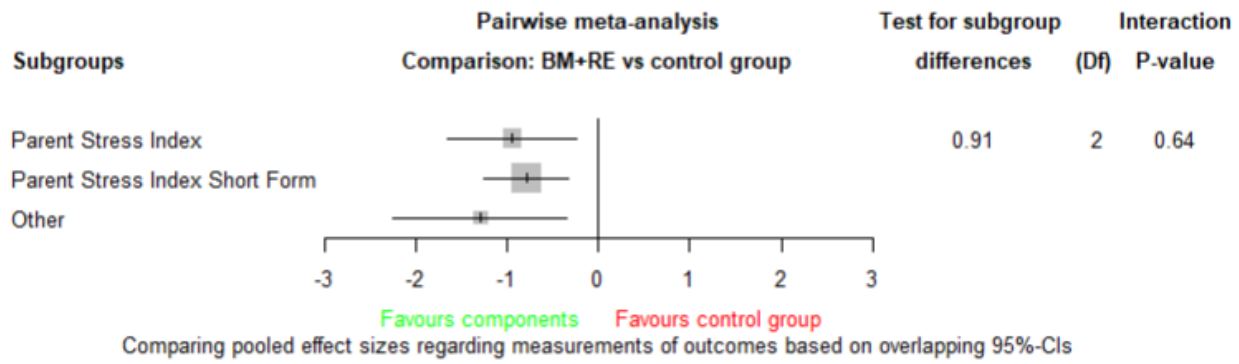
BM+RE vs. control group

Study origin (country) was tested as the potential categorical modifier



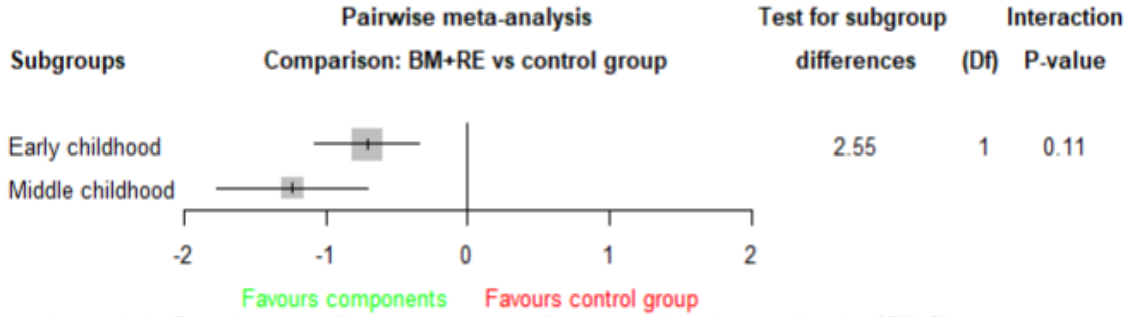
BM+RE vs. control group

Measurement of outcomes was tested as the potential categorical modifier



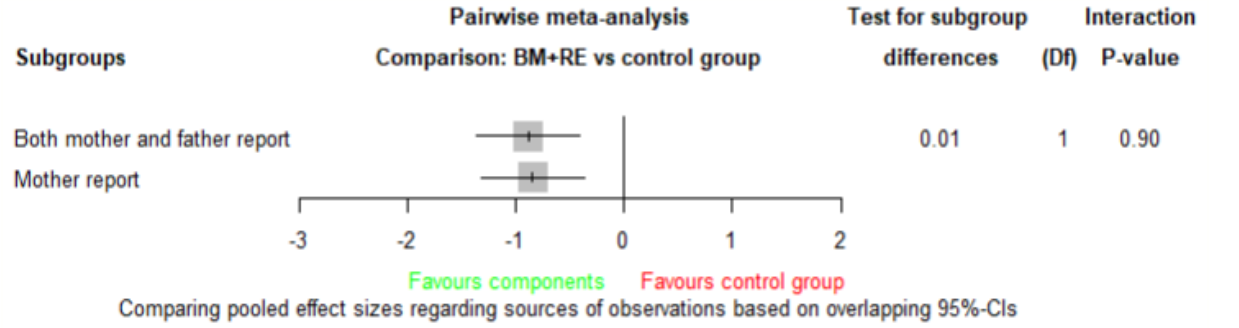
BM+RE vs. control group

Developmental stage of the children (early childhood versus middle childhood)



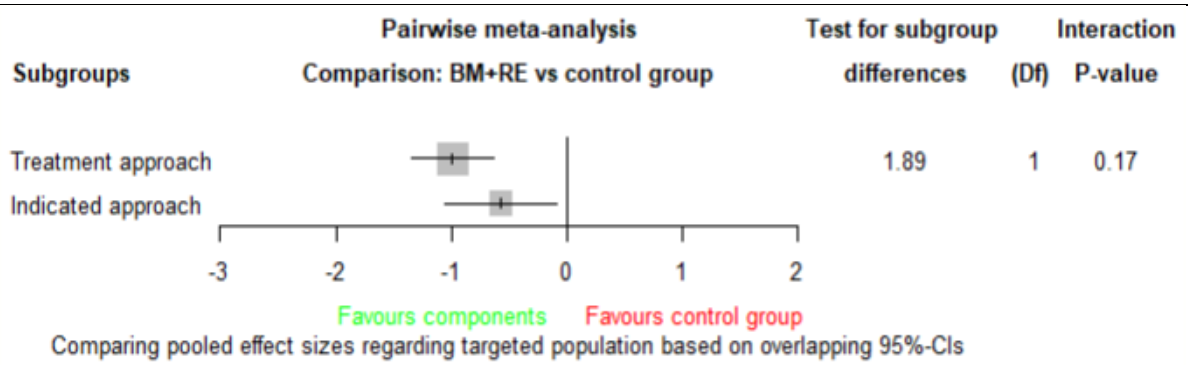
BM+RE vs. control group

The source of observations was tested as the potential categorical modifier



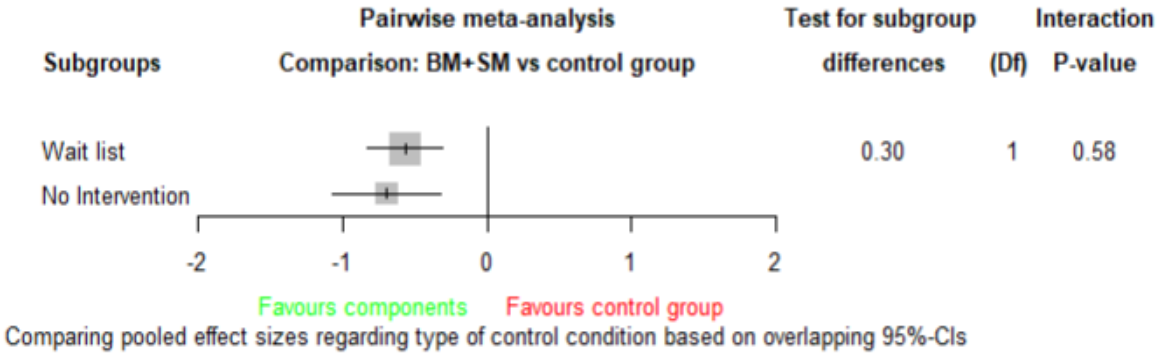
BM+RE vs. control group

The targeted population was tested as the potential categorical modifier



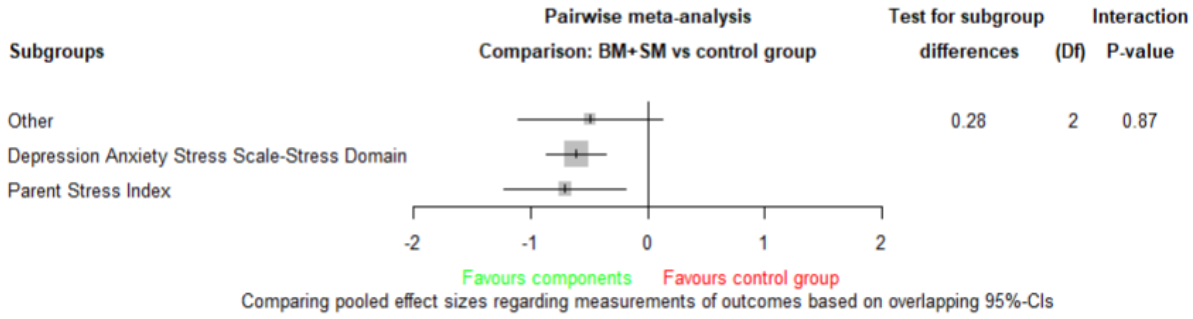
BM+SM vs. control group

The type of control condition was tested as the potential categorical modifier



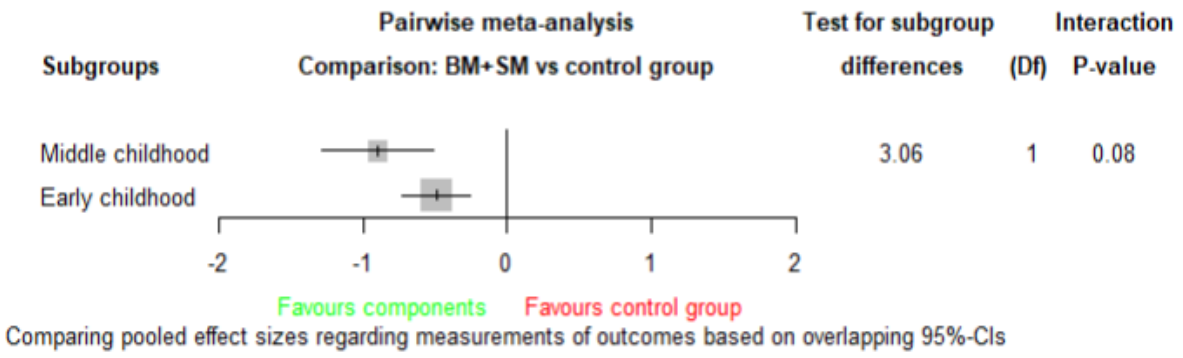
BM+SM vs. control group

Measurement of outcomes was tested as the potential categorical modifier



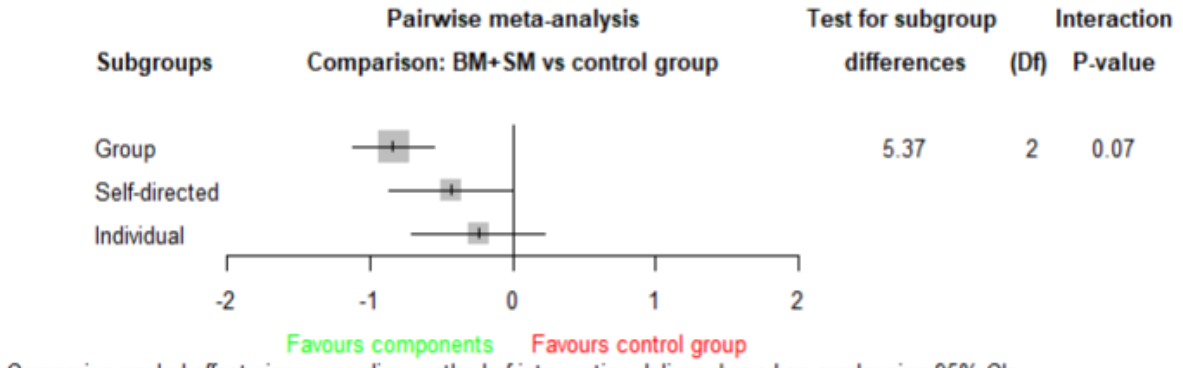
BM+SM vs. control group

Developmental stage of the children (early childhood versus middle childhood)



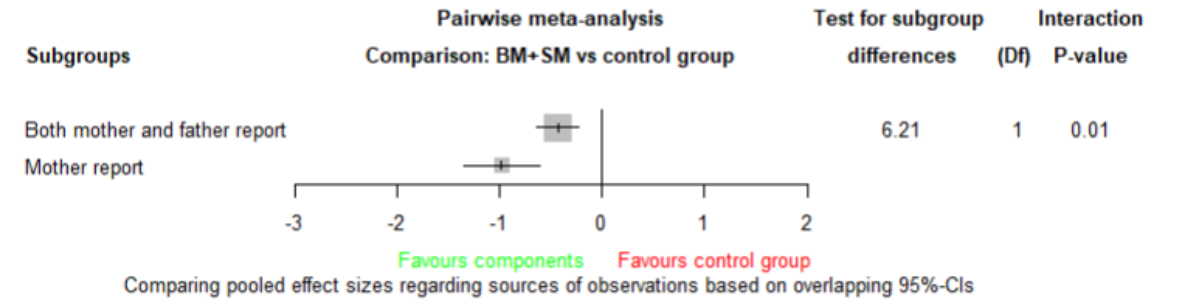
BM+SM vs. control group

Methods of intervention delivery were tested as the potential categorical modifier



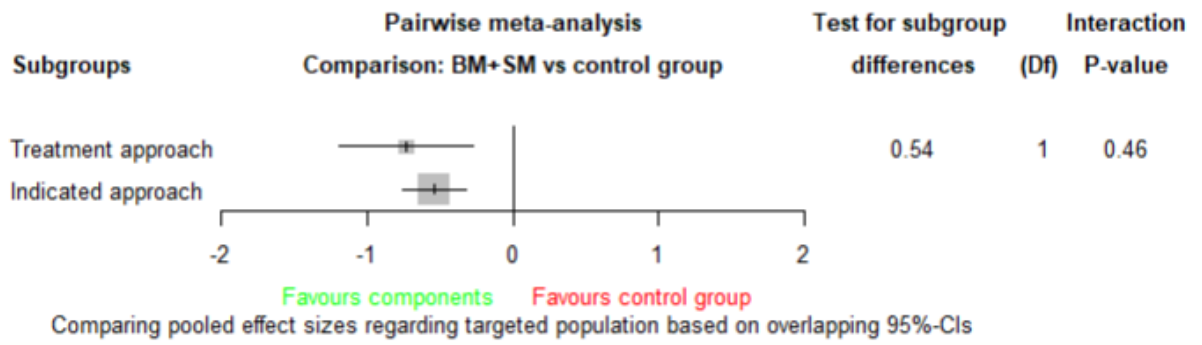
BM+SM vs. control group

The source of observations was tested as the potential categorical modifier



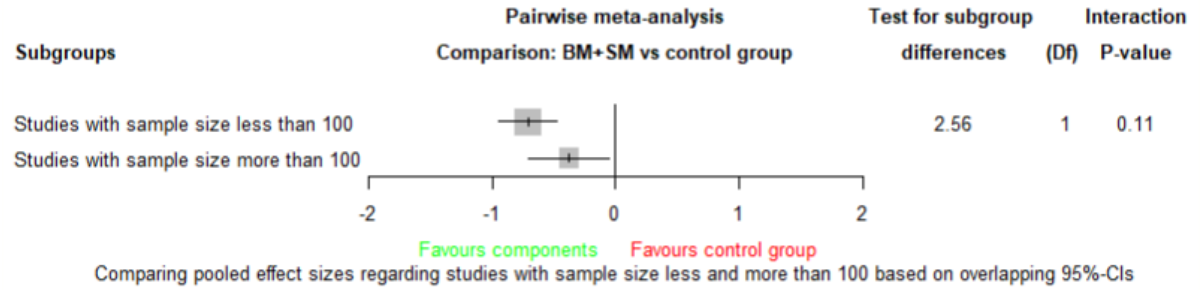
BM+SM vs. control group

The targeted population was tested as the potential categorical modifier



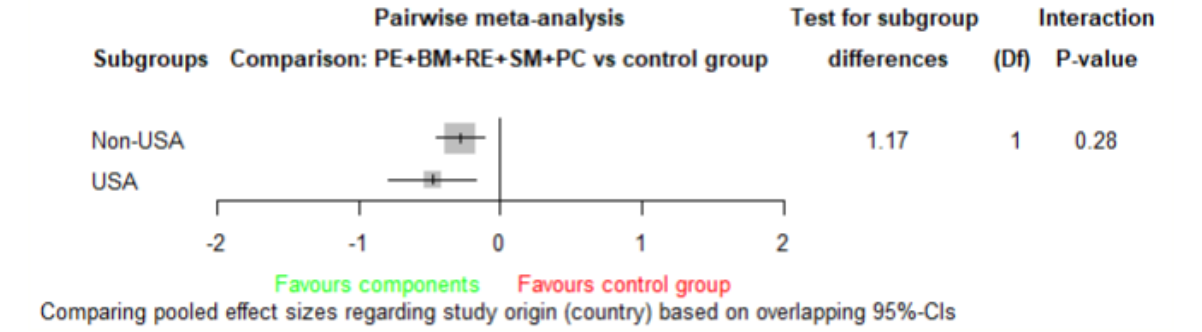
BM+SM vs. control group

Studies with a sample size of less than 100 were tested as the potential categorical modifier



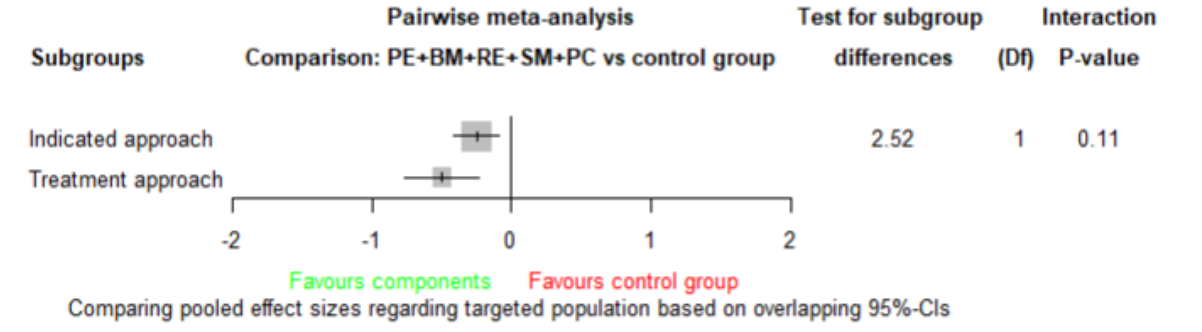
PE+BM+RE+SM+PC vs. control group

Study origin (country) was tested as the potential categorical modifier



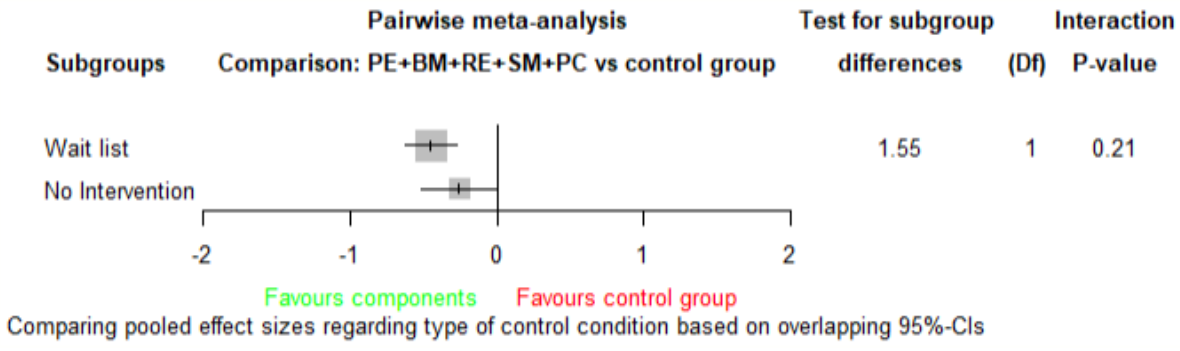
PE+BM+RE+SM+PC vs. control group

The targeted population was tested as the potential categorical modifier



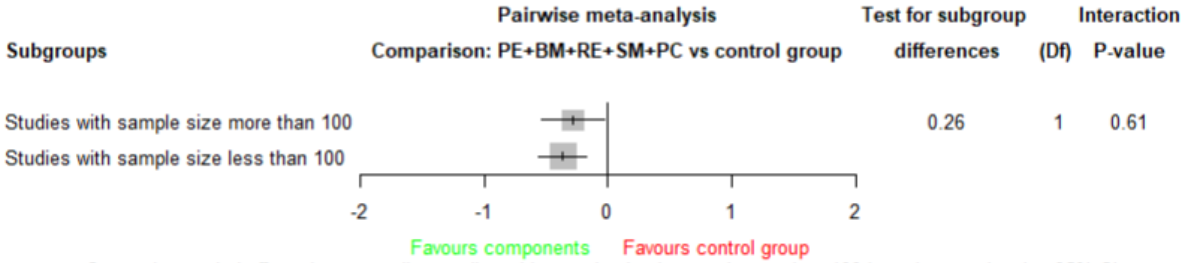
PE+BM+RE+SM+PC vs. control group

The type of control condition was tested as the potential categorical modifier



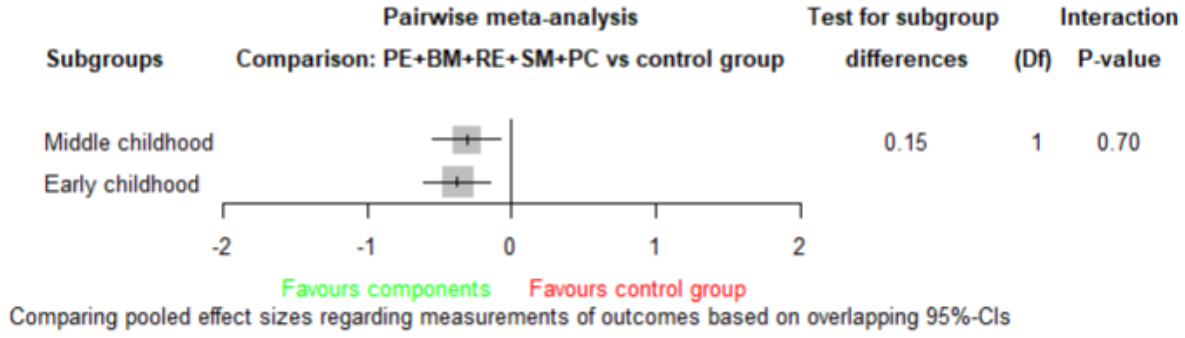
PE+BM+RE+SM+PC vs. control group

Studies with a sample size of less than 100 were tested as the potential categorical modifier



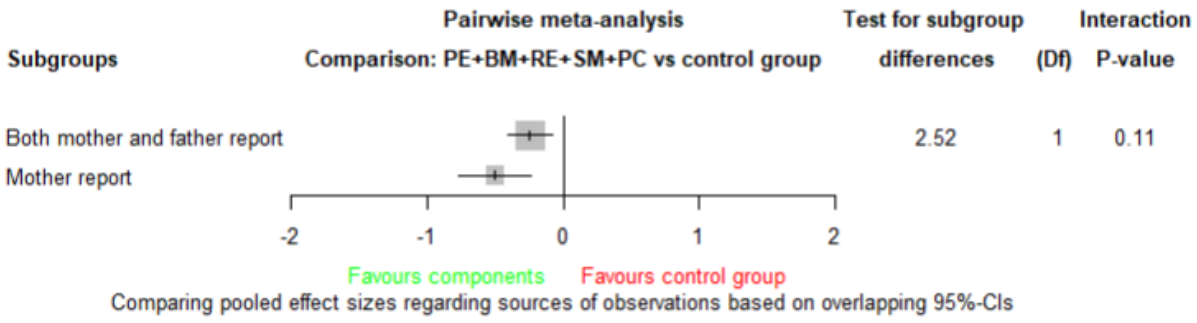
PE+BM+RE+SM+PC vs. control group

Developmental stage of the children (early childhood versus middle childhood)



PE+BM+RE+SM+PC vs. control group

The source of observations was tested as the potential categorical modifier



Note. PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach; 95%-CIs is 95% confidence intervals; Df refers to the degree of freedom.
If neither of the 95%-CIs covered the average effect size for another stratum (non-overlapping), the two strata (levels) were considered distinct. In this regard, the pattern shows that the average estimated probability came from different populations. On the contrary, the overlapping 95%-CIs indicated that the interpretation of the pooled effect size in each subgroup was not significantly different. Likewise, if the test's p-value for subgroup differences (based on the random-effects model) was non-significant, thus no differences in the overall effect between different subgroups were found.

Table S19.

Meta-Regression for Continuous Moderators to Test Transitivity Assumptions Regarding Different Combinations of Parenting Program Components Compared with the Control Group in Reducing Parental Stress.

BM+SM vs. control group						
Continuous modifiers	**K**	**Estimate**	**SE**	**zval**	**QM**	**P-value**
Mean age of the parent in intervention groups	17	-0.0260	0.0469	-0.5535	0.3064	0.5799
Mean age of the parent in comparison groups	14	-0.0854	0.0493	-1.7312	2.9971	0.0834
Percentage of mothers in intervention groups	19	-0.0015	0.0052	-0.2817	0.0793	0.7782
Percentage of mothers in comparison groups	16	-0.0037	0.0101	-0.3678	0.1353	0.7130
Percentage of single parents in intervention groups	13	-0.0001	0.0056	-0.0112	0.0001	0.9911
Percentage of single parents in comparison groups	12	0.0064	0.0066	0.9701	0.9411	0.3320
Percentage of girls in intervention groups	20	0.0094	0.0046	2.0536	4.2171	0.04
Percentage of girls in comparison groups	17	0.0068	0.0052	1.3058	1.7051	0.1916
White percentage of intervention groups	3	-0.0001	0.0061	-0.0139	0.0002	0.9889
PE+BM+RE+SM+PC vs. control group						
Continuous modifiers	**K**	**Estimate**	**SE**	**zval**	**QM**	**P-value**
Mean age of the parent in intervention groups	10	0.0099	0.0255	0.3894	0.1516	0.6970
Mean age of the parent in comparison groups	5	-0.0086	0.0289	-0.2981	0.0888	0.7657
Percentage of mothers in intervention groups	12	-0.0075	0.0090	-0.8311	0.6907	0.4059
Percentage of mothers in comparison groups	9	-0.0154	0.0120	-1.2820	1.6436	0.1998
Percentage of single parents in intervention groups	10	-0.0044	0.0093	-0.4774	0.2279	0.6331
Percentage of single parents in comparison groups	4	-0.0052	0.0068	-0.7627	0.5817	0.4457
Percentage of girls in intervention groups	12	-0.0034	0.0069	-0.5015	0.2515	0.6160

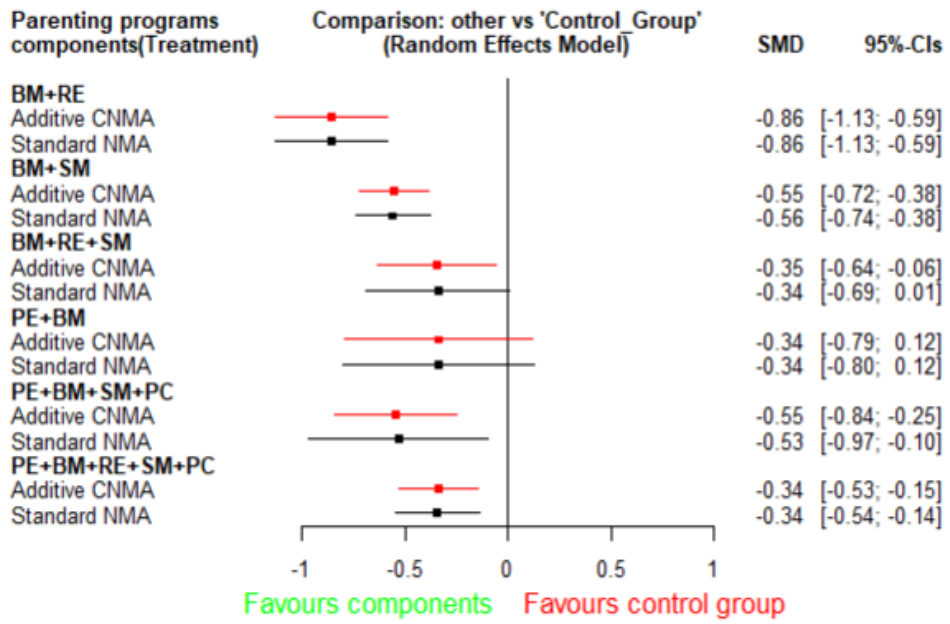
Percentage of girls in comparison groups	8	-0.0137	0.0085	-1.6073	2.5835	0.1080
BM+RE vs. control group						
Continuous modifiers	**K**	**Estimate**	**SE**	**zval**	**QM**	**P-value**
Mean age of the parent in intervention groups	6	-0.1233	0.1157	-1.0654	1.1350	0.2867
Mean age of the parent in comparison groups	3	-0.0566	0.1238	-0.4574	0.2092	0.6474
Percentage of mothers in intervention groups	9	0.0027	0.0403	0.0680	0.0046	0.9458
Percentage of mothers in comparison groups	9	0.0164	0.0409	0.4005	0.1604	0.6888
Percentage of single parents in intervention groups	6	0.0012	0.0233	0.0528	0.0028	0.9579
Percentage of single parents in comparison groups	5	-0.0086	0.0160	-0.5379	0.2894	0.5906
Percentage of girls in intervention groups	10	0.0107	0.0263	0.4077	0.1662	0.6835
Percentage of girls in comparison groups	7	0.0568	0.0493	1.1505	1.3236	0.2499
White percentage of intervention groups	3	-0.0321	0.0363	-0.8840	0.7814	0.3767

Note. PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach; K showed the number of studies combined in the pairwise meta-analysis; SE indicated the standard error; zval displayed the test statistics of the coefficients; QM showed test statistic for the omnibus test of coefficients (test of moderators); when the p-value for the test of a moderator was not significant, it was concluded that the intended predictor was not significantly associated with the effect size.

S20. A comparison of the Results of the Additive CNMA and the Standard NMA

Figure S20

Comparing the Results of the Additive CNMA Model with the Standard NMA Model using Forest Plots Based on Overlapping 95%-CIs.

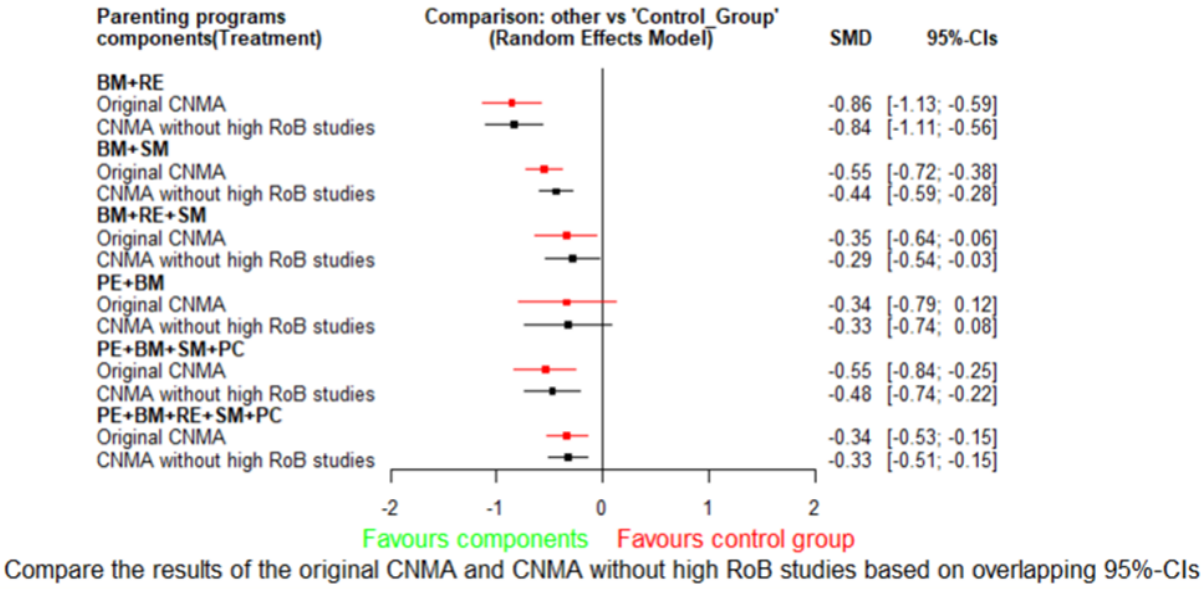


Note. Forest plots to compare results of the additive CNMA and the standard NMA model; Parenting programs components showed eligible combined components of parenting programs used in meta-analyses; PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach; CNMA is additive component network meta-analysis; NMA refers to network meta-analysis; SMD (Cohen's d) is the standardized mean difference; 95%-CI indicated 95% Confidence Intervals; Additive CNMA and standard NMA used the random-effects model.

S21. Sensitivity Analysis

Figure S21

Sensitivity Analyses to Conduct Component Network Meta-Analysis Excluding Studies Rated as High RoB.



Note. Forest plots of CNMA excluding studies rated as high RoB regarding the effectiveness of the different combinations of parenting program components compared with the control group in reducing parental stress; CNMA without high RoB studies revealed the result of the CNMA when we conducted CNMA by excluding studies rated for high RoB; Parenting programs components showed eligible combined components of parenting programs used in meta-analyses; PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach; CNMA is additive component network meta-analysis; SMD (Cohen's d) is the standardized mean difference; 95%-CI indicated 95% Confidence Intervals; RoB is the risk of bias; CNMA used the random-effects model.

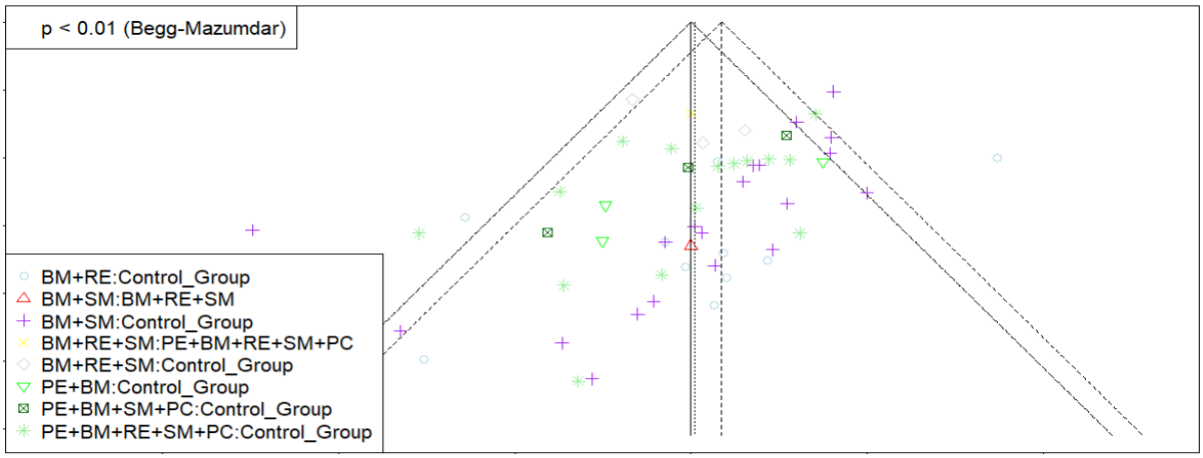
S22. Publication Bias (Dissemination Bias)

For each direct pairwise comparison to detect dissemination bias, a comparison-adjusted funnel plot with an accompanying Begg-Mazumdar test showed evidence for small-study effects (see Figure S22 A). However, the trim-and-fill method revealed that there are no missing studies (k= 0) for BM+RE, PE+BM+SM+PC, BM+RE+SM, PE+BM compared with control group, and the pooled effect sizes remained stable. Additionally, the trim-and-fill method showed that four studies were imputed for PE+BM+RE+SM+PC, and twelve studies were imputed for BM+SM compared with the control group (see Table S22). For these cases, we compared pooled effect sizes before and after trim-and-fill analysis using the 95%-CIs. Overlapping 95%-CIs showed that when studies were imputed using the trim-and-fill

method, the interpretation of the pooled effect size did not significantly differ (see Figure S22 B). It should be mentioned that, when BM+SM is compared to control group, the trim-and-fill analysis after imputation produces no significant results, which may cause some concern. However, in general, the results of publication bias indicated that small-study effects could be ignored in the majority of cases.

Figure S22 A.

Detection of Small-Study Effects (reporting bias)



Note. A comparison-adjusted funnel plot and accompanying Begg-Mazumdar tests on different combinations of parenting program components compared with the control group in reducing parental stress for each direct pairwise comparison to detect dissemination bias.

Table S22.

Trim-and-fill Analysis to Detect Dissemination Bias on Direct Pairwise Comparison

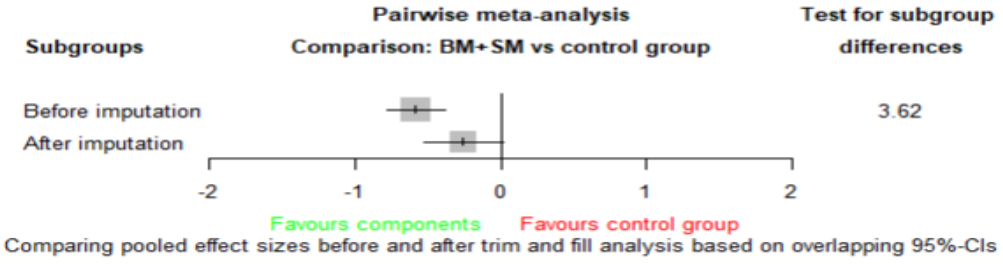
Parenting programs components	Trim-and-fill analyses				
	K_t	d_t	95%-CI		Z (*P-value*)
BM+SM vs. control group	12	-0.26	-0.46	0.04	-2.36 (0.0182)
PE+BM+RE+SM+PC vs. control group	4	-0.23	-0.39	-0.06	-2.77 (0.005)

Note: K_t is the estimated number of missing studies detected based on trim-and-fill analysis; d_t is the estimated effect size after trim-and-fill analysis; Trim-and-fill analyses were based on random-effects models for each effect size; 95%-CI indicated 95% Confidence Intervals; Parenting programs components showed eligible parenting program components used in meta-analyses; PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach.

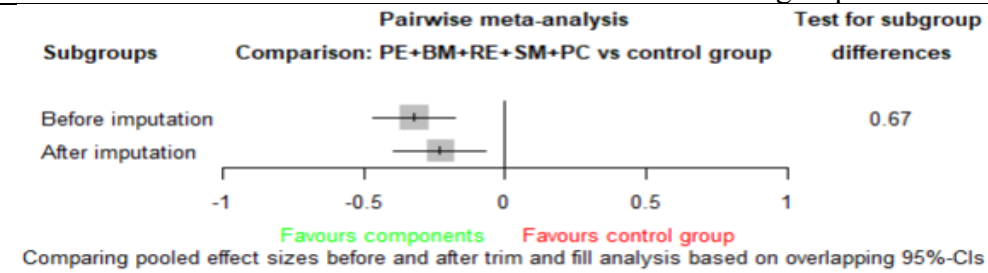
Figure S22 B.

Forest Plot for Comparing Pooled Effect Sizes Before and After Trim-and-fill Analysis

BM+SM vs. control group



PE+BM+RE+SM+PC vs. control group



Note. PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach; 95%-CIs is a 95% confidence interval; Before imputation refers to pooled effect sizes before trim-and-fill analysis; After imputation represents pooled effect sizes after trim-and-fill analysis.
This comparison was carried out when one or more studies were imputed by the trim-and-fill method; the 95%-CIs were used to make comparisons. This study reported both 95%-CIs and the test for subgroup differences. However, we focused on overlapping 95%-CIs to identify mean differences between various levels. If neither of the 95%-CIs covered the average effect size for another stratum (non-overlapping), the two strata (levels) were considered distinct. In this regard, the pattern shows that the average estimated probability came from different populations. On the contrary, overlapping 95%-CIs indicated that when one or more studies imputed using the trim-and-fill method, the interpretation of the pooled effect size did not significantly change.

S23. Detection of Outlier and Influential Analyses.

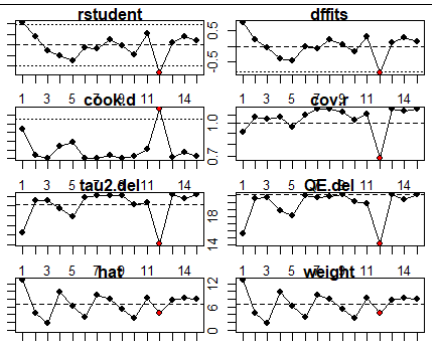
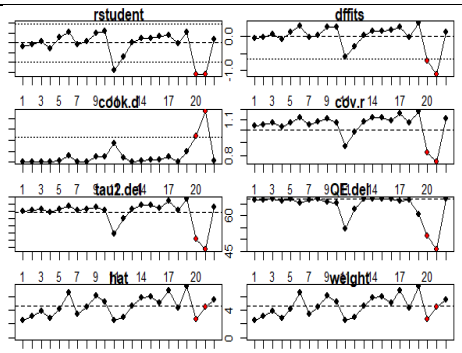
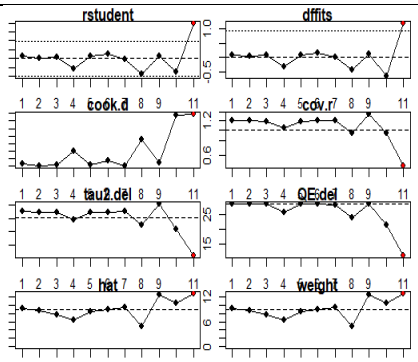
Outlier and influential analyses for each direct pairwise comparison was conducted to examine the robustness of the findings (see Figure S23 A). To determine outliers and influential analyses between parenting program components against the control group, SMDs and 95%-CIs were compared, which were estimated from the meta-analytic results of direct pairwise comparisons with and without outlying and influential cases. This comparison was performed when one or more outlier and influential cases went beyond the defined cut-off values. Comparisons between 95%-CIs and tests for differences showed overlapping between the 95%-CIs, and tests for differences for all of the comparisons were non-significant (see Figure S23 B). It revealed that after excluding outlying samples, the same patterns of

results were observed. That is, the results are comparable when using complete data and excluding outliers. Thus, the results were robust, even in the presence of outlier samples.

Figure S23 A.

The Detection of Outlier and Influence Plots.

Detecting outlier and influential cases for effect sizes derived from direct pairwise comparison

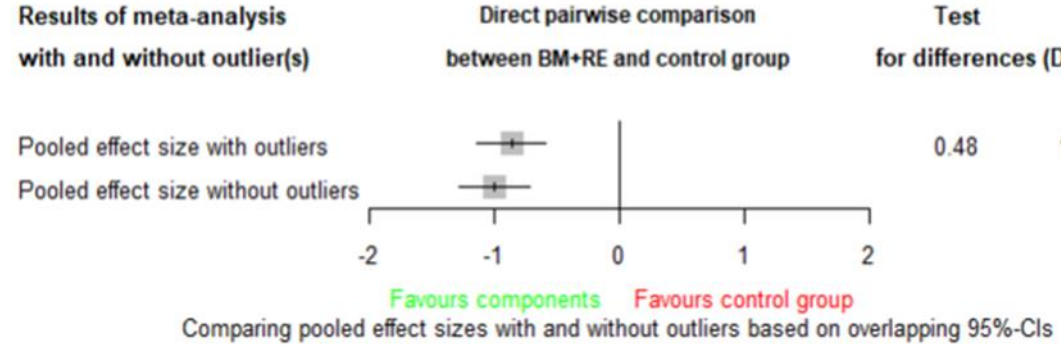
PE+BM+RE+SM+PC vs. control group	BM+SM vs. control group	BM+RE vs. control group
		
Outlier and influential study: Webster-Stratton et al., (1997)	Outlier and influential study: Aghebati et al., (2014) Shahrivar et al., (2008)	Outlier and influential study: Thomas et al., (2012)

Note. PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach.

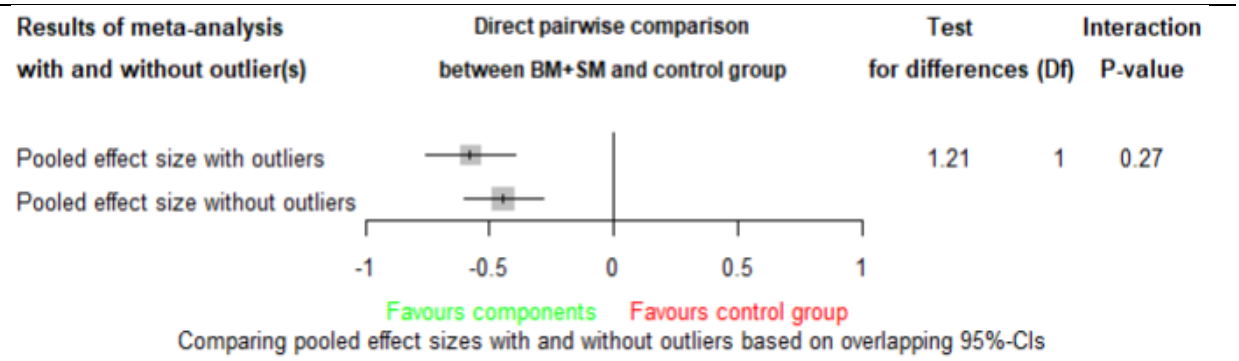
Figure S23 B.

Forest Plot for Comparing Pooled Effect Sizes derived from Direct Pairwise Comparison with and without Outliers using Overlapping 95%-CIs

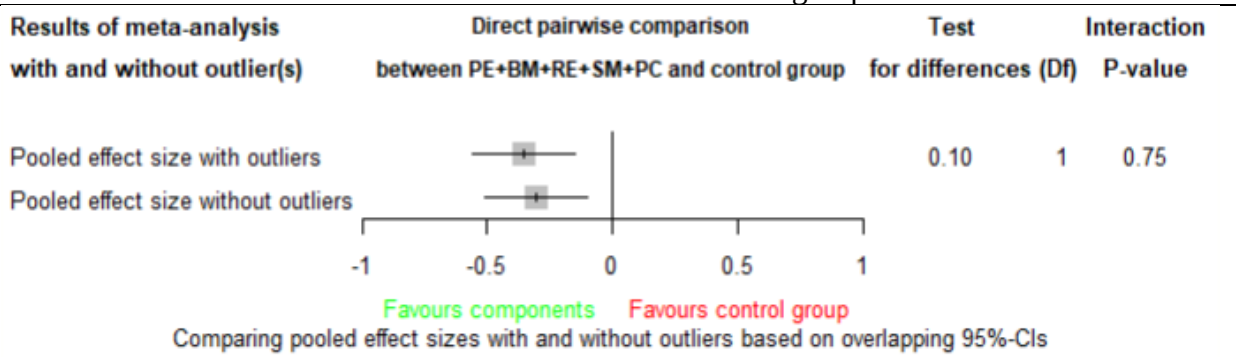
BM+SM vs. control group



BM+SM vs. control group



PE+BM+RE+SM+PC vs. control group



Note. PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach; 95%-CIs is a 95% confidence interval.

This comparison was carried out when one or more outliers were detected. We compared SMDs and 95%-CIs derived from the meta-analysis of direct pairwise comparisons with and without outlying and influential cases. The current study employed both 95%-CIs and the test for subgroup differences. We used overlapping 95%-CIs to identify mean differences between different levels. If neither of the 95%-CIs covered the average effect size for another stratum (non-overlapping), the two strata (levels) were considered distinct. On the contrary, overlapping 95%-CIs indicated that when one or more outlying and influential detected, the interpretation of the pooled effect size did not significantly change.

S24. Credibility of the Evidence (GRADE Ratings for each network)

Network Meta-Analysis for the Effectiveness of Parenting Program Components Compared with Control Group in Reducing Parental Stress

In the comparisons of BM+RE vs. control group, BM+SM vs. control group, and PE+BM vs. control group, some evidence of within-study bias (i.e., study limitations) can be identified. Concerning the across-study bias (i.e., publication bias or reporting bias), the Begg-Mazumdar test for funnel plot asymmetry was significant. However, the trim-and-fill method revealed that there are no missing studies (k= 0) for BM+RE, PE+BM+SM+PC, BM+RE+SM, PE+BM compared with control group, and the pooled effect sizes remained stable. Moreover, the trim-and-fill method demonstrated that four studies were imputed for PE+BM+RE+SM+PC, and twelve studies were imputed for BM+SM compared with the control group (see Table S22 in Supplementary Material). In these cases, we compared pooled effect

sizes before and after trim-and-fill analysis using the 95%-CIs. Overlapping 95%-CIs revealed that when studies were imputed using the trim-and-fill method, the interpretation of the pooled effect size did not significantly differ (see Figure S22 B in Supplementary Material). It should be mentioned that, when BM+SM is compared to control group, the trim-and-fill analysis after imputation produces no significant results, which may cause some concern.

Since all the included studies matched the indirectness items, there was no concern regarding indirectness. Based on the evaluation of imprecision, we found that the four comparisons (i.e., BM+RE+SM vs. control group, PE+BM vs. control group, PE+BM+SM+PC vs. control group, PE+BM+RE+SM+PC vs. control group) exhibited some concerns. Considering the procedure suggested by CINeMA for evaluating the heterogeneity, we found that for BM+RE vs. control group, there are "no concerns" about heterogeneity because 95%-CIs and 95%-PIs lead to the similar conclusions. For BM+RE+SM vs. control group, BM+SM vs. control group, and PE+BM vs. control group, there are "some concerns" about heterogeneity. In both PE+BM+SM+PC vs. control group and PE+BM+RE+SM+PC vs. control group, heterogeneity is remarkable because 95%-PIs include values that result in a different conclusion than an assessment based on the 95%-CIs. Finally, there was no evidence of incoherence for BM+RE vs. control group, BM+SM vs. control group, BM+RE+SM vs. control group, PE+BM vs. control group, PE+BM+SM+PC vs. control group, and PE+BM+RE+SM+PC vs. control group. Likewise, no evidence of inconsistency was identified in the NMA when calculating the global design-by-treatment interaction test ($Q_{statistic}$ = 3.87, *df*= 3, and *p-value* = .28).

Table S24

GRADE Ratings for Each Network Meta-Analysis.

Comparison	Number of Studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Confidence rating	Reason(s) for downgrading
				Mixed evidence					
BM+RE vs Control_Group	11	Some concerns ☑	Low risk	No concerns	No concerns	No concerns	No concerns	Moderate	| Within-study bias |
BM+RE+SM vs Control_Group	3	No concerns	Low risk	No concerns	Some concerns ☑	Some concerns ☑	No concerns	Moderate	| Imprecision | Heterogeneity |
BM+SM vs Control_Group	22	Some concerns ☑	Some concerns ☑	No concerns	No concerns	Some concerns ☑	No concerns	Moderate	| Within-study bias | Reporting bias | Heterogeneity |
Control_Group vs PE+BM	3	Some concerns ☑	Low risk	No concerns	Some concerns ☑	Some concerns ☑	No concerns	Moderate	| Within-study bias | Imprecision | Heterogeneity |
Control_Group vs PE+BM+RE+SM+PC	15	No concerns	Low risk	No concerns	Some concerns ☑	Major concerns ☑	No concerns	Low	| Imprecision | Heterogeneity |
Control_Group vs PE+BM+SM+PC	3	No concerns	Low risk	No concerns	Some concerns ☑	Major concerns ☑	No concerns	Low	| Imprecision | Heterogeneity |

Note. Confidence in Network Meta-Analysis (CINeMA) rating for the network on parental stress; PE is psychoeducation; BM is behavior management; RE is relationship enhancement; SM is parental self-management; PC is the parent as a coach.

References

Abikoff, H. B., Thompson, M., Laver-Bradbury, C., Long, N., Forehand, R. L., Miller Brotman, L., Klein, R. G., Reiss, P., Huo, L., & Sonuga-Barke, E. (2015). Parent training for preschool ADHD: a randomized controlled trial of specialized and generic programs. *Journal of Child Psychology and Psychiatry*, *56*(6), 618-631. https://doi.org/10.1111/jcpp.12346

Abrahamse, M. E., Tsang, V. M., & Lindauer, R. J. (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), 8244. https://doi.org/10.3390/ijerph18168244

Aghebati, A., Gharraee, B., Shoshtari, M. H., & Gohari, M. R. (2014). Triple p-positive parenting program for mothers of ADHD children. *Iranian Journal of Psychiatry and Behavioral Sciences*, *8*(1), 59.

Aliakbari Dehkordi, M., Alipour, A., Esmaeilzadeh Kiabani, M., & Mohtashami, T. (2014). Effectiveness of positive parenting program on mothers' stress with attention deficit/hyperactivity disorder children. *Journal of Exceptional Children*, *13*(4), 23-32.

Allen, C., Walker, A. M., Premji, Z. A., Beauchemin-Turcotte, M. E., Wong, J., Soh, S., Hawboldt, G. S., Shinkaruk, K. S., & Archer, D. P. (2022). Preventing Persistent Postsurgical Pain: A Systematic Review and Component Network Meta-analysis. *European Journal of Pain*, *26*(4), 771-785. https://doi.org/10.1002/ejp.1915

Anastopoulos, A. D., Shelton, T. L., DuPaul, G. J., & Guevremont, D. C. (1993). Parent training for attention-deficit hyperactivity disorder: Its impact on parent functioning. *Journal of Abnormal Child Psychology*, *21*(5), 581-596. https://doi.org/10.1007/BF00916320

Antoniou, S. A., Koelemay, M., Antoniou, G. A., & Mavridis, D. (2019). A practical guide for application of network meta-analysis in evidence synthesis. *European Journal of Vascular and Endovascular Surgery*, *58*(1), 141-144. https://doi.org/10.1016/j.ejvs.2018.10.023

Arruabarrena, I., Rivas, G. R., Cañas, M., & De Paúl, J. (2021). 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

Au, A., Lau, K. M., Wong, A. H. C., Lam, C., Leung, C., Lau, J., & Lee, Y. K. (2014). The efficacy of a group Triple P (positive parenting program) for Chinese parents with a child diagnosed with ADHD in Hong Kong: A pilot randomised controlled study. *Australian Psychologist*, *49*(3), 151-162. https://doi.org/10.1111/ap.12053

Bagner, D. M., Sheinkopf, S. J., Vohr, B. R., & Lester, B. M. (2010). Parenting intervention for externalizing behavior problems in children born premature: An initial examination. *Journal of*

Developmental and Behavioral Pediatrics: JDBP, *31*(3), 209-216. https://doi.org/10.1097/DBP.0b013e3181d5a294

Baker, S., Sanders, M. R., Turner, K. M., & Morawska, A. (2017). A randomized controlled trial evaluating a low-intensity interactive online parenting intervention, Triple P Online Brief, with parents of children with early onset conduct problems. *Behaviour Research and Therapy*, *91*, 78-90. https://doi.org/10.1016/j.brat.2017.01.016

Bakker, A., Cai, J., English, L., Kaiser, G., Mesa, V., & Van Dooren, W. (2019). Beyond small, medium, or large: Points of consideration when interpreting effect sizes. *Educational Studies in Mathematics*, *102*(1), 1-8. https://doi.org/10.1007/s10649-019-09908-4

Braet, C., Meerschaert, T., Merlevede, E., Bosmans, G., Van Leeuwen, K., & De Mey, W. (2009). Prevention of antisocial behaviour: Evaluation of an early intervention programme. *European Journal of Developmental Psychology*, *6*(2), 223-240. https://doi.org/10.1080/17405620601033194

Caldwell, D. M., Ades, A., & Higgins, J. (2005). Simultaneous comparison of multiple treatments: combining direct and indirect evidence. *Bmj*, *331*(7521), 897-900. https://doi.org/10.1136/bmj.331.7521.897

Caldwell, D. M., Davies, S. R., Hetrick, S. E., Palmer, J. C., Caro, P., López-López, J. A., Gunnell, D., Kidger, J., Thomas, J., & French, C. (2019). School-based interventions to prevent anxiety and depression in children and young people: a systematic review and network meta-analysis. *The Lancet Psychiatry*, *6*(12), 1011-1020. https://doi.org/10.1016/S2215-0366(19)30403-1

Chaimani, A., Higgins, J. P., Mavridis, D., Spyridonos, P., & Salanti, G. (2013). Graphical tools for network meta-analysis in STATA. *PloS one*, *8*(10), e76654. https://doi.org/10.1371/journal.pone.0076654

Chaimani, A., & Salanti, G. (2012). Using network meta-analysis to evaluate the existence of small-study effects in a network of interventions. *Research Synthesis Methods*, *3*(2), 161-176. https://doi.org/10.1002/jrsm.57

Chesterfield, J. A., Porzig-Drummond, R., Stevenson, R. J., & Stevenson, C. S. (2021). Evaluating a brief behavioral parenting program for parents of school-aged children with ADHD. *Parenting*, *21*(3), 216-240. https://doi.org/10.1080/15295192.2020.1777783

Chu, C.-S., Li, C.-T., Brunoni, A. R., Yang, F.-C., Tseng, P.-T., Tu, Y.-K., Stubbs, B., Carvalho, A. F., Thompson, T., & Yeh, T.-C. (2021). Cognitive effects and acceptability of non-invasive brain stimulation on Alzheimer's disease and mild cognitive impairment: a component network meta-analysis. *Journal of Neurology, Neurosurgery & Psychiatry*, *92*(2), 195-203. http://dx.doi.org/10.1136/jnnp-2020-323870

Coates, J., Taylor, J. A., & Sayal, K. (2015). Parenting interventions for ADHD: A systematic literature review and meta-analysis. *Journal of Attention Disorders*, *19*(10), 831-843. https://doi.org/10.1177/1087054714535952

Cohen, J. (1988). Statistical power analysis for the behavioural sciences. Hillsdale, NJ: Laurence Erlbaum Associates. In: Inc.

Connell, S., Sanders, M. R., & Markie-Dadds, C. (1997). Self-directed behavioral family intervention for parents of oppositional children in rural and remote areas. *Behavior Modification*, *21*(4), 379-408. https://doi.org/10.1177/01454455970214001

Cooley, M. E., Veldorale-Griffin, A., Petren, R. E., & Mullis, A. K. (2014). Parent–child interaction therapy: A meta-analysis of child behavior outcomes and parent stress. *Journal of Family Social Work*, *17*(3), 191-208. https://doi.org/10.1080/10522158.2014.888696

Das, A., Roy, B., Schwarzer, G., Silverman, M. G., Ziegler, O., Bandyopadhyay, D., Philpotts, L. L., Sinha, S., Blumenthal, J. A., & Das, S. (2019). Comparison of treatment options for depression in heart failure: a network meta-analysis. *Journal of Psychiatric Research*, *108*, 7-23. https://doi.org/10.1016/j.jpsychires.2018.10.007

Day, J. J., & Sanders, M. R. (2018). Do parents benefit from help when completing a self-guided parenting program online? A randomized controlled trial comparing Triple P Online with and without telephone support. *Behavior Therapy*, *49*(6), 1020-1038. https://doi.org/10.1016/j.beth.2018.03.002

Dekkers, T. J., Hornstra, R., Van der Oord, S., Luman, M., Hoekstra, P. J., Groenman, A. P., & van den Hoofdakker, B. J. (2021). Meta-analysis: Which components of parent training work for children with Attention-Deficit/Hyperactivity Disorder? *Journal of the American Academy of Child & Adolescent Psychiatry*, *61*(4), P478-494. https://doi.org/10.1016/j.jaac.2021.06.015

Dias, S., Welton, N. J., Caldwell, D., & Ades, A. E. (2010). Checking consistency in mixed treatment comparison meta-analysis. *Statistics in Medicine*, *29*(7-8), 932-944. https://doi.org/10.1002/sim.3767

Dias, S., Welton, N. J., Sutton, A. J., Caldwell, D. M., Lu, G., & Ades, A. (2013). Evidence synthesis for decision making 4: inconsistency in networks of evidence based on randomized controlled trials. *Medical Decision Making*, *33*(5), 641-656. https://doi.org/10.1177/0272989X12455847

Durlak, J. A. (2009). How to select, calculate, and interpret effect sizes. *Journal of Pediatric Psychology*, *34*(9), 917-928. https://doi.org/10.1093/jpepsy/jsp004

Duval, S., & Tweedie, R. (2000). A nonparametric "trim and fill" method of accounting for publication bias in meta-analysis. *Journal of the American Statistical Association*, *95*(449), 89-98. https://doi.org/10.1080/01621459.2000.10473905

Egger, M., Smith, G. D., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *BMJ*, *315*(7109), 629-634. https://doi.org/10.1136/bmj.315.7109.629

Eyberg, S. M., Boggs, S. R., & Algina, J. (1995). Parent-child interaction therapy: a psychosocial model for the treatment of young children with conduct problem behavior and their families. *Psychopharmacology Bulletin*, *31*(1), 83-91.

Fong, K. M., Au, S. Y., & Ng, G. W. Y. (2021). Steroid, ascorbic acid, and thiamine in adults with sepsis and septic shock: a systematic review and component network meta-analysis. *Scientific Reports*, *11*(1), 1-7. https://doi.org/10.1038/s41598-021-95386-9

Franke, N., Keown, L. J., & Sanders, M. R. (2020). An RCT of an online parenting program for parents of preschool-aged children with ADHD symptoms. *Journal of Attention Disorders*, *24*(12), 1716-1726. https://doi.org/10.1177/1087054716667598

Freeman, S. C., Scott, N. W., Powell, R., Johnston, M., Sutton, A. J., & Cooper, N. J. (2018). Component network meta-analysis identifies the most effective components of psychological preparation for adults undergoing surgery under general anesthesia. *Journal of Clinical Epidemiology*, *98*, 105-116. https://doi.org/10.1016/j.jclinepi.2018.02.012

Furlong, M., McGilloway, S., Bywater, T., Hutchings, J., Smith, S. M., & Donnelly, M. (2013). Cochrane review: behavioural and cognitive-behavioural group-based parenting programmes for early-onset conduct problems in children aged 3 to 12 years. *Evidence-Based Child Health: A Cochrane Review Journal*, *8*(2), 318-692. https://doi.org/10.1002/14651858.CD008225.pub2

Gallart, S. C., & Matthey, S. (2005). The effectiveness of Group Triple P and the impact of the four telephone contacts. *Behaviour Change*, *22*(2), 71-80. https://doi.org/10.1375/bech.2005.22.2.71

Gross, D., Fogg, L., & Tucker, S. (1995). The efficacy of parent training for promoting positive parent—toddler relationships. *Research in Nursing & Health*, *18*(6), 489-499. https://doi.org/10.1002/nur.4770180605

Guyatt, G. H., Oxman, A. D., Vist, G., Kunz, R., Brozek, J., Alonso-Coello, P., Montori, V., Akl, E. A., Djulbegovic, B., & Falck-Ytter, Y. (2011). GRADE guidelines: 4. Rating the quality of evidence—study limitations (risk of bias). *Journal of Clinical Epidemiology*, *64*(4), 407-415. https://doi.org/10.1016/j.jclinepi.2010.07.017

Hennessy, E. A., Tanner-Smith, E. E., Mavridis, D., & Grant, S. P. (2019). Comparative effectiveness of brief alcohol interventions for college students: Results from a network meta-analysis. *Prevention Science*, *20*(5), 715-740. https://doi.org/10.1007/s11121-018-0960-z

Higgins, J., Jackson, D., Barrett, J., Lu, G., Ades, A., & White, I. (2012). Consistency and inconsistency in network meta-analysis: concepts and models for multi-arm studies. *Research Synthesis Methods*, *3*(2), 98-110. https://doi.org/10.1002/jrsm.1044

Higgins, J. P., Altman, D. G., Gøtzsche, P. C., Jüni, P., Moher, D., Oxman, A. D., Savović, J., Schulz, K. F., Weeks, L., & Sterne, J. A. (2011). The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *BMJ, 343:* d5928. https://doi.org/10.1136/bmj.d5928

Higgins, J. P., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *Bmj*, *327*(7414), 557-560. https://doi.org/10.1136/bmj.327.7414.557

Hoang, N.-P. T., Kirby, J. N., Haslam, D. M., & Sanders, M. R. (2022). Promoting Positive Relationship Between Parents and Grandparents: A Randomized Controlled Trial of Group Triple P Plus Compassion in Vietnam. *Behavior Therapy, 53*(6), 1175-1190. https://doi.org/10.1016/j.beth.2022.06.002

Hoath, F. E., & Sanders, M. R. (2002). A feasibility study of Enhanced Group Triple P—positive parenting program for parents of children with attention-deficit/hyperactivity disorder. *Behaviour Change*, *19*(4), 191-206. https://doi.org/10.1375/bech.19.4.191

Hua, N., & Leijten, P. (2022). Parenting Programs for Disruptive Child Behavior in China: A Meta-Analysis and Systematic Review. *Research on Social Work Practice*, *32*(1), 32-48. https://doi.org/10.1177/10497315211018509

Huang, X., Lin, J., & Demner-Fushman, D. (2006). Evaluation of PICO as a knowledge representation for clinical questions. AMIA Annual Symposium Proceedings,

Hutchings, J., Bywater, T., Daley, D., Gardner, F., Whitaker, C., Jones, K., Eames, C., & Edwards, R. T. (2007). Parenting intervention in Sure Start services for children at risk of developing conduct disorder: pragmatic randomised controlled trial. *BMJ*, *334*(7595), 678. https://doi.org/10.1136/bmj.39126.620799.55

Jackson, D., Barrett, J. K., Rice, S., White, I. R., & Higgins, J. P. (2014). A design-by-treatment interaction model for network meta-analysis with random inconsistency effects. *Statistics in Medicine*, *33*(21), 3639-3654. https://doi.org/10.1002/sim.6188

Jouriles, E. N., McDonald, R., Spiller, L., Norwood, W. D., Swank, P. R., Stephens, N., Ware, H., & Buzy, W. M. (2001). Reducing conduct problems among children of battered women. *Journal of Consulting and Clinical Psychology*, *69*(5), 774. https://doi.org/10.1037/a0015994

Kaminski, J., Valle, L. A., Filene, J. H., & Boyle, C. L. (2008). A meta-analytic review of components associated with parent training program effectiveness. *Journal of Abnormal Child Psychology*, *36*(4), 567-589. https://doi.org/10.1007/s10802-007-9201-9

Karjalainen, P., Kiviruusu, O., Aronen, E. T., & Santalahti, P. (2019). Group-based parenting program to improve parenting and children's behavioral problems in families using special services: A randomized controlled trial in a real-life setting. *Children and Youth Services Review*, *96*, 420-429. https://doi.org/10.1016/j.childyouth.2018.12.004

Karjalainen, P., Santalahti, P., Aronen, E. T., & Kiviruusu, O. (2021). Parent-and teacher-reported long-term effects of parent training on child conduct problems in families with child protection and other support services: a randomized controlled trial. *Child and Adolescent Psychiatry and Mental Health*, *15*(1), 1-14. https://doi.org/10.1186/s13034-021-00358-6

Keown, L. J., Sanders, M. R., Franke, N., & Shepherd, M. (2018). Te Whānau Pou Toru: A randomized controlled trial (RCT) of a culturally adapted low-intensity variant of the Triple P-Positive Parenting Program for indigenous Māori families in New Zealand. *Prevention Science*, *19*(7), 954-965. https://doi.org/10.1007/s11121-018-0886-5

Kjøbli, J., Hukkelberg, S., & Ogden, T. (2013). A randomized trial of group parent training: Reducing child conduct problems in real-world settings. *Behaviour Research and Therapy*, *51*(3), 113-121. https://doi.org/10.1016/j.brat.2012.11.006

Kleefman, M., Jansen, D. E., Stewart, R. E., & Reijneveld, S. A. (2014). The effectiveness of Stepping Stones Triple P parenting support in parents of children with borderline to mild intellectual disability and psychosocial problems: a randomized controlled trial. *BMC medicine*, *12*(1), 1-10. https://doi.org/10.1186/s12916-014-0191-5

Lange, A.-M., Daley, D., Frydenberg, M., Houmann, T., Kristensen, L. J., Rask, C., Sonuga-Barke, E., Søndergaard-Baden, S., Udupi, A., & Thomsen, P. H. (2018). Parent training for preschool ADHD in routine, specialist care: a randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, *57*(8), 593-602. https://doi.org/10.1016/j.jaac.2018.04.014

Larsson, B., Fossum, S., Clifford, G., Drugli, M. B., Handegård, B. H., & Mørch, W.-T. (2009). Treatment of oppositional defiant and conduct problems in young Norwegian children. *European Child & Adolescent Psychiatry*, *18*(1), 42-52. https://doi.org/10.1007/s00787-008-0702-z

Leckey, Y., McGilloway, S., Hickey, G., Bracken-Scally, M., Kelly, P., & Furlong, M. (2019). A randomised control trial of parent and child training programmes (versus wait list control) for children with ADHD-type behaviours: A pilot study. *Child Care in Practice*, *25*(4), 419-438. https://doi.org/10.1080/13575279.2018.1481368

Lee, P.-c., Niew, W.-i., Yang, H.-j., Chen, V. C.-h., & Lin, K.-c. (2012). A meta-analysis of behavioral parent training for children with attention deficit hyperactivity disorder. *Research in Developmental Disabilities*, *33*(6), 2040-2049. https://doi.org/10.1016/j.ridd.2012.05.011

Leijten, P., Gardner, F., Melendez-Torres, G., Van Aar, J., Hutchings, J., Schulz, S., Knerr, W., & Overbeek, G. (2019). Meta-analyses: Key parenting program components for disruptive child behavior. *Journal of the American Academy of Child & Adolescent Psychiatry*, *58*(2), 180-190. https://doi.org/10.1016/j.jaac.2018.07.900

Leijten, P., Melendez-Torres, G., Knerr, W., & Gardner, F. (2016). Transported versus homegrown parenting interventions for reducing disruptive child behavior: A multilevel meta-regression study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *55*(7), 610-617. https://doi.org/10.1016/j.jaac.2016.05.003

Leijten, P., Melendez-Torres, G., & Gardner, F. (2021). Research Review: The most effective parenting program content for disruptive child behavior–a network meta-analysis. *Journal of Child Psychology and Psychiatry*, *63*(2), 132-142. https://doi.org/10.1111/jcpp.13483

Leijten, P., Melendez-Torres, G., Gardner, F., Van Aar, J., Schulz, S., & Overbeek, G. (2018). Are relationship enhancement and behavior management "the golden couple" for disruptive child behavior? Two meta-analyses. *Child Development*, *89*(6), 1970-1982. https://doi.org/10.1111/cdev.13051

Leung, C., Fan, A., & Sanders, M. R. (2013). The effectiveness of a Group Triple P with Chinese parents who have a child with developmental disabilities: A randomized controlled trial. *Research in Developmental Disabilities*, *34*(3), 976-984. https://doi.org/10.1016/j.ridd.2012.11.023

Leung, C., Tsang, S., Ng, G. S., & Choi, S. (2017). Efficacy of parent–child interaction therapy with Chinese ADHD children: Randomized controlled trial. *Research on Social Work Practice*, *27*(1), 36-47. https://doi.org/10.1177/1049731516643830

Leung, C., Tsang, S., Sin, T. C., & Choi, S.-y. (2015). The efficacy of parent–child interaction therapy with Chinese families: Randomized controlled trial. *Research on Social Work Practice*, *25*(1), 117-128. https://doi.org/10.1177/1049731513519827

Li, N., Peng, J., & Li, Y. (2021). Effects and moderators of triple p on the social, emotional, and behavioral problems of children: systematic review and meta-analysis. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.709851

Lu, G., & Ades, A. (2004). Combination of direct and indirect evidence in mixed treatment comparisons. *Statistics in medicine*, *23*(20), 3105-3124. https://doi.org/10.1002/sim.1875

Lundahl, B., Risser, H. J., & Lovejoy, M. C. (2006). A meta-analysis of parent training: Moderators and follow-up effects. *Clinical Psychology Review*, *26*(1), 86-104. . https://doi.org/10.1016/j.cpr.2005.07.004

Lundahl, B. W., Tollefson, D., Risser, H., & Lovejoy, M. C. (2008). A meta-analysis of father involvement in parent training. *Research on Social Work Practice*, *18*(2), 97-106. https://doi.org/10.1177/1049731507309828

Markie-Dadds, C., & Sanders, M. R. (2006 a). A controlled evaluation of an enhanced self-directed behavioural family intervention for parents of children with conduct problems in rural and remote areas. *Behaviour Change*, *23*(1), 55-72. https://doi.org/10.1375/bech.23.1.55

Markie-Dadds, C., & Sanders, M. R. (2006 b). Self-directed Triple P (Positive Parenting Program) for mothers with children at-risk of developing conduct problems. *Behavioural and Cognitive Psychotherapy*, *34*(3), 259-275. https://doi.org/10.1017/S1352465806002797

Matos, M., Bauermeister, J. J., & Bernal, G. (2009). Parent-child interaction therapy for Puerto Rican preschool children with ADHD and behavior problems: A pilot efficacy study. *Family Process*, *48*(2), 232-252. https://doi.org/10.1111/j.1545-5300.2009.01279.x

Mavridis, D., Giannatsi, M., Cipriani, A., & Salanti, G. (2015). A primer on network meta-analysis with emphasis on mental health. *Evidence-Based Mental Health*, *18*(2), 40-46. http://dx.doi.org/10.1136/eb-2015-102088

McCabe, K., & Yeh, M. (2009). Parent–child interaction therapy for Mexican Americans: A randomized clinical trial. *Journal of Clinical Child & Adolescent Psychology*, *38*(5), 753-759. https://doi.org/10.1080/15374410903103544

McGilloway, S., Mhaille, G. N., Bywater, T., Furlong, M., Leckey, Y., Kelly, P., Comiskey, C., & Donnelly, M. (2012). A parenting intervention for childhood behavioral problems: a randomized controlled trial in disadvantaged community-based settings. *Journal of Consulting and Clinical Psychology*, *80*(1), 116-127. https://doi.org/10.1037/a0026304

Merz, J., Schwarzer, G., & Gerger, H. (2019). Comparative efficacy and acceptability of pharmacological, psychotherapeutic, and combination treatments in adults with posttraumatic stress disorder: a network meta-analysis. *JAMA Psychiatry*, *76*(9), 904-913. https://doi.org/10.1001/jamapsychiatry.2019.0951

Miklowitz, D. J., Efthimiou, O., Furukawa, T. A., Scott, J., McLaren, R., Geddes, J. R., & Cipriani, A. (2021). Adjunctive psychotherapy for bipolar disorder: a systematic review and component network meta-analysis. *JAMA Psychiatry*, *78*(2), 141-150.

Molloy, G., Noone, C., Caldwell, D., Welton, N., & Newell, J. (2018). Network meta-analysis in health psychology and behavioural medicine: a primer. *Health Psychology Review*, *12*(3), 254-270. https://doi.org/10.1080/17437199.2018.1457449

Momeni, K. M., & Taziki, T. (2017). The effectiveness of parent-child communication and parental stress Positive Parenting Program on students with attention deficit. *Empowering Exceptional Children*, *8*(1), 83-93.

Nikolakopoulou, A., Higgins, J. P., Papakonstantinou, T., Chaimani, A., Del Giovane, C., Egger, M., & Salanti, G. (2020). CINeMA: an approach for assessing confidence in the results of a network meta-analysis. *PLoS medicine*, *17*(4), e1003082.

Nikolakopoulou, A., Mavridis, D., Furukawa, T. A., Cipriani, A., Tricco, A. C., Straus, S. E., Siontis, G. C., Egger, M., & Salanti, G. (2018). Living network meta-analysis compared with pairwise meta-

analysis in comparative effectiveness research: empirical study. *BMJ, 360: k585*. https://doi.org/10.1136/bmj.k585

Nixon, R. D., Sweeney, L., Erickson, D. B., & Touyz, S. W. (2003). Parent-child interaction therapy: a comparison of standard and abbreviated treatments for oppositional defiant preschoolers. *Journal of Consulting and Clinical Psychology*, *71*(2), 251-260. https://doi.org/10.1037/0022-006X.71.2.251

Nowak, C., & Heinrichs, N. (2008). A comprehensive meta-analysis of Triple P-Positive Parenting Program using hierarchical linear modeling: Effectiveness and moderating variables. *Clinical Child and Family Psychology Review*, *11*(3), 114-144. https://doi.org/10.1007/s10567-008-0033-0

Papakonstantinou, T., Nikolakopoulou, A., Higgins, J. P., Egger, M., & Salanti, G. (2020). CINeMA: Software for semiautomated assessment of the confidence in the results of network meta-analysis. *Campbell Systematic Reviews*, *16*(1), e1080. https://doi.org/10.1002/cl2.1080

Patterson, J., Barlow, J., Mockford, C., Klimes, I., Pyper, C., & Stewart-Brown, S. (2002). Improving mental health through parenting programmes: block randomised controlled trial. *Archives of Disease in Childhood*, *87*(6), 472-477. http://dx.doi.org/10.1136/adc.87.6.472

Petropoulou, M., Nikolakopoulou, A., Veroniki, A.-A., Rios, P., Vafaei, A., Zarin, W., Giannatsi, M., Sullivan, S., Tricco, A. C., & Chaimani, A. (2017). Bibliographic study showed improving statistical methodology of network meta-analyses published between 1999 and 2015. *Journal of Clinical Epidemiology*, *82*, 20-28. https://doi.org/10.1016/j.jclinepi.2016.11.002

Piquero, A. R., Farrington, D. P., Welsh, B. C., Tremblay, R., & Jennings, W. G. (2009). Effects of early family/parent training programs on antisocial behavior and delinquency. *Journal of Experimental Criminology*, *5*(2), 83-120. https://doi.org/10.1007/s11292-009-9072-x

Piquero, A. R., Jennings, W. G., Diamond, B., Farrington, D. P., Tremblay, R. E., Welsh, B. C., & Gonzalez, J. M. R. (2016). A meta-analysis update on the effects of early family/parent training programs on antisocial behavior and delinquency. *Journal of Experimental Criminology*, *12*(2), 229-248. https://doi.org/10.1007/s11292-016-9256-0

Pompoli, A., Furukawa, T. A., Efthimiou, O., Imai, H., Tajika, A., & Salanti, G. (2018). Dismantling cognitive-behaviour therapy for panic disorder: a systematic review and component network meta-analysis. *Psychological Medicine*, *48*(12), 1945-1953. https://doi.org/10.1017/S0033291717003919

Puhan, M. A., Schünemann, H. J., Murad, M. H., Li, T., Brignardello-Petersen, R., Singh, J. A., Kessels, A. G., & Guyatt, G. H. (2014). A GRADE Working Group approach for rating the quality of

treatment effect estimates from network meta-analysis. *BMJ*, *349: g5630*. https://doi.org/10.1136/bmj.g5630

Richardson, W. S., Wilson, M. C., Nishikawa, J., & Hayward, R. S. (1995). The well-built clinical question: a key to evidence-based decisions. *Acp j club*, *123*(3), A12-A13.

Rücker, G., Petropoulou, M., & Schwarzer, G. (2020). Network meta-analysis of multicomponent interventions. *Biometrical Journal*, *62*(3), 808-821. 821. https://doi.org/10.1002/bimj.201800167

Rücker, G., & Schwarzer, G. (2015). Ranking treatments in frequentist network meta-analysis works without resampling methods. *BMC Medical Research Methodology*, *15*(1), 1-9. https://doi.org/10.1186/s12874-015-0060-8

Salanti, G. (2012). Indirect and mixed-treatment comparison, network, or multiple-treatments meta-analysis: many names, many benefits, many concerns for the next generation evidence synthesis tool. *Research Synthesis Methods*, *3*(2), 80-97. https://doi.org/10.1002/jrsm.1037

Salanti, G., Del Giovane, C., Chaimani, A., Caldwell, D. M., & Higgins, J. P. (2014). Evaluating the quality of evidence from a network meta-analysis. *PloS one*, *9*(7), e99682. https://doi.org/10.1371/journal.pone.0099682

Salmon, K., Dittman, C., Sanders, M., Burson, R., & Hammington, J. (2014). Does adding an emotion component enhance the Triple P− Positive Parenting Program? *Journal of Family Psychology*, *28*(2), 244-252. https://doi.org/10.1037/a0035997

Sanders, M. R., Baker, S., & Turner, K. M. (2012). A randomized controlled trial evaluating the efficacy of Triple P Online with parents of children with early-onset conduct problems. *Behaviour research and therapy*, *50*(11), 675-684. https://doi.org/10.1016/j.brat.2012.07.004

Schappin, R., Wijnroks, L., Uniken Venema, M., Wijnberg-Williams, B., Veenstra, R., Koopman-Esseboom, C., Tollenaer, S. M.-D., van der Tweel, I., & Jongmans, M. (2013). Brief parenting intervention for parents of NICU graduates: a randomized, clinical trial of Primary Care Triple P. *BMC Pediatrics*, *13*(1), 1-9. https://doi.org/10.1186/1471-2431-13-69

Schardt, C., Adams, M. B., Owens, T., Keitz, S., & Fontelo, P. (2007). Utilization of the PICO framework to improve searching PubMed for clinical questions. *BMC Medical Informatics and Decision Making*, *7*(1), 1-6. https://doi.org/10.1186/1472-6947-7-16

Schuhmann, E. M., Foote, R. C., Eyberg, S. M., Boggs, S. R., & Algina, J. (1998). Efficacy of parent-child interaction therapy: Interim report of a randomized trial with short-term maintenance. *Journal of Clinical Child Psychology*, *27*(1), 34-45. https://doi.org/10.1207/s15374424jccp2701_4

Schwarzer, G., Carpenter, J. R., & Rücker, G. (2015). *Meta-analysis with R* (Vol. 4784). Springer.

Schwingshackl, L., Schwarzer, G., Rücker, G., & Meerpohl, J. J. (2019). Perspective: network meta-analysis reaches nutrition research: current status, scientific concepts, and future directions. *Advances in Nutrition*, *10*(5), 739-754. https://doi.org/10.1093/advances/nmz036

Serketich, W. J., & Dumas, J. E. (1996). The effectiveness of behavioral parent training to modify antisocial behavior in children: A meta-analysis. *Behavior Therapy*, *27*(2), 171-186. https://doi.org/10.1016/S0005-7894(96)80013-X

Shahrivar, Z. (2008). Efficacy of the Positive Parenting Program (Triple P) for parents of children with attention deficit/hyperactivity disorder. *Iranian J Psychiatry*, *3*(2), 59-63.

Sheeber, L. B., & Johnson, J. H. (1994). Evaluation of a temperament-focused, parent-training program. *Journal of Clinical Child Psychology*, *23*(3), 249-259. https://doi.org/10.1207/s15374424jccp2303_3

Shimabukuro, S., Daley, D., Thompson, M., Laver-Bradbury, C., Lovern, K., & Tripp, G. (2020). Supporting Japanese mothers of children at risk for attention deficit hyperactivity disorder (ADHD): a small scale randomized control Trial of well parent Japan. *Journal of Child and Family Studies*, *29*(6), 1604-1616. https://doi.org/10.1007/s10826-020-01704-6

Social, I. o., & Preventive Medicine, U. o. B. (2017). CINeMA: Confidence in Network Meta-Analysis.

Somech, L. Y., & Elizur, Y. (2012). Promoting self-regulation and cooperation in pre-kindergarten children with conduct problems: A randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, *51*(4), 412-422. https://doi.org/10.1016/j.jaac.2012.01.019

Sourander, A., McGrath, P. J., Ristkari, T., Cunningham, C., Huttunen, J., Lingley-Pottie, P., Hinkka-Yli-Salomäki, S., Kinnunen, M., Vuorio, J., & Sinokki, A. (2016). Internet-assisted parent training intervention for disruptive behavior in 4-year-old children: a randomized clinical trial. *JAMA Psychiatry*, *73*(4), 378-387. https://doi.org/10.1001/jamapsychiatry.2015.341

Stattin, H., Enebrink, P., Özdemir, M., & Giannotta, F. (2015). A national evaluation of parenting programs in Sweden: The short-term effects using an RCT effectiveness design. *Journal of Consulting and Clinical Psychology*, *83*(6), 1069. https://doi.org/10.1037/a0039328

Stewart-Brown, S., Patterson, J., Mockford, C., Barlow, J., Klimes, I., & Pyper, C. (2004). Impact of a general practice based group parenting programme: quantitative and qualitative results from a controlled trial at 12 months. *Archives of Disease in Childhood*, *89*(6), 519-525. http://dx.doi.org/10.1136/adc.2003.028365

Thomas, R., Abell, B., Webb, H. J., Avdagic, E., & Zimmer-Gembeck, M. J. (2017). Parent-child interaction therapy: a meta-analysis. *Pediatrics*, *140*(3). https://doi.org/10.1542/peds.2017-0352

Thomas, R., & Zimmer-Gembeck, M. J. (2012). Parent–Child Interaction Therapy: An evidence-based treatment for child maltreatment. *Child Maltreatment*, *17*(3), 253-266. https://doi.org/10.1177/1077559512459555

Thongseiratch, T., Leijten, P., & Melendez-Torres, G. (2020). Online parent programs for children's behavioral problems: a meta-analytic review. *European Child & Adolescent Psychiatry*, *29*(11), 1555-1568. https://doi.org/10.1007/s00787-020-01472-0

Tully, L. A., & Hunt, C. (2017). A randomized controlled trial of a brief versus standard group parenting program for toddler aggression. *Aggressive Behavior*, *43*(3), 291-303. https://doi.org/10.1002/ab.21689

Van Aar, J., Leijten, P., de Castro, B. O., & Overbeek, G. (2017). Sustained, fade-out or sleeper effects? A systematic review and meta-analysis of parenting interventions for disruptive child behavior. *Clinical Psychology Review*, *51*, 153-163. https://doi.org/10.1016/j.cpr.2016.11.006

Van Den Hoofdakker, B. J., Van der Veen-Mulders, L., Sytema, S., Emmelkamp, P. M., Minderaa, R. B., & Nauta, M. H. (2007). Effectiveness of behavioral parent training for children with ADHD in routine clinical practice: a randomized controlled study. *Journal of the American Academy of Child & Adolescent Psychiatry*, *46*(10), 1263-1271. https://doi.org/10.1097/chi.0b013e3181354bc2

Van der Put, C. E., Assink, M., Gubbels, J., & Boekhout van Solinge, N. F. (2018). Identifying effective components of child maltreatment interventions: A meta-analysis. *Clinical Child and Family Psychology Review*, *21*(2), 171-202. https://doi.org/10.1007/s10567-017-0250-5

Viechtbauer, W., & Cheung, M. W. L. (2010). Outlier and influence diagnostics for meta-analysis. *Research Synthesis Methods*, *1*(2), 112-125. https://doi.org/10.1002/jrsm.11

Volker, M. A. (2006). Reporting effect size estimates in school psychology research. *Psychology in the Schools*, *43*(6), 653-672. https://doi.org/10.1002/pits.20176

Webster-Stratton, C. (1990). Enhancing the effectiveness of self-administered videotape parent training for families with conduct-problem children. *Journal of Abnormal Child Psychology*, *18*(5), 479-492. https://doi.org/10.1007/BF00911103

Webster-Stratton, C. (1992). Individually administered videotape parent training:"Who benefits?". *Cognitive Therapy and Research*, *16*(1), 31-52. https://doi.org/10.1007/BF01172955

Webster-Stratton, C., & Hammond, M. (1997). Treating children with early-onset conduct problems: a comparison of child and parent training interventions. *Journal of Consulting and Clinical Psychology*, *65*(1), 93-109. https://doi.org/10.1037/0022-006X.65.1.93

Webster-Stratton, C., Kolpacoff, M., & Hollinsworth, T. (1988). Self-administered videotape therapy for families with conduct-problem children: comparison with two cost-effective treatments and a

control group. *Journal of Consulting and Clinical Psychology*, *56*(4), 558-566. https://doi.org/10.1037/0022-006X.56.4.558

Welton, N. J., Caldwell, D., Adamopoulos, E., & Vedhara, K. (2009). Mixed treatment comparison meta-analysis of complex interventions: psychological interventions in coronary heart disease. *American Journal of Epidemiology*, *169*(9), 1158-1165. https://doi.org/10.1093/aje/kwp014

White, I. R., Barrett, J. K., Jackson, D., & Higgins, J. P. (2012). Consistency and inconsistency in network meta-analysis: model estimation using multivariate meta-regression. *Research Synthesis Methods*, *3*(2), 111-125. https://doi.org/10.1002/jrsm.1045