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Evidence base review of couple- and family-based psychosocial interventions to promote infant and early childhood mental health, 2010–2019

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Abstract

Infant and early childhood mental health (IECMH) has been defined as the capacity of infants and young children to regulate their emotions, form secure relationships, and explore their environments. For this special issue, we conducted a review of IECMH outcomes from evaluations of couple- and family-based psychosocial interventions not explicitly designed for trauma exposure published from 2010 through 2019, following Evidence Base Update criteria and the current convention of classifying general categories of intervention approaches rather than the former practice of evaluating specific brand-name packaged programs. Full-text review of 695 articles resulted in 39 articles eligible for categorization into intervention approaches, taking into consideration the theoretical orientation of the treatment, the population served, the intervention participants, the target outcomes, the treatment theory of change, and the degree to which the intervention was standardized across participants. Four intervention approaches were identified in this review as Probably Efficacious: *Behavioral Interventions to Support Parents of Toddlers*, *Interventions to Support Adolescent Mothers*, *Tiered Interventions to Provide Support Based on Assessed Risk*, and *Home Visiting Interventions to Provide Individualized Support to Parents*. Other intervention approaches were classified as Possibly Efficacious, Experimental, or did not have sufficient evidence in this time period to classify under these criteria. Further research could explore how to ensure that all families who need support can receive it, such as by increasing the reach of effective programs and by decreasing the number of families needing additional support.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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Keywords

couple interventions; family interventions; infant and early childhood mental health; psychosocial interventions

INTRODUCTION

Infancy and early childhood are periods of rapid brain development and dependence on responsive relationships for safety, stability, and nurturance, laying the foundation for lifelong physical and mental health (Lyons-Ruth et al., 2017; Robinson et al., 2019). In this sensitive period of development, adversity and toxic stressors (e.g., poverty, child maltreatment, racism) can be particularly deleterious to neurologic, metabolic, and immunologic systems, highlighting the importance of intervening early to protect the child's developing capacities to adapt to interactions within their environment (Shonkoff et al., 2021). However, nurturing interactions with caregivers can be powerfully protective, as infants and young children rely on their caregivers to regulate the effects of stress (Lyons-Ruth et al., 2017). Responsive behaviors and interactions characterized by positive feedback, consistent discipline, warmth, and sensitive emotional responding can buffer against adversity and can promote children's mental health (National Academies of Sciences, Engineering, and Medicine [NASEM], 2016; NASEM, 2019a, 2019b).

Infant and early childhood mental health (IECMH) is defined as the capacity of infants and young children to experience, express, and "regulate emotions, form close, secure interpersonal relationships, and explore his/her environment and learn" (p. 178, Fitzgerald et al., 2011). In addition to the negative impacts of impaired IECMH concurrently (e.g., preschool expulsion, sibling/peer aggression), deficits in IECMH are associated with increased risks longitudinally, such as grade retention and dropout, juvenile and criminal justice involvement, and poor physical, mental, and behavioral outcomes in adulthood (Caspi et al., 1996; NASEM, 2019a, 2019b). The ability of a parent to respond to their child's needs in a predictable manner that ensures safety and emotional security for the child in times of distress is associated with a secure attachment relationship that supports the capacities of IECMH (Ainsworth, 1979; Bowlby, 1983; Crittenden, 2006). Foundational to IECMH is, therefore, that psychopathology exists not within the individual but within the context of child and caregiver (Zeanah & Liberman, 2016).

Previous reviews of evidence have documented long-term benefits of specific early childhood interventions based on theoretical orientation such as attachment-based parenting interventions (Bakermans-Kranenburg et al., 2003; Barlow et al., 2010; Gregory et al., 2020; Rose & O'Reilly, 2017) and broader intervention approaches such as high-quality early childcare and home visiting programs (Center on the Developing Child, 2007; Michalopoulos et al., 2017; National Research Council and Institute of Medicine, 2000). Meta-analyses have also characterized the overall effect sizes and moderators of IECMH interventions. Piquart and Teubert (2010) reported an average effect size of 0.40 for child mental health outcomes for parenting education programs with expectant and new parents published through 2009, with significantly larger effect sizes for interventions

that used professional staff (as compared with paraprofessionals or lay staff). Mortensen and Mastergeorge (2014) reviewed 19 studies of relationship-based interventions serving socioeconomically disadvantaged families of infants and toddlers, reporting an overall effect size of 0.23 for observational parent–child interaction outcomes. They identified significant variability related to the professional level of the interventionist, child age at the start of the intervention, and the breadth of intervention services included (with larger effects for direct services as compared with comprehensive services). The IECMH field is thus characterized by a diversity of intervention approaches, and resultant diversity of effectiveness conclusions.

Couple- and parent-based psychosocial interventions to support IECMH have not been reviewed under the rubric of Evidence Base Updates (Southam-Gerow & Prinstein, 2014). Past updates have covered related areas, such as psychosocial treatments for disruptive behaviors in children (Kaminski & Claussen, 2017), family-based interventions for child and adolescent disorders (Kaslow et al., 2012), family treatment for childhood behavioral and emotional disorders (Northey et al., 2003), and family-based therapies for selected behavioral disorders of childhood (Estrada & Pinsof, 1995). Cowan and Cowan (2019) also reviewed the history of father involvement, parenting, and coparenting interventions.

Objective

For this special issue, we undertook a review of couple- and family-based psychosocial interventions to promote IECMH and serve as a foundation for life success, using a public health lens that incorporates considerations to ensure that results can inform widespread dissemination decisions to optimize population-level impact. We followed the convention of classifying general categories of intervention approaches rather than the former practice of evaluating specific programs. While the latter has the advantage of assisting in the selection of effective programs when multiple brand-name programs are available, the former identifies common approaches across packaged programs, which can inform larger policy-based decisions about the types of approaches likely to be effective on a broader population scale. Rating the evidence for intervention approaches may also support the achievement of comprehensive geographic coverage and saturation of services, which individual programs have not been able to achieve. More general intervention approach descriptions may also help referring providers select among the available services in their area (that may not contain well-known brand-name programs). Our review is inclusive of some programs in earlier reviews, with the objective of providing results to inform family, provider, community, and health plan decision-making.

METHODS

Literature search

In June 2020, we conducted Medline and PsycINFO searches of peer-reviewed journal articles published in English using search strings comprised of terms to describe the interventions of interest (i.e., couple and family interventions), the outcomes of interest (i.e., infant and early childhood mental health), and results of an evaluation. We began by searching for articles published from 2000 to the search date, to identify if publications

prior to the past 10 years would change the classification of the levels of evidence for each intervention type. The complete set of search terms that returned 51,936 records (7,390 of which were identified as duplicates) is presented in Supplemental File A. A total of 44,394 articles thus comprised the initial pool of potentially eligible studies (Figure 1).

Study inclusion and exclusion criteria

This review focuses on evidence from 2010 to 2019 of couple and family-based psychosocial interventions on IECMH as a benchmark for future Evidence Base Updates. Studies were included if the intervention began prior to or at child age 3 years and if immediate postintervention outcomes were measured prior to or at child age 5 years, to distinguish this review from Sheidow et al.'s (this volume) review of couple- and family-based interventions for child and adolescent mental health. To qualify as a couple and family-based intervention, participants were either married or cohabitating couples, parent-child dyads, families (e.g., parent-parent-child triads), or parents. Parents may have included a mix of biological, step-, and/or adoptive parents. However, interventions specifically for foster parents were excluded, as the issues faced by children and families served by child welfare can differ markedly from children and families who have no history of child protective services involvement.

To qualify as a psychosocial intervention, the intervention focused on changing the knowledge, attitudes, emotions, behaviors, and/or relationships among participants. To qualify as reporting on IECMH outcomes, results must have been reported on child emotional, behavioral, functional, or relational (e.g., secure parent-child attachment) outcomes in the age range of interest. To increase generalizability of our results to the broadest population, we excluded interventions tested with children who were born low birthweight or preterm, children who had stays in a neonatal intensive care unit, parents with documented or assessed marital conflict or violence, children with known trauma exposure, and children with specific diagnosed conditions such as developmental disabilities. As with interventions for foster families, each of those intervention literatures deserves a more complete review than our scope would allow. We also limited the review to studies conducted in high-income countries: the United States, Canada, Australia, New Zealand, and countries in western Europe and Scandinavia, to optimize generalizability to the most likely audiences for this review.

Article review, coding, and categorization

Full-text review of 695 articles resulted in 58 potential articles from 2010 to 2019 for review (see Figure 1 for PRISMA flow chart and details). Eight of the 58 articles were subsequently determined to meet original exclusion criteria. Eleven others were identified as reporting duplicate results, either reporting the same IECMH outcomes on the same sample as another included study or reporting mid-treatment or follow-up IECMH outcomes on a sample for which posttest IECMH results are reported in another included study. These duplicative articles are described in text but were excluded in classifying the level of evidence to avoid double-counting results.

The remaining 39 studies were eligible for categorization into intervention approaches based on the theoretical orientation of the treatment (if mentioned), as well as characteristics to facilitate the use of these results in community, state, and health plan decision-making. The first distinguishing feature used to categorize interventions was whether the intervention was tested with families with an identified need for IECMH-related treatment that was identified through active screening, such as for mothers with postpartum depression or for high levels of infant irritability or other behavioral concerns. Among the interventions intended as preventive (i.e., before a documented mother or infant concern had been identified), interventions were distinguishable as either narrowly or broadly defining the population and/or outcome of interest. Narrow-population preventive interventions were those tested with specific populations or outcomes, such as preparing couples for the transition to parenthood or supporting adolescent mothers who might be identified by indicators in health system or other records without additional screening. Broader-population preventive interventions addressed a wider array of family and child outcomes such as reducing child difficult behavior and improving parenting efficacy more generally and were evaluated with heterogeneous populations. Among those broader-population preventive interventions, the characteristic used to further distinguish interventions was the approach taken to providing services in that study, which has implications for manualization of services for widespread implementation. Some programs provided the same curriculum to all parents; other programs formally assessed families' levels of risk and provided concordant levels of services to all families with the same risk classification. Alternatively, some programs allowed the interventionist to individualize support for each family based on interventionist-identified needs. All three approaches to providing preventive services are intended to match the intensity and/or content of the intervention to the family's identified risks, with greater standardization of services in the first two methods and greater flexibility of implementation in the third. Each of these features would have implications for how these results could be incorporated into efforts to improve population-level IECMH. Each study was classified into an intervention approach based on the intervention and evaluation as conducted in that published article, which may or may not represent every evaluation or variation of a particular named program.

RESULTS

Stratification of the 39 eligible studies by population of interest, target of the intervention, and standardization of the intervention resulted in the 11 categories of intervention are described below and given in Table 1, summarizing the evidence for couple- and family-based psychosocial interventions published between 2010 and 2019. When not otherwise specified, an intervention was evaluated in the United States.

IECMH treatments

Parent-focused psychotherapy—This set of interventions aimed to improve parent-child interactions by directly supporting the mother's psychological health and well-being. The theoretical orientations of these programs were described as psychodynamic, psychoanalytic, or maternal attachment-focused, or targeted the mothers' emotion or maternal reflectivity, intervening on mothers' cognitions about their parenting of origin,

and representations of the infant rather than behavioral responses in interactions (even if the infants are present during the intervention). Among the four randomized studies, significant effects were limited. Salomonsson and Sandell (2011) reported positive significant effects on one of two IECMH outcome measures. Puckering et al. (2010) included four IECMH outcome measures, reporting significant positive effects on only one. At posttest, only one of four IECMH outcome measures documented a significant effect in Lowell et al. (2011), although two of four were significant at follow-up. Suchman et al. (2010) reported that neither of the two IECMH outcomes evidenced significant findings at posttest, although Suchman et al. (2011), using the same sample with different covariates, reported that one out of two IECMH outcomes was significant at posttest and both IECMH outcomes were significant at follow-up. Among non-randomized studies, Smith et al. (2010) reported significant increases on both IECMH outcomes, and Paris et al. (2011) reported significant increases on three out of five IECMH outcomes.

Parent–infant psychotherapy—This intervention approach differs from parent-focused psychotherapy, in that parent–infant psychotherapy intervenes directly with the parenting behaviors and the parent–infant interactions to improve parents’ sensitive responding to the infant’s needs. Similar to the results for parent-focused psychotherapy, significant results were limited. Bagner et al. (2016) reported significant effects favoring the treatment group on three out of four IECMH outcomes from baseline to follow up. Cassidy et al. (2011) reported a significant IECMH outcome for the subsample of highly irritable infants in their study (but not the moderately irritable infants). Horowitz et al. (2013) reported on two IECMH outcomes, with neither showing significant effects. Bagner et al. (2013) reported that two out of four IECMH outcomes evidenced significant increases at follow-up in a Spanish-speaking sample, but neither of the two IECMH outcomes measured at posttest showed significant increases.

Focused preventive interventions

Couple interventions to support the transition to parenthood—An intervention approach was classified in this category if the intended outcome was strengthening the partner and co-parenting relationship of couples expecting their firstborn child. Although our inclusion criteria would have allowed for interventions for same-sex couples, none were identified by our search. The single eligible intervention in this category focused on increasing productive communication, problem solving, and conflict management techniques. Only one study (Feinberg et al., 2016) contributed unique results to classification of evidence, reporting favorable results at immediate posttest based on a randomized trial. Additional studies by the same investigators in this time period (not included in Table 1) offered contextual information but did not contribute to classification of evidence. Using the same sample as Feinberg et al. (2016), Feinberg and Jones (2018) reported no significant differences on two different measures of IECMH (Child Behavior Checklist (CBCL) internalizing and externalizing behavior) either at posttest or at the follow-up. Using the same sample but a different analytic model, Jones et al. (2018) reported a significant difference on the CBCL internalizing but not externalizing behavior subscales. Results of this intervention from an earlier trial revealed no differences on child adjustment problems 3.5 years postintervention (Solmeyer et al., 2014).

Interventions to support adolescent mothers—This category represents interventions specifically developed and delivered to first-time adolescent mothers, who may not have attained an adequate level of cognitive, emotional, and behavioral maturity to promote optimal IECMH (Barlow et al., 2015; Crugnola et al., 2016 in Italy; Jacobs et al., 2016). Content typically was focused on improving the adolescent mother’s health and well-being, increasing positive parenting behaviors (e.g., responsiveness), and decreasing harmful parenting behaviors (e.g., coercive interactions). Three favorable studies of interventions to support adolescent mothers from different investigators with significant IECMH results were identified, though the age range of the samples considered “adolescent” varied across interventions: age 12–19 years (Barlow et al., 2015), under 21 years (Jacobs et al., 2016), and age 14–21 years (Crugnola et al., 2016).

Interventions to support breastfeeding by improving mother–infant interactions—One intervention aimed to improve mothers’ interpretation of and response to infant behavior to encourage continued breastfeeding. Additional content included breastfeeding guidance, mothers’ self-care, and planning for the mother’s return to work or school. Although the intervention’s main intended outcome was not IECMH, Wood and Sanders (2018) reported a significant improvement in IECMH scores from pretest to posttest.

Interventions to enhance parent–infant relationships—This category comprised interventions tested in the general population and focused specifically on enhancing the early parent–infant relationship through increasing sensitive and responsive parenting. The three interventions classified in this category (Barnes et al., 2017 in the United Kingdom; Cassibba et al., 2015 in Italy; Pontoppidan et al., 2016 in Denmark) began either prenatally or shortly after birth with no targeted criteria for study inclusion. In addition to the programs’ central aims regarding secure parent–child attachment, additional content may have included promoting infants’ cognitive development and physical health, parents’ life skills, social support, and attitudes toward parenting. Of the three eligible studies for this intervention approach, only the non-randomized Cassibba et al. (2015) evidenced a significant effect on IECMH. Not shown in Table 1, Torres et al. (2011) reported no follow-up effects, and Cerezo et al. (2013) found that higher dosage was associated with larger IECMH effects.

Interventions to promote positive parenting through shared reading and play—A single study investigated the effects of an intervention delivered universally through primary care practice focused on enhancing positive parent–child interactions through reading and play (Weisleder et al., 2016). In this study, interventionists recorded, reviewed, and provided parents with feedback on video-recorded shared reading and play interactions during well-child visits to primary care. Intervention and comparison groups did not differ significantly on IECMH.

Behavioral interventions to support parents of toddlers—Behavioral interventions that focused on increasing effective parenting practices in the toddler years (i.e., 18 months through 3 years) were classified into this intervention approach. Interventions in this

category focused almost exclusively on preventing and dealing with challenging behaviors in toddlerhood. This intervention approach was represented by two favorable studies from different investigators with significant IECMH results favoring the intervention group: Kochanska et al. (2013) based on a randomized study, and Lauw et al. (2014) in Australia based on a non-randomized study.

Broader-scope preventive interventions

Curriculum-based interventions for at-risk parents and families—Interventions in this approach offered the same parenting curriculum to all families in a selected at-risk sample. Content of the curricula typically emphasized sensitive and responsive parenting and may have included ancillary components related to infant development and safety, mothers' social support and coping, and maternal self-reflection. Three studies (Guttentag et al., 2014; Kaminski et al., 2013 reporting on two different curricula within this intervention approach; and Suess et al., 2016 in Germany) reported evaluations of this category of intervention. All reported equivalence of intervention and comparison groups at posttest on IECMH outcomes.

Tiered interventions to provide support based on assessed risk—This set of interventions is characterized by a formal assessment of parent, child, or family risk and assignment of families to different interventions or intensity of intervention based on their risk level. Chang et al. (2014) and Sitnick et al. (2015) reported on separate IECMH outcomes from the same four-site trial of the Family Check-up, which conducts a “comprehensive ecological assessment” of the family's strengths and areas in need of support before offering indicated intervention components. Svanberg et al. (2010) assigned mothers to one of three levels of intervention intensity based on initially assessed levels of maternal sensitivity. These approaches offer lower-dose interventions for families with lower assessed risk level, such as information about typical child development, and more intensive behavioral parenting strategies for families with higher levels of assessed risk. Results are reported for the sample as a whole, and thus represent the model of matching a set of tiered intervention strategies to family needs rather than any one of the approaches used. Chang et al. (2014) and Sitnick et al. (2015) reported on different IECMH outcomes from the same trial of the Family Check-Up, but only the results in Sitnick et al. (2015) favored the intervention group. Sitnick et al. (2015) also documented significant effects 2.5 years after intervention (at child age 7.5 years). Two additional articles (McEachern et al., 2013; Shelleby et al., 2012) reported on outcomes from the same four-site Family Check-Up evaluation. In a non-randomized study, Svanberg et al. (2010) also reported significant, positive effects of matching intervention intensity to formally assessed family needs.

Home visiting interventions to provide individualized support to families at risk—The most frequently appearing intervention was home visiting programs, in which a professional, paraprofessional, or trained peer mentor engages the family in their home regularly for up to a year or more. The interventionist provides individualized support, teaches child development knowledge and parenting skills, promotes the child's physical health and safety, assists with referrals to community services, and/or offers parent-focused components such as stress reduction or economic planning. Programs may have been

offered universally within an economically disadvantaged geographic area to families who qualify as having low income, to mothers who received inadequate prenatal care, or to families identified as having multiple sociodemo-graphic risks. Two randomized studies of home visiting by different investigators reported significant IECMH outcomes for the intervention group (Cluxton-Keller et al., 2014; Fergusson et al., 2013). Notably, Fergusson et al.'s (2013) classifiable results represent a repeated-measures analysis of scores from age 5 (immediate posttest) through 9 years, suggesting sustained impact of that intervention. Six additional randomized studies showed equivalence of the intervention and comparison groups on IECMH outcomes (Côté et al., 2018; Cupples et al., 2011; Katz et al., 2011; Kemp et al., 2011; Sierau et al., 2016; Tereno et al., 2017). Three of the four non-randomized studies (Cullen et al., 2010; Sadler et al., 2013; Sidor et al., 2013) documented positive outcomes for the intervention group, while one non-randomized study (Chartier et al., 2017) failed to show a significant difference on IECMH outcomes.

DISCUSSION

Previous reviews of interventions related to IECMH in the *Journal of Marital and Family Therapy* (Estrada & Pinsof, 1995; Kaslow et al., 2012) have not been classified using the Evidence Base Update criteria. Thus, for the purposes of classifying level of evidence, we also incorporated any eligible studies published between 2000 and 2009 that would influence the classification of an intervention approach. Of the 26 eligible studies in those earlier years, the results of only two (Caughy et al., 2004 for *Tiered Interventions to Provide Support Based on Assessed Risk*; Niccols, 2009 for *Behavioral Interventions to Support Parents of Toddlers*) would change the classification of evidence for an intervention approach.

Evidence Base Update classifications

Supplemental File B shows the determination made for each individual study within the intervention approach categories, to reflect whether a study's IECMH outcomes as a whole documented the superiority of the intervention group, the superiority of the comparison group, or the equivalence of the intervention and comparison groups. The resulting classification of evidence for each intervention approach was determined by the application of the Southam-Gerow and Prinstein (2014) criteria, which consider the number of favorable versus equivalent or unfavorable studies for randomized and nonrandomized study designs, to each intervention approach category. Using those criteria, no intervention approach in this review was classifiable as Well-Established. With the inclusion of the two earlier studies noted above, four intervention approaches were classifiable as Level 2, Probably Efficacious: *Behavioral Interventions to Support Parents of Toddlers*, *Interventions to Support Adolescent Mothers*, *Tiered Interventions to Provide Support Based on Assessed Risk*, and *Home Visiting Interventions to Provide Individualized Support to Parents*. The first three represented consistent significant results on IECMH outcomes (i.e., a greater number of randomized studies showed superiority of the intervention group than equivalence or inferiority) using different curricula and thus appear to be robust to variations in program delivery and type of IECMH outcome reported. The fourth Probably Efficacious approach, *Home Visiting Interventions to Provide Individualized Support to Parents*, documented

greater variability in individual study results, as evidenced by two randomized studies documenting superiority of the intervention group and five randomized studies documenting equivalence of the intervention and comparison groups.

Two intervention approaches were classified as Level 3: Possibly Efficacious. *Couple Interventions to Support the Transition to Parenthood* was represented by one eligible study (Feinberg et al., 2016) and five non-classifiable studies (i.e., duplicate reports or follow-up results) of a single program: Family Foundations (Feinberg et al., 2009; Feinberg & Jones, 2018; Feinberg & Kan, 2008; Jones et al., 2018; Solmeyer et al., 2014). *Parent-Infant Psychotherapy* was represented by four studies, two of which (Bagner et al., 2013, 2016) tested a version of PCIT, which also has an extensive body of evidence with children aged 2 to 7 years (Thomas et al., 2017). *Parent-Focused Psychotherapy, Interventions to Enhance Parent-Infant Relationships*, and *Interventions to Support Breastfeeding by Improving Mother-Infant Interactions* each had at least one non-randomized study suggesting evidence of positive effects on IECMH, which sufficed to be classified as Experimental. Neither *Curriculum-Based Interventions for At-Risk Parents and Families* nor *Interventions to Promote Positive Parenting through Shared Reading and Play* had an eligible study showing intervention superiority, which meant they could not be classified under the current criteria based on the time period for this review.

Comparison to previous reviews of evidence

With respect to *Behavioral Interventions to Support Parents of Toddlers*, interventions included in this review were tested universally within a population or selectively with an at-risk population. The literature on treatments for disruptive and other challenging behaviors in young children has been reviewed elsewhere using these same criteria and procedures, concluding that two intervention approaches (group-based behavioral parent training and individually delivered behavioral parent training with child participation) classified as Well-Established for treatment of disruptive behaviors in children 12 years of age and younger (Kaminski & Claussen, 2017). Our findings support this type of intervention approach in universal and at-risk contexts for children less than 3 years old.

Interventions to Support Adolescent Mothers typically target outcomes other than IECMH, such as preventing repeat pregnancies, supporting the mother's educational and occupational attainment, and reducing negative or harsh parenting behaviors. Thus, the published literature on interventions for adolescent mothers is broader than the three eligible studies for this IECMH review. A 2011 Cochrane review of individual and group-based parenting programs for adolescent parents included the IECMH outcome of infant responsiveness to the mother as one of the outcomes of interest and reported significant positive effects (Barlow et al., 2011). The level of evidence based on the three more recent adolescent parenting programs reviewed here continue to support that finding.

Similarly, *Tiered Interventions to Provide Support Based on Assessed Risk* can have a range of different intended outcomes for children and families other than IECMH. The Family Check-Up (Chang et al., 2014; Sitnick et al., 2015), housed in primary care, focuses on the ultimate outcome of reducing children's conduct problems. Also housed in primary care, HealthySteps (Caughy et al., 2004) aims to promote the health, well-being,

and school readiness of babies and toddlers. Considering outcomes other than IECMH might lead to different conclusions about the strength of evidence for these intervention approaches. Another well-known intervention that would have been categorized into this tiered-intervention approach is the Triple P Parenting Program. Although no articles on Triple P met the inclusion criteria for this review due to age and/or children in the sample, the effectiveness of the program has been reviewed elsewhere via meta-analysis (e.g., Nowak & Heinrichs, 2008).

Home visiting interventions were originally developed to address a wide range of outcomes, including improving child physical and cognitive health, preventing child maltreatment, and improving the life course of the mothers themselves (U.S. Department of Health & Human Services, n.d.). Filene et al. (2013) reported outcomes in six domains from a meta-analysis of home visiting programs: birth outcomes, maternal life course outcomes, parenting behavior and skills, child cognitive outcomes, child physical health, and child maltreatment. IECMH outcomes were not included in the Filene meta-analysis because too few home visiting studies reported on this measure at that time. Filene and colleagues also note the wide variety of content included in home visiting programs in that review, and the overall small effect sizes documented. Similarly, although Nievar et al. (2010) reported significant effect sizes for parenting outcomes in their meta-analysis of home visiting programs for at-risk families, no IECMH outcomes were reported, and the authors noted the significant variability in effect size and diversity of home visiting programs. Summative statements about the evidence for any group of interventions that share the home visitation delivery model may therefore not represent all home visiting programs.

To increase generalizability of results, this review did not focus on specific risk populations such as those who have experienced child maltreatment or other trauma. Meta-analyses of interventions designed for trauma-exposed populations (e.g., Bakermans-Kranenburg et al., 2003; Facompré et al., 2018) have reported that that couple and family-based interventions (inclusive of a variety of approaches) demonstrated small effects in improving young children's mental health with larger effects in higher risk groups. However, similar to meta-analyses of IECMH interventions not specifically for trauma exposure (e.g. Mortensen & Mastergeorge, 2014; Nievar et al., 2010; Piquart & Teubert, 2010) substantial heterogeneity exists in interventions and effect sizes. Thus, caution is warranted in making comparisons across evidence review findings in the IECMH field. The current review is intended as a benchmark for future Evidence Base Updates.

Limitations

As with all reviews of published evidence, this review was limited to the quality, quantity, and content of the published literature. Publication bias in favor of significant findings was a possibility, as with any study based on peer-reviewed articles, which could appear as either particular findings not being presented in eligible studies, or with non-significant studies less represented in the literature. Many of the approaches here were either only tested on one population, or on populations similar in sociodemographic and racial and ethnic distributions. The level of evidence for an intervention approach cannot be assumed to represent effectiveness if implemented with populations that differ in sociodemographic,

racial, and ethnic background, or in language spoken from those in the included studies here. The focus on IECMH outcomes necessitated exclusion of outcomes in other potentially important parent, child, and family domains. Although ample previous literature links parent behavior to child outcomes, in the context of couple and family-based psychosocial interventions to promote IECMH (i.e., parent–child relations and child emotional and behavioral indicators), parent behaviors are the intended mediator of change to achieve better IECMH. Programs that have only documented effects on parental behavior mediators, without evidence of effectiveness in influencing IECMH outcomes, could risk being a poorer population-level investment of family, provider, and payer resources, as compared with programs with previously documented effects on IECMH. Reviewing the evidence for parenting behavior outcomes might lead to different conclusions about program effectiveness.

Classifying intervention approaches, rather than specific branded or packaged programs, also creates limitations. The level of evidence of a general approach cannot be assumed to be true for every specific program that would be categorized in an approach. Before adopting a specific program or model, decision-makers can consult the literature on a particular program. If convincing evaluation evidence is not available for a particular program, evidence reviews such as the current review and others identifying key characteristics of effective programs (e.g. Filene et al., 2013; Kaminski et al., 2008; Mortensen & Mastergeorge, 2014; Nievar et al., 2010; Pinquart & Teubert, 2010) can also guide decision-making.

Gaps in the literature

Although the interventions reviewed span a variety of couple and family-based psychosocial interventions for IECMH, gaps in the literature were noted. No interventions specific to fathers were identified as eligible for this review. DeGarmo (2020) similarly noted the limited availability of parent training interventions for fathers of young children and proposed strategies to tailor existing interventions for fathers and to promote father engagement in parenting programs. We are also unable to draw conclusions about the possible impact of each intervention approach on health equity. Stress due to racial and economic inequalities may compromise early childhood mental health and development (Braveman et al., 2018). Measuring the impact of interventions by their success in addressing racial/ethnic health inequities may inform which interventions are most likely to reduce those inequities (Bailey et al., 2021).

Future directions

If, because of previously documented small to medium effect sizes and limited geographic coverage of effective programs, available couple and family-based psychosocial interventions are not sufficient alone to support population-level IECMH, a broader public health approach could be considered, and has been recommended by NASEM (2019a, 2019b). Hoagwood and Kelleher (2020) offered a set of propositions for renewal of children’s mental health after the COVID-19 pandemic that suggest future directions, including: (1) making services available in locations convenient to the family; (2) realigning

an alternative payment system; and (3) promoting equity by meeting parents' basic mental health and economic security needs.

Making services accessible—The interventions in this review represent a variety of different delivery methods, many of which had the stated intent of making the intervention more accessible. Home-visiting programs aim to remove access barriers by bringing the interventionist to the family, yet these interventions bear the costs of transportation and individual delivery. Primary care offers the opportunity to provide intervention where families visit routinely. Behavioral health interventions integrated into primary care have been recommended to support families of children aged 0–5 years (Brown et al., 2018) and to increase the reach of family-focused preventive programs (Leslie et al., 2016) such as those reviewed here. Primary care settings were represented primarily in this review by the Probably Efficacious approach of *Tiered Interventions to Provide Support Based on Assessed Risk*; other models could be adapted and evaluated for effectiveness in primary care settings. Notably absent from this literature were interventions delivered in any other mode than in-person. Future research could explore how to optimize effectiveness of telehealth delivery methods, to further increase the number of families who can potentially benefit from support.

Implementing alternative payment models—Many of the evaluations included in this review were based on research studies, accompanied by research funding to support the intervention during the evaluation. Other programs were government-funded, which supports the program for the duration of the policy authorizing or mandating it. Emerging opportunities for alternative payment models may offer more long-term sustainable funding options to support IECMH. The Centers for Medicare and Medicaid Services' Integrated Care for Kids demonstration projects are piloting payment models that include paying for prevention to reduce future expenditures and support children's behavioral health needs (Centers for Medicare & Medicaid Services, 2020). Some states are also exploring models of integrated family care, which treat the family (rather than only the child) as the unit of care, such as paying for services prior to the child showing symptoms of a mental disorder (Brundage & Shearer, 2019). Finally, other entities are exploring accountable communities for health (ACH) for children and families (Gratale et al., 2020) which involve cross-sector partnerships working together on a shared vision and responsibility to improve child health. Additional research could document if the couple and family-based approaches with strongest evidence in this review would provide cost savings and returns on investment within ACH models.

To explore alternative payment structures, ZERO TO THREE launched their Infant and Early Childhood Mental Health Financing Policy Project in 2016 to support innovations in state policy to advance IECMH assessment, diagnosis, and treatment, such as a 1115 Medicaid waiver application to intervene as early as possible and the inclusion of social determinants of health to qualify individuals for services (Cohen et al., 2019). In addition, many of these states have included training on the clinical diagnostic DC: 0–5 tool for infant and early childhood mental disorders (ZERO TO THREE, 2016), and integration of this tool into their services and reimbursement systems. Results from these pilot efforts are

still pending and may offer state-level policy options to promote IECMH (Cohen & Stark, 2020). Similarly, calls have been published for transformation of the health care system to reimburse for prevention, rather than only treatment (Counts et al., 2018).

Promoting equity by meeting parents' basic needs—Economic security policies may be an underutilized prevention strategy to reduce the number of children and families who need other support services (Yoshikawa et al., 2012). For example, the Earned Income Tax Credits program (EITC) for low- and moderate-income workers was included by NASEM (2019a, 2019b) as one of the ten national strategies that could reduce child poverty by 50% within a decade. Research on EITC has indicated that higher EITC payments were associated with improved child behavioral health scores (Hamad & Rehkopf, 2015). The Centers for Disease Control and Prevention (CDC) has also identified EITC as one approach that can show positive health impacts within 5 years and offers cost savings over the lifetime of the population (Centers for Disease Control & Prevention, 2018). The CDC Foundation, in partnership with the Robert Wood Johnson Foundation, has published an EITC public health action guide to assist public health professionals to learn about the development, enactment, and implementation of EITCs (CDC Foundation, n.d.). In addition, paid family leave policies can support the transition to parenting for those financially unable to take unpaid leave, by allowing parents time to connect with their new infant and develop new parenting routines without the stressors of competing work demands (NASEM, 2019a, 2019b). Studies have suggested that shorter maternity leave is associated with observed infant dysregulation and irritability in maternal–child interactions (Clark et al., 1997), externalizing behaviors among children at age 4 (Berger et al., 2005), and attachment security, indirectly, through the quality of parenting interactions (Plotka & Busch-Rossnagel, 2018). Future research could determine if economic security policies such as EITC and paid family leave reduce the number of parents and families needing more intensive treatment to support their children's mental health.

CONCLUSIONS

No intervention approaches in this review were classified as Well Established, the highest level attainable via the Evidence Base Update criteria. Our review classified four intervention approaches as Probably Efficacious for IECMH outcomes. Two intervention approaches were classified as Possibly Efficacious, three met criteria as Experimental, and two did not have sufficient published evidence in this time period to classify. Additional research on couple and family-based interventions to promote IECMH may help identify approaches that could set up young children for lifelong success. However, given previously documented barriers to accessibility and availability of children's mental health services, future research could also explore how to ensure that all families who need support can receive it, such as by increasing the reach of effective programs and/or by decreasing the number of families needing additional support to optimize the mental health of infants and young children.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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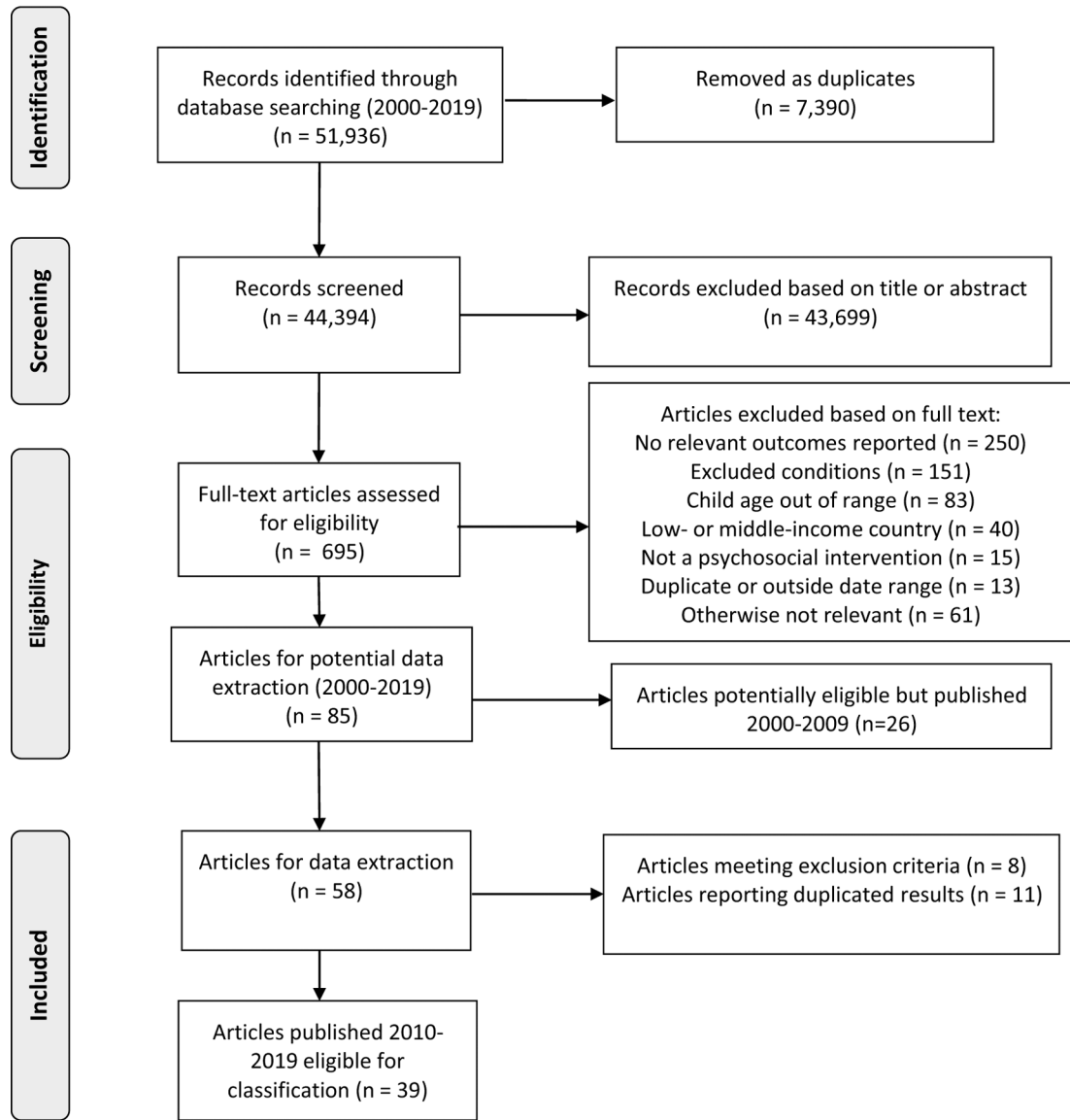


FIGURE 1. PRISMA flow diagram for studies of couple and family-based psychosocial interventions to promote infant and early childhood mental health, 2010–2019

Eligible studies for classification of couple- and family-based psychosocial interventions for infant and early childhood mental health, 2010–2019

TABLE 1

Authors (Year)	Study conditions	Sample size	Sample characteristics	Focal outcomes	Assessment points	Results
IECMH treatments						
Parent-focused psychotherapy						
Lowell et al. (2011)	1. Child FIRST home-based parent psychotherapy 2. Control = usual care (C)	157 mother-child dyads	Mother <i>M</i> age: Child FIRST = 27.7 years; C = 26.9 years Child age: 5.4–35.9 months at baseline Child Gender: Child FIRST = 57.7% Girls; C = 54.4% Girls Maternal ethnicity: Child FIRST = 60.3% Latino/Hispanic, 26.9% African American, 6.4% Caucasian, 6.4% other; C = 57% Latino/Hispanic, 32.9% African American, 8.9% Caucasian, 1.3% other Location: USA	ITSEA, PSI Short Form (Difficult Child)	Post (6-months after baseline), 12-month FU (12 months after baseline)	Post externalizing symptoms: Child FIRST = C Post internalizing symptoms: Child FIRST = C Post dysregulation: Child FIRST = C Post Difficult Child: Child FIRST < C
Paris et al. (2011)	1. Early Connections home-based parent psychotherapy	25 mother-infant dyads, including 3 sets of twins (28 infants)	Infant <i>M</i> age: 17 weeks (range = 1–63 weeks) Mother <i>M</i> age: 32.96 Mother race/ethnicity: 75% Caucasian, 12.5% Asian, 4.2% Black, 4.2% Latina, 4.2% Biracial Location: USA	PSI Short Form (Difficult Child), modified CIB Manual (Positive Affect, Negative Emotionality, Initiation and Involvement, Dyadic Reciprocity)	Pre; Post	Difficult Child Post < Pre Positive Affect Post > Pre Negative Emotionality Post = Pre Initiation and Involvement Post > Pre Dyadic Reciprocity Post = Pre
Puckering et al. (2010)	1. Mellow Babies group psychotherapy intervention 2. Waiting list control (C)	17 mother-infant dyads	Location: Scotland	Video-taped interaction and Mellow Parenting observation coding scheme	Pre; Post	Post Positive Responsiveness Mellow Babies > C Post Positive Co-operation Mellow Babies = C Post Negative Responsiveness Mellow Babies = C Post Negative Co-operation Mellow Babies = C
Salomonsson and Sandell (2011)	1. Mother-infant psychotherapy (MIP) 2. Usual care comparison (C)	80 mother-infant dyads	Location: Sweden Infant <i>M</i> age: MIP = 4.4 months; C = 5.9 months Infant gender: MIP = 60% girls; C = 57% girls Mother <i>M</i> age: MIP = 34; C = 32.3	ASQ:SE, Parent-infant relationship (PIR-GAS)	Pre; Post	ASQ-SE Post-MIP = C PIR-GAS Post-MIP > C
Smith et al. (2010)	1. Parent and Infant Relationship Support (PAIRS) 2. Comparison (C)	74 mother-infant dyads	Infant <i>M</i> age: 9 months Location: USA	DMC mother-infant attachment, BSID behavior	Pre; Post	DMC Post-PAIRS > Pre-PAIRS DMC Post-C = Pre-C
Suchman et al. (2010)	1. Mothers and Toddlers Program (MTP)	47 mother-infant dyads	Mother <i>M</i> age: MTP = 31; C = 29 Mother race/ethnicity: MTP = 22% “minority”; C = 38% “minority”	NCAST behavior	Pre; Post	Post NCAST total score PAIRS = C

Authors (Year)	Study conditions	Sample size	Sample characteristics	Focal outcomes	Assessment points	Results
Parent-infant psychotherapy	2. Parent Education Program comparison (C)		Child <i>M</i> age (months): MTP = 19; C = 17 Location: USA			Post NCAST total contingency PAIRS = Post C
Bagner et al. (2013)	1. Home-based Parent-Child Interaction Therapy	7 parents and their infants	Maternal <i>M</i> age: 31 years Infant ages: 12–15 months Ethnicity: 100% Hispanic Location: USA	ITSEA, CBCL	Baseline, 6 month FU	ITSEA Externalizing Baseline = FU ITSEA Dysregulation Baseline = FU CBCL Externalizing Baseline > FU CBCL Emotionally Reactive Baseline > FU
Bagner et al. (2016)	1. Home-based Parent-Child Interaction Therapy (PCIT) 2. Usual care (C)	60 mother-infant dyads	Mother <i>M</i> age = 30 years Ethnicity: 90% Hispanic; Race: 80% White; 10% Black, 2% Asian, 2% Bi-racial, 6% other Infant <i>M</i> age = 13.5 months Location: USA	ITSEA	Baseline; 6-month FU	Compliance PCIT > C Activity/Impulsivity PCIT = C Aggression/Defiance: PCIT < C Internalizing PCIT < Control
Cassidy et al. (2011)	1. COS-HV4 home-based parenting intervention 2. Alternate home visiting treatment comparison (C)	220 mother-infant dyads	Mother <i>M</i> age = 24 years Infant race/ethnicity: 43.2% African American/Black, 20.5% White, 18.6% more than one race, 14.1% Hispanic, 2.7% Asian, 0.5% Native American/Alaska Native and 0.5% Hawaiian Native/Pacific Islander Infant gender: 98 girls, 122 boys Location: USA	SSP	3-month FU	FU Attachment COS-HV4 > C (highly irritable infants) FU Attachment COS-HV4 = C (moderately irritable infants)
Horowitz et al. (2013)	1. CARE home-based maternal-infant interaction intervention 2. Alternate home visiting treatment control (C)	134 mother-infant dyads	Mother <i>M</i> age: 31 years Mother race/ethnicity: 54% Caucasian, 22% Hispanic, 12% African American, 8% Asian, 5% other Location: USA	NCATS Responsiveness to Caregiver scale	Pre; Mid-treatment; Post	Post NCATS Responsiveness to Caregiver CARE = C
Focused preventive interventions						
Couple interventions to support the transition to parenthood						
Feinberg et al. (2016)	1. Family Foundations (FF) Transition to Parenting 2. Control (C)	399 Parents	Mothers <i>M</i> age = 29.1 years; Father <i>M</i> age = 31.1 years Race/Ethnicity: 81% non-Hispanic White 7% Hispanic, 6% Black, 4% Asian, 2% multiple races/ethnicities Location: USA	Infant Behavior Questionnaire: child soothing and duration of orientation	Post	Post child soothing: FF > C Post child duration of orientation: FF > C
Interventions to support adolescent mothers						
Barlow et al. (2015)	1. Family Spirit intervention+optimized standard care (ES) 2. Optimized standard care comparison (C)	322 Mothers	Mother <i>M</i> age = 18.1 years Race/Ethnicity: 100% American Indian from White Mountain Apache, San Carlos Apache, and Navajo Reservations Location: USA	ITSEA	Post	Post ITSEA Externalizing: FS < C Post ITSEA Internalizing: FS < C Post ITSEA Dysregulating: FS < C

Authors (Year)	Study conditions	Sample size	Sample characteristics	Focal outcomes	Assessment points	Results
Crugnola et al. (2016)	1. Promoting Responsiveness, Emotion Regulation and Attachment in Young Mothers and Infants (PRERAYMI) 2. Routine Postnatal Care (C)	48 Mother-infant dyads	Mother Age (PRERAYMI Group) = 18.75 years; Mother Age (Control Group) = 17.94 years Location: Italy	Child-Adult Relationship Experimental Index	Mid-treatment, Post	Post ITSEA Competence: FS = C Mid-Post Cooperative style: PRERAYMI > C Mid-Post Difficult style: PRERAYMI = C Mid-Post Compliant-Compulsive style: PRERAYMI = C Mid-Post Passive style: PRERAYMI < C
Jacobs et al. (2016)	1. Healthy Families Massachusetts (HFM) 2. Control (C)	837 Mothers	Mother Age = 18.8 years Race/Ethnicity: 36.8% Non-Hispanic White; 19.0% Non-Hispanic Black; 36.1% Hispanic; 8.1% Non-Hispanic other Child gender: 52% male Location: USA	Behavior Problems: BITSEA Difficult Child Behavior: PSI Short Form	Mid-Treatment; Post	Mid PSI Difficult Child: HFM < C Mid + Post BITSEA Child Behavior Problems: HFM = C
Interventions to support breastfeeding by improving mother-infant interactions						
Wood and Sanders (2018)	1. Breastfeeding intervention (Protecting Your Ability to Breastfeed Your Baby)	14 mother-infant dyads	Race/Ethnicity: 64% Caucasian, 21% Asian, 7% Asian Hispanic, 7% Asian Caucasian Location: USA	Clarity of Cues and Responsiveness to Caregiver	Pre, Mid-treatment, Post	Clarity of Cues Post > Pre; Responsiveness to Caregiver Post > Pre
Interventions to enhance parent-infant relationships						
Barnes et al. (2017)	1. Group Family Nurse Partnership (gFNP) + usual care 2. Control/usual care (C)	164 Mother-infant dyads	Mother Age = 21 years Race/Ethnicity: (gFNP group): 63.5% White-British, 14.6% Black British-Caribbean; Race/Ethnicity (C): 71.6% White-British, 9.0% Black British-Caribbean Location: United Kingdom	CARE Index: Infant Cooperativeness	Post	Post Infant cooperativeness: gFNP = C
Cassibba et al. (2015)	1. Video-Feedback Intervention to Promote Positive Parenting with Discussions on the Representational Level (VIPP-R) 2. Comparison (C)	32 Mother-infant dyads	Mother Age = 33 years Location: Italy	SSP	Pre; Post	Post SSP Attachment Security: VIPP-R > C
Pontoppidan et al. (2016)	1. Incredible Years Parents and Babies (IYPB) program + Usual Care 2. Usual Care	112 Families	Mother Age = 29 years 95–100% spoke Danish as first language Child Age = 1.5–1.6 months Location: Denmark	ASQ:SE and a single item on child temperament	Pre; Post	Post ASQ-SE: IYPB + Usual Care = Usual Care Post Temperament: IYPB + Usual Care = Usual Care
Interventions to promote positive parenting through shared reading and play						
Weisleder et al. (2016)	1. Video Interaction Project (VIP) materials (BB) 3. Comparison (C)	675 Mother-infant dyads	Mother age < 21 years: VIP = 10%, BB = 12%, C = 9% Ethnicity: VIP = 94% Hispanic, BB = 96% Hispanic, C = 92% Hispanic Child gender: VIP = 56% female, BB = 51% female, C = 48% female Location: USA	ITSEA: imitation/play, attention, and separation distress. BASC-2: social skills, attention problems, hyperactivity, and aggression.	Mid-treatment; Post	Post Social Skills: VIP = Control; Post Attention Problems: VIP = Control; Post Hyperactivity: VIP < Control; Post Aggression: VIP = Control;

Authors (Year)	Study conditions	Sample size	Sample characteristics	Focal outcomes	Assessment points	Results
Behavioral interventions to support parents of toddlers						
Kochanska et al. (2013)	1. Child-oriented play group (Treatment) 2. Play-as-usual group (C-Play) 3. Historical community group (C-Community)	186 Mothers (Treatment and Control-Play Groups); 102 Mothers (Control-Community Group)	Mother <i>M</i> age = 27.54 years Ethnicity: 10.8% Hispanic, 87.1% not Hispanic, 2.2% other Race: 1.6% American Indian, 1.6% Asian, 14.5% African American, 72.6% White, 7% more than one race Child <i>M</i> age 30.33 months Child gender: ~50% female Location: USA	Committed compliance, Noncompliance (video coded), ITSEA Competence	Pre; Post; Follow-up	Pre-F/U Compliance/Cooperation: Treatment >C-Play Pre-F/U Competence: Treatment = C-Play
Launw et al. (2014)	1. Tuning in to Toddlers (TOTS)	34 Mother-infant dyads	Mother <i>M</i> age = 36.15 years Child <i>M</i> age = 25.37 months Child gender: 41% female Location: Australia	BITSEA	Pre; Post	BITSEA externalizing: TOTS Post < TOTS Pre
Broader-scope preventive interventions						
Curriculum-based interventions for at-risk parents and families						
Gutentag et al. (2014)	1. My Baby & Me (MBM) 2. Comparison (C)	361 Mothers	Teen Mother <i>M</i> age = 17.18 years, Adult Mother <i>M</i> age = 24.29 years Race/Ethnicity: 56.23% African American, 35.45% Hispanic, 11.91% White non-Hispanic Location: USA	BITSEA	Mid-treatment; Post	Post Competence: MBM = C Post Problems: MBM = C
Kaminski et al. (2013)—LA curriculum	1. Legacy for Children—LA (Legacy) 2. Comparison (C)	606 Mother-infant dyads (LA and Miami combined)	(LA and Miami combined) Mother <i>M</i> age = 24 years Race/Ethnicity: 57% non-Hispanic Black, 24.9% Hispanic Location: USA	BITSEA, DECA, SDQ	Mid-treatment; Post; Follow-up	Post DECA behavioral concerns: Legacy=C Post DECA socioemotional: Legacy=C
Kaminski et al. (2013)—Miami curriculum	1. Legacy for Children—Miami (Legacy) 2. Comparison (C)	606 Mother-infant dyads (LA and Miami combined)	(LA and Miami combined) Mother <i>M</i> age = 24 years Race/Ethnicity: 57% non-Hispanic Black, 24.9% Hispanic Location: USA	BITSEA, DECA, SDQ	Mid-treatment; Post; Follow-up	Post DECA behavioral: Legacy=C Post DECA socioemotional: Legacy=C Post SDQ conduct: Legacy=C Post SDQ hyperactivity: Legacy=C Post SDQ peer problems: Legacy=C
Suess et al. (2016)	1. Steps Toward Effective and Enjoyable Parenting (STEEP) 2. Standard services of the German Child Welfare System	107 mother-infant dyads	Mother <i>M</i> age (STEEP) = 18.08 years, Mother <i>M</i> age (standard care) = 19.34 years Location: Germany	SSP, Attachment Q Sort, PSI Difficult Child	Mid; Pos	Post Attachment (secure): STEEP = Standard Care Post Attachment (insecure): STEEP = Standard Care Post Attachment (disorganized): STEEP = Standard Care Post Attachment (organized):

Authors (Year)	Study conditions	Sample size	Sample characteristics	Focal outcomes	Assessment points	Results
Tiered interventions to provide support based on assessed risk						
Chang et al. (2014)	1. Family Check-up (FCU) 2. Comparison (C)	731 Caregiver-Infant Dyads	Child <i>M</i> age = 29.9 months Child gender: 49% female Child Race/Ethnicity: 50% European American, 28% African American, 13% biracial, 9% other, 13% Hispanic Location: USA	Inhibitory Control subscale of the Children's Behavior Questionnaire DSM-oriented narrowband scale of Oppositional Defiant Problems	Pre; Mid-Treatment; Post; Follow-up	STEEP >Standard Care Post Attachment (D-Score): STEEP < Standard Care PostAttachment (QRS): STEEP = Standard Care Post PSI (difficult child): STEEP = Standard Care
Sitnick et al. (2015)	1. Family Check-up (FCU) 2. Comparison: care as usual	731 caregiver-child dyads	Child <i>M</i> age = 29.9 months; Child gender: 49% female; Child Race: 50% European American, 28% African American, 13% biracial, 9% other Child Ethnicity: 13% Hispanic; Location: USA	OPP/AGG measure based on CBCL	Pre; Mid-treatment; Post	Post OPP and AGG behaviors: FCU < comparison
Svanberg et al. (2010)	1. Sunderland Infant Programme 2. Routine Care	323 Mothers	Mother <i>M</i> age = 26.1 Child gender: 52% male Location: England	SSP, CARE-Index	Post	Post Cooperativeness: Infant Programme >routine care Post Compulsivity: Infant Programme < routine care Post Difficultiness: Infant Programme = routine care Post Passivity: Infant Programme = routine care Post Secure Attachment: Infant Programme >routine care
Home visiting interventions to provide individualized support to families at risk						
Chartier et al. (2017)	1. Families First participants 2. Eligible for Family First, but did not participate	9746 Mother-child dyads	Mother <i>M</i> age = 21 years Location: Canada	Early Development Index	Post	Post Developmentally vulnerable in Social Competence: FFHV participants = Eligible Post Developmentally vulnerable in Emotional Maturity: FFHV participants = Eligible
Cluxton-Keller et al. (2014)	1. Healthy Families Alaska (HEAK) 2. Services as usual	364 Mother-infant dyads	Mother <i>M</i> age = 23.5 years Race/Ethnicity: 20% Alaskan Native, 56% Caucasian, 8% Multiracial, 16% other Child sex: 51% female Location: USA	CBCL	Mid-treatment; Post	Mid-Post Externalizing: HFPAK=services as usual Mid-Post Internalizing: HFPAK<services as usual
Côté et al. (2018)	1. Treatment (a home visiting program, Baby Massage Training,	232 Mothers	Mother <i>M</i> age = 25 years Location: Ireland	CBCL	Post	Post CBCL Externalizing High Trajectory: PFL = C

Authors (Year)	Study conditions	Sample size	Sample characteristics	Focal outcomes	Assessment points	Results
Cullen et al. (2010)	and the Triple P Positive Parenting Program (PPP) 2. Control (C) 1. Healthy Families America (HFA)	201 mother-infant dyads (and partners when possible)	Mother age: 73% age 19 years or less, 11% age 14 years or less Race/Ethnicity: 78% white, 17% Black/African-American, 2% Hispanic/Latino, 3% other Location: USA	ASQ-SE	Post	Post CBCL Internalizing High Trajectory: PFL = C Post Social and emotional competence: HFA observed >expected
Cupples et al. (2011)	1. Peer mentor 2. Control (C)	343 Pregnant Women	Mother <i>M</i> age = 22 years Location: Northern Ireland	BSID, PSI	Post	Post BSID Emotional Regulation: Peer mentor = C Post PSI Difficult Child Peer mentor = C
Fergusson et al. (2013)	1. Early Start 2. Comparison	443 families	Maternal Age: 24 years at enrollment Race/Ethnicity: Primarily New Zealanders, 24.8–26.7% Maori Child Age: <3 months at enrollment Location: New Zealand	SDQ	Post; Follow-Up	Post-F/U behavior problem scores: Early Start < comparison
Katz et al. (2011)	1. Pride in Parenting 2. Control	286 women at delivery	Mother <i>M</i> age = 30 years Race/Ethnicity = 98.6% African American, 1.4% other Location: USA	IBS	Post	Post IBS: Pride in Parenting = Control
Kemp et al. (2011)	1. Nurse home visiting program (HV) 2. Usual Universal Care (C)	208 Mothers	Mother <i>M</i> age = 28 years (48% (comparison) and 50% (intervention) were born in Australia) Location: Australia	National Institute for Child Health and Development scales of parent-child interaction; BSID II	Mid-treatment	Mid-Treatment Engaged Child HV = C Mid-Treatment Behavior Development Percentile HV = C
Sadler et al. (2013)	1. Minding the Baby 2. Usual care	139 Mother-infant dyads	Mother <i>M</i> age = 19.6 years Race/Ethnicity: 62% Latina, 28% African American or of Caribbean descent, 10% mixed ethnic/racial backgrounds Child gender: 52% Male Location: USA	SSP	Mid-treatment	Mid Secure attachment: Minding the Baby >usual care Mid Disorganized attachment: Minding the Baby < usual care
Sidor et al. (2013)	1. "Keinerf allt durchsNetz"; "Nobody Slips Through the Net" (KfIdN) 2. Comparison	302 mother-child dyads	Mother <i>M</i> Age: KfIdN = 24.5 years (KfIdN), 28.2 years (Comparison)	ASQ; PSI Difficult Child	Pre; Post	Post ASQ Social Development: KfIdN >comparison Post PSI-SF Difficult Child: KfIdN < comparison
Sierau et al. (2016)	1. Pro-Kind 2. Control	755 low-income first-time mothers	Mother age = 21–22 years Location: Germany	BSID-II; CBCL	Mid-treatment; Post	Post Socio-emotional development (internal): Pro-Kind = Control Post Socio-emotional development (external): Pro-Kind = Control
Tereno et al. (2017)	1. Compétences paren taleset Attachement dans la Petite	367 mothers recruited (SSP data only)	Mother <i>M</i> age = 23 years Race: 59% French National origin Location: France	SSP	Mid-treatment	Mid Disorganized: CAPEDP < Usual Care Mid Organized: CAPEDP =

Authors (Year)	Study conditions	Sample size	Sample characteristics	Focal outcomes	Assessment points	Results
	Enfance (CAPEDP) 2. Usual care	available for 117 mother-infant dyads)				Usual Care Mid Disrupted: CAPEDP = Usual Care Mid Not Disrupted: CAPEDP = Usual Care

Abbreviations: ASQ, Ages and Stages Questionnaire; ASQ:SE, Ages and Stages Questionnaire: Social Emotional; ASQ:SE-2e, Ages and Stages Questionnaire: Social-Emotional-2 experimental version; BASC-2, Behavior Assessment System for Children–Second Edition; BITSEA, Basic Infant–Toddler Social and Emotional Assessment; BSID, Bayley Scales of Infant Development; CARE–Index, Child–Adult Relationship Experiment Index for Infants; CBCL, Child Behavior Checklist; DECA, Devereux Early Childhood Assessment; DMC, Dyadic Mutuality Code; ECBI, Eyberg Child Behavior Inventory; F/U, Follow-up; IBS, Infant Behavior Scale; ITSEA, Infant–Toddler Social and Emotional Assessment; *M*, Mean; Mid + Post, Results reflect mid-treatment for some participants and post-test for other participants; Mid-Post, Results reflect mid-treatment to posttest mean or change; NBAS, Neonatal Behavioral Assessment Scale; NCAST, The Nursing Child Assessment Satellite Training; NCATS, Nursing Child Assessment Teaching Scale (NCATS); PIR-GAS, Parent–Infant Relationship Global Assessment Scale; Post, Results reflect immediate posttest; Post-F/U, Results reflect post-test to follow-up mean or change; Pre-F/U, Results reflect pretest to follow-up mean or change; PSI, Parenting Stress Index; SDQ, Strengths and Difficulties Questionnaire; SSP, Strange Situation Procedure.