



Parenting Programs That Address Physical Abuse in Childhood for Families of Children With Developmental Disabilities in Mainland China: Systematic Review and Meta-Regression

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Abstract

Millions of children in China are diagnosed with developmental disabilities (DD), many of whom are subject to physical abuse. While a significant body of research suggests that parenting interventions can reduce the incidence and risk of such abuse, there is currently limited evidence of their effectiveness for this population or from non-English-speaking countries. This review involved searches in both English and Chinese databases to identify randomized controlled trials and quasi-experimental studies of parenting interventions for families of children with DD in mainland China. Multilevel meta-analyses were undertaken to examine the effectiveness of parenting programs. Subgroup analyses and meta-regression were conducted to investigate heterogeneity and identify potential moderators with a focus on intervention and delivery components. Risk of bias was assessed for each study. Thirty-one studies were included. The results showed that parenting interventions could reduce child emotional and behavioral problems (CEBP) and improve the parent–child relationship, although only one study directly measured the actual incidence of abuse. Programs for autism and epilepsy had stronger treatment effects. Teaching knowledge about CEBP, skills to improve parental mental health, and techniques to cultivate empathy were associated with program success; however, positive reinforcement was associated with more problems. The results also supported the delivery of programs with longer duration, a combination of group and individual sessions, efforts to build rapport, ongoing communication outside the programs, and delivery in hospitals or service agencies. Further research is needed, however, in addition to improvements in the quality of research and reporting.

Keywords

physical abuse in childhood, parenting interventions, developmental disabilities, multilevel meta-analysis, meta-regression, moderator analysis, intervention and delivery components

Physical abuse in childhood is defined as all corporal punishment and all other forms of torture, cruel, inhuman, or degrading treatment or punishment against children under 18 by parents or other adult caregivers (The United Nations Children's Fund [UNICEF], 2014). It is one of the most serious factors undermining healthy child development, and its negative impacts have been documented across a range of domains including cognition, language, socioemotional development, and mental and physical health (World Health Organization [WHO], 2014). Child emotional and behavioral problems (CEBP) are characterized by (1) inappropriate behaviors or feelings under normal conditions; (2) a pervasive mood of unhappiness or depression; (3) an inability to establish or maintain satisfactory relationships; (4) difficulty in learning that cannot be explained by intellectual, sensory, or health factors; or (5) a tendency to develop physical symptoms, pains, or fears

with individual issues (United States Congress, 1990). There is substantial research showing that children with developmental disabilities (DD; e.g., autism spectrum disorder, attention deficit hyperactivity disorder (ADHD), intellectual disability, cerebral palsy, epilepsy, Down syndrome, and Tourette's syndrome) are much more likely to present with a wide range of CEBP than children without such diagnoses (Herring et al.,

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2006). Problems of this nature, combined with other disability symptoms, compound the DD condition, creating further activity limitations in children's daily functioning and imposing more challenges to parenting, such as the inability to communicate with children and difficulty in managing disruptive behaviors and noncompliance. Indeed, research consistently demonstrates a higher risk of parental stress among parents of children with DD, as well as a greater exposure to other mental health problems and chronic diseases (Hastings et al., 2012). Additionally, as a result of the parenting challenges and frustration such child problems can cause, there is an increased likelihood of such parents becoming less responsive, supportive or affectionate to their child, and less engaged in positive parent-child interactions, which ultimately leads to impaired parent-child relationships (Belsky, 1993). CEBP and dysfunctional parent-child relationships have historically been important predictors for physical abuse against children (Patterson, 1982; Tolan et al., 2006). As such, compared with typically developing cohorts, children with DD are at a considerably higher risk of experiencing such abuse (Jones et al., 2012).

In accordance with global data, epidemiological studies in China have shown that there are increasing numbers of children with DD diagnoses, with an estimate of 0.8 million children diagnosed with autism (Sun et al., 2013), 17 million children diagnosed with ADHD (Liu et al., 2018; UNICEF, National Bureau of Statistics of China, & United Nations Population Fund, 2017), 1.98 million children diagnosed with intellectual disability (China Disabled Persons' Federation, 2012), and 1.83 with epilepsy (Song et al., 2017). In addition to CEBP and parental health issues, Chinese parents are affected by a range of other challenges. Traditionally, parents in China believe that corporal punishment is an effective, and legitimate, parenting practice that promotes attributes such as diligence, integrity, and obedience (Wang & Liu, 2014) and that such disciplinary practice reflects a parent's affection toward their child (Qiao & Xie, 2015). Also, the general lack of understanding regarding the implications of DD diagnoses and a lack of reliable information for parents of children with DD in China contribute to parents having expectations of children and attributions of behavioral intent, which are not appropriate to their children's developmental capacity (Hu et al., 2015). These inappropriate expectations and misunderstandings may increase the use of physical discipline (Dix & Grusec, 1985; Weisleder, 2011).

Parental stress in Chinese parents is further exacerbated by social isolation, restricted access to state financial supports, and the limited provision of education and rehabilitation services, which are geographically unevenly spread (Hu et al., 2015; State Council, 2012). A high level of stress is recognized to contribute to low parental warmth and dysfunctional disciplinary practices, which intensifies CEBP and increases the likelihood of physical abuse (Belsky, 1993; Pinderhughes et al., 2000). Despite the elevated risk of physical abuse, a comprehensive detection and reporting system for child abuse has yet to be established. As a result, the situation of children with DD in mainland China is of concern.

Parenting Interventions

Parenting programs are brief interventions that are aimed at reducing the incidence and risk of physical abuse against children and promoting the parent-child relationship, by improving emotional and behavioral adjustment, reducing parental stress, changing parenting attitudes, and increasing positive parenting knowledge and skills (Barlow et al., 2006; Montgomery et al., 2009). They are underpinned by a range of theoretical frameworks but are usually grounded in social learning theory (Bandura, 1971), operant learning theory (Skinner, 1950), the coercion model of interaction (Patterson, 1982), and attachment theory (Bowlby, 1969). Despite different theoretical models, such programs often share common strategies such as positive reinforcement, parent-child play, and emotion coaching, in addition to having unique components to address particular concerns (Leijten et al., 2019). A variety of delivery techniques can be used including modeling and role-play. The duration and intensity of parenting programs vary, although they are typically provided on a weekly basis over the course of 8–12 weeks. They can be delivered individually and/or on a group basis, by professionals and/or trained nonprofessionals. Manuals are typically available to guide the sessions.

A significant body of evidence has shown the effectiveness of parenting interventions in reducing the incidence of physical abuse against children and modifying risk and/or protective factors associated with such abuse among typically developing children (e.g., Altafim & Linhares, 2016; Knerr et al., 2013; Mejia et al., 2012; van der Put et al., 2018). As such, parenting interventions are recommended as one of the seven critical strategies for preventing child abuse by WHO (2016).

Despite the specific issues that children with DD may experience, the core principles of the above theories still apply. For instance, research shows that the associations between reinforcement and behavior among children with autism and intellectual disability are consistent with operant theories of the establishment and maintenance of behavior (Baghdadli et al., 2003; Oliver et al., 2012). Children with autism can also benefit from interventions underpinned by behavioral and attachment-based models of working (Rutgers et al., 2004).

To address the challenges resulting explicitly from DD (such as disability-related emotional and behavioral problems, repetitive and stereotyped behaviors in children with autism, and delayed language skills in children with Down syndrome and cerebral palsy), parenting programs directed at parents of children with DD also incorporate principles from a number of other sources: (1) behavioral interventions characterized by applied behavioral analysis (ABA) which is grounded in operant learning theory (Cooper et al., 2007); (2) child development theories, which lead to a focus on skill acquisition and inform the creation of developmentally appropriate learning experience (Harvey et al., 2009); and (3) educational frameworks (such as the Treatment and Education of Autistic and Communication-Handicapped Children—TEACCH), which encourage the development of individualized treatment plans and a structured teaching environment, to maximize learning opportunities (Mesibov & Shea, 2010).

Three systematic reviews have been conducted to assess the effectiveness of parenting programs for parents of children with DD (Singer et al., 2007; Skotarczak & Lee, 2015; Tellegen & Sanders, 2013). Skotarczak and Lee (2015) and Tellegen and Sanders (2013) showed that Stepping Stones Triple P—a parenting program underpinned by ABA principles with a focus on behavioral change (Sanders et al., 2004)—had a significant effect on changing children’s behaviors and promoting positive parenting skills for a broad range of DD diagnoses. Skotarczak and Lee (2015) found that the program Parents Plus appeared to improve the behavior of children with autism, although the results failed to achieve statistical significance. Singer et al. (2007) found that behavioral parenting programs were effective in reducing parental psychological distress.

There have been no further reviews of the effectiveness of other parenting programs for DD, and notably existing evidence is primarily gathered from high-income countries (HICs). Although an increasing number of parenting interventions for DD have been evaluated in other countries such as China, prior reviews commonly miss these studies, mostly due to language and database biases (Shenderovich et al., 2016). This systematic review aims to address this gap by including Chinese studies in an update of the evidence base more generally and through the inclusion of a moderator analysis.

Objectives

This review aims to

- 1) assess the effectiveness of parenting interventions for families of children aged 0–18 years of age with DD in mainland China in:
 - a) reducing the incidence of physical abuse in childhood,
 - b) decreasing CEBP (risk factor), and
 - c) improving parent–child relationships (protective factor).
- 2) investigate potential moderators of such interventions, with a focus on the most effective intervention and delivery components.

Method

Inclusion Criteria

Studies of parenting interventions were eligible for inclusion if they were delivered to adult primary caregivers of children with DD in mainland China and aimed at (1) reducing physical abuse in childhood, (2) improving parent–child relationships or creating healthy parent–child attachment, or (3) reducing child emotional and/or behavioral problems, by increasing parental knowledge, improving parenting skills, changing parental attitudes, reducing parental stress, or improving parental self-efficacy. There were no limits in terms of the following criteria: underpinning theoretical framework, intervention duration, intensity, setting, format, year of delivery, or qualification of

facilitators. Only randomized controlled trials (RCTs) and quasi-experimental studies with control conditions of treatment-as-usual (TAU; including wait-list treatment and no treatment) were selected. The outcomes could be measured at different time points, but the primary time point of interest was postintervention.

Intervention and delivery components included in the review were identified using a thematic analysis. Due to the fact that the included studies provided very limited and inconsistent descriptions of the interventions, exhaustive inductive coding of the reports was conducted to capture features of the interventions (Sutcliffe et al., 2015). Word-by-word coding was first performed to identify all available information regarding the interventions. Codes were then categorized into intervention components and delivery components.

Search Methods

Electronic searches were carried out in August 2018 using the four major Chinese databases (China National Knowledge Infrastructure, China Science and Technology Journal Database, Wanfang Database, and Chinese Electronic Periodical Services) and four English databases (Cochrane Central Register of Controlled Trials, MEDLINE, Embase, and PsycINFO). Search terms were structured around three concepts: (1) child abuse, (2) parent training, and (3) DD. Sensitive searches were conducted by using multiple search terms for each concept. Twelve sources of gray literature were also explored, the reference lists of all included studies were hand searched, and experts were consulted to identify additional studies.

Selection of Studies and Data Extraction

The first author screened all titles and abstracts to determine whether they met the inclusion criteria. A random 30% of the titles and abstracts were selected using a random number generator and double-screened by the third author. Full texts were retrieved if titles and abstracts appeared to meet the criteria. The first author reviewed all retrieved full texts, and the third author independently screened a random 30% of texts. Any disagreements were reconciled by the second author.

Data were extracted and coded by the first author, with the third author also independently extracting data for a random 30% of included studies. Authors of the included trials were contacted via phone calls and/or emails to obtain information regarding study methods or missing data if the reasons for missing data were not specified.

A data extraction and coding form was created to collect data for narrative and quantitative synthesis and for quality assessment of each included study. The form included the following information: publication information (author, title, year, and study design), participant demographics (screening strategy, number of children and girls, child age, diagnosis, comorbidity; caregiver type, age, economic status, education level; and any other participant characteristics), intervention and

comparison data (brand, transported or homegrown, origin, adaptation, content description, delivery mode and format, duration of the program and each session, number and frequency of sessions, facilitator qualification, setting, incentives for participants and staff, and fidelity control methods), and design/outcome data (total sample size; subgroup and sample size; outcome; measurement tool and validation; type of outcome data; respondent type; unit of analysis; response rate; number of participants and dropouts in each arm; and mean and standard deviation in each arm at baseline, postintervention, and follow-ups).

Assessment of Risk of Bias (RoB)

The RoB was examined in each included study using the Cochrane Collaboration's tool (Higgins & Green, 2011). Seven domains were assessed including random sequence generation, allocation concealment, blinding (of participants and personnel and outcome assessment), incomplete outcome data, selective reporting, and other sources of bias, particularly the baseline comparability of treatment groups.

Unit of Analysis

No cluster RCTs were identified. The unit of analysis was individual participants.

Assessment of Heterogeneity

Clinical heterogeneity was explored by comparing the characteristics of participants and programs. Methodological heterogeneity was assessed by comparing study designs. Statistical heterogeneity (between-study variance) was assessed using the Q statistic that contrasts observed variance between studies and within-study error, as well as the I^2 statistic that quantifies the amount of the variability that is caused by residual heterogeneity, with p values reported (Borenstein et al., 2011).

Assessment of Reporting Bias

Publication bias was investigated by examining the asymmetry of a funnel plot of the intervention effect estimates against the standard error of the intervention effect estimates (Higgins & Green, 2011). An Egger's test was combined with the funnel plot to test the asymmetry (Egger et al., 1997). Publication bias was assessed for CEBP only because the other outcomes were measured by fewer than 10 trials.

Data Synthesis

The included studies assessed the outcomes using a variety of tools and reported subscales and/or total scores. When a study provided both a total score and subscale scores, the total score was used if all subscales were associated with the same outcome of interest. However, if the subscales were measuring several outcome domains relevant to this review, they were

extracted and analyzed separately, and the total score was not used.

The effect sizes for each outcome domain were assessed using standardized mean difference (SMD)-Hedges' g with a 95% confidence interval (CI). The mean, standard deviation, and number of observations in each arm were extracted from the included trials to calculate Hedges' g in RStudio (Version 1.1.463). A meta-analysis was conducted to combine the effect sizes for each outcome domain, when appropriate. Given the inclusion of studies reporting more than one subscale for the outcome(s) of interest, multilevel mixed-effect models were used to account for the data dependency. The restricted maximum likelihood estimator was incorporated into the multilevel models to reduce bias (Hartung et al., 2008).

Subgroup Analysis and Meta-Regression

Subgroup analyses were conducted to assess whether and how the origin of the program, child diagnosis, comorbidity, and comparison conditions contributed to a reduction of heterogeneity and affected treatment effects for two outcomes—CEBP and the parent-child relationship. For parent-reported CEBP at postintervention, intervention and delivery components of the included programs were (1) individually assessed to investigate whether group differences existed and (2) included in multivariate meta-regression models to explore moderation effects. It was not possible to assess child age and gender because all trials included children with a wide age range and a mix of boys and girls. Parental characteristics were not well reported in most of the included trials and thus not investigated.

The review compared differences in the effects of subgroups by testing interactions between treatment and subgroup, instead of conducting separate meta-analyses for each subgroup, which can increase the likelihood of Type I errors (identifying positive treatment effects when there is not a genuine effect; Brookes et al., 2004). Two main multivariate meta-regression models were fitted to further examine moderating effects. One model incorporated all intervention components, while the other included all delivery components. To improve precision, an additional meta-regression model was created for each original model by removing outliers. Outliers were defined as studies for which the upper CI was smaller than the lower CI of the pooled effect or for which the lower CI was larger than the upper CI of the pooled effect (Viechtbauer & Cheung, 2010). All quantitative data analyses were conducted using the *meta*, *metafor*, and *car* packages in RStudio.

Sensitivity Analysis

Sensitivity analyses were conducted to assess the impact of study quality on the outcomes CEBP and parent-child relationships. The impact of study quality was assessed by (1) removing quasi-experiments, (2) removing studies with overall high RoB, and (3) removing outliers. Studies with high RoB were those for which at least five of the seven domains were rated at high RoB or unclear RoB.

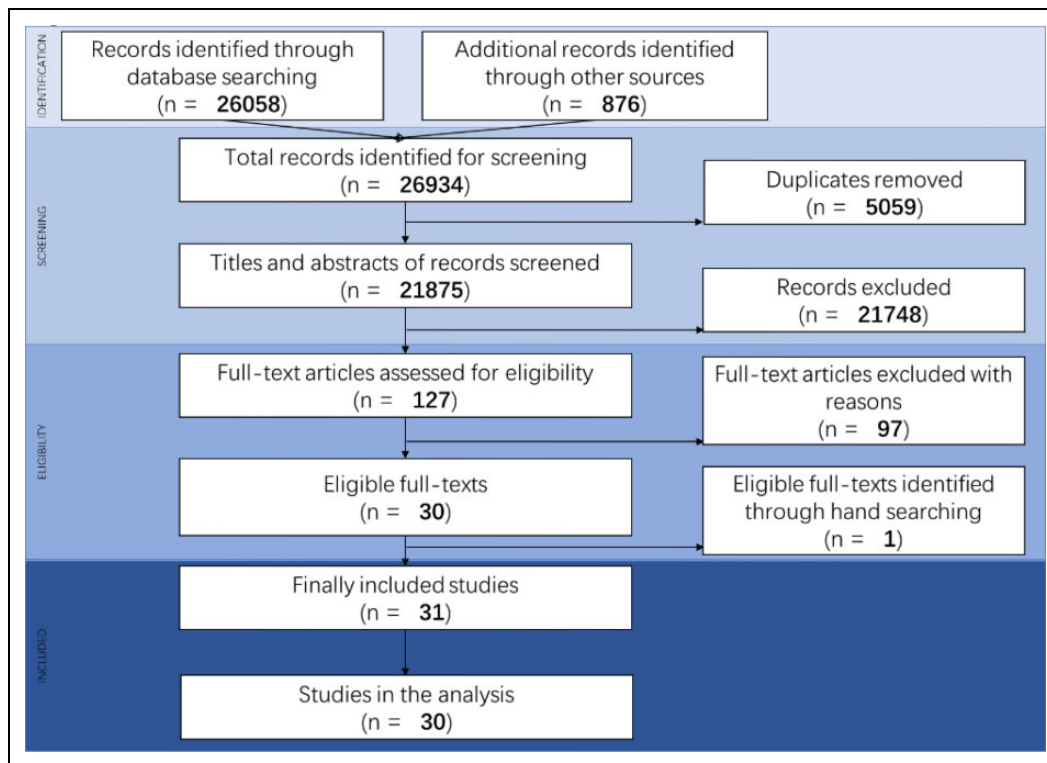


Figure 1. PRISMA flowchart.

Results

Search Results

The search resulted in 26,934 records. Following assessment of eligibility, 31 studies (evaluating 31 parenting programs and involving 2,410 primary caregivers) were included in this review; 29 were published in Chinese and 2 in English. Due to missing data in one report (Huang & Du, 2005), 30 studies were included in the analysis. A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart is presented in Figure 1.

Study Design

Twenty trials randomized individual participants into treatment and control groups, and the remaining 11 studies used a quasi-experimental design. The TAU conditions in the included studies can be classified into three broad categories: (1) regular services only (16 studies); (2) medication only (9 studies), providing children of parents in both treatment and control groups with the same dose of medication; and (3) a combination of both (6 studies). There were three studies having more than one control group, and data from these additional comparison groups were not included in this review. Table 1 provides further details about the sample sizes, designs, participant characteristics, and intervention types.

Outcomes

Outcomes were predominantly reported by parents. Three trials (L. Yan et al., 2012; Wang, 2005; Wu, 2016) also used

observational measurements (i.e., videotaping), and four studies (Xue, 2014; G. Yan et al., 2011; L. Yan et al., 2012; Zhou et al., 2014) obtained children's self-report data. All included studies measured outcomes at postintervention. Only one study (Zhang et al., 2009) measured child abuse using a questionnaire developed for the evaluation. It asked parents whether or not they "often used verbal and corporal punishment"; however, it did not provide the data for corporal punishment only. Twenty-five studies measured CEBP, and nine studies measured the parent-child relationship.

RoB

Figures 2 and 3 present an overview of the methodological quality of the included studies. Figure 2 presents the result of an assessment of the RoB items across all included studies. The risk was rated low for nine out of the 31 studies with regard to random sequence generation. In terms of allocation concealment, 20 studies were rated high RoB, and the remaining 11 studies did not provide adequate information. Due to the nature of parenting programs, all included studies were rated as being at high risk of performance bias. The outcome assessments predominantly relied on data reported by caregivers or children, which could be compromised in a variety of ways including detection or social desirability bias (Fisher, 1993); all studies were therefore rated as posing a high RoB in relation to blinding. Twenty studies were rated as being at low risk of attrition bias, while the remaining 11 studies excluded dropouts in the analyses and were consequently rated high RoB. Two studies posed a high risk of reporting bias, while there were no

Table 1. Included Studies.

Study ID	Design	Sample	Diagnosis	Child Age	Program Origin	Outcome Measures
Cen (2016)	RCT	60	Autism	5–11 years old	Homegrown	unvalidated questionnaire
Chu et al. (2007)	RCT	112	Epilepsy	4–18 years old	Homegrown	CBCL; FES-CV
Gong et al. (2009)	RCT	60	ADHD	6–12 years old	Homegrown	CBCL
Hang et al. (2012)	Quasi-RCT	100	ADHD	8–12 years old	Homegrown	Conners CBRS-P; FAD
Hu et al. (2010)	Quasi-RCT	116	ADHD	6–14 years old	Homegrown	Conners CBRS-P
Huang & Du (2005)	Quasi-RCT	60	ADHD	Mean 9.06 years	Homegrown	Conners CBRS-P
Huang (2018)	Quasi-RCT	78	Autism	2–11 years old	Homegrown	PEP and ABC
Ji et al. (2014)	Quasi-RCT	50	Autism	Mean 5.26 years	Homegrown	FAD
Jiang & Zhu (2017)	RCT	80	ADHD	6–11 years old	Homegrown	Psychological Scale; unvalidated questionnaire
Lin et al. (2013)	Quasi-RCT	100	ADHD	Mean 8.20 years	Homegrown	Conners CBRS-P
Liu et al. (2007)	RCT	62	ADHD	7–11 years old	Homegrown	EMBU
Liu et al. (2017)	Quasi-RCT	68	Autism	0.6–3 years old	Homegrown	ABC
Liu et al. (2009)	RCT	31	ADHD	6–13 years old	Homegrown	Conners CBRS-P
Lu et al. (2006)	RCT	67	ADHD	6–13 years old	Homegrown	CBCL
Luo & Wang (2011)	Quasi-RCT	88	ADHD	6.5–14 years old	Transported	Conners CBRS-P
Nie et al. (2016)	RCT	80	ADHD	7–12 years old	Transported	Conners CBRS-P
Qian et al. (2015)	RCT	60	ADHD	6–13 years old	Homegrown	SNAP-IV
Sun & Li (2015)	RCT	100	Autism	mean 5.8 years	Homegrown	ABC; ATEC
Sun (2015)	Quasi-RCT	60	Autism	1–11 years old	Homegrown	ATEC
Wang & Chu (2015)	RCT	98	Epilepsy	6–18 years old	Homegrown	FES-CV; FAD
Wang (2005)	RCT	34	Autism	3–9.6 years old	Homegrown	PSI/SF; MBRS
Wu (2016)	Quasi-RCT	26	Autism	3–7 years old	Homegrown	DCS; Parent-Child Interaction Behaviors Coding Scales
Xiao et al. (2015)	RCT	50	Autism	4–7 years old	Homegrown	ABC; ATEC
Xue (2014)	RCT	60	ADHD	6–13 years old	Homegrown	PHCSS
Yan et al. (2011)	Quasi-RCT	66	ADHD	mean 9.83 years	Homegrown	PHCSS
Yan et al. (2012)	RCT	200	Tourette Syndrome	7–14 years old	Homegrown	PedsQL 4.0; unvalidated questionnaire
Zhang & Qiu (2016)	RCT	94	Autism	4–7 years old	Homegrown	ABC; ATEC
Zhang et al. (2011)	RCT	75	ADHD	6–12 years old	Transported	DBDRS
Zhang (2016)	RCT	90	Autism	2–8 years old	Homegrown	ABC; ATEC
Zhang et al. (2009)	RCT	280	ADHD	mean 8.10 years	Homegrown	unvalidated questionnaire
Zhou et al. (2014)	RCT	98	Epilepsy	8–16 years old	Homegrown	PHCSS; FES-CV

Note. CBCL = Child Behavior Checklist; FES-CV = Family Environment Scale–Chinese Version; Conners CBRS-P = Conners Comprehensive Behavior Rating Scales; FAD = Family Assessment Device; PEP = Psychoeducational Profile; ABC = Autism Behavior Checklist; EMBU = Egna Minnen Beträffande Uppfostran; SNAP-IV = Swanson, Nolan, and Pelham; ATEC = Autism Treatment Evaluation Checklist; PSI/SF = Parenting Stress Index; DCS = Dyadic Coding Scales; MBRS = Maternal Behavior Rating Scale; PHCSS = Piers-Harris Children's Self-Concept Scale; PedsQL 4.0 = Pediatric Quality of Life Inventory; DBDRS = Disruptive Behavior Disorder Rating Scale; ADHD = Attention Deficit Hyperactivity Disorder; RCT = randomized controlled trial.

indications of selective reporting in the remaining trials. Eighteen studies did not adequately assess baseline balance; those studies were consequently judged to be at high risk of other bias. Figure 3 shows the details of our judgments about each RoB domain for each included study.

Effects of Interventions: Multilevel Meta-Analyses and Single Study Results

Physical abuse in childhood. An analysis of the data extracted from the one trial measuring child abuse indicated that parents who received the parenting program were less likely to verbally or physically punish their children than parents in the control group at postintervention (Risk Ratio = 0.51, 95% CI [0.28, 0.92]; Figure 4).

CEBP. A variety of scales were used to measure CEBP including the Child Behavior Checklist (Achenbach & Rescorla,

2000), the Conners (2008) Comprehensive Behavior Rating Scales, the Autism Behavior Checklist (Krug et al., 1979), the Autism Treatment Evaluation Checklist (Rimland & Edelson, 1999), the Piers-Harris Children's Self-Concept Scale (Piers & Harris, 1963), the Disruptive Behavior Disorder Rating Scale (Friedman-Weieneth et al., 2009), the Pediatric Quality of Life Inventory 4.0 (Varni et al., 2001), the Swanson, Nolan, and Pelham-IV (Swanson et al., 2001), the Parenting Stress Index (PSI/SF; Abidin, 1990), the Psychoeducational Profile (Schopler & Reichler, 1979), and a psychological scale developed by Beijing Normal University (Jiang & Zhu, 2017). Parent-reported data showed that parenting programs were more effective than control groups at postintervention ($g = -1.37$, 95% CI [-2.03, -0.71]; Figure 5). There was substantial heterogeneity ($I^2 = 75.40\%$, $Q = 1,262.86$, $df = 58$, $p < .0001$). For child-reported scales, there was no statistically significant group difference ($g = -0.68$, 95% CI [-1.82, 0.46]; $I^2 = 90.06\%$, $Q = 35.81$, $df = 4$, $p < .0001$).

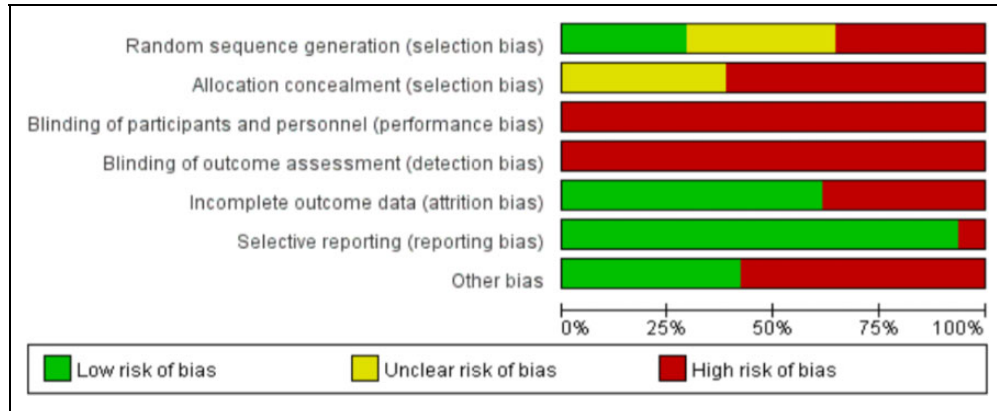


Figure 2. Risk of bias graph.

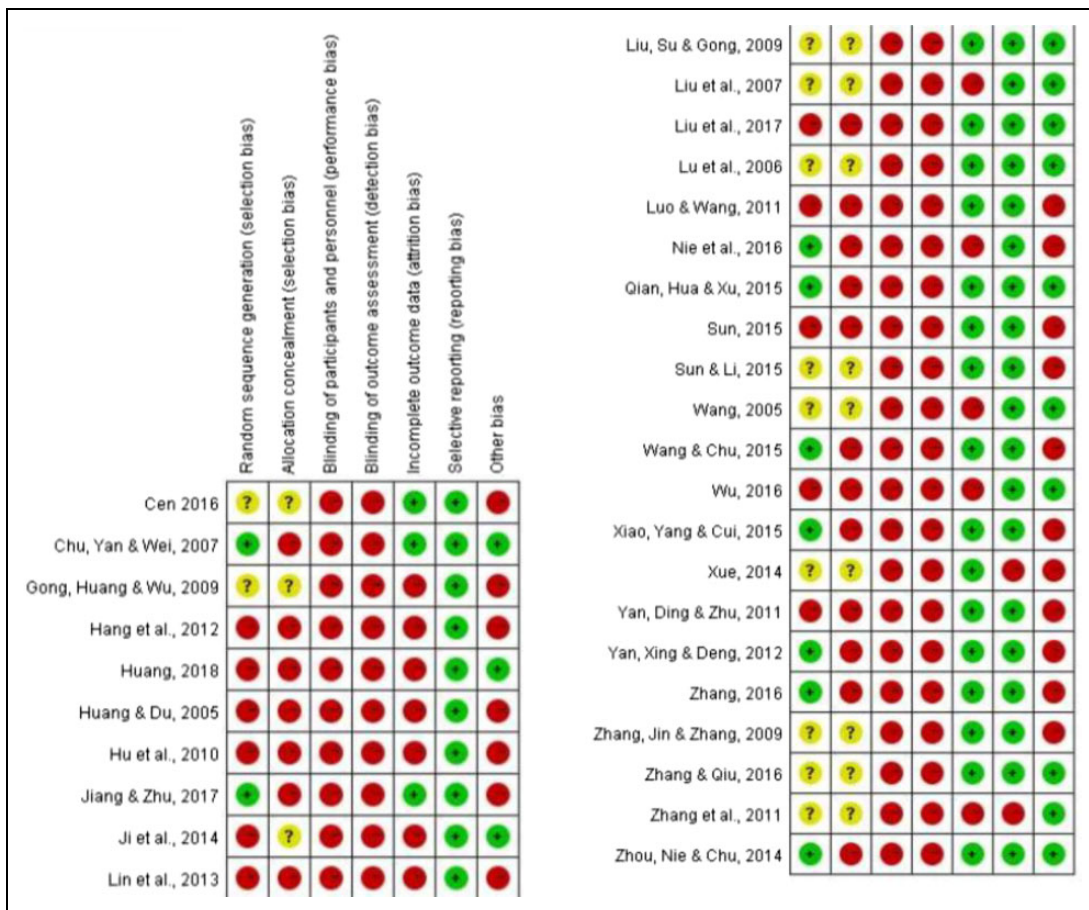


Figure 3. Risk of bias summary.

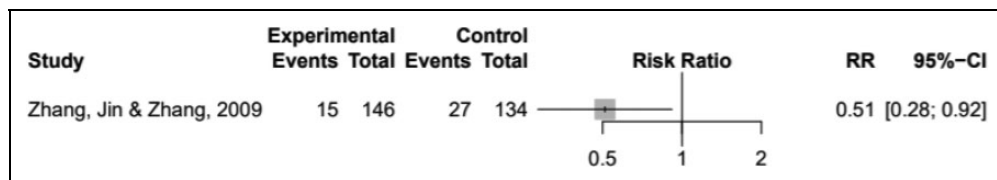


Figure 4. Analysis: Child abuse, parent report, at postintervention..

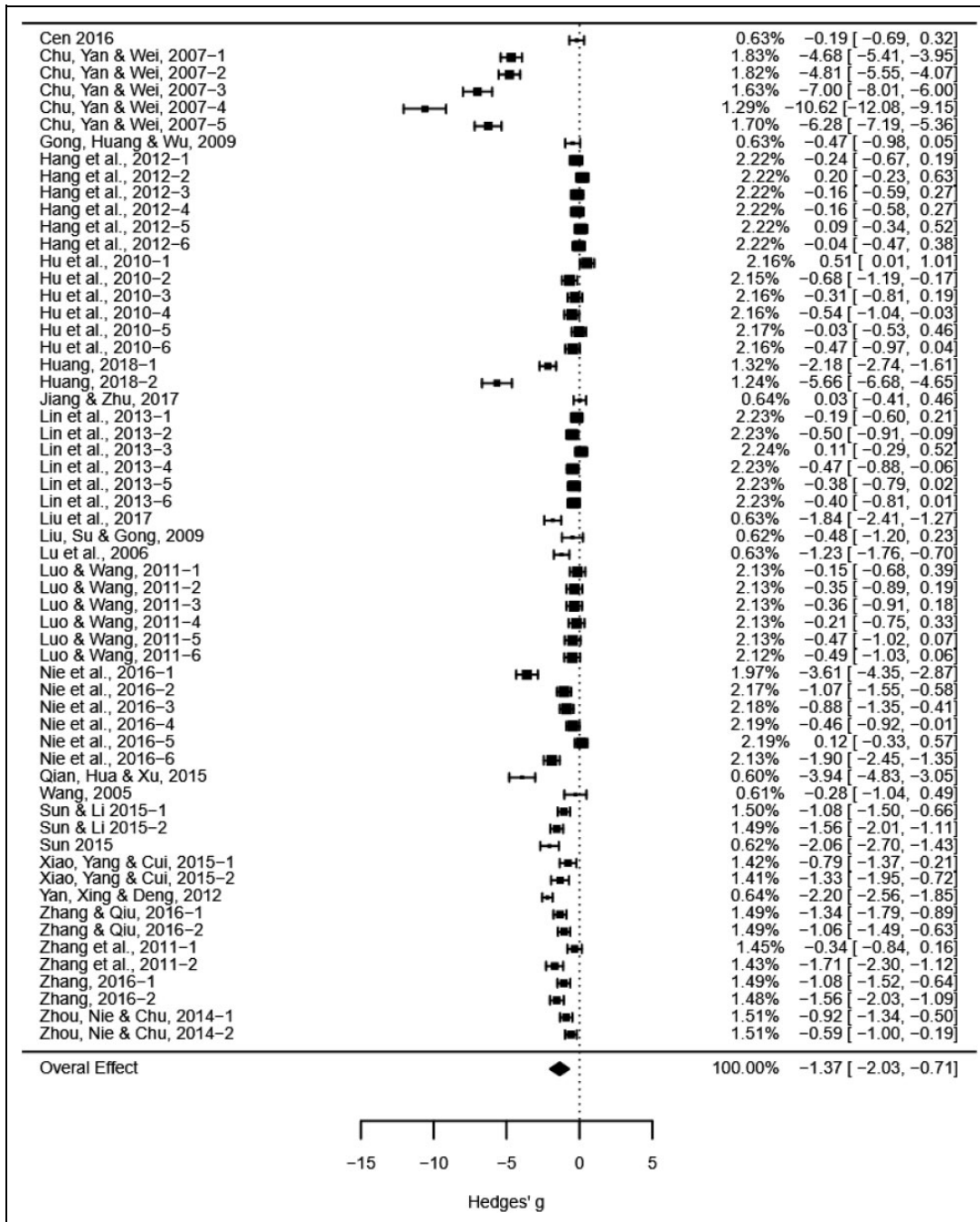


Figure 5. Analysis: Child emotional and behavioral problem, parent report, at postintervention.

Parent-child relationship. The following scales were used to measure the parent-child relationship: the Family Environment Scale (Moos, 1990), the Family Assessment Device (Epstein et al., 1983), the Egna Minnen Beträffande Uppfostran (Arrindell et al., 1999), the Maternal Behavior Rating Scale (Mahoney et al., 1986), PSI/SF (Abidin, 1990), the Dyadic Coding Scales (Humber & Moss, 2005), and two scales designed by the trialists. The analysis showed a small effect favoring the parenting programs at postintervention as reported by parents ($g = 0.47$, 95% CI [0.21, 0.73]; Figure 6). There was low level

of inconsistency ($I^2 = 00.00\%$, $Q = 181.30$, $df = 28$, $p < .0001$). Two studies used observational measurements and also found a similar effect size in improving the parent-child relationship ($g = 0.49$, 95% CI [0.17, 0.81]; $I^2 = 00.00\%$, $Q = 30.77$, $df = 16$, $p = .0144$).

Sensitivity Analyses

CEBP. The treatment effect was slightly larger when the seven quasi-experiments were removed ($g = -1.53$, 95% CI [-2.47,

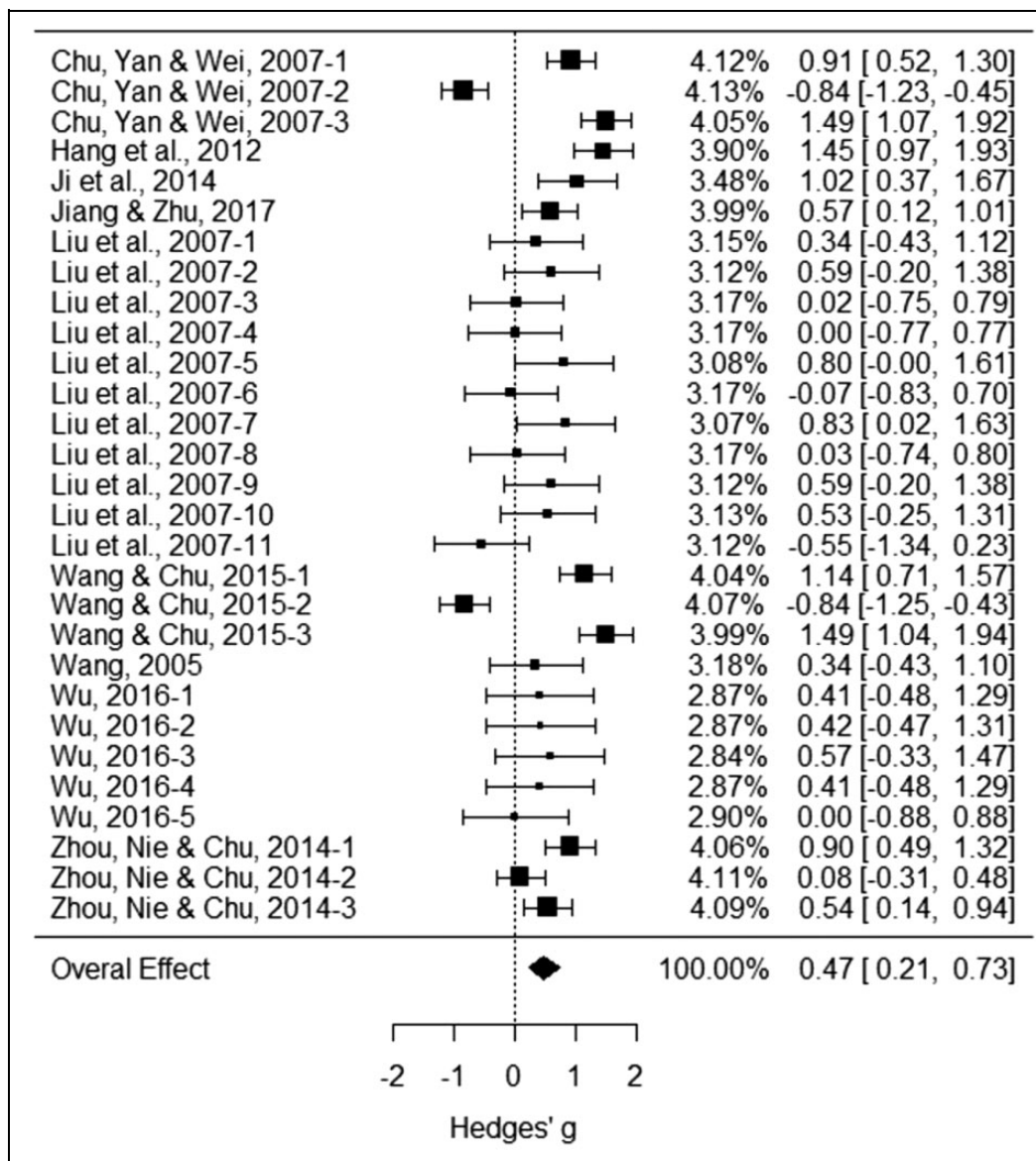


Figure 6. Analysis: Parent-child relationship, parent report, at postintervention.

-0.60]; $I^2 = 61.79\%$, $Q = 833.87$, $df = 30$, $p < .0001$) and when seven studies with high RoB were removed ($g = -1.56$, 95% CI [-2.52, -0.61]; $I^2 = 64.49\%$, $Q = 735.14$, $df = 25$, $p < .0001$). The treatment effect was maintained, although was smaller, when outliers were excluded ($g = -0.99$, 95% CI [-1.31, -0.65]; $I^2 = 77.14\%$, $Q = 215.16$, $df = 31$, $p < .0001$).

Parent-child relationships. The pooled effect was maintained although slightly smaller with the three quasi-experiments removed ($g = 0.42$, 95% CI [0.11, 0.72]; $I^2 = 00.00\%$, $Q = 161.69$, $df = 21$, $p < .0001$), with four studies with high RoB excluded ($g = 0.42$, 95% CI [0.13, 0.72]; $I^2 = 00.00\%$, $Q = 96.65$, $df = 18$, $p < .0001$), and with three outliers removed ($g = 0.41$, 95% CI [0.23, 0.59]; $I^2 = 30.52\%$, $Q = 25.99$, $df = 21$, $p = .2067$).

Subgroup Analyses and Meta-Regression

CEBP. The subgroup analysis detected a significant difference among subgroups based on diagnosis ($Q_m: F_{3,55} = 2.85$, $p = .0457$) and a small reduction in heterogeneity ($I^2 = 68.01\%$, $Q_e = 850.25$, $df = 55$, $p < .0001$). The results indicated that the parenting programs had more significant effects for autism ($g = -1.47$, 95% CI [-2.42, -0.52]) and epilepsy ($g = -3.69$, 95% CI [-5.57, -1.81]), than for ADHD ($g = -0.78$, 95% CI [-1.61, 0.05]) and Tourette's ($g = -2.20$, 95% CI [-5.16, 0.76]). However, there were no statistically significant group differences or heterogeneity reduction in terms of the origin of the program ($Q_m: F_{1,57} = 0.39$, $p = .5366$; $I^2 = 75.95\%$, $Q_e = 1,258.65$, $df = 57$, $p < .0001$); child comorbidity ($Q_m: F_{2,56} = 0.60$, $p = .55$; $I^2 = 76.17\%$, $Q_e = 1,240.77$, $df = 56$, $p < .0001$);

or control condition (Qm: $F_{2,56} = 1.62, p = .2079; I^2 = 73.95\%$, $Q_e = 1,047.04, df = 56, p < .0001$).

Parent-child relationship. The subgroup analysis showed that there were no statistically significant subgroup differences or heterogeneity reduction in terms of child diagnosis (Qm: $F_{2,26} = 0.09, p = .9137; I^2 = 00.00\%$, $Q_e = 181.29, df = 26, p < .0001$) or comparison (Qm: $F_{1,27} = 0.20, p = .6612; I^2 = 00.00\%$, $Q_e = 181.30, df = 27, p < .0001$). Subgroup analysis was not conducted for program origin or child comorbidity, due to the small number of studies.

Intervention components. Statistically significant differences were found between programs with and without components focusing on *cultivating empathy* to enhance the parent-child relationship (Qm: $F_{1,57} = 5.09, p = .0280$) and between programs with and without components teaching parents *techniques to reduce stress* (Qm: $F_{1,57} = 5.70, p = .0203$). However, neither contributed to the reduction of between-study variance (*empathy*: $Q_e = 1,212.41, df = 57, p < .0001, I^2 = 71.32\%$; *stress reduction*: $Q_e = 1,185.08, df = 57, p < .0001, I^2 = 70.69\%$).

The multivariate meta-regression model (Table 2) found a weak association for *stress reduction*. *Offering knowledge of CEBP* was associated with stronger treatment effects ($\beta = -3.69, 95\% \text{ CI } [-6.97, -0.40], p < .05$), whereas the *use of positive reinforcement* ($\beta = 2.74, 95\% \text{ CI } [0.27, 5.21], p < .05$) and *establishing household rules* ($\beta = 5.53, 95\% \text{ CI } [0.61, 10.45], p < .05$) appeared to contribute to an increase in CEBP.

With seven outliers removed, the reduced meta-regression model (Table 2) showed that the moderation effects of *increasing parental knowledge of CEBP* were stronger ($\beta = -4.60, 95\% \text{ CI } [-8.09, -1.10], p < .05$), and the effect of the *use of positive reinforcement* was maintained ($\beta = 2.41, 95\% \text{ CI } [1.13, 3.69], p < .001$). The moderation effects for the component *establishing household rules* no longer existed. Moderation effects were captured for *cultivating empathy* ($\beta = -1.85, 95\% \text{ CI } [-3.14, -0.56], p < .01$) as well as *developing social and communication skills* ($\beta = -0.96, 95\% \text{ CI } [-1.76, -0.16], p < .05$). The two components were both associated with stronger effects in reducing CEBP. *Play* was potentially associated with less CEBP (only significant at p value $< .1$), while *paying positive attention* could potentially increase CEBP (only significant at p value $< .1$). The results should be interpreted with caution because the insufficient reports could have led to the lack of power in the models.

Delivery components. The analysis showed a statistically significant difference between subgroups in terms of *rapport building* (Qm: $F_{1,57} = 6.71, p = .0121$), but no reduction in between-study heterogeneity ($Q_e = 1,048.44, df = 57, p < .0001, I^2 = 68.55\%$). The multivariate meta-regression model (Table 2) indicated that *institutional delivery setting* ($\beta = -7.77, 95\% \text{ CI } [-14.58, -0.95], p < .05$) and *maintaining ongoing communication* ($\beta = -3.17, 95\% \text{ CI } [-5.42, -0.92], p < .01$) were associated with stronger effects in reducing CEBP. In

contrast, the component *individual sessions only* was likely to increase CEBP ($\beta = 10.04, 95\% \text{ CI } [0.40, 19.69], p < .05$). With outliers removed, the moderation effects captured by the original model were no longer sustained (Table 2). However, the new model showed that *shorter programs (one to four sessions)* could contribute to an increase in CEBP ($\beta = 1.88, 95\% \text{ CI } [0.40, 3.36], p < .05$), so were potentially programs with *five to eight sessions* and programs with *exclusively group sessions* (both only significant at p value $< .1$). The results of subgroup analyses and meta-regressions could again be underpowered by insufficient reports of techniques used during program implementation.

Publication Bias

The funnel plot for CEBP (Figure 7) is highly asymmetrical, with the small studies with a lower effect size missing in the bottom right corner. It is likely that only small studies with a large effect size were published, whereas small studies without a significant effect were not. The Egger's test also showed a score of $-14.42 (p = 0)$, indicating substantial asymmetry that could have been caused by publication bias.

Discussion

Summary of Findings

The review identified 20 RCTs and 11 quasi-experimental studies evaluating the effectiveness of parenting interventions for families of children with DD compared to TAU in reducing the incidence and associated factors of physical abuse in Chinese children. A single study showed that parents in the parenting program were less likely to verbally or physically punish their children. The findings of the multilevel meta-analyses provide provisional evidence that parenting interventions for DD (specifically ADHD, autism, epilepsy, and Tourette's) can reduce CEBP and improve the parent-child relationship. The treatment effects were maintained in the sensitivity analyses suggesting a high degree of certainty.

The subgroup analyses suggested that child diagnoses contributed to the heterogeneity such that parenting programs had a stronger effect in reducing CEBP in families of children with autism and epilepsy, but not in terms of the parent-child relationship. For both outcomes, there were no statistically significant group differences in terms of TAU conditions. Neither the origin of the program (China vs. the United States) nor child comorbidity had a significant impact in terms of reducing CEBP. The findings should be treated with caution, however, given the limited numbers of studies in the subgroups.

With regard to the outcome CEBP, the analysis of intervention components showed that programs with content to reduce *parental stress* and *cultivate empathy* appeared to have a stronger effect on reducing CEBP than those without such content; heterogeneity was reduced in both cases. The meta-regression models detected two additional moderators: *teaching parental knowledge of CEBP* (reduced CEBP) and *use of positive reinforcement* (increased CEBP). As regards delivery components,

Table 2. Meta-Regression: Intervention and Delivery Components.

Intervention Components	Full Model			Reduced Model			Full Model			Reduced Model																												
	β	95% CI		β	95% CI		β	95% CI		β	95% CI																											
Intercept	-0.05	[-1.68, 1.59]		-0.17	[-0.80, 0.45]	Intercept	-1.57'	[-3.27, 0.13]		-1.86***	[-2.84, -0.87]																											
Knowledge of CEBP	-3.69*	[-6.97, -0.40]		-4.60*	[-8.09, -1.10]	1-4 sessions	1.46	[-1.76, 4.68]		1.88*	[0.40, 3.36]																											
Reinforcement	2.74*	[0.27, 5.21]		2.41***	[1.13, 3.69]	5-8 sessions	1.38	[-0.73, 3.49]		1.37'	[-0.23, 2.98]																											
Positive attention	0.52	[-3.32, 4.37]		1.89'	[-0.27, 4.06]	9 or more sessions	-1.69	[-6.21, 2.84]		-0.78	[-3.67, 2.11]																											
Ignore	-0.14	[-5.22, 4.94]		-0.61	[-2.17, 0.95]	Institution	-7.77*	[-14.58, -0.95]		-1.39	[-4.49, 1.71]																											
Time-out	-0.39	[-3.18, 2.40]		-0.12	[-1.08, 0.84]	Institution and home	-10.30	[-25.29, 4.68]		0.79	[-3.21, 4.79]																											
Household rules	5.53*	[0.61, 10.45]		0.16	[-0.86, 1.18]	Professional facilitator	4.79	[-1.01, 2.57]		0.66	[-0.32, 1.64]																											
Effective instructions	0.50	[-2.13, 3.13]		-0.18	[-1.02, 0.65]	In person	11.94'	[-2.17, 11.76]		-1.24	[-5.25, 2.77]																											
Emotion coaching	-4.74	[-14.04, 4.55]				In person and online	2.64	[-2.71, 7.99]		-0.24	[-2.29, 1.81]																											
Establish routines	-1.53	[-5.82, 2.77]		1.15	[-0.41, 2.71]	Group and individual sessions	-1.86	[-9.75, 6.03]		2.93'	[-0.39, 6.26]																											
Show affection	-0.49	[-2.65, 1.68]		0.75	[-0.40, 1.91]	Group sessions only	10.04*	[0.40, 19.69]		0.14	[-1.45, 1.73]																											
Play	1.25	[-0.79, 3.29]		-0.93'	[-2.00, 0.13]	Individual sessions only	-0.14	[-3.10, 2.81]		0.62	[-0.89, 2.14]																											
Empathy	-0.05	[-4.35, 4.26]		-1.85**	[-3.14, -0.56]	Didactic and interactive mode	0.48	[-2.24, 3.20]		0.23	[-0.75, 1.21]																											
Parental self-regulation skills	-0.73	[-3.20, 1.74]				Didactic mode	3.08'	[-0.44, 6.59]		2.03	[-0.87, 4.93]																											
Stress reduction skills	-4.64'	[-9.59, 0.32]		-0.96*	[-1.76, -0.16]	Flexibility	0.82	[-9.41, 11.05]																														
Techniques to improve child social skills	0.47	[-3.02, 3.96]				Fidelity promotion																																
Techniques to improve child language	-2.24	[-5.55, 1.06]				Rapport building							and communication skills						Methods to promote skill acquisition	-0.69	[-4.23, 2.85]		-0.49	[-2.36, 1.38]								Ongoing communication	-3.17**	[-5.42, -0.92]				
and communication skills						Methods to promote skill acquisition	-0.69	[-4.23, 2.85]		-0.49	[-2.36, 1.38]																											
						Ongoing communication	-3.17**	[-5.42, -0.92]																														

***p < .001. **p < .01. *p < .05. 'p < .1.

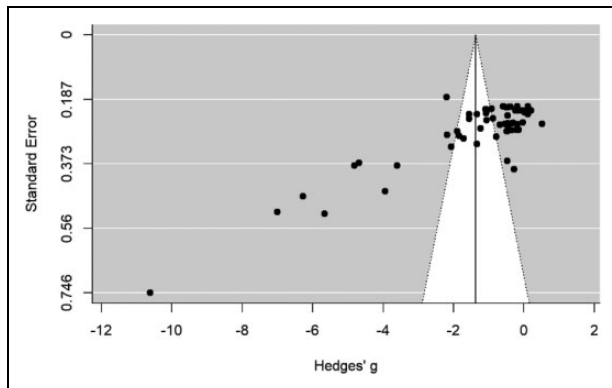


Figure 7. Funnel plot, outcome: Child emotional and behavioral problems.

the subgroup analysis showed that programs with components to *build rapport* were associated with greater success than those without such components; the heterogeneity was also diminished in the analysis. The meta-regression also indicated that *maintaining ongoing communication* and the use of *institutional delivery setting* can potentially promote program effects, while short duration (with less than eight sessions) and the exclusive use of group or individual sessions appear to increase CEBP. The investigation of moderators was exploratory, and the results should be interpreted with caution due to the suboptimal reporting and the consequently underpowered regression models.

Agreements/Disagreements With Other Studies

Overall effectiveness. In terms of the incidence of physical abuse against children, this review found results that were consistent with reviews on families of typically developing children (Altafim & Linhares, 2016; van der Put et al., 2018; Vlahovicova et al., 2017); however, the evidence is more limited in this review and further research is needed. As with CEBP, which is a significant risk factor for physical abuse, the effect found in this review was much stronger ($g = -1.37$, 95% CI [-2.03, -0.71]) compared with the two existing reviews—Skotarczak and Lee (2015; $g = -0.39$, 95% CI [-0.15, -0.63]) and Telleen and Sanders (2013; $d = -0.54$, 95% CI [-0.37, -0.70]). There are three potential explanations. First, there is an overall high RoB across the included studies. Nonetheless, the sensitivity analyses produced even larger effects with quasi-experimental studies and those with high RoB removed, which indicated that there might be a genuinely strong effect. Second, given a dearth of services for DD in mainland China, participating parents could be more engaged and receptive, with more potential for change. This is consistent with previous reviews of programs for families of typically developing children, which showed that the effect sizes were larger for those living in low-resource settings and having urgent needs for tackling disruptive behaviors (Gardner et al., 2015; Leijten et al., 2013). Third, Leijten et al. (2019) found that targeted parenting programs for those with emergent behavioral issues have a

stronger effect than universal (for all families) and selective programs (for families at higher risk). Programs in this review were all targeted interventions, which may also have augmented the treatment effect.

Neither of the two previous reviews on DD examined the effectiveness of the program in improving the parent–child relationship, which is an important protective factor for physical abuse. However, results of this review were similar to those of Knerr et al. (2013), which focused on parenting programs for children without DD in low- and middle-income countries (LMICs) and found that all studies reported significant improvements in the parent–child interaction with a wide range of effect sizes. The pooled effect in this review is consistent with the synthesized results in Barlow et al. (2016), which reported a significant increase in positive interactive behaviors ($d = 0.48$, 95% CI [0.17, 0.79]) among families of young children in HICs.

With regard to the effects of transported versus homegrown programs, this review found comparable results to those of Leijten et al. (2016), which included trials mostly from HICs and found no significant group differences between transported and homegrown programs. However, this review identified only three imported programs, and the subgroup analysis should be treated with caution. In addition, little documentation of adaptations was found in this review, and thus, it was difficult to determine the extent to which the cultural adaptations contributed to the treatment effects.

Overall, the results of treatment effects in this review are mostly consistent with existing evidence drawn from reviews conducted for families of children with or without DD. This indicates that, despite the diverse contexts, the mechanisms hypothesized to underlie parenting intervention effectiveness are also relevant for families of children with DD in Chinese settings.

Intervention components. Existing research investigating parenting intervention components has mostly been conducted based on trials for families of typically developing children in HICs. It was striking that this review consistently identified the *use of positive reinforcement* as a moderator that potentially increased CEBP in Chinese settings. Although some research highlights the fact that reinforcements might result in negative child outcomes (such as preventing children from developing prosocial behaviors; Eisenberg et al., 2015), evidence generally suggests that positive reinforcement is effective in reducing child behavioral problems for typically developing children (Leijten et al., 2019) as well as for children with DD (Baghdadli et al., 2003; Cooper et al., 2007; Oliver et al., 2012).

If there is a genuine negative moderation effect of positive reinforcement for children with DD in mainland China (i.e., as opposed to the result being a Type I error resulting from the underpowered meta-regression), there can be four explanations. First, as suggested by Eisenberg et al. (2015), the frequent use of positive reinforcement may undermine children's intrinsic motivation for empathy-associated responding and prosocial behaviors; this could consequently restrain parent–child

interactions and social development for children with DD. Second, praise needs to be tailored to the child's characteristics, behaviors, and contexts (Hattie & Timperley, 2007; Mueller & Dweck, 1998); inappropriate use of positive reinforcements would not reduce CEBP but cause further frustration among parents. Third, before behavior problems improve, they can sometimes be temporarily intensified—a recognized side effect of behavioral interventions (Lerman et al., 1999). Fourth, it is traditionally less common for Chinese parents to praise children, and as such, it can take longer for these techniques to become established. Most programs lasted for less than 6 months despite the fact that were trying to teach parents a wide range of skills; there were thus limited opportunities for parents to practice such skills, which could have also led to the misapplication of techniques in actual parent-child interactions.

Delivery components. The findings of this review are consistent with those of Tellegen and Sanders (2013), in identifying a potential pattern for parenting programs with more sessions to have a stronger effect in reducing CEBP. The reason may again be that there is generally a lack of service provision for DD in mainland China, with parents thereby benefiting from extended provision.

This review also revealed that the sole use of individual sessions or group sessions was less likely to reduce CEBP than a combination of individual and group sessions, a finding that is consistent with those of the two previous reviews (Skotarczak & Lee, 2015; Tellegen & Sanders, 2013). This indicates that, while tailored strategies and individualized sessions are necessary to recognize the diversity of CEBP, group sessions are also important, especially in terms of gaining peer support and promoting social integration.

While Skotarczak and Lee (2015) suggested that facilitators with a higher educational level can yield larger effects, this review found that the programs were effective irrespective of facilitator qualification, perhaps because the included programs were mostly delivered in hospitals, which parents already perceived as having authority. This is of particular importance because there is a shortage of well-trained health professionals for DD in mainland China and the use of alternative professionals or laypersons can maximize access to interventions.

Generalizability

Programs included in this review were all behavioral (or cognitive behavioral) and attachment-based interventions. Despite some variation in terms of delivery mode and format, the programs were predominantly implemented in hospitals with a duration less than 6 months.

The programs included both male and female caregivers where specified, suggesting that the findings can be generalized to both parents. The included programs were mostly delivered to families with diverse socioeconomic status, which suggests that the findings can be applied to families from diverse backgrounds, including those living in low-resource settings. Child age ranged from 8 months to 18 years. While

this wide range could have contributed to the between-study heterogeneity, it may also indicate that such programs can be suitable for children of all ages; this is important for areas with insufficient resources to offer separate programs for different age groups.

The included programs only involved four types of DD, which may mean that the findings are not applicable to other diagnoses. However, there was a mixture of studies recruiting parents of children with and without comorbid DD diagnoses, physical impairments, or mental health symptoms. The subgroup analysis also suggested that the presence of comorbidities did not have a statistically significant impact on the level of heterogeneity or treatment effects. Therefore, the findings of this review can potentially be generalized to children with diverse clinical conditions. Furthermore, given that there is a lack of research on families of children with other diagnoses and that parents of children with DD share common challenges, this review may be the most relevant evidence for developing and implementing parenting interventions for a broader range of DD in mainland China or other LMICs with similar contexts.

Limitations

One important source of bias in this review is the limited number of included studies ($k = 31$). Since the sample sizes of the included studies were generally small, the quantitative analyses were based on an inadequate number of participants, especially for the outcomes of physical abuse in childhood ($k = 1, n = 280$) and the parent-child relationship ($k = 8, n = 507$). The small number of studies and participants could also have underpowered the subgroup analyses and meta-regression models. As such, the nonstatistically significant group differences detected in subgroup analyses may not always indicate that the components did not have any impact in terms of reducing the high level of heterogeneity. Similarly, the nonsignificant coefficients in the meta-regression models should not always be interpreted as a true absence of relationships between components and treatment effects. Multiple covariates were included in the meta-regression models, which may better adjust for confounding and increase the accuracy of estimates. Nonetheless, the suboptimal reporting of the included studies could limit the ability to properly control for confounders.

Although the review included control conditions of TAU (including wait-list treatment and no treatment), there was variation in the definitions of TAU in each study, with some studies not explicitly specifying what constituted the services in the control groups. The subgroup analyses of the comparison conditions also revealed that the effect sizes of parenting programs appeared to vary according to the nature of the control condition, although the differences were not statistically significant. As a result, it was difficult to determine to what extent the potential heterogeneity among the comparison groups may affect the results of meta-analyses. This limitation is not unique to the current review but a common concern in all meta-analyses; however, as long as overgeneralization and

extrapolation of review findings can be avoided, this method (once carried out in a valid and reliable way) can still provide the best evidence regarding intervention effectiveness.

The review was also affected by the manner of reporting. The length of reports varied from full descriptions of techniques delivered in each session to a short introduction of the programs using no more than a couple of sentences. Despite the robustness of the findings shown in the sensitivity analyses, the suboptimal reporting style resulted in substantial unexplained heterogeneity and the underpowering of moderator analysis. However, it should also be pointed out that even with detailed program descriptions, it would still be difficult to determine whether the program facilitators delivered all the prescribed components and whether any components absent in the manuals were in fact also absent in the actual sessions. The inadequate reporting also raised concerns about the internal validity of the included studies as some studies did not provide enough information about critical quality indicators.

Implications for Policy and Practice

This review has confirmed that parenting programs are an important strategy for the prevention of physical abuse in childhood for families of children with DD. The findings are relevant to local social service agencies, nongovernmental organizations, people's organizations (such as the China Disabled Persons' Federation), and child welfare centers in urban and rural communities in China, as well as to international organizations that aim to address global violence against children in LMICs for achieving the Sustainable Development Goals (United Nations, 2015). The review supports the use of both homegrown and transported programs, as well as the use of professional or nonprofessional facilitators. It also suggests that such programs should teach parents about CEBP, how to reduce parental stress, and how to cultivate empathy. It calls attention to the use of positive reinforcement, which can have adverse effects when not applied appropriately. In addition, this review provides some support for delivering parenting programs that have more than eight sessions, have a delivery setting in hospitals or social service agencies, build rapport between facilitators and participants, combine sessions delivered in groups and on an individual basis, and maintain ongoing communication between facilitators and participants outside program sessions.

Parenting interventions for families of children with DD can be used a part of a range of policies in mainland China. China faces mounting pressure in terms of service provision for children with disabilities. However, the current policy is limited to offering auxiliary equipment and rehabilitation trainings that aim to promote daily functioning and social participation to children between the ages 0 and 6 who have vision, hearing, language, physical, intellectual impairments, or autism spectrum disorder and live in impoverished households or foster care agencies (State Council, 2018). The findings of this review suggest that, for children with DD but not meeting the eligibility criteria of the current policy, parenting programs can be

offered to their primary caregivers, in order to promote equity and create more opportunities for those children to reach their potential. Such interventions could also fit into the 2016–2020 Five-Year Plan to Promote Family Education in China (All-China Women's Federation, 2016; Ministry of Education, 2015), which set a range of goals such as the promotion of positive parenting practices on a national scale and the provision of regular services for families of vulnerable children (affected by disabilities, poverty, diseases, and child abuse) to create a nourishing family environment that fosters child development.

Further, parenting interventions for families of children with DD are relevant to the Minors' Social Protection Pilot Scheme in China, which was launched in 2014 as a response to the burgeoning concern regarding child abuse (Ministry of Civil Affairs, 2015). Such interventions could be integrated as part of the preventative services. Although direct evidence is limited in the current review, parenting programs have shown promise in reducing rates of child abuse perpetrated by primary caregivers across countries (van der Put et al., 2018; Vlahovicova et al., 2017); given their success in reducing risk factors for children with DD in Chinese settings, such interventions could also be one of the potential solutions to child abuse in mainland China.

The implementation of such interventions could also be facilitated by the policy agendas that aim to establish a community-based child welfare service system. The Ministry of Civil Affairs (2015) requires that all urban and rural communities set up a child welfare center to support vulnerable children and their families. Evidence-based parenting programs for families of children with DD could be delivered in those centers to increase the quality and reach of services.

Implications for Research

This review highlights the importance of seeking evidence from non-English databases using local languages. Future evaluations should extend time points of assessment and conduct long-term follow-up. The review also points to the need for research to (1) investigate the effects of parenting programs in reducing the actual incidence of physical abuse in childhood for families of children with DD, (2) assess to what extent the results apply for children with a broader range of DD diagnoses, and (3) report the costs and conduct cost-effectiveness analysis. The limited service provision for families of children with DD in mainland China and financial burden among those families warrants the delivery of optimized interventions at low cost. This requires future research to further investigate the effects of individual components (examined and not examined in this review) which will also contribute to the reduction of potential harm. There is also a need to improve the scientific rigor of studies and to register trials in publicly accessible systems. The suboptimal reporting prevents readers from determining the generalizability of findings and delays the translation of research findings into policy and practice. As such, future trial reports should use guidelines for RCT reporting,

such as the Consolidated Standards of Reporting Trials statement (Schulz et al., 2010).

Summary of Critical Findings

- This is the first attempt to focus on LMICs and explore the effectiveness and critical components of parenting interventions for families of children with developmental disabilities in reducing the incidence and modifying associated factors of physical abuse in childhood.
- This review finds that such programs reduce child emotional and behavioral problems and improve the parent-child relationship. The effects are not affected by the origin of programs or the qualification of facilitators.
- Programs with components to increase parental knowledge of child emotional and behavioral problems, reduce parental stress, and cultivate empathy were associated with greater success; the use of positive reinforcement in LMICs has not shown the expected effects and might need further sociocultural adaptations. Programs with the following delivery features tend to have stronger effects: a longer duration, an institutional setting, efforts to build rapport, a combination of group and individual sessions, and ongoing communication.
- Research investigating the effects in reducing the actual incidence of physical abuse in childhood is needed.

Implications for Practice

- Behavioral and attachment-based parenting interventions should be provided to families of children with DD of both homegrown and transported programs as well as the use of professional or nonprofessional facilitators.
- Such programs should teach parents about child emotional and behavioral problems, techniques to reduce parental stress, and methods to cultivate empathy, but the use of positive reinforcements might need to be sensitive to contextual and individual characteristics. Such programs can be delivered with more than eight sessions, in an institutional setting, rapport building efforts, a combination of group and individual sessions, and ongoing communication.

Implications for Policy

- Such programs can be used as part of existing policies in China that aim to provide services for more families affected by disabilities, promote positive parenting practices on a national scale, and establish a child protection system.
- The implementation of such programs can be facilitated by policy agendas to establish a community-based child welfare service system.

Implications for Research

- Future systematic reviews should seek evidence from non-English databases using local languages.
- Future evaluations should conduct long-term follow-ups.
- More evaluations of such programs should be conducted to examine the direct impact on child abuse and for a broader range of diagnoses, optimize program components, and analyze the cost.
- There is a need to improve the methodological quality and reporting of future trials.

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