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Parent–infant psychotherapy: a systematic review of the evidence for improving parental and infant mental health

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ABSTRACT

Background: Parent–infant psychotherapy (PIP) is a psychodynamic intervention with parent–infant dyads, designed to address regulatory disturbances in infancy and problems in the parent–infant relationship.

Aims: This systematic review aimed to examine whether PIP is effective in improving the parent–infant relationship or other aspects of parent or infant functioning.

Methods: A systematic review was undertaken. Electronic databases were searched for randomised controlled trials in which participants had been allocated to a PIP intervention or control group/other treatment.

Results: Eight studies were identified that provided data comparing parent–infant psychotherapy with a no-treatment control group (four studies) or comparing PIP with other kinds of treatment (four studies). Meta-analyses indicated that parents who received PIP were more likely to have an infant who was rated as being securely attached to the parent after the intervention; however, there were no significant differences in studies comparing outcomes of PIP with another model of treatment.

Conclusions: Although PIP appears to be a promising method of improving infant attachment security, there is inconclusive evidence of its benefits in terms of other outcomes, and no evidence to show that it is more effective than other interventions for parents and infants. Many studies had limitations in their design or implementation, and findings must be interpreted with caution.

ARTICLE HISTORY

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KEYWORDS

Systematic review; parent–infant psychotherapy; attachment

Infant regulatory disturbances such as excessive crying, feeding or sleeping difficulties and bonding/attachment problems represent the main reasons for referral to infant mental health clinics (Keren, Feldman, & Tyano, 2001), with prevalence of such problems in the general population, for children at 18 months of age, estimated to be in the region of 18% (Skovgaard, 2010; Skovgaard et al., 2008). Some regulatory disturbances are stable over time, with as many as 49.9% of infants and toddlers (aged 12–40 months) showing a continuity of emotional and behavioural problems one year after initial presentation (Briggs-Gowan, Carter, Bosson-Heenan, Guyer, & Horwitz, 2006). Problems of this nature are also significant

predictors of longer-term difficulties (Skovgaard, 2010; Skovgaard et al., 2008) including continuing parent–child relational problems (De Gangi, 2000; DeGangi, Breinbauer, Roosevelt, Porges, & Greenspan, 2000) and internalising and externalising problems at 5 years of age (Keenan, Shaw, Delliquadri, Giovannelli, & Walsh, 1998) and beyond (Hemmi, Wolke, & Schneider, 2011). Insecure and disorganised attachment in infancy is also associated with poorer outcomes in childhood across a range of domains such as emotional, social and behavioural adjustment, scholastic achievement and peer-rated social status (Sroufe, 2005; Sroufe, Egeland, Carlson, & Collins, 2005), particularly in the case of disorganised attachment, which is a significant predictor of later psychopathology (Green & Goldwyn, 2002; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999), including externalising disorders (Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, & Roisman, 2010); dissociation (Lyons-Ruth, Dutra, Schuder, & Bianchi, 2006); post-traumatic stress disorder (PTSD) (MacDonald et al., 2008); and personality disorder (Steele & Siever, 2010).

Infant regulatory and attachment problems can best be understood in a relational context, and disturbances to the parent–child relationship and parental psychosocial adversity are significant risk factors for infant emotional, behavioural, eating and sleeping disorders (Skovgaard, 2010; Skovgaard et al., 2008). As well as the well-documented impact of poverty (Duncan & Brooks-Gunn, 2000), substance misuse (Rayns, Dawe, & Cuthbert, 2004) and perinatal mental health problems (Hogg, 2012) on the parent–child relationship, recent research has also emphasised the critical nature of the interaction between the parent and infant including, for example, parental sensitivity (Wolff & IJzendoorn, 1997), the quality of the attunement or contingency between parent and infant (Beebe et al., 2010), and the parent's capacity for what has been termed 'maternal mind-mindedness' (Meins et al., 2012; Meins, Fernyhough, Fradley, & Tuckey, 2001) or 'reflective functioning' (Slade, Grienberger, Bernbach, Levy, & Locker, 2005).

Recent research has also highlighted a number of 'atypical' parenting behaviours that can be present during the postnatal period, including affective communication errors (for example, mother positive while infant distressed), disorientation (frightened expression or sudden complete loss of affect) and negative-intrusive behaviours (mocking or pulling infant's body) (Lyons-Ruth, Yellin, Melnick, & Atwood, 2005). A meta-analysis of 12 studies found a strong association between disorganised attachment at 12–18 months and parenting behaviours characterised as 'anomalous' (that is, frightening, threatening, looming), dissociative (haunted voice, deferential/timid) or disrupted (failure to repair, lack of response, insensitive/communication error) (Madigan et al., 2006). These atypical parenting practices have been identified in parents described as 'unresolved' with regard to previous trauma (Cicchetti, Rogosch, Gunnar, & Toth, 2010; Cicchetti, Rogosch, & Toth, 2006; Jacobvitz, Hazen, & Riggs, 1997). However, disturbances to the mother–infant relationship are common and are associated with a range of maternal problems including postnatal depression (Murray, Fiori-Cowley, Hooper, & Cooper, 1996), Personality Disorder (Crandell, Hobson, & Patrick, 2003; Newman & Stevenson, 2008), psychotic disorders (Chaffin, Kelleher, & Hollenberg, 1996), substance misuse (Suchman, McMahon, Slade, & Luthar, 2005; Tronick et al., 2005) and domestic violence (Lyons-Ruth, Yellin, Melnick, & Atwood, 2003; Lyons-Ruth et al., 2005).

Over the past two decades, a range of interventions (e.g. home visiting and parenting programmes) have been developed to address developmental problems in the infant, and problems in the parent–infant relationship, with a view to promoting optimal infant development. These have mostly targeted the parent and used a range of techniques in their delivery (e.g. discussion, role play, watching video vignettes and homework) with varying degrees of success

in terms of improving parenting behaviours (Barlow, Smailagic, Ferriter, Bennett, & Jones, 2010) and infant outcomes (Olds et al., 1998). However, the relational nature of many infant regulatory problems points to the potential importance of targeting the parent–infant dyad, and a review of such ‘attachment-based’ interventions found them to be effective in reducing insensitive parenting ($d = 0.33$), with some evidence of a small impact on infant attachment insecurity ($d = 0.20$) (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003).

Parent–infant psychotherapy (PIP; also known as infant–parent psychotherapy or IPP in the USA) is one of the earliest forms of dyadic intervention to be developed (or triadic if two parents are involved) and involves targeting the parent–infant relationship (i.e. it is delivered to both parent and infant together). A parent–infant psychotherapist works by listening and observing the interaction, identifying the concerns and worries, and helping the parent observe and find different ways to relate to their baby. PIP focuses on improving the parent–infant relationship and infant attachment security by targeting parental internal working models (Main, Kaplan, & Cassidy, 1985), and by working directly with the parent–infant relationship in the room. The approach is essentially psychodynamic in that it involves identifying patterns of parent–infant relating, which are often rooted in the legacy of the parent’s own early experiences with caregivers, especially when such experiences have been traumatic. The earliest approach, developed by Selma Fraiberg et al. (1975; 1980) focused primarily on the mother’s ‘representational’ world (‘representation-focused’ approach) or the way in which the mother’s current view of her infant was affected by interfering representations from her own history. The aim of such therapy was to help the mother to recognise the ‘ghosts in the nursery’ (that is, the unremembered influences from her own past) and to link them to her current functioning, in order to directly improve the parent–infant relationship, thereby facilitating new paths for growth and development for both mother and infant (Cramer & Stern, 1988). Fraiberg emphasised that the model is flexible, and may include developmental guidance, insight-oriented interpretation, emotional support, and concrete assistance with problems of living, depending on the presenting clinical problems and the parent’s mental health, and level of family and social support.

Fraiberg’s model has been further developed and evaluated by others (for example, Lieberman, Weston, & Pawl, 1991; Toth, Rogosch, Manly, & Cicchetti, 2006), and more recently, representational and behavioural approaches have been combined (Cohen et al., 1999). For example, ‘Watch, Wait and Wonder’ (WWW) is an ‘infant-led’ PIP that involves the mother spending time observing her infant’s self-initiated activity, accepting the infant’s spontaneous and undirected behaviour, and being physically accessible to the infant (behavioural component). The mother then discusses her experiences of the infant-led play with the therapist with a view to examining the mother’s internal working models of herself in relation to her infant (representational component) (Cohen et al., 1999). PIP can also be used to support the father or other primary carer, or be delivered to two parents together.

The duration of the intervention depends on the presenting problems, but typically ranges from 5 to 20 weeks, usually involving weekly sessions. Parents may be referred to this service by a clinician (e.g. general practitioner or health visitor in the UK) or may self-refer to privately run services. PIP services typically target infants less than two years of age at the time of referral. This reflects the importance of the first two years of life in terms of children’s later development.

There is a growing body of evidence pointing to the role that PIP can play in terms of improving both parental functioning (Cohen, Lojkasek, Muir, Muir, & Parker, 2002; Cohen

et al., 1999) and fostering secure attachment relationships in young children (Toth et al., 2006), and there is some evidence to suggest that different forms of the therapy may be differentially effective for parents with different types of attachment insecurity (Bakermans-Kranenburg, Juffer, & Van Ijzendoorn, 1998). However, there has to date been only one 'thematic' summary of the evidence about the effectiveness of PIP (Sleed & Bland, 2007), which did not involve a systematic search for evidence. Three other systematic reviews (Singleton, 2004; Bakermans-Kranenburg et al., 2003; Poobalan et al., 2007) produced promising results, but all of them had high levels of heterogeneity, both in terms of the nature of the intervention(s) being tested and in the design of the evaluation(s). This paper provides a summary of the key findings of a Cochrane systematic review (Barlow, Bennett, Midgley, Larkin, & Wei, 2015) of randomised studies to identify whether this unique method of working has benefits for parents and infants, and whether the outcome is affected by the duration or content of the intervention.

Method

Study design

We conducted a systematic review of both published and unpublished literature using a range of electronic databases.

Electronic searches

The databases Central, Medline, Embase, Cinahl, PsychINFO, BIOSIS Citation Index, SSCI (Web of Science), ERIC and Sociological Abstracts (which includes dissertations) were searched up to 13 January 2014. No language or date restrictions were used and randomised controlled trial (RCT) filters were applied where appropriate. We searched the metaRegister of Controlled Trials (mRCT) on 20 January 2014 to identify any registered clinical trials in the UK and internationally, and reference lists of articles identified through database searches and bibliographies of systematic and non-systematic review articles, to identify relevant studies. We also contacted authors and experts in the field to identify unpublished studies.

Inclusion/exclusion criteria

We included RCTs and quasi-randomised controlled trials that compared a PIP with a control condition (i.e. waiting list, no treatment or treatment-as-usual) or a second treatment group. PIP was defined in terms of an intervention underpinned by a psychodynamic model and delivered jointly to the parent–infant dyad. Studies were only included with a clinical sample, i.e. in which either the parent was experiencing mental health problems or the infant was showing signs of attachment and/or dysregulation problems. We only included studies that used a standardised measure to assess parental mental health; parental sensitivity; or infant attachment security.

Selection of studies, data extraction and risk of bias assessment

Titles and abstracts of studies identified through searches of electronic databases were screened by two authors (CB and JB) to assess whether they met the inclusion criteria. Full

copies of papers that appeared to meet the inclusion criteria were then independently assessed and any uncertainties were resolved by discussion with the third author (NM). Two review authors extracted data independently (CB and SL) using a data extraction form and the data were then entered into Review Manager (RevMan), 2012.5 software (version 5.2.7). Where data were not available in the published trial reports, study investigators were contacted to supply missing information. A risk-of-bias assessment was carried out using the Cochrane 'Risk of bias' assessment tool (Higgins & Thompson, 2002).

Statistical analysis

Meta-analysis was undertaken where there was sufficient clinical homogeneity in the intervention delivered, the characteristics of the study participants (such as age or the definition of 'at risk' participants), and the outcome measures. Data were combined using a random-effects model. We calculated overall effects using inverse variance methods. All analyses included all participants in the treatment groups to which they were allocated, whenever possible.

For dichotomous endpoint measures, we present the number of parents or infants who showed an improvement as a proportion of the total number of parents/infants treated. Standardised mean differences (SMDs) and 95% confidence intervals are presented for continuous data, and risk ratios for dichotomous data. Risk ratios (RRs) were calculated by dividing the risk in one group with the risk in the other group, and these are presented with 95% confidence intervals and standard deviations. For studies where there was more than one active intervention and only one control group, we selected the intervention that most closely matched our inclusion criteria and either excluded (in the case of one alternative treatment) or combined the others (see Higgins & Thompson, 2002, chapter 16.5.4).

Results

Study selection

Electronic searches in February 2013 and updated in January 2014 identified 2604 records. We identified 16 additional records through other sources. Fifty-eight did not meet the inclusion criteria and were excluded. Of these, eight were RCTs but did not fit our inclusion criteria. Twenty-one were not RCTs but otherwise met at least one of our inclusion criteria. Twenty-five studies did not assess the effectiveness of PIP. In three RCTs of PIP, the age of the children was outside the maximum age specified in the inclusion criteria for this review. We included eight studies (from 19 reports of trials) and identified five ongoing studies (see Figure 1).

A total of eight studies were included, comprising 846 randomised participants. The parent populations were diverse, including mothers experiencing depression, previously confirmed maltreatment, maternal depression and feelings of failure in bonding or attachment. Some parents were immigrants who faced a high incidence of depression and anxiety as a result of poverty, unemployment and cultural uprootedness, or who reported problems with managing infant sleep, feeding and behavioural disorders. In one study participants were infants incarcerated with their mothers in prisons within mother and baby units, where the prison environment and subsequent separation may have had adverse consequences for the mother–infant relationship. The infants in all studies were showing or considered to be

at risk of developing adverse attachment or dysregulation problems. In all eight studies, the mean age of the infant participants was under 24 months at study enrolment, with a range from 8 weeks to 30 months. The studies were conducted in a number of settings, and ranged in duration from 8 sessions to 49 weeks.

Of the eight studies, four involved comparisons of PIP with control groups only (Cicchetti, Toth, & Rogosch, 1999; Lieberman, Weston, & Pawl, 1991; Salomonsson & Sandell, 2011; Sleed, Baradon, & Fonagy, 2013). Of the four studies that compared PIP with another treatment, one compared a representative parent–infant psychotherapy (PPT) with an ‘infant-led’ parent–infant psychotherapy called ‘Watch and Wait and Wonder’ (WWW) (Cohen et al., 1999); one compared parent–infant psychotherapy with interaction guidance (Robert-Tissot et al., 1996); one comprised three arms permitting a comparison of PIP with both a no-treatment community control group and a psychoeducational parent training programme (Cicchetti et al., 2006); and a fourth study employed a randomised four-arm comparison of parent–infant psychotherapy, cognitive behavioural therapy (CBT), non-directive counselling, and routine primary care (Cooper et al., 2003), in which for the purposes of this review we aggregated data from the counselling and CBT arms (non-psychodynamic interventions). Further details of the characteristics of the studies included in the meta-analysis, including the outcome measures used in each of them, are shown in Table 1.

Risk of bias in included studies

Our risk of bias estimates show that overall the quality of the included studies was low. Many studies had limitations in their design or implementation, or were unclear about important quality criteria including randomisation and allocation concealment, sequence generation, and blinding. Although study authors were contacted for more information, these domains remain unclear. It should be noted that all of the studies were judged at high risk of performance bias because it is not possible to blind participants and personnel in studies of this nature. It should be noted, however, that despite this it may still be possible to blind outcome assessors, and so there could still be a low risk of detection bias. A summary of risk of bias across all studies can be found in Figure 2, which presents the judgements for each study.

Effects of interventions

PIP versus control group

Six studies contributed data to the PIP versus control comparisons (Cicchetti et al., 1999; Cooper et al., 2003; Lieberman et al., 1991; Salomonsson & Sandell, 2011; Sleed et al., 2013) producing 19 meta-analyses of outcomes measured at post-intervention or follow-up, or both.

The results showed significant improvements in the proportion of children securely attached at post-intervention (RR 8.93; 95% CI 1.25 to 63.70; $P = 0.03$), but significant levels of heterogeneity were identified ($\chi^2 = 3.71$; $df = 1$; $P = 0.054$; $\tau^2 = 3.71$; $I^2 = 73\%$) (see Figure 3). There was a reduction in children with an avoidant attachment at post-intervention (RR 0.48; 95% CI 0.24 to 0.95); and significantly fewer infants with disorganised attachment at post-intervention (RR 0.32; 95% CI 0.17 to 0.58). However, there were no statistically significant differences at post-intervention for the resistant category (RR 0.69; 95% CI 0.16 to 2.97). There was an increase in the proportion of children moving from insecure at pre-intervention

Table 1. Characteristics of included studies.

Study ID	Condition	Comparison	N	Mean infant age	Duration of intervention	Outcomes
Cicchetti 1999	Depressed mothers	Toddler parent psychotherapy (TPP) versus control	131	20.4 months (SD = 2.38),	Mean 59.03 weeks (SD = 10.44), range 42.88–78.93 weeks. Mean number of intervention sessions 45.63 (SD = 11.40; range = 31–68).	<ul style="list-style-type: none"> • Parent: Potential for subsequent episodes of maternal depression to influence the efficacy of the preventive intervention. (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Depressive episodes (DSM-III-R) (Robins et al., 1985). • Parent/Infant interaction: none • Child: Attachment security utilising the Attachment Q-set (Waters 1995), later publications report the pre- and post-intervention attachment classifications using the Strange Situation procedure (SSP; Ainsworth, Blehar, Waters, & Wall, 1978). Infant development and IQ utilising the Bayley Mental Development Index Wechsler Preschool and Primary Scales of Intelligence (WPPSI-R; Wechsler 1989). • Parent: none published at post-intervention or follow up • Parent/Infant interaction: none published at post-intervention or follow up • Child: Strange Situation Procedure. Morning salivary cortisol levels (micrograms per decilitre (mg/dl) no disaggregated data for IPP and PPI available (only available as combined intervention maltreated group, non-intervention maltreated control group, and non-maltreated comparison group). Strange Situation Procedure: Child Behavior Checklist/2–3 (CBCL; Achenbach 1992). The CBCL (internalising, externalising and total scale; self-report) for children's behaviour problems at follow-up. • Parent: Parenting Stress Index (PSI; Abidin 1986). Parenting Sense of Competence Scale (self-esteem) specific to the parenting role (PSOC; Johnston & Mash, 1989). Depression - Beck Depression Inventory (BDI; Beck 1978). • Parent/Infant interaction: the Chatoor Play Scale (Chatoor 1986); dyadic reciprocity, dyadic conflict, maternal intrusiveness, maternal unresponsiveness. • Child: Presenting symptoms. A symptom report form was developed for this study (self-report). Strange Situation Procedure for infant–mother attachment (Ainsworth et al., 1978). Infant cognitive development and behaviour - he Mental Scales of the Bayley Scales of Infant Development-I or II (Bayley 1993); Emotion Regulation, Orientation-Engagement, and Motor Quality. The Emotion Regulation subscale (i.e. infant activity, adaptation, affect, cooperation, persistence, frustration tolerance, sensitivity to stimulation, ability to attend, and responsiveness to the examiner)
Cicchetti 2006	Abuse and neglect prevention	Infant–parent psychotherapy (IPP also called child parent psychotherapy (CPP) versus psychoeducational parenting intervention (PPI)	137	13.31 months of age (SD 0.81).	The length of intervention averaged 46.4 weeks (SD 7.36) for the IPP group and 49.4 weeks (SD 4.81) for the PPI group	
Cohen et al., 1999	Infant functional or behavioural problems, maternal depression and feelings of failure in bonding or attachment (impeding mother's ability to relate to infant)	Two psychodynamic psychotherapeutic interventions (mother–infant psychotherapy, PPT versus infant-led parent–infant psychotherapy, 'Watch Wait and Wonder', WWW)	67	WWW 21.5 (SD 6.5); PPT 19.2 (SD 6.1)	Approximately 5 months	

(Continued)

Table 1. (Continued)

Study ID	Condition	Comparison	N	Mean infant age	Duration of intervention	Outcomes
Cooper et al., 2003	Depressed mothers	Routine primary care, non-directive counselling, Cognitive behavioural therapy (CBT) or psychodynamic therapy	193	8 weeks at study entry	From 8 to 18 weeks postpartum	<ul style="list-style-type: none"> Parent: at 4.5 months, immediately post-intervention maternal depression (EPDS; Cox, Holden, & Sagovsky, 1987). Structured interview for DSM III R. At 9 months short-term follow-up (EPDS). At 18 months and intermediate-term follow-up maternal depression (EPDS) (Cox et al., 1987). At 5 years long-term follow-up maternal depression (EPDS). Parent/infant interaction: quality of the mother–infant relationship (maternal sensitivity, warmth, responsiveness and acceptance), global rating scales (Murray et al., 1996). Child: childhood cognitive and emotional development – Behavioural Screening Questionnaire (BSQ; Richman & Graham, 1971) at 18 months follow-up. <p>Infant attachment at 18 months follow-up – Strange Situation Procedure (Ainsworth et al., 1978). Infant cognitive development at 18 months follow-up – mental development index of the Bayley scales of infant development.</p> <p>Five-year long-term follow-up of the McCarthy scales of children's abilities (McCarthy 1972). Five years Rutter A² scale (Rutter, Tizard, & Whitmore, 1970) for child behaviour problems of clinical significance. Five-year long-term follow-up Preschool Behaviour checklist (PBCL; McGuire & Richman, 1988)</p> <ul style="list-style-type: none"> Parent: Life Event inventory (Egeland, Deinand, Brunnequell, Phipps-Yonas, & Crichton, 1980) at baseline only. Parent/infant interaction: free play measures; maternal empathic responsiveness/empathy (equivalent to HOME maternal care, maternal responsiveness and maternal involvement; Bradley & Caldwell, 1977); maternal initiation of interaction (7-point scale); behaviour on reunion (goal-corrected partnership, 9-point scale); maternal child-rearing attitudes (control aggression, encourage reciprocity, complexity; Cohler, Weiss, & Grunebaum, 1970) Child: Restriction of affect (7 point scale); angry behaviour (frequency); security of attachment (Q sort Waters 1995). Avoidance and resistance, behaviour on reunion and goal-corrected partnership were measured using Ainsworth interactive behaviour scales modelled after Strange Situation Procedure but with longer 10 min episodes suitable for younger children (Ainsworth et al., 1978)
Lieberman 1991	Anxiously attached dyads	Infant psychotherapy versus control	59	11–14 months at entry	12 months	

Robert-Tissot 1996	Infant sleep, feeding, and behavioural disorders (mostly crying fits, aggression, and temper tantrums)	Psychodynamic therapy versus interaction guidance therapy	75	15.6 months, range 2–30 months (SD 8.4)	Mean duration 9.3 weeks (SD 4.6)	<ul style="list-style-type: none"> • Parent: Maternal representation (R-interview; Stern et al., 1989) • Parent/infant interaction: maternal sensitivity (Ainsworth, Bell, & Stayton, 1974), CARE-Index (Crittenden 1981) • Child: Symptom checklist
Salomonsson 2011	Mothers had expressed concerns about themselves as mothers, their infants' well-being or their relationship with the infant	Parent–infant psychotherapy versus child health centre (TAU) control	80	PIP mean 4.4 months (SD 2.4); control mean 5.9 months (SD 3.8)	10 weeks on average	<ul style="list-style-type: none"> • Parent: Maternal postnatal depression - the EPDS (Cox et al., 1987); maternal stress SPSQ (Östberg 1997) Swedish-language version of the Parenting Stress Index (Abidin 1990); Maternal general psychological distress symptom report - General Severity Index (GSI; Derogatis 1994) • Parent/infant interaction: mother–baby relationship. The PIR-global assessment scale (GAS; Zero to Three 2005) The Emotional Availability Scales (EAS; Biringen, Robinson, & Emde, 1998) assessed videotaped mother–baby interactions of 10 min duration. • Child: Infant social and emotional functioning. Ages and Stages Questionnaire: Social–Emotional (ASQ: SE; Squires et al., 2002). Healthcare utilisation records were requested, somatic or psychological concerns, or visits other than routine calls
Sleed 2013	Prison mother and baby units	'New Beginnings Programme' versus Standard care controls	163	1–23 months (range: intervention 0.2–23.0 mean 4.9 (SD 4.5); control 0.1–18.5 months mean 4.4 (SD 4.6))	4 weeks	<ul style="list-style-type: none"> • Parent: Parental reflective functioning - The Parent Development Interview (PDI; Slade, Berger, Bresgi, & Kaplan, 2004), maternal depression (The Centre of Epidemiologic Studies Depression Scale (CES-D; Radloff 1977), maternal representations (Mother's Object Relations Scales (MORS; Danis, Oates, & Gervai, 2005)). • Parent/infant: Coding interactive behaviour scale (CIB; Feldman 1998), coded videotaped free-play episodes (dyadic attunement, parent positive engagement, child involvement). • Child: none

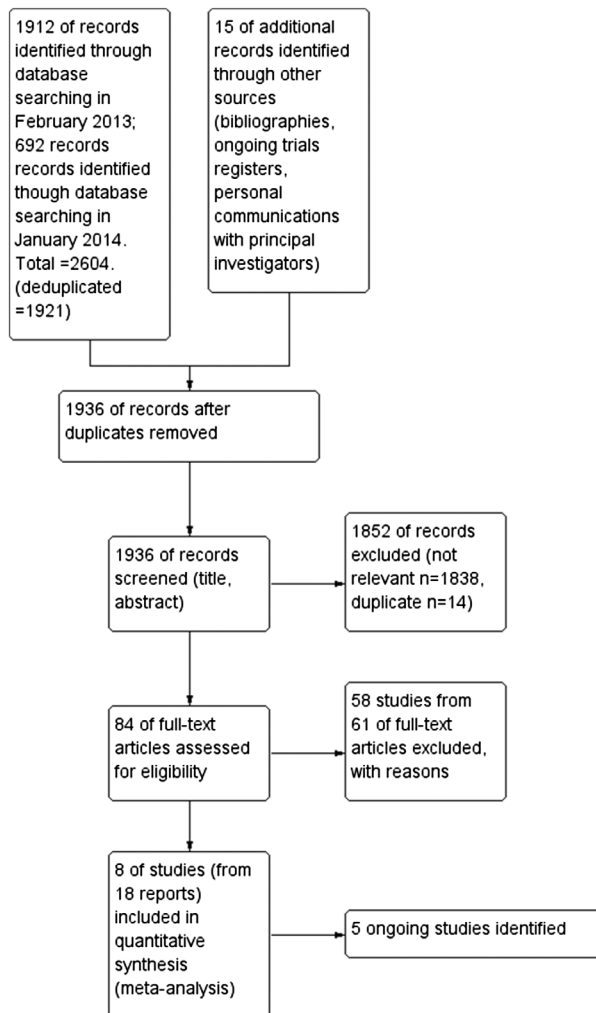


Figure 1. Study flow diagram (PRISMA).

to secure attachment at post-intervention (RR 11.45; 95% CI 3.11 to 42.08; $P = 0.0002$) favouring PIP.

Two studies reported attachment category at 1 and 5 year follow-up ($n = 129$) (Cooper et al., 2003; Cicchetti et al., 2006), and showed a statistically significant difference at 1 year favouring the intervention group for the number of infants securely attached (RR 3.3; 95% CI 1.82 to 6.0, $P \leq 0.000$); with significantly more control children being avoidant (RR 0.33; 95% CI 0.15 to 0.76; $P = 0.000$). There were, however, no differences between the groups in the proportion of children classified as resistant (RR 0.57; 95% CI 0.11 to 3.07) or disorganised (RR 0.80; 95% CI 0.29 to 2.19).

Two studies reported whether participants had changed attachment category by the end of the intervention (i.e. immediately post-intervention) (See Figure 4). Significantly more intervention group infants had moved from *insecure at pre-intervention* to *secure at post-intervention* (RR 11.45; 95% CI 3.11 to 42.08; $P = 0.0002$). Moderate levels of heterogeneity were

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Other bias
Cicchetti 1999	?	+	+	?	+	+	+
Cicchetti 2006	+	+	?	+	+	+	+
Cohen 1999	+	+	+	?	+	+	?
Cooper 2003	+	+	+	+	+	+	+
Lieberman 1991	?	+	+	+	+	+	+
Robert-Tissot 1996	?	?	+	+	+	+	+
Salomonsson 2011	+	+	+	+	+	+	+
Sleed 2013	+	+	+	+	+	+	+

Figure 2. Risk of bias summary for the included studies.

Note: The risk of bias summary below highlights each domain (columns) within each of the studies (rows).

identified ($\chi^2 = 1.61$; $df = 1$; $P = 0.205$; $I^2 = 38\%$). More infants who were *secure at pre-intervention and remained secure at post-intervention* (stably secure) were in the PIP groups, but this was not statistically significant (RR 2.28; 95% CI 0.41 to 12.56).

There was no statistically significant difference between the number of participants whose attachment category changed from *secure at pre-intervention to insecure at post-intervention* (RR 0.09; CI 0.01 to 1.56). Although more children in the control group were insecure at pre- and post-intervention (stably insecure), there was no significant difference in children who were *stably insecure* (RR 0.56; 95% CI 0.26 to 1.22).

There was also no statistically significant difference between parent–infant psychotherapy and control groups for data from all four studies measuring maternal sensitivity post-intervention (SMD -0.13 ; 95% CI -0.64 to 0.38); or for child involvement using data from two studies (SMD Random -0.01 ; 95% CI -0.32 to 0.30); or for data from three studies measuring maternal positive engagement at post-intervention (SMD Random -0.16 ; 95% CI -0.46 to 0.15). None of the above results were altered following adjustment for clustering. There was no evidence of an impact on child behaviour based on data from two studies (SMD 0.22 ; 95% CI -0.34 to 0.77); or infant cognitive development (SMD -0.15 , 95% CI -0.82 to 0.51).

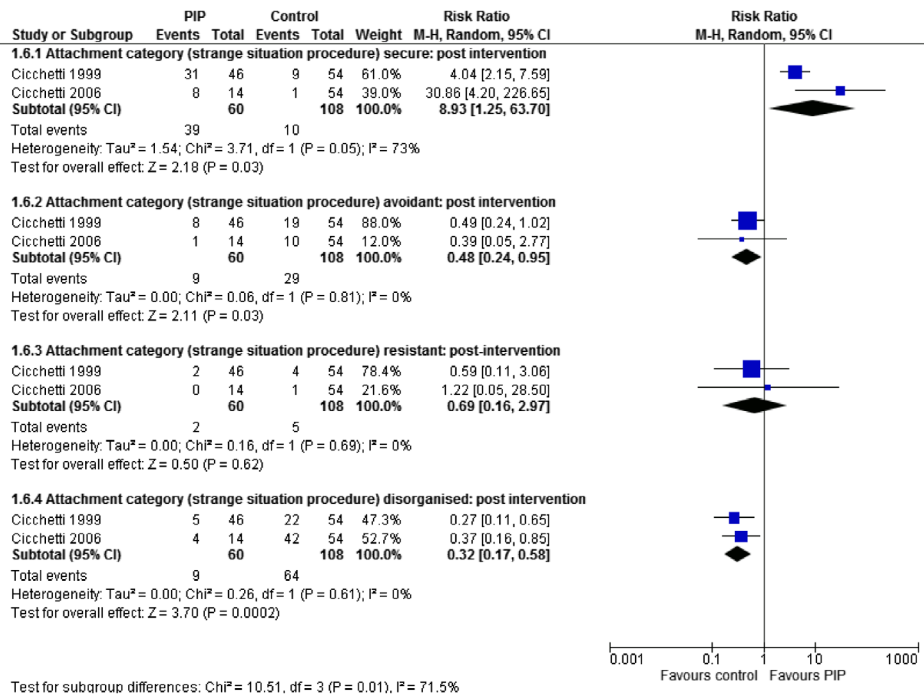


Figure 3. Forest plot of Comparison 1: parent–infant psychotherapy intervention versus control meta-analyses, outcome: Infant attachment categories meta-analysis: post-intervention.

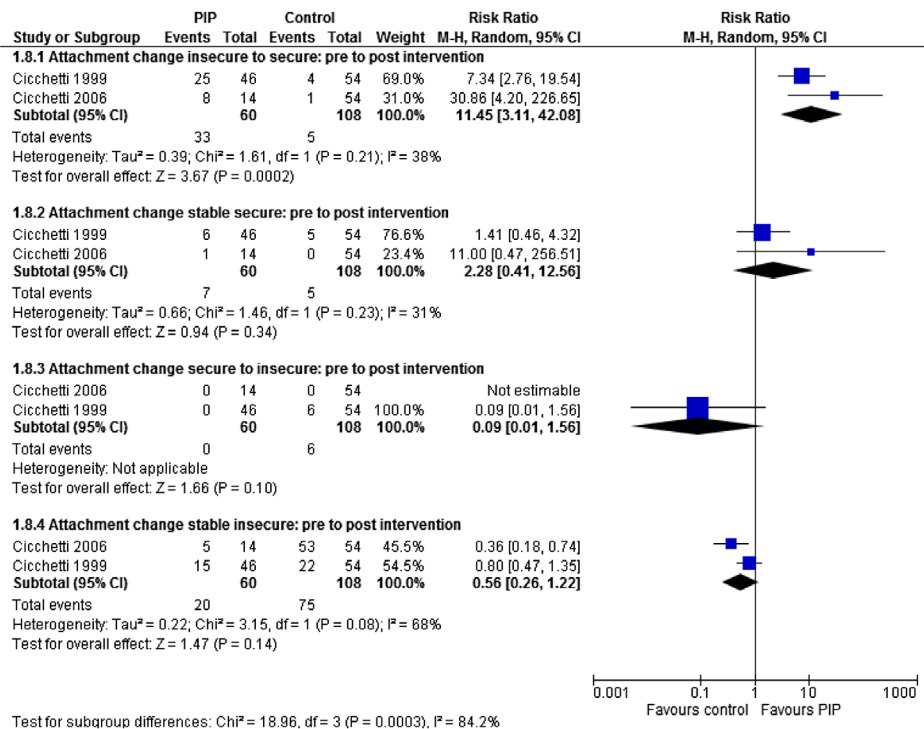


Figure 4. Forest plot of Comparison 1: parent–infant psychotherapy intervention versus control meta-analyses, outcome: 1.8 Infant attachment change meta-analysis.

Four studies reported a continuous measure of maternal depression at post-intervention ($n = 356$) and showed no difference between parent–infant psychotherapy and control groups (SMD -0.22 ; 95% CI -0.46 to 0.02 ; three of these studies that reported the number of subsequent episodes of depression post-intervention, also found no differences between intervention and control groups (RR 0.74 ; 95% CI 0.52 to 1.04).

PIP versus alternative treatment

Four studies contributed data to the PIP versus alternative treatment analyses (Cicchetti et al., 2006; Cohen et al., 1999; Robert-Tissot et al., 1996; Sled et al., 2013) producing 15 meta-analyses measuring parent mental health (depression); parent–infant interaction (maternal sensitivity); infant attachment category (secure, avoidant, resistant, disorganised) and attachment change (insecure to secure; stable insecure). Meta-analysis was not possible for infants who were stable secure; or changed from secure to insecure because no events occurred in the PIP group. None of the meta-analyses of PIP versus alternative treatment at post-intervention or follow-up showed significant differences in outcome between PIP and alternative treatment interventions.

Discussion

The results of this review suggest that PIP may be a promising model in terms of improving infant attachment security in high-risk populations including maltreating parents and incarcerated mothers, but that there is currently limited evidence of benefit across many other outcomes measured including maternal representations and parent–infant interaction. These findings need to be interpreted with caution, however, given the small number of studies identified, and their heterogeneity in terms of both the referral problem and the target populations. Moreover, the small number of included studies precluded the possibility of examining whether there were any moderating factors that might have affected the strength of the results. In addition, a number of the studies were lacking in rigour, and there was significant statistical heterogeneity affecting some of the key outcomes. The null findings for most of the outcomes synthesised in this review provide no evidence of an effect (rather than evidence of no effect) and may be due to low statistical power given the small number of included studies and the imprecision in the random-effects variance component.

With regard to the effectiveness of PIP relative to other methods of working the evidence is again inconclusive, partly as a result of the diverse interventions with which PIP was compared, and the fact that data regarding the cost of implementing parent–infant psychotherapy or its cost-effectiveness relative to other methods of intervening was not provided in any of the included studies. Despite the evidence suggesting that PIP has a role in improving infant attachment, it is noticeable that there was no difference in attachment outcomes between the PIP and alternative treatments, and the reasons for this are unclear. Some of the non-psychodynamic interventions are also relationship-based and this may be sufficient to promote parental sensitivity and secure infant attachment.

Comparison of these findings with the three earlier reviews is difficult because they included highly heterogeneous populations (e.g. low birth-weight babies; low-income families; infants with cerebral palsy) (Singleton, 2004) and interventions (i.e. targeting both parents alone and parent–infant dyads (Singleton, 2004; Poobalan et al., 2007; Bakermans-Kranenburg et al., 2003) (e.g. infant massage, home visiting and parent–infant

psychotherapy), which were evaluated using mixed designs including non-RCTs (Singleton, 2004; Poobalan et al., 2007). However, Bakermans-Kranenburg et al. (2003) review of 70 attachment interventions including parent–infant psychotherapy, video–interaction guidance and social support included a meta-regression, which showed that the most effective interventions used a moderate number of sessions and a clear-cut behavioural focus in families with, as well as without, multiple problems. Interventions that were more effective in enhancing parental sensitivity were also more effective in enhancing attachment security, which supports the notion of a causal role of sensitivity in shaping attachment. This review included studies of both PIP and Interaction Guidance, the latter of which appears to be an effective model of intervening (NICE, 2012). There is, however, currently insufficient evidence about the relative benefits of these two approaches either clinically (Robert-Tissot et al., 1996), or in terms of their cost-effectiveness (no cost-effectiveness data were provided in any of the included studies), and it is possible that both have a role in terms of supporting different groups of parents (Bakermans-Kranenburg et al., 1998). In the UK some organisations providing parent–infant psychotherapy have also incorporated video-based interaction guidance techniques into routine practice (e.g. Anna Freud Centre and OXPIP).

Potential biases in the review process were limited. However, it should be noted that random allocation does not guarantee equality of means between groups at pre-test, and also that post-test standard deviations may be inflated by a differential response to intervention, and may as such, underestimate the effect size attributable to the intervention.

Although we corrected for unit analysis issues arising from cluster-randomisation, we did not investigate further the clustering effect of individually randomised trials with group delivered therapies. This could mean that we have overestimated the significance of the findings.

We contacted the study investigators to provide missing data, but where this was not provided, we did not impute missing data. In addition, we had planned to carry out additional subgroup analyses to explore the programme components that appeared to be associated with more effective outcomes, and factors that modified intervention effectiveness, but there were too few included studies in each meta-analysis to do this. There were similarly too few studies to conduct sensitivity analyses to examine the impact of study design or quality.

The high prevalence of infant regulatory problems in addition to the poor long-term trajectory, particularly in the case of infants who have a disorganised attachment, suggests the need for practitioners who can work effectively with high-risk dyads during this crucial period of child development. Indeed, the delivery of services to children during the first two years of life could be effective in reducing some of the later demand for specialist child and adolescent mental health services, and although the findings of this review are currently inconclusive in terms of the effectiveness of parent–infant psychotherapy per se, or indeed relative to other methods of working, they nevertheless support the increasing body of evidence suggesting that brief, dyadic, attachment-based techniques of this sort can bring about improvement in children's attachment in high-risk dyads, with significant potential long-term benefits for the child.

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