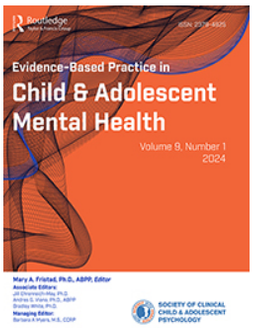

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A Systematic Review of Infant Mental Health Prevention and Treatment Programs

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ABSTRACT

Although many prevention and treatment programs exist for children and families, there have been no reviews specifically examining their impact on infant mental health at the program level. Therefore, the purpose of the current review was to a) systematically examine prevention and treatment programs targeting infant mental health outcomes (i.e. internalizing problems, externalizing problems, social-emotional development, trauma) or the parent-infant relationship/attachment in children from pregnancy to 2 years; b) classify each program by level of empirical support; and c) highlight strengths and identify gaps in the existing literature to inform future mental health intervention science. From over 121,341 publications initially identified, 60 prevention and treatment programs met inclusion criteria for this review. Each program was reviewed for level of scientific evidence. Of the 60 programs reviewed, 29 (48.33%) were classified as promising, while only six (10.0%) were classified as effective. Lastly, only two programs (3.33%; Attachment and Biobehavioral Catch-Up and Video-feedback Intervention Parenting Program) were classified as evidence-based specific to infant mental health and/or parent-infant relationship/attachment outcomes. Implications related to disseminating evidence-based prevention/treatment programs are discussed.

Infancy (i.e., birth to 2 years), is a sensitive and critical developmental period (Bagner et al., 2012; Uylings, 2006). Environmental stressors within the first few years of life can have longstanding deleterious impacts on children's development (Clark et al., 2019; Fanning, 2021; Knudsen, 2004). Therefore, maximizing environmental support to optimize development during the first 2 years of life and/or buffer the negative effects of environmental stressors is of utmost importance. While many reviews of prevention or treatment efforts for children have been conducted (e.g., McLuckie et al., 2019), none to our knowledge, have focused solely on infancy (0–2) and evaluated evidence at the program level. Identifying which existing prevention/treatment programs are most effective for promoting infant mental health-related outcomes would have a tremendous practical impact in informing programmatic choices for community providers and institutions during such a critical developmental period.

Infant mental health

Within the first 2 years of life, neural plasticity occurs rapidly establishing important circuitry architecture in the brain (Uylings, 2006). During this critical period, children are more susceptible to robust neurological impacts from environmental factors. The most common problems during infancy include emotional, behavioral, sleep, and eating difficulties, along with child abuse and neglect (Carr, 2019; Skovgaard et al., 2007). Importantly, some research suggests that social-emotional difficulties for children ages 1–2 years old persist into preschool, especially for at-risk groups (Alink et al., 2006; Briggs-Gowan et al., 2006). Yet, disentangling typical versus atypical behavior early in life remains difficult, with identifying and differentiating between mental health disorders being a significant challenge (Bagner et al., 2012; Foreman, 2015; Szaniecki & Barnes, 2016). Therefore, it is important to examine how

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prevention and treatment efforts in infancy impact not only early behavioral and emotional indicators of mental health difficulties but also potential protective factors.

The parent-infant relationship, defined as components of the caregiver's developing connection to the child and the child's developing relationship with their caregiver (Zeanah, 2018) is arguably the most important protective factor impacting early mental health/well-being given its influence on the development of infants' behavioral and emotion regulation (Samdan et al., 2020). Not surprisingly, the parent – infant relationship, which serves as a useful index of an infant's overall well-being, is robustly associated with a range of infant outcomes (Goldberg, 2000; Slade, 2005). The parent-infant relationship is also predictive of child functioning in subsequent periods of development (Crockenberg & Leerkes, 2000). Therefore, programs targeting infant mental health must incorporate parenting and/or the parent-infant relationship to maximize outcomes. Additionally, while many studies often interchange the terms parent-infant relationship and attachment, attachment is a separate construct defined as a specific and circumscribed aspect of the relationship between a child and caregiver that is involved with making the child feel safe, secure, and protected (Zeanah, 2018). Thus, attachment is also an important treatment target for improving infant mental health.

Prevention and treatment

kGiven the early emergence of behavioral and emotional indicators of mental health difficulties during infancy, many prevention and treatment programs have been created, with numerous systematic reviews and meta-analyses completed (Carr, 2014; Pearl, 2009; Sampers et al., 2001; Tully & Hunt, 2016). However, significant limitations have not been addressed, including the examination of programs that focus on parenting, specifically with infants (0–2). In addition, while some of the literature examines prevention and treatment programs separately (e.g., Tereno et al., 2019), in order to most efficiently and effectively maximize optimal mental health, prevention, and treatment science must coexist (Weisz et al., 2005). Further, while meta-analyses are important to synthesize large amounts of data, most examine the combined effectiveness of available programs (Bakermans-Kranenburg et al., 2003; Mountain et al., 2017), answering the question "do the available treatments work?" While this is an important question, it limits the ability to identify which specific programs are effective. Lastly, almost no reviews provide information at the program level or categorize programs by level of scientific evidence, rather they list and/or describe individual programs (Reid et al., 2021) or individual studies (e.g., McLuckie et al., 2019), limiting the reader's ability to draw clear conclusions about programs to implement in practice. Ultimately, evaluation of the existing literature at a program level is necessary to inform clinical decision-making, as well as future research and policy.

The current study

While various biological and environmental factors impact infant mental health, parenting style, behaviors, and the quality of parent-infant relationship are undoubtably among the most influential (Engel, 1980). Further, although innumerable prevention/treatment programs exist, there have been no reviews, to our knowledge, examining how well parent-based programs target early behavioral and social-emotional indicators of infant mental health, as well as its most influential protective factor: the parent-infant relationship. Thus, the purpose of the current review was to a) systematically examine prevention and treatment programs treating children prenatally to age 2 years; b) classify each treatment program by level of empirical support; c) highlight strengths and identify gaps in the existing literature to inform clinical decision-making and future mental health intervention science in areas of greatest need. Identifying effective programs targeting early behavioral and social-emotional indicators of mental health and/or the parent-infant relationship during the early years of life would identify gaps in the literature for future research to examine and reach populations in greatest need.

Methods

Electronic databases (i.e., PsychINFO, Google Scholar) were used to identify peer-reviewed

studies of prevention/treatment programs developed over the last 30 years using the following keywords: (*prevention* or *treatment* or *program or intervention* or *parent program* or *attachment* or *parent training or prenatal or perinatal or postpartum*) and (*infant* or *infancy* or *toddler*) and (*mental health* or *internalizing* or *externalizing* or *behavior problems* or *anxiety* or *depression* or *oppositional defiant disorder* or *attention-deficit/hyperactivity disorder or regulation or social-emotional* or *trauma or parent-child* or *parent-infant or mother-infant or mother-child* or *caregiver-child* or *caregiver-infant)*. In addition, searches were also conducted on well-established early intervention programs found in the What Works Clearinghouse database (e.g., The Incredible Years, Triple P, Parent-Child Interaction Therapy, Child-Parent Psychotherapy). The reference sections of all retrieved articles were searched for any other relevant programs.

Inclusion and exclusion criteria

Programs were included if manuscripts were published in a peer-reviewed journal between January 1990 and October 2021 and met all of the following a priori inclusion criteria: 1) parent/caregiver prevention or treatment program that targets behavioral and social-emotional indicators of infant mental health and/or the parent-infant relationship/attachment, 2) the program must start at 12 months or earlier, 3) age range of children served in the program had to include prenatal to 2 years, and 4) at least one outcome measure of infant mental health (i.e., internalizing symptoms, externalizing symptoms, social-emotional development, trauma), or the parent-infant relationship (i.e., defined as examining some type of bidirectionality, whether it be through observation, questionnaire, or interview; we did not include programs that solely examined parenting practices or use of certain skills without consideration of the child's response). Additionally, as it is difficult to tease apart the parent-infant relationship and attachment and many papers often use the terms interchangeably, attachment was also included as an outcome of interest. Inclusion criteria was partly informed by recommendations for early intervention from a systems perspective (Guralnick, 2011). Programs were excluded if they: 1) primarily targeted infant physical health/development (e.g., feeding, sleeping) or other targets (e.g., academics), 2), only focused on medical or physical aspects of infant health (e.g., premature birth), 3) were designed to only target parents' own psychopathology 4) were designed to be implemented within schools/daycares, hospitals (e.g., neonatal intensive care units) or primary health-care settings (e.g., physician's offices), or 5) the program was not manualized (i.e., published and/or cited manual), or manuscripts did not provide a detailed program outline (e.g., session by session content) for clinical replication purposes. Additionally, case studies, unpublished studies, or programs only reported at conferences were also excluded.

From over 121,341 citations identified, 183 programs were identified. Only 60 programs met the criteria and were included. All programs were evaluated for level of empirical support, specific to indicators of infant mental health and/or parent-infant relationship/attachment outcomes, based on the typology for classifying programs outlined by Brownson et al. (2009).

Level of scientific evidence

Brownson's typology emphasizes the weight of evidence and a wider range of considerations beyond efficacy. It also places greater emphasis on evidence from clinical research, especially randomized controlled trials. Further, this typology focuses on implementation of principles of evidence-based public health as being critical for bridging the gap between discovery of new knowledge and its application. In addition, unlike many other criteria, programs must have an aggregated peer-reviewed summary of available studies (e.g., systematic review) to be classified as evidence-based. Given the time commitment and cost for community settings to change and/or implement a new program, this stringent criterion provides a stricter assessment of programs to aid in policy and decision-making. Therefore, as this study is meant as a guide for clinicians and policymakers, Brownson's typology was chosen over other psychotherapy typology given the broader public health focus of this study.

Brownson et al. (2009) typology for classifying programs by level of scientific evidence includes

four categories ranging from least to most effective: Emerging, Promising, Effective, Evidence-based. An "Ineffective" category was included for this review, which represents programs that met inclusion criteria but demonstrated no improvements in infant mental health or the parent-infant relationship/attachment. Importantly, studies only demonstrating significant findings in one homogenous sample, limits the generalizability of program effectiveness in more diverse populations. Therefore, in order to be classified as effective or evidence-based and ensure that programs were not only evaluated within homogenous samples, within at least 1 RCT, 50% or more of the sample had to be different than another RCT sample in some aspect of diversity (e.g., racial/ethnicity/sex/economic/at-risk population). Further, as differentiating between typical and atypical behavior in infancy remains difficult (Bagner et al., 2012; Foreman, 2015; Szaniecki & Barnes, 2016), programs had to demonstrate improvements across multiple behavioral and social-emotional domains to be categorized as effective or evidence-based. Of note, a number of prenatal programs did not examine pre- to post-treatment changes or have a comparison group, limiting the ability to assess the program's effectiveness. Thus, these programs were excluded (e.g., For Baby's Sake; Domoney et al., 2019).

Programs were classified as ineffective if they met all inclusion criteria, but published studies revealed no improvements in infant mental health or parent-infant relationship/attachment outcomes at post-treatment. Emerging programs had at least one single measure or scale showing infant mental health or parent-infant relationship/attachment improvement pre- to post-treatment or in relation to a comparison group, but it did not have to include a randomized control trail (RCT). Programs were classified as promising if they had at least 1 RCT, were theoretical grounded, and demonstrated intervention improvements in infant mental health or the parent-infant relationship/attachment pre-to post-treatment or in relation to a comparison group within a RCT, even if only within one single measure or scale. The effective category was defined by having at least 2 RCTs, theoretically grounded, and demonstrated positive improvements from pre-to post-treatment or in relation to the comparison group within an RCT for at least 50% of the infant mental health or the parent-infant relationship/attachment outcomes across studies. Lastly programs were classified as evidence-based if they met all criteria for an effective program, had at least three RCTs, *and* included a meta-analysis or review paper, which demonstrated explicit systematic methods in order to limit bias and reduces chance effects (Oxman & Guyatt, 1993). Further, the meta-analysis or review must show overall positive findings for indicators of infant mental health or the parent-infant relationship/attachment outcomes.

Results

Program characteristics

The majority of the programs reviewed were prevention (70.00%), an additional 8.33% were treatment, and some programs were utilized as both prevention and treatment programs (21.67%). See Table 1 for descriptive features (e.g., target population) of reviewed programs. Furthermore, Table 2 summarizes demographic information about study samples, number of randomized controlled trials (RCT) with non-overlapping samples, and outcomes of interest. While all programs reviewed included children ranging from birth to 2 years/24 months of age, 30 (50.0%) programs only targeted infants under 2 years and under. Eleven additional programs targeted children up to 3 years or age.

Ineffective and emerging programs

As seen in Table 2, 16.67% of programs were classified as ineffective, while another 21.67% were classified as emerging. Broadly, within the emerging category, programs demonstrated some improvements, but not via an RCT.

Promising programs

The largest percentage of the programs reviewed were classified as promising (48.33%). This category was almost evenly split across programs with only 1 RCT (13 programs), and 16 programs that did not demonstrate improvements across multiple domains or show improvement in at least 50% of

Table 1. Characteristics of reviewed programs.

Program	Prevention/ Treatment	Description	Target Population	Recipients	Delivery Format	Setting	Sessions	Who is delivering the program?
ACT – Raising Safe Kids	Prevention	Promote positive parenting and safety to prevent child exposure to abuse and violence	Parents/caregivers of young children	Caregiver	Group	Clinic/ Community	8 weekly (2 hr) sessions	ACT certified clinicians (Associates degree required, BS/ BA degree preferred)
Attachment and Biobehavioral Catch-Up (ABC)	Prevention	Attachment-based intervention designed to promote self-regulation and positive attachment relationships	Caregivers and children with early adversity	Caregiver + child	Individual	Home	10 weekly (1 hr) sessions	ABC trained clinicians/"parent coaches"
Attachment Based Cognitive-Behavioral Approach (ABCB)	Prevention	Attachment-based intervention to promote infant mental health	Low-income	Caregiver + child	Group	Clinic/ Community	10 weeks	ABCB trained clinician
Attachment Video-feedback Intervention (AVI)	Prevention	Attachment-based intervention for maltreated families	Caregiver with a maltreatment report	Caregiver + child	Individual	Home	8 weekly (1.5 hr) sessions	Clinical workers with experience in child welfare settings and trained in AVI
Child Parent Psychotherapy (CPP)/ Toddler-Parent Psychotherapy (TPP)/Preschooler-Parent Psychotherapy (PPT)/Infant-Parent Psychotherapy (IPP)/ Perinatal adaptation	Prevention	Relationship-based treatment to strengthen parent-child relationship, resolve trauma history, promote child development	Families with trauma/Mothers who have experienced trauma or significant stress	Caregiver + child	Individual	Clinic/ Community	Weekly sessions for 1+ year/Weekly sessions from third trimester to 6 months (for perinatal adaptation)	Trained mental health professional
Child FIRST (Child and Family Interagency, Resource, Support, and Training	Prevention; Treatment	Parent-child psychotherapy to repair the impact of trauma and connect families to needed services	Families with high cumulative risk	Caregiver + child	Individual	Home	12 home visits over 22 weeks	Master's level developmental/ mental health clinician
Child-Parent Enrichment Project	Prevention	Child-abuse prevention program that aims to reduce stressors that contribute to child abuse and promote good parenting	Mothers at risk for engaging in child abuse during or just after pregnancy	Caregiver + child	Individual	Home	2 visits per month, for 6 months	Paraprofessional parenting consultant
Circle of Security (COS)	Prevention	Promote positive caregiver-child attachment; COS-Intensive (COS-I) and COS-Parenting (COS-P)	Caregivers and children	Caregiver + child	Group (COS-P and COS-I); Individual (COS-P)	Clinic/ Community	8–24 sessions	Clinicians/social workers trained in COS
Communicating and Relating Effectively (CARE)	Prevention	A relationship-focused intervention designed to promote responsive interaction between depressed mothers and their infants	Mothers with post-partum depression (PPD)	Caregiver + child	Individual	Home; location preferred by mother	6 sessions (1 hr), over 9 months	Registered nurse
Community HUGS/CHUGS	Prevention; Treatment	Intervention program aimed at enhancing the mother-infant relationship both in group and individual setting	Mothers experiencing a range of postnatal mental health difficulties	Caregiver + child	Individual; Group	Clinic/ Community	Community HUGS: 10 wkly sessions (1–1.5hrs); Baby HUGS: 4 wkly sessions (1.5 hr)	Clinical psychologist, health nurse, or other health professionals trained to delivery HUGS/CHUGS
COPEing with Toddler Behaviour (CWTB)	Prevention	To improve parent-child interactions to prevent disruptive behavior	Parents/caregivers of young children	Caregiver	Group	Clinic/ Community	8 weekly (2 hr) sessions	Infant development specialists

(*Continued*)

Table 1. (Continued).

Program	Prevention/ Treatment	Description	Target Population	Recipients	Delivery Format	Setting	Sessions	Who is delivering the program?
Day-Stay	Prevention	Intensive brief intervention to promote positive parenting and provide psychoeducation about child development	Parents having difficulty managing infants and toddlers	Caregiver + child	Individual	Clinic/ Community	1 session for 6 hrs	Maternal and child health nurse and early childhood worker
Early Connections	Treatment	Focused on the developing parent-child relationship and decreasing PPD and mitigating its impact on the mother-infant relationship	Mothers with PPD and/or are having difficulties connecting with their babies	Caregiver + child	Individual	Home; Clinic/ Community	12–16 weekly visits (can be longer/ shorter based on mother's needs)	Mental health clinicians trained in perinatal and infant/parent mental health
Early Pathways (formerly Parenting Young Children Program, formerly STAR Parenting Program)	Prevention; Treatment	Trauma-informed intervention to promote authoritative parenting	Children with behavioral or emotional problems, trauma, living in poverty	Caregiver	Individual; Group	Home; Clinic/ Community	8–12 sessions	Trained clinicians
Emotional Attachment and Emotional Availability (EA2)	Prevention	Improve adoptive parent – child relationships	Adopted children	Caregiver	Group	Clinic/ Community; Online	6 weekly sessions	Clinician trained in the EA system with knowledge of adoption practice and experience working with adoptive families
eMums plus	Prevention; Treatment	Online group – based intervention designed to help mothers better manage common parenting problems during the postnatal period	Mothers experiencing problems with their mood and caregiving roles	Caregiver	Individual	Online application via mobile device	4 months, mothers view curriculum twice a week and interact on a need basis	Nurse-led
Families First	Treatment	Short term intervention aimed at skill building in parents, increase effectiveness of parents, help families deal with problems in their home	At-risk families for out-of-home placement	Caregiver + child	Individual	Adoptive or birth family home; Community	3–4 home visits wkly (totaling 6–10 hrs per week), typically lasting 10–12 weeks	Bachelor's degree in related field and FF trained
Family Foundations	Prevention	Program to enhance the family, parent, and child mental health	First time parents	Caregiver + child	Group	Clinic; Community	8 sessions (4 prenatal; 3 hrs/4 postnatal; 2 hrs)	Two co-leaders, one being a childbirth educator
Family Partnership/Parent Adviser Model	Prevention; Treatment	Promotes mental health, teaches basic skills of parenting, and child behavioral management	Parents under stress, or children showing early behavior problems	Caregiver + child	Individual	Home	Weekly visits for 1.5–2 years	Nurses/health visitors trained in counseling, parenting, & behavior management
Family Spirit	Prevention	Designed for young Native American mothers and their children to reduce health and behavioral risk	American Indian adolescents at high risk	Caregiver + child	Individual	Home or other private locations	43-sessions (1 hr), over 45 visits; minimum dose of 22 sessions	Well-trained American Indian/ indigenous paraprofessional
Healthy Families America (HFA)/The Healthy Start Program	Prevention	Program to prevent child maltreatment by promoting positive parenting skills	Families at risk for child maltreatment	Caregiver + child	Individual	Home	Weekly visits for the first 6–9 months, up to 3 years	At least bachelors or 4 yrs of related work with at-risk families

(*Continued*)

Table 1. (Continued).

Program	Prevention/ Treatment	Description	Target Population	Recipients	Delivery Format	Setting	Sessions	Who is delivering the program?
Home-Start Program	Treatment	Designed to support parents with young children; increase maternal well-being	Parents looking for support	Caregiver	Individual	Home	Weekly visits (3–4 hrs each); for an average of 7 months	Trained community volunteer
Incredible Years: Babies and Toddlers Programs	Prevention	Adapted specifically for babies and toddlers	Infants and toddlers	Caregiver	Group	Clinic; Community	8–12 weekly sessions	Experience in one of the helping professions: social work, psychology, education, nursing, psychiatry, or have experience working with families and children
Infant Behavioral Assessment and Intervention Program (IBAIP)	Prevention	Support development of premature infants with low or very low birth weight or disabilities	Very preterm birth	Caregiver + child	Individual	Clinic/ Community; Home	6–8 sessions (1 hr) until child 6 month corrected age	Physical and occupational therapists, communication disorder specialists, nurses, pediatricians, psychologists, social workers, and infant developmental specialists
Infant Mental Health Home Visiting (IMH-HV)	Prevention	Trauma-informed and attachment based, aimed at enhancing parental capacities to optimize child social-emotional development	At-risk caregivers and infants	Caregiver + child	Individual	Home; Child Welfare Agency; Community	Weekly (1-2 hr visits) up to 3 years	Clinically-trained in IMH-HV, master's level professionals
Interaction coaching for at-risk parents and their infants (ICAP)	Prevention	Designed to strengthen the maternal-infant relationship	At-risk caregivers and infants	Caregiver + child	Individual	Home	3 sessions scheduled at 3–5 week intervals	Nurse
International Child Development Programme (ICDP)	Prevention	Enhance caregiver-child relationships to promote child well-being	Children and caregivers	Caregiver	Group	Community	10–12 weekly sessions	Teachers, caregivers, child-care staff, clinicians trained in ICDP
Keys to Caregiving	Prevention	Help parents understand and respond to infant behaviors, with a goal of increasing positive affective expressions in infants	Mothers with PPD, caregivers wanting to improve their relationship with their infant	Caregiver + child	Individual + Group	Home; Community	5–6 weekly (1 hr) sessions	Nurses, infant caregivers, pediatricians, social workers, infant mental health specialists, early childhood educators
KOPP program	Prevention	multicomponent program to reduce the risk of psychiatric and social problems in the offspring of parents with a mental disorder	Mothers with depressive symptoms	Caregiver + child	Individual	Home	6–8 visits (60–90 mins) over 3–4 months	Specialist in infant mental health care
Legacy for Children	Prevention	Parenting program to support low-income families	Low-income families	Caregiver and caregiver + child	Group	Clinic; Community	Weekly (1.5-2 hr sessions) for 3–5 years, with breaks	Bachelor's degree, preferably in the field of social science or equivalent experience
Mellow Babies/Mellow Bumps	Prevention; Treatment	Attachment-informed aimed at promoting mother-infant interaction and maternal well-being	Vulnerable families with limited parenting capacity	Caregiver + child; Caregiver & Child	Group	Community	14 weekly sessions (5 hrs each)	Two Mellow trained practitioners

(*Continued*)

Table 1. (Continued).

Program	Prevention/ Treatment	Description	Target Population	Recipients	Delivery Format	Setting	Sessions	Who is delivering the program?
Miller Early Childhood Sustained Home-Visiting/Maternal Early Childhood Sustained Home-Visiting	Prevention	Aimed at improving maternal and child health and well-being by helping parents interact with their children in developmentally supportive ways	At-risk mothers living in areas of socio-economic disadvantage	Caregiver + child	Individual	Home	At least 25 home visits across pregnancy and the first 2 yrs post birth	Child and family health nurses
Minding the Baby	Prevention	Intensive relationship-based home visiting service addressing physical and mental health difficulties	First time young, low-income mothers, babies and their families	Caregiver + child	Individual	Home	Weekly visits first year, less frequent second year as needed	Master's level nurse & social worker alternating visits
Mindful with your Baby/Toddler	Prevention	Mindful parenting group	Mothers and infants/toddlers	Caregiver	Group	Clinic/ Community; Online	8–9 weekly sessions (2 hr)	Infant mental health specialist and a mindfulness trainer
Mother Infant Therapy Group (M-ITG)	Prevention; Treatment	Addresses the individual emotional needs of mothers, infants, and family members as well as their needs in mother – infant dyadic and family interactions	Mothers with PPD	Caregiver + child	Group	Clinic	12 wks, two-part session: first 1.5 hr mother in group + infant in group; final .5 hr mother and infant in dyadic group	Psychologists and trainees with backgrounds in child development
My Baby & Me	Prevention	Improve mothers' responsive behaviors during interactions with their children	Low-income mothers with less than a high school education	Caregiver + child	Individual	Home; location of their choice	55 total sessions; 1.5 hr weekly or biweekly	Family coaches; minimum bachelor's degree in psychology or related field
My Baby's First Teacher	Prevention	Meet the needs of parents and infants staying in emergency housing	Homeless and at-risk parents	Caregiver + child	Group	Shelter	5 weekly (1–1.5 hr) sessions	Shelter staff
New Beginnings	Prevention; Treatment	Psychotherapy group for high-risk mothers	Incarcerated mothers who have care of their babies in prison; mothers in shelters	Caregiver + child	Group	Prison; Shelter	8 sessions (2 session daily, 2hrs each) over 4 weeks	2 trained psychotherapists per group
Newborn Behavioral Observations (NBO) system	Prevention	Enhance the parents' understanding of the newborn's cues and thereby respond sensitively to their newborn's expressions and cues	Parents of infants	Caregiver + child	Individual	Home; Clinic	7 weekly visits, for 3 months	NBO certified health visitors
Nurse Family Partnership/ PreCare	Prevention	Improve parenting skills, reduce risk factors of child maltreatment and improve the utilization of social & community resources	Young vulnerable first-time mothers	Caregiver + child	Individual	Home	10 visits during pregnancy, 20 during 1st year, 20 during 2nd year	Nurses with BSN degree and trained in NFP

(*Continued*)

Table 1. (Continued).

Program	Prevention/ Treatment	Description	Target Population	Recipients	Delivery Format	Setting	Sessions	Who is delivering the program?
Parent-Child Interaction Therapy (PCIT)-Toddler (PCIT-T)	Treatment	Adapted to be developmentally sensitive for infants and toddlers	Young children with challenging behavior	Caregiver + child	Individual	Clinic/ Community	2 (one teaching 1 hr, one coaching 30-45 mins) sessions weekly for 6–8 weeks	Professionals qualified to provide mental health services certified in PCIT
Infant Behavior Program	Treatment	Brief home-based adaptation for high-risk infants	High-risk infants	Caregiver + child	Individual	Home	5–7 weekly (1–1.5 hour) sessions	Professionals qualified to provide mental health services certified in PCIT
Parent-Child Attunement Therapy (PCAT)	Prevention	For toddlers with maltreatment	Maltreated children with disruptive behavior	Caregiver + child	Individual	Clinic; Community	30-45 minute sessions	Professionals qualified to provide mental health services certified in PCIT
Parent-Infant Psychotherapy (PIP)	Prevention	Psychoanalytic relationship-oriented parenting program	At-risk families	Caregiver + child	Individual; Group	Home; Clinic/ Community	4wks to 1 yr; 8–18 sessions on average	Mental health professional trained in PIP
Parent – Child Psychological Support Program (PCPS)	Prevention	Universal prevention program that aims to support families by building positive parent-child relationship. Monitors child growth and all areas of development	Parents of infants	Caregiver + child	Individual	Community	6 quarterly/every 3 months visits, 45–60 min sessions (at 3, 6, 9, 12, 15 and 18 months)	PCPS trained public health nurses/ health visitors, speech and language therapists or psychology practitioners
Perinatal Dyadic Psychotherapy (PDP)	Prevention; Treatment	Intervention to prevent/decrease maternal PPD and the mother-infant relationship	Mothers with PPD	Caregiver + child	Group	Home	8 sessions (1 hr) over 3 months	Nurses trained in PDP
Promoting First Relationships	Prevention	Brief attachment-based intervention to promote social-emotional development through caregiving relationships	Children in child welfare or with history of maltreatment	Caregiver + child	Individual	Home	10 weekly (1-2 hr) sessions	Professionals who work with caregivers and young children
Right from the Start	Prevention; Treatment	Attachment-focused parent-child interaction skills training group for parents of infants	Parents with poor parent-child relationships	Caregiver	Group	Community; Convenient locations	8-sessions (2 hr)	Infant development specialists
Secure Attachment Family Education (SAFE)	Prevention	Attachment-based prevention, addresses both partners have equal importance in raising their child	Universal program for mothers and fathers	Caregiver + child	Group + Individual	Clinic	10 group sessions (full-day sessions) and 3 individual	Professionals who work in the social-service field, including physicians, midwives, psychologists, nurses, and social workers
Smart Start (formerly, Trauma-Informed Behavioral Parenting)	Prevention	Trauma-related social-emotional problems for child welfare	Child welfare	Caregiver	Individual	Home; Child Welfare Agency	8 weekly sessions	Early interventionists trained in Smart Start/Trauma-Informed Behavioral Parenting
Steps Toward Effective, Enjoyable Parenting (STEEP)	Prevention	Help parents understand their child's development and learn to make decisions to ensure a safe and supportive environment	First-time low-income mothers	Caregiver + child	Individual + Group	Home; Clinic	Bi-weekly visits from 2nd trimester to about 2 years	Minimum bachelor's degree

(*Continued*)

Table 1. (Continued).

Program	Prevention/ Treatment	Description	Target Population	Recipients	Delivery Format	Setting	Sessions	Who is delivering the program?
Sunderland Infant Programme	Prevention	Aims to improve attachment outcomes by increasing maternal sensitivity using video feedback	Families ranging from low to high risk for poor attachment	Caregiver + child	Individual	Home	varies based on risk; ranges from 1 to 4 video feedback sessions + couples/family counseling	Health visitors and clinical parent/ infant psychologists
Technology-based supportive educational parenting program (SEPP)	Prevention	Technology-based supportive educational program to support both fathers and mothers across the perinatal period	First-time and experienced parents across the perinatal period	Caregiver	Individual	Online	30-min phone antenatal educational session, 60-min phone postnatal educational session, educational mHealth app for 4 weeks	Parental queries through the application are answered by a trained midwife
Together in Mind	Prevention; Treatment	Intensive perinatal and infant mental health group intervention program that provides psychoeducation and support	Mothers with moderate to severe mental illness	Caregiver + child	Group	Clinic/ Community	Once weekly sessions (5hrs) for 6 weeks	Adult perinatal mental health clinician, infant mental health clinician, & child health nurse all working in collaboration
Triple P	Prevention; Treatment	Suite of programs to support parents and children	Universal, at-risk, diagnosed	Caregiver; Child; Caregiver + child	Individual; Group	Home; Clinic/ Community; Primary Care; Web-based	1 session consultation; focus groups; wkly sessions; wkly sessions + intensive support	Trained Triple P clinician/ practitioner
Baby Triple P	Prevention; Treatment	Parenting intervention aimed to prepare new parents for a positive transition to parenthood	Expectant couples	Caregiver	Individual; Group	Home; Clinic/ Community	8 individual weekly sessions (1 hr); 4 × 2 hour sessions during pregnancy, 4 phone session for 30 min each in early postnatal period (group)	*Same as Triple P
Tuning in to Toddlers (TOTS)	Prevention	Promote positive parenting and child outcomes	Caregivers of toddlers	Caregiver	Group	Clinic/ Community	6 weekly (2 hr) sessions	Professionals who work in family and community services, child protection, foster/kinship care, mental health and education sectors
Victorian Infant Brain Studies (VIBeS) Plus	Prevention	Home-visit program to educate parents and provide support for child development	Children born preterm	Caregiver	Individual	Home	9 home visits (1.5-2hrs) until age 1	Physiotherapist and psychologist together deliver the preventative care program

(*Continued*)

Table 1. (Continued).

Program	Prevention/ Treatment	Description	Target Population	Recipients	Delivery Format	Setting	Sessions	Who is delivering the program?
Video-feedback Intervention Parenting Program (VIPP)	Prevention	Attachment-based brief intervention to provide video-feedback to parents about caregiving	Caregivers and children	Caregiver + child	Individual	Home; Daycare	4 sessions +2 booster sessions	Clinicians and professionals working with families trained in VIPP
Watch, Wait, and Wonder (WWW)	Prevention	Child-led program to improve parental sensitivity and child outcomes	Caregivers and children with identified difficulties	Caregiver + child	Individual	Clinic/ Community	8–18 sessions (up to 1 year)	Infant health specialists with more than 5 years of clinical experience

Note. Programs are listed alphabetically by program name, with the exception of program adaptations, which are listed alphabetically under the original program name. Wk = week; Hr = hour.

Table 2. Summary of evidence for reviewed programs.

Program	Age	Research Samples	Total # RCTs (different samples)	# RCTs, including children 0-2 (different samples)	Parent-Infant Relationship/Attachment & Infant Mental Health Outcomes	Level of Scientific Evidence
Attachment and Biobehavioral Catch-Up (ABC)	6–48 months	White, Black/African American, foster care, domestic violence, homeless, child protective services	6	6	Improved attachment, self-regulation (executive functioning, inhibitory control), improved regulation, less internalizing and externalizing behavior	Evidence-Based
Video-feedback Intervention Parenting Program (VIPP)	0–6 years	Turkish minority families, adopted children, foster care, poverty, children with Autism, visual impairments, learning disabilities,	10+	10+	Decreased externalizing behavior problems, less internalizing behaviors at 6 years, Improved parent-infant relationship/attachment	Evidence-Based
ACT – Raising Safe Kids	0-10 years	White, Black/African American, Hispanic/Latinx, families involved with child welfare. Implemented in 80+ communities across world	5	2	Decreased conduct problems, behavioral and emotional problems	Effective
Early Pathways (formerly Parenting Young Children Program/STAR Parenting Program)	1–5 years	Black/African American, Hispanic/Latinx, at-risk families, trauma history	5	5	Decreased behavior problems and trauma, decreased % of children meeting criteria for a disorder	Effective
Legacy for Children	0–5 years	Black/African American, Hispanic/Latinx, low-income	2	2	Decreased child behavior problems, lower risk for social emotional concerns	Effective
Minding the Baby	0–2 years	Hispanic, Black/African American, White European, first-time mothers	3	3	Decreased externalizing behavior problems, improved parent-infant relationship/attachment	Effective
Nurse Family Partnership	0–2 years	Dutch, White, Hispanic, Black/African American, low educational level, young first-time mothers	6	6	Decreased internalizing and externalizing problems, improved mother-infant relationship	Effective
Triple P	0–16 years	Internationally diverse (e.g., Black/African American, Asian, Swiss, indigenous Australians) Poverty, foster care, child welfare	50+	10+	Decreased behavior problems, child maltreatment, internalizing problems	Effective
Attachment Based Cognitive-Behavioral Approach (ABCB)	12–36 months	Korean	1	1	Decreased internalizing and total ITSEA problems	Promising
Child and Family Interagency, Resource, Support, and Training (Child FIRST)	Prenatal – 5 years	Hispanic, high-risk families	1	1	Decreased externalizing behavior problems	Promising
Child-Parent Enrichment Project	0–1 years	White	2	2	Improved mood	Promising
Community HUGS/CHUGS	0–1 years	Australia	2	2	Improved parent-infant relationship/attachment	Promising
Child Parent Psychotherapy (CPP)/ Toddler-Parent Psychotherapy/ Preschooler-Parent Psychotherapy /Infant-Parent Psychotherapy/ Perinatal adaptation	Prenatal – 5 years	Multinational, immigrant families, Hispanic/Latinx, perinatal, children with maltreatment	5	3	Improved self-regulation (i.e., cortisol) and mood	Promising
Circle of Security (COS)	0–12 years	Foster children, caregivers with post-partum depression (PPD)	5	3	Decreased in internalizing and externalizing problems	Promising
COPEing with Toddler Behaviour (CWTB)	12–36 months	Low SES, range of cultural backgrounds (not specified)	1	1	Decreased externalizing behavior problems	Promising
Day-Stay	1–40 months	No information about racial/ethnic background, mostly Australian-born	1	1	Decreased difficult child behavior	Promising
Emotional Attachment and Emotional Availability (EA2)	1–5 years	White, all adopted	1	1	Decreased total problems behavior	Promising
eMums plus	0–7 months	South Australia, mothers with PPD	2	2	Improved attachment	Promising

(*Continued*)

Table 2. (Continued).

Program	Age	Research Samples	Total # RCTs (different samples)	# RCTs, including children 0-2 (different samples)	Parent-Infant Relationship/Attachment & Infant Mental Health Outcomes	Level of Scientific Evidence
Family Foundations	5th month of pregnancy-6 months post-partum	Non-Hispanic, hite	2	2	Decreased internalizing problems	Promising
Family Partnership/Parent Adviser Model	0–4 years	White, UK, Australia born (52%), Overseas (31 different countries worldwide; 48%)	2	2	Decreased internalizing and externalizing problems	Promising
Family Spirit	28 weeks' gestation – 3 years	Young American Indian mothers across rural reservation communities	3	3	Decreased internalizing and externalizing problems, improved regulation	Promising
Healthy Families America (HFA)/The Healthy Start Program/Home Visiting Program	0–3 years	White, African American, Hispanic, American Indian, expectant parents/parents who are deemed to be at risk for child abuse or neglect	10+	10+	Decreased internalizing and externalizing problems	Promising
Infant Behavior Program	12–18 months	High-risk infants, Hispanic/Latinx; Brazilian	1	1	Decreased externalizing and internalizing	Promising
Interaction coaching for at-risk parents and their infants (ICAP)	0–1 years	European American or White	1	1	Improved parent – infant relationship/attachment	Promising
KOPP Program	0–1 years	Dutch	1	1	Improved parent – infant relationship/attachment and infant empathy	Promising
Mellow Babies/ Mellow Bumps	0–5 years	UK (Scottish and English samples)	4	4	Improved parent – infant relationship/attachment	Promising
Mindful with your Baby/Toddler	0–2 years	Amsterdam, mostly White	2	2	Decreased child dysregulation, improved child aggression and emotional reactivity	Promising
My baby & me	3rd trimester – 30 months	African American, Hispanic, unmarried mothers, Pregnant women with less than a high school education	2	2	In high-intensity condition, improved parent – infant relationship/attachment	Promising
*My Baby's First Teacher**	0–12 months	Black/African American; homeless	1	1	Improved parent – infant relationship/attachment	Promising
New Beginnings	0–2 years	White, South Africa, UK	2	2	Improved parent – infant relationship/attachment	Promising
PCIT-Toddler (PCIT-T)	12–24 months	Australia	2	2	Decreased externalizing and internalizing behavior at follow-up, less noncompliance	Promising
Parent-Infant Psychotherapy (PIP)	0–3 years	Diverse samples, including caregiver domestic abuse, homeless	10+	10+	Improved parent-infant/attachment	Promising
Promoting First Relationships	0–5 years	Child welfare, American Indian Community	5	5	Decreased externalizing behavior, separation distress, improved self-regulation (e.g., RSA, cortisol patterns)	Promising
Right from the Start	0–1 years	Canada, low SES	1	1	Improved parent – infant relationship/attachment	Promising
Sunderland Infant Programme	8 weeks – 2.5 years	English, low-income	1	1	Improved parent – infant relationship/attachment	Promising
Victorian Infant Brain Studies (VIBeS) Plus	0–1 year	Australia, no information about racial/ethnic background	1	1	Decreased externalizing and internalizing behavior	Promising
Watch, Wait, and Wonder (WWW)	0–4 years	Canada	1	1	Decreased infant problems, improvements in emotion regulation,	Promising
Early Connections	1–63 weeks	White	0	0	Improved infant social functioning	Emerging
Families First	0–17 years	White, African-American, Dutch	2	1	Decreased externalizing problems & improved (not in RCT)	Emerging
Home-Start parenting support program	0–6 years	White, Dutch	2	2	Decreased externalizing and internalizing problems (not in RCTs)	Emerging

(*Continued*)

Table 2. (Continued).

Program	Age	Research Samples	Total # RCTs (different samples)	# RCTs, including children 0-2 (different samples)	Parent-Infant Relationship/Attachment & Infant Mental Health Outcomes	Level of Scientific Evidence
Infant Mental Health Home Visiting (IMH-HV)	prenatal-3 years	African American, mothers of children who were removed from their care by the court, low-income /qualify for Medicaid	1	1	Increased child prosocial behavior (not in RCT)	Emerging
International Child Development Programme (ICDP)	1–6 years	30+ countries, at-risk samples	0	0	Decreased in child conduct problems	Emerging
Keys to Caregiving	3–6 months	Canada, adolescent mothers, Taiwan	2	2	Improved parent-infant relationship/attachment.	Emerging
Parent-Child Attunement Therapy (PCAT)	1–3 years	No information about racial/ethnic background	0	0	Decreased intensity of behavior problems	Emerging
Parent – Child Psychological Support Program (PCPS)	3–18 months	Irish, Spanish (two programs run in Dublin, Ireland and Valencia, Spain)	0	0	Improved parent-infant relationship/attachment	Emerging
Secure Attachment Family Education (SAFE)	0–1 years	German	1	1	Improved parent-infant relationship/attachment (for fathers only, not mothers)	Emerging
Smart Start (formerly, Trauma-Informed Behavioral Parenting)	18–30 months	Mostly non-Hispanic White	0	0	Improved child trauma symptoms	Emerging
Technology-based supportive educational parenting program (SEPP)	0–4 weeks	Singapore, only heterosexual married couples	1	1	Improved parent-infant relationship/attachment	Emerging
Together in Mind	0–1 years	Australian	1	1	Improved infant social-emotional functioning and parent-infant relationship (not in RCT)	Emerging
Tuning in to Toddlers (TOTS)	18–36 months	Australia, no information about racial/ethnic background	0	0	Decreased externalizing behavior problems	Emerging
Baby Triple P	20–35 weeks' gestation-1 year	British, Australia, Iranian mothers with hearing impairments, first time fathers, German	6	6	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective
Communicating and Relating Effectively (CARE)	6 weeks – 9 months	White	2	2	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective
IY Babies and Toddlers Programs	0–3 years	Low-income, poverty	3	3	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective
Infant Behavioral Assessment and Intervention Program (IBAIP)	until 6 month corrected age	Netherlands, predominantly White	1	1	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective
Miller Early Childhood Sustained Home-Visiting/Maternal Early Childhood Sustained Home-Visiting	0–2 years	50% Australian, 50% overseas (31 different countries worldwide)	2	2	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective
Mother Infant Therapy Group (M-ITG)	1–24 months	White	0	0	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective
Newborn Behavioral Observations system	3 weeks-3 months	Danish, White, Iceland	5	5	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective
Attachment Video-feedback Intervention (AVI)	1–5 years	French, low-income	2	2	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective
Perinatal Dyadic Psychotherapy (PDP)	4 weeks-1 year	First time mothers, 57.1% White, 23.8% Hispanic	1	1	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective
Steps Toward Effective, Enjoyable Parenting (STEEP)	0–23 months	Singapore, Participants were mothers and their children involved in child welfare agencies.	2	2	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective

Note: RCT = randomized control trial.

the infant mental health or parent-infant relationship/attachment outcomes across studies. For example, Child Parent Psychotherapy (CPP), which encompasses Toddler-Parent Psychotherapy (Cicchetti et al., 1999), Preschooler-Parent Psychotherapy (PPT), and Infant-Parent Psychotherapy (IPP)—hereby referred to collectively as CPP, is a relationship-based program for families prenatally through age 5 with a history of trauma or other difficulties. Results demonstrated CPP to be effective in reducing child trauma symptoms and clinical severity of depression and behavior problems for children ages 3–5 years (Ippen et al., 2011; Lieberman et al., 2005, 2006; Toth & Gravener, 2012). However, CPP studies examining the effects on infants are less clear. For example, while CPP improved attachment styles in a sample of infants with a history of maltreatment, CPP did not outperform psychoeducation on externalizing or internalizing problems (Cicchetti et al., 2011; Stronach et al., 2013; Toth et al., 2015). Lastly, while the only pilot study to our knowledge of CPP implemented prenatally (Lavi et al., 2015) demonstrated improvements in maternal mental health, the study did not include any outcomes relevant to the current paper. Therefore, while CPP is evidence-based for children ages 3–5, given its limited consistent positive findings specific to infant mental health, it was categorized as promising.

Healthy Families America (HFA), also called The Healthy Start Program and Home Visiting Program, is a home visiting program to prevent child maltreatment by promoting positive parenting skills. Across the US, different states have implemented various versions while following the core program model (e.g., Healthy Families New Jersey, Healthy Families Alaska), accumulating multiple RCTs in infants. While some studies demonstrated decreases in internalizing and externalizing problems, many RCTs showed no difference in infant outcomes or the parent-infant relationship/attachment. Further, many studies solely looked at other outcomes not examined in the current review, such as parental mental health, social support, and access to resources. Therefore, HFA was categorized as promising.

Effective programs

A total of six (10.0%) programs were classified as effective programs. All programs demonstrated effectiveness across racially and ethnically diverse samples, including samples with majority Hispanic/Latinx or Black/African American participants. For example, Triple *P*-Positive Parenting Program (Sanders, 1999) is a suite of programs designed to support parents and children ages 0–16 years. The levels of Triple P include: Level 1 (e.g., universal media and communications strategy), Level 2 (e.g., brief consultations about minor concerns), Level 3 (e.g., targeted intervention for children with mild-to-moderate difficulties), Level 4 (e.g., individual or group intervention for severe difficulties) and Level 5 (e.g., intensive support for complex difficulties; www.triplep.net). There is substantial literature on the effectiveness of Triple P with a variety of samples (e.g., poverty, foster care, and child welfare) that are racially and ethnically diverse, including multiple meta-analyses. Triple P has been demonstrated to decrease child externalizing and internalizing behavior problems, as well as reduce rates of child maltreatment (Nowak & Heinrichs, 2008; Prinz et al., 2009; Sanders et al., 2008; Wiggins et al., 2009). Triple P has been implemented and deemed feasible for families with trauma, including an institutional residential setting (Glazemakers & Deboutte, 2013). However, fewer studies include infants or examine the effects of Triple P for infants separately (Wilson et al., 2012). While one meta-analyses found a greater effectiveness of Triple P for parents of younger children (Nowak & Heinrichs, 2008), many of the studies started at the upper bounds of infancy (i.e., 2 years). Therefore, Triple P was classified as an effective program.

Evidence-based programs

Only two (3.33%) programs reviewed were classified as evidence-based: Attachment and Biobehavioral Catch-Up (ABC) and Video-feedback Intervention Parenting Program (VIPP).

Attachment and biobehavioral catch-up

The ABC (Dozier et al., 2006) program was developed to meet the needs of infants experiencing

early adversity by targeting secure attachment and healthy biological regulation and is theoretically based in attachment theory and stress neurobiology (Dozier et al., 2018). Since inception, ABC has been implemented with diverse samples (e.g., foster care, children involved with Child Protective Services, children adopted internationally) and disseminated to multiple sites across the US, including community samples. Numerous RCTs with follow-up have demonstrated the effectiveness of ABC in improving parent-infant relationship/attachment, self-regulation, and externalizing and internalizing behavior problems (Bernard et al., 2012; Dozier et al., 2006; Grube & Liming, 2018; Lind et al., 2014, 2017; Tabachnick et al., 2019). Additionally, ABC is trauma-informed, including sessions dedicated to addressing caregiver trauma history, and has demonstrated improvements in child mental health among populations with elevated trauma (Dozier et al., 2006; Grube & Liming, 2018). While it has been noted that a cost-effectiveness analysis of ABC is currently being conducted (Costello et al., 2018), there is currently no publication examining the cost-effectiveness of the ABC program. Of note, the in-person training to become an ABC parent coach and year of supervision costs $7,000 per person, plus additional costs for equipment (www.abcintervention.org). Overall, the ABC program is an evidence-based parenting program for high-risk families demonstrating a wide range of positive outcomes for infant mental health and the parent-infant relationship/attachment.

Video-feedback intervention parenting program

VIPP (Juffer et al., 2008) is a brief home visiting intervention targeting parental sensitivity to improve outcomes for at-risk children ages 0–6 years. VIPP is based in attachment theory and utilizes video-feedback to provide real-life example to parents. VIPP has been adapted and utilized across multiple countries with a variety of samples (e.g., insecure mothers, adopted children, children with Autism Spectrum Disorder, visually impaired children), and demonstrated effectiveness in improving child behavior problems, cortisol levels, and the parent-infant relationship/attachment, while decreasing risk for internalizing disorders (Juffer et al., 2018; Klein Velderman et al., 2006; Van Zeijl et al., 2006). There are currently no published studies examining the cost-effectiveness of VIPP. The cost to be trained in VIPP is not publicly available; however, training in one of its adaptations (Video-Feedback Intervention to promote Positive Parenting-Sensitive Discipline; VIPP-SD) cost roughly $2,000 for the VIPP-SD manual, a four-day training course, and three post-training coaching sessions. Taken together, VIPP is an evidence-based parenting intervention with demonstrated improvements in externalizing and internalizing behavior problems across diverse samples.

Secondary outcomes: programs starting after 12 months but include infants (0–2)

Additionally given the focus of infancy, programs had to start at 12 months or earlier, which excluded some programs that still treat children during infancy (i.e., 12 to 24 months). Although these programs are not included in the main outcomes, given the rapid developmental changes that occur across infancy (Zeanah, 2018), it is still important to consider these programs as they may be appropriate for older infants. For example, Incredible Years (IY; Webster-Stratton et al., 2008) includes a series of compatible programs (i.e., child programs, parent programs, teacher programs, adjunctive home-visiting services) designed to prevent and treat child (ages 2–12) mental health difficulties (www.incredibleyears.com). Broadly, IY has demonstrated improvements across domains of child functioning among diverse, multicultural, and international samples. Additionally, IY allows for the incorporation of trauma into session components (e.g., trauma narrative with puppets), in addition to demonstrating improvements in child outcomes in samples with exposure to trauma (e.g., domestic abuse, incarcerated parents) (Webster-Stratton, 2017). Meta-analyses, reviews, and multiple RCTs have demonstrated IY's effectiveness in improving externalizing and internalizing behavior problems, social-emotional development, and academic functioning (Leijten et al., 2018; Morpeth et al., 2017; Pearl, 2009; Webster-Stratton & Reid, 2018). While there is substantial support for IY for children as young as 2 years of age, most studies focused on older children.

Additionally, Parent Child Interaction Therapy (PCIT) (Eyberg et al., 1995) is a behavioral parent training program that was designed for children (18 months – 7 years) with clinically elevated behavior problems. The overall goals of PCIT are to improve caregiver warmth, the parent-child relationship, and child compliance. Many RCTs, meta-analyses, and reviews have demonstrated the effectiveness of PCIT across a variety of samples, including racial and ethnic minority groups and high-risk families. PCIT has been shown to decrease child disruptive behaviors and parental stress, and increase positive parenting and the quality of the parent-child relationship (Cooley et al., 2014; Thomas et al., 2017; Ward et al., 2016), with persistence of treatment gains up to three years later (Boggs et al., 2005; Hood & Eyberg, 2003). Although PCIT starts after 12 months, many studies have been conducted with infants 18–24 months, demonstrating significant improvement. Therefore, PCIT was classified as evidence-based for older infants. See Tables 3 and 4 for more details on other programs targeting older infants and their level of evidence based on infancy.

Discussion

The purpose of this review was to a) systematically examine prevention and treatment programs targeting early behavioral and emotional indicators of infant mental health and the parent-infant relationship/attachment, b) classify each treatment program by level of empirical support, c) highlight strengths and identify gaps in the existing literature to inform clinical decision-making and future mental health intervention science in areas of greatest need. Results from this systematic review revealed that only two programs were categorized as evidence-based for infant mental health or parent-infant relationship/attachment outcomes, demonstrating a significant gap in the literature.

Infancy is a developmentally sensitive and critical period, in which programs can mitigate negative biological and environmental impacts on development (Engel, 1980; Knudsen, 2004; Uylings, 2006). While all programs included in this review have been implemented in children 0–2, 40.30% of programs specifically targeted infancy. Further, only two programs met all inclusion criteria and were categorized as evidence-based. These findings highlight the need for future research on parenting programs specifically targeting infant mental health. Importantly, there were 29 programs (48.33%) categorized as promising, with almost half only having 1 RCT conducted. Further, many of the emerging programs showed positive results, but had yet to conduct an RCT. These results suggest there may be benefit in further exploring the potential of these existing programs, rather than devoting resources, time, and money to developing new programs.

While the current review categorized treatments by level of scientific evidence, this paper may also serve as a guide for clinicians/providers in making the best choice for families, across a variety of factors, such as setting (e.g., home), risk status (prevention verse treatment; families at-risk for neglect), and timing (i.e., pre- versa post-natal). It may also be useful for clinicians in deciding which treatments are practical and cost-effective to implement within their own practice (e.g., programs that can only be implemented by a registered nurse may not be feasible to implement). Many studies also reported low rates of attrition, especially for high-risk families (e.g., Hernández et al., 2019). For example, as expected, research has shown that home vising programs struggle to retain families who do not have stable housing. More precision-based approaches that consider the unique factors of each family, such as those being explored by Family Spirits (Haroz et al., 2020; Ingalls et al., 2021), may aid this problem. Lastly, while there is significant work to be done in increasing representation in treatment research, our results show that programs categorized as evidence-based and effective have been conducted with marginalized and minoritized families (e.g., Black, Hispanic, low SES, at-risk for abuse). Additionally, many programs categorized as promising or emerging were conducted with historically underrepresented samples, suggesting an important shift toward increasing diversity, equity, and inclusion within prevention and treatment science.

Limitations

It is important to note that while this study is among the first to examine parenting interventions targeting early behavioral and emotional indicators

Table 3. Level of evidence base for programs that include infants but programs start at older than 12 months.

Program	Age	Research Samples	Total # RCTs (different samples)	# RCTs, including children 0-2 (different samples)	Parent-Infant Relationship & Infant Mental Health Outcomes	Level of Scientific Evidence
*Parent-Child Interaction Therapy (PCIT)**	18 months −7 years	Multicultural, international, maternal psychopathology, high-risk, trauma	50+	10+	Decreased externalizing behavior problems, improved parent-infant relationship/attachment	Evidence-Based
Family Check-Up	2-17 years	Across all race races, high-risk families	10+	2	Decreased externalizing behavior problems, decrease in child depression via decreases in maternal depression (no direct effect)	Effective
*Incredible Years (IY)**	2–12 years	Culturally diverse (Hispanic/Latinx, Asian, Black, new migrant families, Norway, Holland, Russia, Portugal, Hong Kong, Singapore, etc.), Poverty, mothers with depression	50+	10+	Decreased behavior problems, internalizing problems, and conduct problems, Improved social-emotional functioning	Effective
Ghanbari et al. (2018) attachment-based parent training	2–6 years	Recruited from Tehran nurseries	1	1	Decreased in anxiety (general, social, separation, total)	Promising
The Parent and Child Enhancement program (PACE)	2–3 years	Hong Kong residents, low-income, new immigrant, or single-parent families	1	1	Decreased externalizing behavior, improved infant prosocial behavior	Promising
Family Links Nurturing Program (FLNP)	4-11 yrs (have included children 2 yrs)	Multisite study, no information about racial/ethnic background	2	1	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective
More Intelligent Sensitive Child (MISC)	2–11 years	Uganda, Israel, South Africa, vulnerable children, infected and uninfected children of parents with HIV/AIDS	4	4	No improvements on infant mental health or parent-infant relationship/attachment outcomes	Ineffective

Note: RCT = randomized control trial.

Table 4. Characteristics of programs that include infants but start at older than 12 months.

Program	Prevention/ Treatment	Description	Target Population	Recipients	Delivery Format	Setting	Sessions	Who is delivering the program?
Ghanbari et al. (2018) attachment-based parent training	Treatment	Attachment-based parenting program to improve attachment and decrease child anxiety	Children with elevated anxiety	Caregiver	Group	Clinic/ Community	8 weekly (2 hr) sessions	Expert in child and adolescent clinical psychology
Family Check-Up	Prevention	Promote positive family relationships to address child adjustment problems	Children at risk for behavior problems; high-risk families	Caregiver + child	Individual	Home; Clinic/ Community; School	3 sessions (40-60 mins) + 12 self-contained modules, yearly check-ups	Professionals that provide services to families with children
Family Links Nurturing Program (FLNP)	Prevention	Support positive relationships and promote self-esteem, resiliency, and emotional development	Preschool and school-aged children	Caregiver + child	Group	Clinic/Community	10 weekly sessions	A minimum of two facilitators trained in FLNP
Incredible Years	Prevention; Treatment	Programs designed to prevent and treat child mental health problems for parents, teachers, and children	High-risk children, children with externalizing behavior problems	Caregiver; Child; Teachers; Caregiver + child	Individual; Group	Clinic/ Community; School; Primary Care	Consultation; workshops; weekly sessions; daily sessions	Experience in one of the helping professions: social work, psychology, education, nursing, psychiatry, or have experience working with families and children
More Intelligent Sensitive Child (MISC)	Prevention; Treatment	Enabling caregivers to enhance their child's cognitive and emotional development through daily interactions	At-risk families	Caregiver + child	Individual + Group	Home; Community	Bi-weekly individual sessions alternating between video and live feedback over 12 months (24 session); bi-monthly group meetings (all cooccurring)	MISC trainer with at least Bachelor's in social work or psychology
Parent and Child Enhancement program	Prevention	Parent-child intervention that aims to enhance child psychosocial development	Disadvantaged families with 2-year-old children	Caregiver + child	Group	Community social services centers	40 sessions (2hrs), conducted twice weekly	Registered social workers with tertiary training
Parent-Child Interaction Therapy (PCIT)	Treatment	Improve positive parenting and effective discipline strategies	Children with behavior problems	Caregiver + child	Individual; Group	Home; Clinic/ community; Web-based; Child welfare Agency;	Variable	Professionals qualified to provide mental health services certified in PCIT

Note. Programs are listed alphabetically by program name, Hr = hour.

of infant mental health and the parent-infant relationship/attachment at the program level, some limitations should be addressed. The current paper did not exclusively review programs only targeting infancy (0–2). The reason for this is twofold. First, there is a very limited number of programs that only target and are implemented in infants as seen by the small number of programs found in other reviews (e.g., Barlow et al., 2015; Mountain et al., 2017), highlighting a large limitation in the field broadly. Second, some interventions that were created for a larger age range are still effective or evidence-based for infants (e.g., VIPP). Other reviews that have limited their scope to programs only designed for restricted age ranges neglected to include many of the effective and evidence-based programs that were included in the current review (e.g., Izett et al., 2021). While this review represents the first step in identifying what current programs are evidence-based for infants, future work should utilize more rigorous analytical approaches, such as meta-analyses, specifically examining the effect sizes at the program level. Additionally, our review did not examine other outcomes (e.g., specific parenting behaviors, health outcomes); although we recognize the importance of such factors, they were beyond the scope of the current review.

The current review also did not examine the effectiveness of programs in particularly vulnerable populations (e.g., homelessness, NICU, and child abuse), representing a significant gap in the literature. Understanding which of these programs may best serve at-risk populations has significant implications for informing future research and policy. See accompanying brief report examining how programs in the current review have been implemented in homeless populations (Hare et al., 2023), which is particularly relevant given the prevalence of homelessness in infancy (Shaw, 2019). We also recognize the potential limitations of combining parent-infant relationship and attachment into one outcome and using outcomes/terms such as internalizing and externalizing. However, as this was a systematic review, the current paper was limited by terminology utilized by previous research. Moving forward, it is important for studies to clearly define outcomes of interest (e.g., parent-infant relationship verse attachment). Further, given the difficulty differentiating externalizing and internalizing concerns in infancy from dysregulation that is reflective of typical developmental (Bagner et al., 2012; Foreman, 2015; Szaniecki & Barnes, 2016), it is important to continue to have control groups and assess multiple outcomes to better understand behaviors that represent behavioral and emotional indicators of infant mental health problems. Additionally, as most disorders require the age of 3 years (36 months) for a diagnosis, the labels "internalizing" and "externalizing" may not convey the most accurate picture during this developmental period. Using temperament-related outcomes may be more appropriate, as they have been developed and studied for this young population. Further, as it is difficult to identify clinical disorders in infancy, targeting transdiagnostic outcomes that can be assessed in infancy, such as emotion regulation, may allow for more effective prevention/treatment outcomes.

Additionally, many programs did not utilize multi-informant or multimethod assessments to examine early indicators of infant mental health, which limits generalizability of findings. One large limitation of parenting interventions broadly is high rates of attrition (Chacko et al., 2016), and the programs reviewed in this manuscript are no exception. Lastly, given the dearth of literature specific to programs reporting follow-up time-points, we were unable to compare maintenance of gains across programs. While some programs evaluated follow-up effects, many programs did not; therefore, the results presented in this review were specifically examining pre- to post-treatment outcomes.

The limitations of the current study highlight the need for policy change and future research. Despite a recent task force examining the burden of mental health during infancy (Lyons-ruth et al., 2017), the results presented in the current review suggest much room for improvement. The findings of this review align with the goal in enhancing programs availability, and further support the need for future work on dissemination of programs for infant mental health.

Conclusion

Overall, it is clear from the current review that there are very few prevention and treatment programs meeting criteria for evidence-based in improving

early behavioral and emotional indicators of infant mental health and/or the parent-infant relationship/attachment. Further, many programs within the current review only had one study and/or RCT conducted, limiting the ability to examine the full potential of these programs. More work is needed exploring the effectiveness of these existing programs to guide clinicians, researchers, and policymakers in decision-making regarding resource devotion (e.g., time, money). The current review may also serve as a guide for clinicians and families in making clinical decisions based on family-specific needs, working toward a personalized medicine approach.

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