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Research review: Effects of parenting programs for children's conduct problems on children's emotional problems – a network meta-analysis

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Background: Specific programs are often implemented for specific child mental health problems, while many children suffer from comorbid problems. Ideally, programs reduce a wider range of mental health problems. The present study tested whether parenting programs for children's conduct problems, and which individual and clusters of program elements, have additional effects on children's emotional problems. **Methods:** We updated the search of a previous systematic review in 11 databases (e.g., PsycINFO and MEDLINE) and included studies published until July 2020 with keywords relating to 'parenting', 'program', and 'child behavioral problems'. Also, we searched for recent trials in four trial registries and contacted protocol authors. Studies were eligible for inclusion if they used a randomized controlled trial to evaluate the effects of a parenting program for children aged 2–10 years which was based on social learning theory and included a measure of children's emotional problems postintervention. **Results:** We identified 69 eligible trials (159 effect sizes; 6,240 families). Robust variance estimation showed that parenting programs had small significant parent-reported additional effects on emotional problems immediately postintervention (Cohen's $d = -0.14$; 95% CI, $-0.21, -0.07$), but these effects faded over time. Teachers and children did not report significant effects. Additional effects on emotional problems were larger in samples with clinical baseline levels of such problems. No individual program elements predicted larger additional effects. Of the clusters of elements, combining behavior management and relationship enhancement elements was most likely to yield the strongest additional effects. **Conclusions:** The additional effects on emotional problems of parenting programs designed to reduce conduct problems are limited, but some clusters of elements predict larger effects. Our findings may contribute to realistic expectations of the benefits of parenting programs for children's conduct problems and inform the development of programs with wider benefits across mental health problems. **Keywords:** Conduct problems; emotional problems; children; parenting programs; additional effects.

Introduction

The adverse impact of child mental health problems on individuals and society is profound (Caspi & Moffitt, 2018). The past decades have yielded dozens of empirically supported interventions to effectively reduce child mental health problems, but most programs target a single type of mental health problems (e.g., conduct problems or emotional problems), while most children referred for mental health problems suffer from multiple problems. It has been suggested that programs developed for one target problem can have additional effects on other problems, and indeed some programs have shown such effects (Webster-Stratton & Herman, 2008), but systematic empirical evidence is lacking. Besides, the magnitude of additional effects may depend on specific program elements (i.e., specific content, skills, or techniques taught). If we can identify programs, and program elements, that have such additional effects, these can be used to reduce a wide

range of child mental health problems (Mulder, Murray, & Rucklidge, 2017).

Comorbid conduct and emotional problems are the norms rather than the exception (Caspi & Moffitt, 2018; Pearce et al., 2018; Wichstrøm et al., 2012). Theoretically, there may be reasons to expect additional effects if an intervention targets one of these problems. If conduct problems spill over to emotional problems through compromised social and academic development problems (i.e., Dual Failure Model [Patterson & Capaldi, 1990]), parenting programs that successfully reduce children's conduct problems may have additional effects on children's emotional problems. Similarly, a common psychopathology may underly both conduct and emotional problems. For instance, evidence has indicated that emotion regulation may be a risk factor for both problems (Caspi & Moffitt, 2018; Lahey et al., 2015), and if parenting programs for children's conduct problems improve children's emotion regulation, they may have beneficial outcomes both on conduct problems and emotional problems.

Conflict of interest statement: No conflicts were declared.

There may be reasons to assume that parenting programs for children's conduct problems are also beneficial for children's emotional problems: shared mechanisms may include improved parent-child relationship quality (e.g., through enhanced positive involvement and child-led interactions, and reduction of harsh and critical parenting) and parental reinforcement of positive behavior (e.g., prosocial and courageous behavior) rather than negative (e.g., aggression or avoidance) – elements common in most parenting programs for conduct problems (see Leijten et al., 2019) and associated with children's emotional problems (George, Herman, & Ostrander, 2006). This suggests that increasing parent-child relationship quality and parental behavior management skills in a parenting program may reduce children's emotional problems.

But there are also reasons to believe that benefits for children's emotional problems may be limited. For instance, effective cognitive-behavioral treatments for youth anxiety typically consist of cognitive restructuring of anxious thoughts and graduated exposure, with moderate effects immediately after the intervention ($g = .68$), and small effects at later follow-up ($g = .18$; Öst & Ollendick, 2017). More specifically, in a recent review, CBT-based parenting programs for reducing anxiety that were considered 'well-established', typically included the element of exposure, as well as elements addressing overprotection and family accommodation (i.e., parents' behaviors to help the child avoid feelings of distress and anxiety), psychoeducation about anxiety, and parent-child relationship quality (Comer, Hong, Poznanski, Silva, & Wilson, 2019). Except for the latter, these elements are not typically found in parenting programs for conduct problems.

Empirically, some trials have found that parenting programs for children's conduct problems also reduce children's emotional problems (Chase & Eyberg, 2008; Kjøbli & Ogden, 2012; Webster-Stratton & Herman, 2008), but findings from several other trials suggest no such effects (Leijten et al., 2018). Both theoretically and empirically, the literature thus is inconclusive as to whether parenting programs developed to reduce conduct problems can be expected to have additional effects on children's emotional problems, highlighting the need for a systematic synthesis of available evidence.

This is important also because the effects on emotional problems may depend on the specific elements in parenting programs for children's conduct problems. For instance, in the pioneering work by Hanf (1969), parents learned first relationship enhancement skills, and second, behavior management skills. The premise underlying this model is that strengthening the parent-child relationship magnifies the effects of behavior management and this two-step approach is now the cornerstone of many established parenting programs (see Kaehler, Jacobs, & Jones, 2016, for an overview). Moreover, many

empirically supported programs are based on Patterson's social learning model of a coercive parent-child interaction cycles (Patterson, 1982). This model posits that the key process maintaining and exacerbating children's conduct problems is parent-child interaction patterns where parents and children unwittingly reinforce aversive behavior in each other, leading to interaction cycles that become increasingly difficult to manage. Based on these principles, most programs teach parents behavior management techniques, for example, the use of differential attention to break these cycles – consistent reinforcement of positive behavior and avoiding reinforcement of disruptive behavior (Kaehler et al., 2016).

Some programs add elements from other, complementary perspectives on how parenting can contribute to children's conduct problems, such as relational perspectives on the importance of parent-child, and perspectives focused on parents' emotion regulation and stress. For example, the Incredible Years Parenting Program includes child-led play elements to enhance parent-child relationship quality (Webster-Stratton & Herman, 2008). Similarly, some programs emphasize the importance of parents' emotional regulation and stress in successfully managing difficult child behavior. For example, a version of Parent Management Training Oregon addresses emotion regulation difficulties in parents (Gewirtz & Davis, 2014).

Including specific parenting program elements can predict stronger program effects (Kaminski, Valle, Filene, & Boyle, 2008; Leijten et al., 2019). We, therefore, tested whether the inclusion of specific elements in parenting programs, most notably relationship enhancement and parental self-regulation and stress elements, yields stronger effects on children's emotional problems. In addition, because program elements may not operate in isolation – the effects of some elements may depend on the inclusion of other elements –, we also examined associations between clusters of elements. Elements were derived from a prior meta-analysis of parenting program elements (Leijten et al., 2019) based on their distinct theoretical approach (e.g., behavior management techniques derived from social learning theory principles and relationship-enhancement techniques derived from relational principles); clusters were formed based on their natural co-occurrence in established programs. Because elements to strengthen the parent-child relationship quality are also often included in parenting programs for emotional problems (Comer et al., 2019), including these elements in parenting programs for children's conduct problems may result in stronger effects on children's emotional problems.

In the current meta-analysis, we aimed to: (1) examine whether parenting programs for reducing child conduct problems have additional effects on child emotional problems; (2) identify parenting program elements associated with stronger

additional effects on child emotional problems; and (3) identify clusters of program elements associated with stronger additional effects on child emotional problems.

Methods

Protocol and registration

We published our study protocol and research questions on PROSPERO (#CRD42020145130) prior to finishing data extraction.

Information sources and search

We updated the searches of a previous systematic review (Leijten et al., 2019), searching 11 databases and trial registries, including work published up to July 2020, and included studies both from the initial search and the updated search. In structuring the search, we used the following four conceptual categories: *intervention, parenting, child behavioral, and emotional problems*. We also searched for recent trials that may not yet have been published through searches of four trial registries and by contacting the protocol authors. For the full search strategy, see the protocol of our systematic literature review on PROSPERO under #CRD42019141844.

Eligibility criteria

Studies were eligible for inclusion if (1) they evaluated the effects of a parenting program for children's conduct problems; (2) the parenting program was primarily based on social learning theory principles (to ensure sufficient homogeneity of programs); (3) they included a measure of children's emotional problems postintervention; (4) children were on average between 2 and 10 years; (5) they used a randomized-controlled or cluster randomized trial. More detailed inclusion and exclusion criteria can be found in the study protocols.

Data items

Studies were coded on basic study characteristics (e.g., country and children's age), type (e.g., anxiety or depression), and level of emotional problems ($0 = M$ and $M + 1$ SD are below clinical threshold; $1 = M$ is below the clinical threshold, but $M + 1$ SD is above clinical threshold; and $2 = M + 1$ SD are above clinical threshold), and individual and clusters of program elements in the studies' intervention and control conditions. We coded 25 individual elements (see Table S1) derived from an earlier meta-analysis (Leijten et al., 2019), and four clusters empirically derived from an earlier network meta-analysis (Leijten, Weisz, & Gardner, 2021): (1) behavior management (BM): programs with a main emphasis on teaching basic behavior management skills. Although these programs may also include additional content (e.g., teaching parents problem-solving skills or encouraging positive involvement), the majority of their content is on behavior management. (2) Behavior management and relationship enhancement (BM + RE): programs with a strong emphasis on both behavior management and relationship enhancement. BM + RE programs differ from BM programs in their emphasis on actually teaching parents specific skills (e.g., child-led interactions, active listening, sensitivity, and responsiveness to the child's needs) to enhance the parent-child relationship without focusing on improving child behavior. Importantly, general information and advice regarding positive interactions, as well as encouraging parents to be involved, or to spend quality time with children, were not coded as teaching relationship-enhancing skills. Programs had to explicitly teach parents how

to build a positive parent-child relationship while spending time together. (3) Behavior management, relationship enhancement, and multiple additional components designed to enhance parent and child skills, such as parental anger management and how parents can cultivate children's social skills (BM + RE + other): programs with an emphasis on additional skills, above and beyond behavior management and relationship enhancement. And (iv) no/minimal components: control conditions where parents were offered no program or only minimal support (e.g., a website). Because we specifically focused on programs based on social learning theory principles, all active clusters included behavior management techniques. Studies were double coded with 90% agreement.

Risk of bias

We assessed the risk of bias using the Cochrane Collaboration tool 1.0 on random sequence generation, allocation concealment, blinding of assessors, and blinding of providers and families (Higgins et al., 2011). We did not test for publication bias because a key assumption of standard tests of publication bias (e.g., funnel plots, Egger test, and trim-and-fill analysis) is the independence of effect sizes. It was key to our analysis strategy that we included all relevant effect sizes. Standard tests of publication bias were therefore not applicable.

Statistical analysis

We expressed effect sizes as Cohen's d using postintervention means and standard deviations. We included multiple-effect sizes per study if studies measured multiple indicators of children's emotional problems (e.g., multiple informants or multiple time points). To estimate overall additional effects, we used random-effects robust variance estimation, including multiple effect sizes per study and weighting them using an approximate variance-covariance matrix (Tanner-Smith, Tipton, & Polanin, 2016). Because the time lag between the intervention and the type of informant can impact program outcomes, we stratified effect sizes by time lag (i.e., immediate postintervention, up to 6 months later, and ≥ 12 months later) and informant (i.e., parent, teacher and child), estimating both conditional estimates (e.g., immediate postintervention with teacher informants) and marginal estimates (e.g., all immediate postintervention effect sizes; all teacher informant effect sizes). We then focused on parent-reported effects at postintervention to estimate associations between program elements and additional effects, as this was by far the largest amount of evidence, and narrowing it down would reduce confounding by informant or time lag. We again used robust variance estimation meta-regression with random effects. All analyses assumed an intercorrelation parameter of 0.8 (cf. Tanner-Smith et al., 2016).

To identify whether clusters of program elements were associated with the strongest additional effects, we used network meta-analysis in a multivariate meta-analysis framework (Leijten et al., 2018). Network meta-analyses used a common heterogeneity parameter across contrasts. We used a bootstrapping-based method to generate probabilistic ranks for each cluster, with 10,000 repetitions. Inconsistency analyses were not needed given the tree-shaped nature of the network of evidence. We did not prespecify any additional analyses (e.g., sensitivity or subgroup analyses).

Results

Included studies

Our systematic search identified 13,055 unique hits, in addition to the 13,414 unique hits from the

original systematic search. Sixty-nine studies met inclusion criteria; and 117 studies met inclusion criteria except for assessing children's emotional problems postintervention. In other words, of the overall evidence base of parenting programs for children's conduct problems, 37% of the studies included a measure of children's emotional problems. Together, these studies yielded 159 effect sizes based on data from 6,240 families. The PRISMA flow diagram is shown in Figure S1, the PRISMA Checklist is shown in Table S2, and the study characteristics are presented in Table S3 (see also Appendix S1 for a reference list of included studies).

Parenting program effects on children's emotional problems

There was limited evidence for additional parenting program effects (Figure 1). Although overall improvements in children's emotional problems were significant (Cohen's $d = -0.16$; 95% CI, -0.21 -0.07), significant effects were reported only by parents immediately after the end of the program (Table 1). Effects faded over time and teachers and children themselves did not report effects at any of the time points.

Parenting program elements associated with stronger effects

Of the 25 elements tested, none were significantly associated with stronger additional parenting program effects on children's emotional problems (Table 2); one element was significantly associated with weaker effects when included in programs: psychoeducation regarding typical child development (differential $d = 0.16$; 95% CI, -0.001 to -0.31).

Parenting program clusters yielding the strongest effects

The network meta-analysis with four clusters (BM, BM + RE, BM + RE + other, and no/minimal components) suggests that two active clusters (BM and BM + RE) are superior to the inactive cluster (no/minimal components) with effect sizes of $d = -0.18$ (95% CI, -0.30 to -0.06 , $p = .004$) and $d = -0.25$ (95% CI, -0.41 to -0.09 , $p = .002$), respectively. The third active cluster (BM + RE + other) was marginally superior ($d = -0.12$; 95% CI, -0.26 to 0.01 , $p = .069$). Probability rankings suggest that of the three active clusters, combining behavior management and relationship enhancement was most likely to yield the strongest additional effects on emotional problems compared to the inactive cluster (Table 3).

Post hoc sensitivity analysis

Because baseline severity of children's conduct problems is known to predict parenting program effects (Leijten et al., 2019), we conducted a multivariate meta-analysis to stratify the program clusters by samples' mean baseline levels of children's emotional problems ($0 = M + 1SD$ fell in the nonclinical range; $1 = M$ fell nonclinical range but $M + 1SD$ fell in the subclinical/clinical range; and $2 = M$ fell in the subclinical/clinical range). As expected, additional effects on emotional problems were larger in samples with higher baseline levels of emotional problems ($d_{\text{across clusters}} = -0.03$ to -0.10 for samples where $M + 1SD$ fell in the nonclinical range; and $d_{\text{across clusters}} = -0.10$ to -0.30 for samples where $M + 1SD$ fell in the subclinical/clinical range vs. $d_{\text{across clusters}} = -0.12$ to -0.32 for samples where M fell in the subclinical/clinical range). Importantly, however, baseline emotional problem severity did not interact with the clusters. In other words, findings from the network meta-analysis regarding the

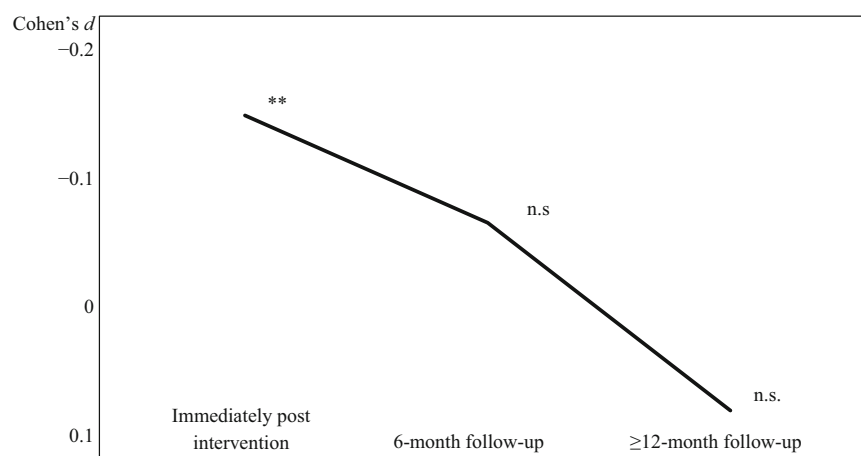


Figure 1 Initial parent-reported reductions of children's emotional problems fade over time. $**p < .01$; teacher- and child-reported reductions were nonsignificant at all time points

Table 1 Parenting program effects on children's emotional problems

Informant	Posttest			Up to 6 months			12 months and beyond			Overall		
	K	95% CI	Estimate	K	95% CI	Estimate	K	95% CI	Estimate	K	95% CI	Estimate
Parent	88	(-0.21, -0.07)	-0.16*	33	(-0.26, 0.10)	-0.08	13	(-0.27, 0.38)	0.06	134	(-0.23, -0.07)	-0.15*
Teacher	10	(-0.06, 0.15)	0.04	3	(-0.04, 0.23)	0.09	4	(-0.87, 0.85)	-0.01	17	(-0.14, 0.23)	0.04
Child	5	(-0.66, 0.79)	0.07	2	(-0.38, 0.35)	-0.01	—	—	—	7	(-0.62, 0.74)	0.06
Other carers	1	(-0.77, 0.19)	-0.29	—	—	—	—	—	—	1	(-0.77, 0.19)	-0.29
Overall	104	(-0.22, -0.08)	-0.15*	38	(-0.22, 0.11)	-0.06	17	(-0.29, 0.23)	-0.03	159	(-0.22, -0.06)	0.14***

Effect sizes in bold were significant ($*p < .01$); K = number of studies.

relative effects of different clusters of components could not be explained by differences in baseline problem severity.

Post hoc analysis

We tested whether parenting programs are more likely to yield stronger effects on children's emotional problems when they yield stronger effects on children's conduct problems. To this end, we estimated the correlation between effect sizes for emotional and conduct problems, assuming that individual participants' scores for emotional and conduct problems correlate .30 (Goodman, 2001). This resulted in a marginal correlation of 0.22, a weak positive association between the effect sizes on children's emotional and conduct problems.

Risk of bias

The risk of bias assessment of the included studies was similar to previous evaluations of this field (Leijten et al., 2019). Explanations of random-sequence generation and allocation concealment were often not reported. Participant blinding is difficult to achieve in this field because parents know they attend a program. We found little evidence of bias regarding blinding of assessors, addressing incomplete data, and drop-outs. That only 37% of the studies from the original systematic review reported program effects on children's emotional problems raises the question of whether the remaining studies did not include measures of children's emotional problems, or whether they did not report these outcomes because no program effects on these outcomes were found, suggesting selective reporting bias (Dwan et al., 2008). Study design and sample features of these 37% of studies were similar to those of other studies (e.g., $N_{\text{average}} = 97$ vs. 90; active control 23% vs. 18%; and established, branded intervention 63% vs. 61%), except that samples of studies including emotional problems outcomes might have on average somewhat more severe

conduct problems (69% vs. 58% indicated prevention/treatment settings, as opposed to universal/selective prevention). Incomplete outcome data and selective reporting were difficult to assess because most trials were not preregistered.

Discussion

This study tested whether parenting programs for reducing children's conduct problems have additional effects on children's emotional problems. We found that such effects were limited. There was a small significant parent-reported additional effect immediately after the end of the program, but this effect faded at later follow-up. Teachers and children did not report any additional effects. Importantly though, additional effects were larger in samples with clinical baseline levels of emotional problems. None of the individual program elements tested was associated with larger additional effects. Comparing three clusters of elements against their control conditions, we found that programs combining behavior management and relationship enhancement elements were most likely to yield the strongest additional effects.

That additional effects are limited might suggest that parenting programs for children's conduct problems do not completely reduce the risk factors that may underlie both conduct and emotional problems (e.g., emotion regulation skills). Instead, these programs may specifically reduce factors that maintain children's conduct problems (e.g., coercive parent-child interaction cycles). In line with the Dual Failure Model (Patterson & Capaldi, 1990), however, one might still expect a successful reduction in conduct problems to spill over to reduce children's emotional problems. However, we found little evidence that this was the case. To further explore this issue, future studies should examine whether there is a covariance between effects on conduct problems and emotional problems, as that was not possible with our data. However, combining our current finding that larger effects on emotional problems

Table 2 Program elements associated with stronger or weaker additional effects

	Effect size (<i>d</i>) without element	Effect size (<i>d</i>) with element	Differential effect size (<i>d</i>)
Psychoeducation	-0.20	-0.08	0.12
Explaining child development	-0.21	-0.05	0.16*
Explaining parent-child interactions	-0.21	-0.07	0.14
Positive reinforcement	-0.15	-0.17	0.02
Praise	-0.29	-0.15	0.14
Rewards	-0.29	-0.15	0.04
Nonviolent disciplining	-0.29	-0.16	0.13
Time-out	-0.29	-0.14	0.15
Ignore	-0.17	-0.16	0.01
Natural/logical consequences	-0.32	-0.15	0.17
Proactive parenting	-0.26	-0.16	0.10
Direct and positive commands	-0.10	-0.17	0.07
Rule setting	-0.23	-0.13	0.10
Monitoring	-0.12	-0.28	0.16
Parent-child play	-0.17	-0.15	0.02
Active listening	-0.17	-0.14	0.03
Skills for parents themselves	-0.10	-0.19	0.09
Emotion regulation skills	-0.17	-0.14	0.03
Problem-solving skills	-0.18	-0.15	0.03
Partner support	-0.16	-0.39	0.24
Parental stress regulation	-0.17	-0.13	0.05
Skills parents teach their children	-0.16	-0.21	0.05
Emotion regulation skills	-0.17	-0.12	0.05
Problem-solving skills	-0.19	-0.07	0.12
Social skills	-0.18	-0.09	0.09

The difference in program effects with or without the program element significant at the level of $*p < .05$ is in bold.

were found in samples where baseline levels of emotional problems were more severe, with previous findings that larger effects on conduct problems are found in samples where baseline levels of conduct problems are more severe, might suggest joint benefits on conduct and emotional problems for the most impaired children.

Our exploratory tests of which individual program elements predicted stronger additional effects did not suggest any robust patterns. When testing which

clusters of program elements predicted stronger additional effects, our findings indicated that programs are most likely to yield additional effects when they teach parents both relationship enhancement and behavior management. This aligns with findings that this combination of elements yields stronger effects also on reducing severe conduct problems (Leijten, Melendez-Torres, et al., 2018; Leijten, Melendez-Torres & Gardner, 2022). A high-quality parent-child relationship and appropriate behavioral control thus seem to curtail the development of both conduct problems and emotional problems. This finding suggests that Hanf's (1969) premise that both relationship enhancement skills and behavior management skills are necessary for reducing conduct problems may also in part pertain to emotional problems. Practically, this may suggest that parenting programs aimed at ameliorating both conduct problems and emotional problems should include elements addressing both relationship enhancement skills and behavior management skills. Another possible explanation for our findings is that programs that include this combination of elements might share other characteristics that drive this effect (e.g., more rigorous therapist training and higher program fidelity), something meta-analysis of associations between program elements and program effects cannot rule out (Leijten et al., 2021).

As noted, additional effects were larger in samples where baseline levels of emotional problems were more severe. This may suggest that elements of parenting programs target common underlying processes for conduct problems and emotional problems. Given that the effect sizes ranged from -0.12 to -0.32, even for the samples with more severe baseline emotional problems, this provides only limited support for use of these programs when a key treatment goal is to reduce children's emotional problems. Interventions are often developed for single mental health problems mismatches with the reality that most children suffer from multiple mental health problems (Marchette & Weisz, 2017). To overcome this mismatch, recent interventions that include elements for both conduct and emotional problems have been developed (Jeppesen et al., 2021; Weisz et al., 2012). One such program is Modular Approach to Therapy for Children with Anxiety, Depression, Trauma and Conduct Problems (MATCH; Weisz et al., 2012). This program brings together 33 separate elements of evidence-based

Table 3 Probabilistic ranking of additional effects of different program types

Rank	Behavior management + relationship enhancement	Behavior management	Behavior management + relationship enhancement + other components	Control
Best	69%	23%	8%	0%
2nd	22%	52%	25%	0%
3rd	8%	24%	64%	4%
Worst	1%	1%	3%	96%

Percentages in bold indicate most likely ranking of each cluster of elements.

treatments for emotional and conduct problems. MATCH has been found to outperform both usual care and standard evidence-based programs for single mental health problems (Weisz et al., 2012). Although evidence is emerging that such wider interventions hold great potential, more systematic research is needed to investigate the precise benefits of such interventions. We hope that our findings regarding what combination of elements are most likely to yield effects on a wider range of mental health problems can help guide the development and use of such interventions.

Strengths and limitations

To our knowledge, this is the first systematic overview to examine the additional effects of psychosocial interventions of children's psychiatric problems. Strengths include stratification of effects by assessment point (i.e., time after the end of the intervention) and informant, showing that additional effects are limited to immediate effects reported by parents, and by individual and clusters of program elements, showing some program content may enhance additional benefits. However, the findings should be interpreted with the following limitations in mind: (1) We tested associations between program elements and program effects. With associations, we can never rule out the possibility that other program elements that are confounded with the clusters of elements predict larger effects. Also, a true test of what changes in parent-child dynamics cause symptom reduction in children requires mediation analysis, which was not possible with our data (i.e., mediation analysis in meta-analysis requires correlations between parenting and child measures for all included studies; Jak, 2015). (2) Only 37% of trials tested intervention effects on children's emotional problems. It might be that authors are more likely to report outcomes regarding children's emotional problems if the intervention yielded favorable effects on these outcomes, possibly yielding too large additional effects, but we were unable to test the magnitude of this potential bias. However, the likelihood is that this bias would work in the direction of overestimating the effects of interventions on emotional problems, if anything, adding to confidence in the conclusions. (3) On the other hand, as our study included samples with low baseline levels of emotional problems, effect sizes may have been underestimated, as suggested by the post hoc analysis showing larger effects when

baseline levels of emotional problems were more severe. (4) Most studies were not designed to estimate additional effects—their primary outcome measure was children's conduct problems. Because of this, the outcome measures used in the primary studies may not have been optimal to detect subtle but meaningful changes in children's symptoms. Specifically, 82% of studies used the Strengths and Difficulties Questionnaire or Child Behavior Checklist, whose 3-point Likert scales may not pick up subtle changes in symptoms.

Conclusions

Evidence for the additional benefits for children's emotional problems of parenting programs for children's conduct problems is limited but combining behavior management and relationship enhancement elements might be most likely to yield additional effects. These findings stress the need for identifying the conditions under which 'single-diagnostic programs' might yield additional effects and a more thorough understanding of the merit of programs specifically designed to produce wider effects.

Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article:

Table S1. Definition of program elements.

Table S2. Prisma Checklist.

Table S3. Studies included in the meta-analysis.

Figure S1. PRISMA Flow Diagram.

Appendix S1. Reference list of included studies.

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Key points

- Interventions are often developed for single mental health problems: this mismatches with the reality that most children suffer from multiple mental health problems.

- This meta-analysis of 69 trials suggests that parenting programs originally developed to target children's conduct problems have limited additional effects on emotional problems.
- Some clusters of elements predict larger effects: programs combining behavior management and relationship enhancement elements were most likely to yield the strongest additional effects.
- Additional effects of parenting programs for children's conduct problems are limited. This provides only limited support for use of these programs when a key treatment goal is to reduce children's emotional problems.

References

- Caspi, A., & Moffitt, T.E. (2018). All for one and one for all: Mental disorders in one dimension. *American Journal of Psychiatry*, 175, 831–844.
- Chase, R.M., & Eyberg, S.M. (2008). Clinical presentation and treatment outcome for children with comorbid externalizing and internalizing symptoms. *Journal of Anxiety Disorders*, 22, 273–282.
- Comer, J.S., Hong, N., Poznanski, B., Silva, K., & Wilson, M. (2019). Evidence base update on the treatment of early childhood anxiety and related problems. *Journal of Clinical Child & Adolescent Psychology*, 48, 1–15.
- Dwan, K., Altman, D.G., Arnaiz, J.A., Bloom, J., Chan, A.W., Cronin, E., ... & Williamson, P.R. (2008). Systematic review of the empirical evidence of study publication bias and outcome reporting bias. *PLoS One*, 3, e3081.
- George, C., Herman, K.C., & Ostrander, R. (2006). The family environment and developmental psychopathology: The unique and interactive effects of depression, attention, and conduct problems. *Child Psychiatry and Human Development*, 37, 163–177.
- Gewirtz, A., & Davis, L. (2014). Parenting practices and emotion regulation in National Guard and reserve families: Early findings from the after deployment adaptive parenting tools/ADAPT study. In S.M. Wadsworth & D.S. Riggs (Eds.), *Military deployment and its consequences for families* (pp. 111–131). New York, NY: Springer. https://doi.org/10.1007/978-1-4614-8712-8_7
- Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry*, 40, 1337–1345.
- Hanf, C. (1969). *A two-stage program for modifying maternal controlling during mother-child (MC) interaction*. Paper presented at the meeting of the Western Psychological Association, Vancouver, British Columbia, Canada.
- Higgins, J.P., Altman, D.G., Gøtzsche, P.C., Jüni, P., Moher, D., Oxman, A.D., ... & Cochrane Statistical Methods Group. (2011). The Cochrane Collaboration's tool for assessing risk of bias in randomized trial. *BMJ (Clinical Research ed.)*, 343, d5928.
- Jak, S. (2015). *Meta-analytic structural equation modelling* (pp. 1–88). New York, NY: Springer.
- Jeppesen, P., Wolf, R.T., Nielsen, S.M., Christensen, R., Plessen, K.J., Bilenberg, N., ... & Correll, C.U. (2021). Effectiveness of transdiagnostic cognitive-behavioral psychotherapy compared with management as usual for youth with common mental health problems: A randomized clinical trial. *JAMA Psychiatry*, 78, 250–260.
- Kaehler, L.A., Jacobs, M., & Jones, D.J. (2016). Distilling common history and practice elements to inform dissemination: Hanf-model BPT programs as an example. *Clinical Child and Family Psychology Review*, 19, 236–258.
- Kaminski, J.W., 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, 567–589.
- Kjøbli, J., & Ogden, T. (2012). A randomized effectiveness trial of brief parent training in primary care settings. *Prevention Science*, 13, 616–626.
- Lahey, B.B., Rathouz, P.J., Keenan, K., Stepp, S.D., Loeber, R., & Hipwell, A.E. (2015). Criterion validity of the general factor of psychopathology in a prospective study of girls. *Journal of Child Psychology and Psychiatry*, 56, 415–422.
- Leijten, P., Gardner, F., Landau, S., Harris, V., Mann, J., Hutchings, J., ... & Scott, S. (2018). Research review: Harnessing the power of individual participant data in meta-analysis of the benefits and harms of the incredible years parenting program. *Journal of Child Psychology and Psychiatry*, 59, 99–109.
- Leijten, P., Gardner, F., Melendez-Torres, G.J., Van Aar, J., Hutchings, J., Schulz, S., ... & Overbeek, G. (2019). Meta-analyses: Key parenting program components for disruptive child behavior. *Journal of the American Academy of Child and Adolescent Psychiatry*, 58, 180–190.
- Leijten, P., Melendez-Torres, G.J., & Gardner, F. (2022). The most effective combination of parenting program components for disruptive child behavior: A network meta-analysis. *Journal of Child Psychology and Psychiatry*, 63, 132–142.
- Leijten, P., Melendez-Torres, G.J., 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, 1970–1982.
- Leijten, P., Weisz, J.R., & Gardner, F. (2021). Research strategies to discern active psychological therapy components: A scoping review. *Clinical Psychology Science*, 9, 307–322.
- Marchette, L.K., & Weisz, J.R. (2017). Practitioner review: Empirical evolution of youth psychotherapy toward transdiagnostic approaches. *Journal of Child Psychology and Psychiatry*, 58, 970–984.
- Mulder, R., Murray, G., & Rucklidge, J. (2017). Common versus specific factors in psychotherapy: Opening the black box. *The Lancet Psychiatry*, 4, 953–962.
- Öst, L.G., & Ollendick, T.H. (2017). Brief, intensive and concentrated cognitive behavioral treatments for anxiety disorders in children: A systematic review and meta-analysis. *Behaviour Research and Therapy*, 97, 134–145.
- Patterson, G.R. (1982). *Coercive family process* (Vol. 3). Eugene, OR: Castalia Publishing Company.
- Patterson, G.R., & Capaldi, D.M. (1990). A mediational model for boys' depressed mood. In J.E. Rolf, A.S. Masten, D. Cicchetti, K.H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 141–163). Cambridge, UK: Cambridge University Press.
- Pearce, N., Marcheselli, F., Vizard, T., Brown, L., Davis, J., Sadler, K., ... & McManus, S. (2018). *Mental health of children and young people in England, 2017: Multiple conditions and wellbeing*. Leeds, UK: Health and Social Care Information Centre.
- Tanner-Smith, E.E., Tipton, E., & Polanin, J.R. (2016). Handling complex meta-analytic data structures using robust variance estimates: A tutorial in R. *Journal of Developmental and Life-Course Criminology*, 2, 85–112.

- Webster-Stratton, C., & Herman, K.C. (2008). The impact of parent behavior-management training on child depressive symptoms. *Journal of Counseling Psychology, 55*, 473–484.
- Weisz, R.J., Chorpita, B.F., Palinkas, L.A., Schoenwald, S.K., Miranda, J., Bearman, S.K., ... & Research Network on Youth Mental Health. (2012). Testing standard and modular designs for psychotherapy treating depression, anxiety, and conduct problems in youth: A randomized effectiveness trial. *Archives of General Psychiatry, 69*, 247–282.
- Wichstrøm, L., Berg-Nielsen, T.S., Angold, A., Egger, H.L., Solheim, E., & Sveen, T.H. (2012). Prevalence of psychiatric disorders in preschoolers. *Journal of Child Psychology and Psychiatry, 53*, 695–705.

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