Australian Government
National Health and Medical Research Council

NHMRC

NHMRC REPORT ON THE EVIDENCE: PROMOTING SOCIAL AND EMOTIONAL DEVELOPMENT AND WELLBEING OF INFANTS IN PREGNANCY AND THE FIRST YEAR OF LIFE

MAY 2017

WORKING TO BUILD A HEALTHY AUSTRALIA

NHMRC Report on the Evidence:

Promoting social and emotional development and wellbeing of infants in pregnancy and the first year of life

During its 2012-15 triennium, NHMRC's former Prevention and Community Health Committee (PCHC) identified mental health as a key project area, with a particular focus on the effectiveness of parenting practices and their role in promoting social and emotional health and wellbeing in children and later on as adults.

NHMRC established the Mental Health and Parenting Working Committee (the Committee) to oversee this work and guide the development of an NHMRC Report on the Evidence on promoting the social and emotional development and wellbeing of infants.

The *NHMRC Report on the Evidence: promoting social and emotional development and wellbeing of infants in pregnancy and the first year of life* (Report on the Evidence):

a) summarises the findings of a comprehensive evaluation of 51 systematic reviews that was commissioned by NHMRC

b) provides a Working Committee's assessment and interpretation of the evidence in the Australian context through its application of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach

c) is designed for governments and other policy makers, researchers and service providers

d) aims to facilitate the development of evidence-based policy in Australia.

The *NHMRC Plain Language Summary: the evidence on promoting social and emotional development and wellbeing of infants in pregnancy and the first year of life* has also been developed to provide an easy to read and condensed resource for stakeholders.

The *Administrative Report* provides a brief summary of the processes underpinning the evidence evaluation and development of the Report on the Evidence.

The *Evidence Evaluation Report* and *Technical Report* provide further information about the body of evidence underpinning the Report on the Evidence.

Foreword

The optimal development of infants and young children is an Australian and international priority. There is increasing recognition that foetal development and infancy are vital periods of very rapid physical, physiological, psychological and neurological growth. This growth is reflected in the cognitive, physical and social-emotional domains of early childhood development.

Human development involves interactions among biological, psychosocial and environmental factors. Environmental influences, and maternal responses to these, prime the developing foetus for the world she or he will be born into. Exposures to risks during pregnancy and early childhood may have lasting adverse effects on physical and physiological development. Interventions that optimise early childhood development during this phase of life have the potential to have a large benefit throughout the child's whole life.

Emotional development is the child's growing capacity to express and regulate emotions and understand how these relate to their experiences. Social development is the process whereby the child gains the life skills for understanding and responding to other people, including having their emotional needs met within relationships. Social–emotional development is the foundation for the establishment of a sense of identity. It begins from the earliest days and continues through life. The family and family environment (which includes cultural practices/approaches, the physical and mental health of family members, intra-family relations, household wealth, occupational status, and housing conditions) are the main sources of the child's experiences, and therefore have a key influence on a child's social and emotional development.[1]

In infancy, social-emotional development is shaped by the repeated exchanges that take place between babies and their primary caregivers. Effective caregivers observe the child's cues, interpret what these indicate, and respond consistently, contingently and competently. Caregivers who are positive, sensitive, responsive, and do not use physical punishment, facilitate optimal early social–emotional development, secure infant-to-parent emotional attachment, and higher infant cognitive ability. Caregivers' capabilities are shaped by their own experiences of being cared for as children, social and economic circumstances, knowledge of infant developmental needs, skills of infant care, and reproductive, physical and mental health.

Sensitive, responsive, affectionate relationships give infants experiences of safety, predictability, encouragement and emotional comfort. These early relationships provide a model for all subsequent relationships, including how to communicate emotions, trust others generally and at times of heightened need, and to develop empathy and compassion. Unpredictable and harsh caregiving practices can lead to suboptimal social and emotional development, which can result in problems with conduct or behaviour among young children, and to mental health problems among adolescents and young adults.

There is no formal training for parenting/caregiving, which has been stereotyped as being intuitive to women. However, parents generally aspire to providing the best care possible within their capacities and circumstances. Parenting knowledge and capabilities can be modified and strengthened if parents are given access to life-stage specific, salient and comprehensible information and learning opportunities. The perinatal period presents an exceptional opportunity to provide parents / caregivers with guidance and education, as they aspire to parent to the best of their ability. Effective parenting foundations will contribute to children's lifetime health and wellbeing. Parents and their babies are engaged with health and social services for routine care, and for assistance with specific or heightened needs related to health, development or personal circumstances during pregnancy and the first postpartum year.

The aim of this evidence evaluation was to assess the effectiveness of interventions, programs or messages for parenting/caregiving practices and behaviours through pregnancy and the first postpartum year to optimise social and emotional development of infants, and subsequently children and adolescents. The NHMRC Mental Health and Parenting Working Committee (the Working Committee) was interested in practices that were effective at a population level, and for more vulnerable and disadvantaged groups. Such practices range from preventive measures and early intervention strategies, through to clinical interventions. The Working Committee then had to consider how best to use this evaluation to promote infant and child social and emotional development and wellbeing in Australia.

An incidental benefit of this evaluation was that it identified important gaps in the evidence for interventions to promote infant social and emotional development and wellbeing, including evidence for effectiveness and cost-effectiveness.

We hope the findings of this report will encourage future research involving purpose-designed, well-reported studies that can guide future policy and practice in Australia.

Professor Jane Fisher, Chair, NHMRC Mental Health and Parenting Working Committee

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Consultant Clinical Psychologist Masada Private Hospital Mother Baby Unit

Purpose

This *Report on the Evidence: Promoting social and emotional development and wellbeing of infants in pregnancy and the first year of life* (Report on the Evidence) summarises the findings of the NHMRC's evaluation of evidence on the effectiveness of interventions (including programs or messages) delivered in pregnancy or the first postpartum year and designed to promote the social and emotional development and wellbeing of infants by influencing parenting/caregiving practices and behaviours.

It has been prepared for the NHMRC, governments and other policy makers, researchers and service providers who work with parents of infants, to promote the social and emotional development and wellbeing of infants and children.*

Notes: scope, context and use

Readers should be aware of the following when interpreting the information in this Report on the Evidence:

- The scope of this project was originally defined as an evaluation of strategies for optimising infant mental health. Given the lack of agreed definition of 'mental health' in infants, and controversy as to whether and how it can be assessed, the Committee interpreted the scope as infant social and emotional development and wellbeing.
- The systematic review (evidence evaluation) commissioned by NHMRC identified research studies that assessed various interventions (e.g. programs, initiatives or practices) for parents of infants aged up to 12 months and reported effects on measures of infant social and emotional development and wellbeing. Because the scope of this evaluation was limited to these effects (measured during infancy, childhood or up to age 18 years), it does not report on broader outcomes of the interventions, such as benefits for other domains of child development, or benefits for parents.
- The evidence evaluation included 51 systematic reviews, and of these, 32 (62%) contained and contributed pooled results.
- The GRADE approach was used to assess the quality of evidence. The large number of single studies reported in the systematic reviews necessitated only assessing those reviews that reported pooled results. This post hoc decision enabled a focused presentation of the key evidence on which the Working Committee could make decisions. This means, however, that some of the evidence for a particular intervention may not be captured in this Report on the Evidence.
- Interventions were not evaluated if they did not meet inclusion criteria for target age or were not included in systematic reviews that contributed pooled numerical results. Examples of interventions initially identified in the literature searches but not eligible for inclusion in the evidence evaluation included interventions to promote various parenting styles (e.g. positive parenting, responsive parenting), interventions to support breastfeeding, antenatal psychosocial assessment, various therapeutic approaches (e.g. solution-focused brief therapy, counselling, play therapy, parent–child interaction therapy, trauma-focused cognitive–behavioural therapy, motivational interventions, psychotherapy), mindfulness techniques, support for intellectually disabled parents, infant education programs, arrangement of services for parents with serious mental illnesses, telephone support, social support interventions, and specific programs (e.g. programs for Indigenous parents and their children, parenting programs for mothers in prison, foster parent training programs, the *Triple-P Positive Parenting Program, the Incredible Years parent training, and Healthy Families America*).
- For several of the interventions assessed, there was insufficient evidence to determine effects on infant social and emotional development and wellbeing, but there was evidence of other, unrelated benefits. This means that interventions that were not found to be suitable for implementation in Australia *for the specific purpose of promoting infant social and emotional development and wellbeing* may nevertheless have benefits not discussed in this Report on the Evidence.
- This Report on the Evidence does not make recommendations, but provides information that organisations and services can use to guide their own policy or planning, including a summary of the Working Committee's notes and conclusions after applying the GRADE approach to selected interventions.

How to use the report

Policy makers can use the report to understand the types of evidence-based practices and programs that exist and are showing benefits. It will help inform evidence-based policy decisions and advice, and to identify opportunities for further research.

Healthcare workers and other practitioners can use the report to help identify the types of evidence-based practices, programs and services that may be useful for their clients. For some of the interventions, we suggest when, where and by whom the practice can be delivered. Results can be viewed in a variety of ways, including by outcomes, by the target community group, or by the type of program.

Researchers can use the report to consider the gaps in the evidence reported and identify opportunities for further research. It will help researchers identify which interventions/programs could be evaluated in Australia, the research questions to address, and current needs for improved study design. Information on research implications and opportunities can be found in the Discussion section of the report, as well as in the GRADE assessment of the evidence for each intervention.

Parents and caregivers can use the report to learn about useful programs and services that help babies develop healthy emotions and relate well to other people as they grow. The report does not provide advice for parents and caregivers or make general recommendations about caring for babies.

*including vulnerable and/or disadvantaged groups, such as infants of parents with mental health problems.

About the Working Committee

The NHMRC Mental Health and Parenting Working Committee was established to oversee this search of the evidence. The Committee comprised experts in child health and wellbeing, family and community health, migrant and refugee health, child abuse and neglect, public health evidence and members of the former NHMRC Prevention and Community Health Committee. Representatives from the Departments of Health and Social Services were observers on the committee.

The Committee Terms of Reference, membership and expertise are available here.

Results viewed by: all interventions (alphabetical)

Note on outcomes

Benefits for the primary outcomes (infant social and emotional wellbeing and development up to one year of age) were not demonstrated by pooled numerical results.

The Committee analysed findings for indicators of primary and secondary outcomes reported in the Evidence Evaluation Report and concluded that no benefits for infant social and emotional development (the primary outcome) were demonstrated in this body of evidence.

Benefits were reported for a range of other indicators of secondary outcomes. These secondary outcomes included some indicators that might affect infant social and emotional development and wellbeing indirectly, such as couple adjustment or maternal mental health. The lack of demonstrated direct benefits of interventions on infant social and emotional development and wellbeing has implications for improving study designs of future research. See Overall research implications.

Antenatal and postnatal education and/or support

Antenatal and postnatal education and support interventions, delivered by appropriately trained professionals and starting before birth or in the first year of life, can improve cognitive and social development, infant mental health, sleep*, preventive care/health-promoting behaviours, parents' knowledge of infant behaviour, and parenting quality and couple adjustment, and can reduce maltreatment.*

Anticipatory guidance

There is insufficient evidence available from systematic reviews with pooled results to ascertain whether anticipatory guidance, starting before birth or in the first year of life, has any effect on infant social and emotional development and wellbeing.

Behavioural sleep interventions

There is insufficient evidence from systematic reviews with pooled results to ascertain whether behavioural sleep interventions during the first year of life, have any effect on infant social and emotional development and wellbeing.

Early childhood education and care interventions

There is insufficient evidence from systematic reviews with pooled results to ascertain whether early childhood education and care interventions provided outside the home during the first year of life have any effect on infant social and emotional development and wellbeing.

Home visiting interventions

Home visiting interventions for parents with particular needs for support (e.g. due to low socioeconomic status, young age or single status), delivered by experienced professionals or trained non-professionals and starting before birth or in the first year of life, are likely to improve parenting quality and interaction, uptake of immunisation, cognitive development/intelligence, and sleeping behaviour. They are also likely to prevent maltreatment (abuse or neglect), and reduce the frequency of unintentional injury and hospital admissions.

Infant massage interventions

Infant massage that is responsive to the needs of the infant, provided by a parent or caregiver during the first year of life, might help to enhance infant personal–social behaviour and sleep* and lessen the duration of crying or fussing.

Interventions for enhancing sensitivity and/or attachment security

Interventions for enhancing maternal sensitivity and/or attachment security, delivered by professionals and trained non-professionals and starting in the first year of life, are likely to enhance maternal sensitivity and attachment. These benefits apply to all infants, including populations with parents of low or middle/high socioeconomic status, adolescent and adult parents, infants born preterm and full term, and those with risk factors for suboptimal attachment. However, these interventions are not likely to be effective when disorganised attachment is already established.

Interventions for fathers

There is insufficient evidence from systematic reviews with pooled results to ascertain whether interventions for fathers, starting before birth or in the first year of life, have any effect on infant social and emotional development and wellbeing.

Interventions for parents in low-income and middle-income countries

Structured interventions to improve the mental health of women in low-income and middle-income countries, starting before birth or in the first year of life, might help to enhance infant development and the mother–infant relationship.

Interventions for parents of preterm and low-birthweight infants

Interventions designed for parents/caregivers of preterm/low birthweight infants, delivered by multidisciplinary teams/skilled trained professionals during the first year of life, are likely to improve infant cognitive development* and parenting quality and interaction.*

Interventions for parents of infants with or at risk of developmental delay or impairment

Interventions for parents of infants with or at risk of developmental delays or impairment, starting in the first year of life, might help to improve overall infant development.

Interventions for parents with alcohol or drug problems

There is insufficient evidence from systematic reviews with pooled results to ascertain whether interventions for parents with drug or alcohol problems, starting before birth or in the first year of life, have any effect on infant social and emotional development and wellbeing.

Interventions for parents who are socioeconomically disadvantaged

Interventions for parents who are socioeconomically disadvantaged, starting before birth or in the first year of life, might enhance parent–child interactions.

Interventions for preventing later antisocial behaviour and delinquency

Home visiting interventions to prevent later antisocial behaviour and delinquency, starting in the first year of life, are likely to lessen disruptive behaviour during childhood.

Interventions for preventing postnatal depression

Interventions for preventing postnatal depression, starting before birth or in the first year of life, might enhance maternal mental health (lessen depression* and anxiety*). It is reasonable to expect effective prevention of postnatal depression to be beneficial. However, in this review, there was insufficient evidence for interventions focusing on preventing postnatal depression as a primary intervention for optimising infant social and emotional development and wellbeing.

Interventions for promoting effective parenting

There is insufficient evidence available from systematic reviews with pooled results to ascertain whether interventions to promote effective parenting, starting before birth or in the first year of life, have any effect on infant social and emotional development and wellbeing.

Interventions for teenage parents

Interventions for teenage parents, starting before birth or in the first year of life, might help to enhance parent–child interactions.*

Interventions for treating maternal depression in the perinatal period

Interventions for treating maternal depression in the perinatal period showed no clear impact on infant emotional wellbeing or on infant behaviour and social function (indicators of primary outcome), but might enhance maternal mental health (lessen depression* and anxiety*) and quality of parenting behaviours.

It is reasonable to expect effective treatment of perinatal depression to be beneficial. However, in this review, there was insufficient evidence for interventions focusing on treating maternal depression as a primary intervention for optimising infant social and emotional development and wellbeing.

Kangaroo care

Kangaroo care in the first year of life, performed by parents/caregivers and supervised by trained health professionals, as appropriate to the infant's clinical needs, can reduce the risk of mortality* and infection/sepsis.*

Neonatal Behavioural Assessment Scale (NBAS)-based interventions

NBAS-based interventions, delivered within a few weeks of birth by trained professionals or by parents with the assistance of trained professionals, might enhance parenting quality.

Skin-to-skin care interventions

There is insufficient evidence available from systematic reviews with pooled results to ascertain whether skin-to-skin care interventions in the first year of life have any effect on infant social and emotional development and wellbeing.

*Effects were reported for multiple follow-up intervals for these outcomes. Improvements were seen for some, but not all follow-up periods.

Results viewed by: target community subgroups

Note on target groups

Interventions designed to target certain groups included:

- Interventions for fathers
- Interventions for parents of preterm and low-birthweight infants
- Interventions for parents in low-income and middle-income countries
- Interventions for parents of preterm and low-birthweight infants
- Interventions for parents of infants with or at risk of developmental delay or impairment
- Interventions for parents with alcohol or drug problems
- Interventions for parents who are socioeconomically disadvantaged
- Interventions for preventing later antisocial behaviour and delinquency
- Interventions for preventing postnatal depression*
- Interventions for teenage parents
- Interventions for treating maternal depression in the perinatal period*.

The Committee also determined the suitability of interventions for universal, targeted or optional implementation in Australia based on consensus after applying the GRADE approach.

The following interventions are suitable for universal implementation in Australia:

- antenatal and postnatal education and/or support
- interventions for enhancing sensitivity and/or attachment security
- Neonatal Behavioural Assessment Scale (NBAS)-based interventions.

Each of these interventions is also suitable for adaptation to suit targeted intervention.

The Committee determined the suitability of interventions for universal, targeted or optional implementation in Australia based on consensus after applying the GRADE approach.

The following interventions are suitable for targeted implementation in Australia:

- antenatal and postnatal education and/or support (also suitable for universal implementation)
- home visiting interventions
- interventions for enhancing sensitivity and/or attachment security (also suitable for universal implementation)
- interventions for parents of preterm and low-birthweight infants
- kangaroo care
- Neonatal Behavioural Assessment Scale (NBAS)-based interventions (also suitable for universal implementation).

The following parenting/caregiving practice is suitable for parents/caregivers to adopt, if they choose:

- infant massage by a parent or primary caregiver.

There was insufficient evidence from systematic reviews with pooled results to reach conclusions on the effectiveness of the following interventions for promoting infant social and emotional development and wellbeing:

- anticipatory guidance
- behavioural sleep interventions
- early childhood education and care interventions
- interventions for fathers
- interventions for parents with alcohol or drug problems
- interventions for promoting effective parenting
- skin-to-skin care interventions.

Note on outcomes

Benefits for the primary outcomes (infant social and emotional wellbeing and development up to one year of age) were not demonstrated by pooled numerical results.

The Committee analysed findings for indicators of primary and secondary outcomes reported in the Evidence Evaluation Report and concluded that no benefits for infant social and emotional development (the primary outcome) were demonstrated in this body of evidence.

Benefits were reported for a range of other indicators of secondary outcomes. These secondary outcomes included some indicators that might affect infant social and emotional development and wellbeing indirectly, such as couple adjustment or maternal mental health.

The lack of demonstrated direct benefits of interventions on infant social and emotional development and wellbeing has implications for improving study designs of future research. See Overall research implications.

* Effective interventions for preventing postnatal depression or treating maternal depression in the perinatal period may be clinically indicated or appropriate. Despite inconclusive evidence for direct benefits on infant social and emotional development and wellbeing within the scope of this review, there are well-documented adverse consequences of maternal depression for the development of the child. Treating or preventing the mother's depression could be regarded as necessary, but not sufficient, to ensure optimal outcomes for the social and emotional development of the infant.[2]

Results viewed by: complexity of interventions

Note on complexity of interventions

Many current approaches to promoting the social and emotional development and wellbeing of infants involve multiple strategies or programs with multiple components. In some cases, a single intervention (e.g. a parenting practice or educational strategy) may be a component of a complex intervention. The content of different complex interventions, such as home visiting programs or antenatal education and support interventions, may partially overlap. This means that it is not possible to evaluate the effectiveness of single components or to assume that complex interventions with similar general aims, but different combinations of components, will have the same effects.

Note on outcomes

Benefits for the primary outcomes (infant social and emotional wellbeing and development up to one year of age) were not demonstrated by pooled numerical results.

The Committee analysed findings for indicators of primary and secondary outcomes reported in the Evidence Evaluation Report and concluded that no benefits for infant social and emotional development (the primary outcome) were demonstrated in this body of evidence.

Benefits were reported for a range of other indicators of secondary outcomes. These secondary outcomes included some indicators that might affect infant social and emotional development and wellbeing indirectly, such as couple adjustment or maternal mental health.

The lack of demonstrated direct benefits of interventions on infant social and emotional development and wellbeing has implications for improving study designs of future research. See Overall research implications.

Single-component interventions

- Anticipatory guidance
- Behavioural sleep interventions
- Infant massage interventions
- Kangaroo care
- Neonatal Behavioural Assessment Scale (NBAS)-based interventions
- Skin-to-skin care interventions

Multimodal interventions

- Antenatal and postnatal education and/or support
- Day care interventions
- Home visiting interventions
- Interventions for fathers
- Interventions for parents in low-income and middle-income countries
- Interventions for parents of preterm and low-birthweight infants
- Interventions for parents of infants with or at risk of developmental delay or impairment
- Interventions for parents with alcohol or drug problems
- Interventions for parents who are socioeconomically disadvantaged
- Interventions for preventing later antisocial behaviour and delinquency
- Interventions for promoting effective parenting
- Interventions for teenage parents

Results viewed by: outcomes

Note on outcomes

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Benefits were reported for a range of other indicators of secondary outcomes. These secondary outcomes included some indicators that might affect infant social and emotional development and wellbeing indirectly, such as couple adjustment or maternal mental health.

The lack of demonstrated direct benefits of interventions on infant social and emotional development and wellbeing has implications for improving study designs of future research. See Overall research implications.

Improved cognitive development

- Antenatal and postnatal education and/or support
- Home visiting interventions
- Interventions for parents of preterm and low-birthweight infants

Reduced crying/fussing

- Infant massage interventions

Improved infant development

- Interventions for parents in low-income and middle-income countries
- Interventions for parents of infants with or at risk of developmental delay or impairment

Improved infant mental health

- Antenatal and postnatal education and/or support

Improved sleep

- Antenatal and postnatal education and/or support
- Home visiting interventions
- Infant massage interventions

Improved social development/behaviour

- Antenatal and postnatal education and/or support
- Infant massage interventions

Reduced disruptive behaviour

- Interventions for preventing later antisocial behaviour and delinquency

Reduction in mortality

- Kangaroo care

Reduction in infection/sepsis

- Kangaroo care

Improved maternal sensitivity and attachment

- Interventions for enhancing sensitivity and/or attachment security

Improved mother-infant relationship

- Interventions for parents in low-income and middle-income countries

Improved parent–child interaction

- Home visiting interventions
- Interventions for parents of preterm and low-birthweight infants
- Interventions for parents who are socioeconomically disadvantaged
- Interventions for teenage parents

Improved parenting quality

- Antenatal and postnatal education and/or support
- Home visiting interventions
- Interventions for parents of preterm and low-birthweight infants
- Interventions for treating maternal depression in the perinatal period
- Neonatal Behavioural Assessment Scale (NBAS)-based interventions

Improved preventive care/uptake of immunisation/health-promoting behaviours

- Antenatal and postnatal education and/or support

- Home visiting interventions

Improved parents' knowledge of infant behaviour

- Antenatal and postnatal education and/or support

Improved couple adjustment

- Antenatal and postnatal education and/or support

Improved maternal mental health

- Interventions for preventing postnatal depression
- Interventions for treating maternal depression in the perinatal period

Prevention of maltreatment

- Antenatal and postnatal education and/or support
- Home visiting interventions

Reduction in unintended injury/hospital admission

- Home visiting interventions

Outcomes uncertain

- Anticipatory guidance
- Behavioural sleep interventions
- Day care interventions
- Interventions for fathers
- Interventions for parents with alcohol or drug problems
- Interventions for promoting effective parenting
- Skin-to-skin care interventions

Background

Subject of this Report on the Evidence

This report summarises an evaluation of evidence on the effectiveness of interventions for parenting/caregiving practices and behaviours for optimal social and emotional development of infants, commissioned by the National Health and Medical Research Council (NHMRC).[3,4]

Whilst the report may be of interest to clinicians, it is designed for policy makers, researchers and service providers whose work involves initiatives intended to support parents of infants as a means of promoting children's social and emotional development and wellbeing.

For full documentation of the evaluation, refer to the Evidence Evaluation Report and Technical Report.

Objectives

The objectives of the evidence evaluation were:

- to assess the effectiveness of interventions (including programs or messages for parenting/caregiving practices and behaviours) for achieving optimal social and emotional development of infants in their first year of life, and as children and adults
- to identify characteristics of interventions, programs or messages that are most likely to lead to optimal social and emotional development.

Why NHMRC commissioned this evidence evaluation

NHMRC has for several years identified mental health as a priority, and has undertaken an evidence-based approach to promote the optimal social and emotional wellbeing and development of infants, children and adults, through early parenting/caregiving practices and behaviours.

The first year of a child's life is an important period for social and emotional development. The practices and behaviours of parents and other caregivers are crucial for children's early social and emotional development. Worldwide, governments and policy makers are increasingly recognising the need to identify early interventions that can be implemented universally or targeted to families of infants at higher risk of poor social and emotional development.[5,6]

Early interventions (during pregnancy or in the first year of a child's life) can promote parent or caregiver practices and behaviours that support infant social and emotional development and wellbeing, and strengthen and improve the relationship between the parent or caregiver and the child.[3] NHMRC was interested in identifying:

- which interventions early in life can improve a child's social and emotional wellbeing and development during infancy, childhood and adolescence
- which aspects of these interventions are most likely to be effective for achieving this
- which interventions (e.g. programs, support initiatives or messages) could be implemented universally and which could best be targeted to specific population groups
- possible evidence gaps and opportunities for further research.

Definition and background

Healthy social and emotional development (sometimes considered to indicate 'mental health') in infancy involves developing the capacity to experience, regulate and express emotions, to form close and secure interpersonal relationships, and to explore the environment and learn – all within the context of family, community and cultural expectations.[7]

Information on the prevalence of problems of social and emotional development among infants is limited. In the first year of life, about one in five infants may have regulatory problems (for example crying, sleeping or feeding difficulties).[8] Dislike of being touched or cuddled by a parent, and an abnormal parent or caregiver-infant relationship have been considered indicators of emotional disturbance in infancy.[9] The Copenhagen Child Cohort Study estimated the population prevalence of mental health disorders among children aged 18 months to be 16–18%. The most common disorders were disorders of emotion, behaviour and eating, and regulatory disorders.[10] The US National Survey of Child and Adolescent Well-being reported that almost 35% of infants aged 12–18 months scored high on the Problem Scale of the Brief Infant Toddler Social Emotional Assessment.[11]

Problems with social and emotional development during infancy are significant predictors of difficulties in childhood and adulthood. Insecure (avoidant and disorganised) attachment in infancy has been shown to predict a range of poorer outcomes in later childhood, including child conduct problems.[12] Children who develop secure attachment in infancy have been shown to be better adjusted at school, enjoying better emotional, social and behavioural adjustment and peer-rated social status.[13]

Behavioural problems in early childhood strongly predict problems with academic achievement and behaviour at school age.[14] Early regulatory problems are often transient, but there is a risk that they may persist – particularly when families are experiencing multiple problems.[8]

Research question

Main question: What is the effectiveness of interventions for caregiving practices or behaviours for optimal social and emotional development of infants, when provided before birth or up to age 12 months?

PICO* questions derived from main question:

- What interventions, programs or messages for practices and behaviours of parents/caregivers prior to birth (during pregnancy) and in the first year of an infant's life have been shown to lead to improved social and emotional development of the infant, the child and later on as the adolescent (up to 18 years of age)?
- What interventions, programs or messages for practices and behaviours of parents/caregivers prior to birth (during pregnancy) and in the first year of an infant's life have been shown to lead to poorer social and emotional development for the infant, the child and later on as the adolescent (up to 18 years of age)?

  * The PICO format identifies the following components, to enable logical literature searches: patient/problem/population, intervention, comparison, outcome/s.

Methods

Approach to identifying and evaluating the evidence

NHMRC commissioned an independent evaluation of evidence, which was undertaken by the Australian Research Centre for the Health of Women and Babies at the University of Adelaide (the evidence reviewers) and overseen by NHMRC's Mental Health and Parenting Working Committee (the Working Committee).
The evaluation of evidence included:

1. an overview of systematic reviews (the overview)

2. a qualitative analysis of selected systematic reviews (those that contributed pooled numerical results, evaluated interventions that were associated with an improvement in at least one of the pre-specified outcome domains for which pooled numerical results were available, and for which the evidence reviewers assessed the quality of evidence to be higher than 'very low' using the GRADE approach).

The Working Committee analysed the evidence using the GRADE [15] approach.

The overview method, inclusion criteria, and processes for assessing the quality of evidence are described in detail in the Evidence Evaluation Report.

The search terms are described in the Technical Report.

Eligibility criteria for included systematic reviews

Study design

The overview included systematic reviews of any of the following types of studies:

- randomised controlled trials (RCTs)
- cluster-randomised trials (cRCT)
- quasi-randomised trials (qRCT)
- non-randomised controlled trials (nRCT)
- controlled before-and-after studies
- interrupted time series
- cohort studies
- case-control studies
- historically controlled studies.

Comparators included standard care, usual practice, no intervention, or an alternative parenting/caregiving/parent-child intervention or program (details in the Evidence Evaluation Report and Technical report).

Study population

The overview included systematic reviews of studies with the following participants:

- expecting parents (mothers, fathers, partners) of infants prior to birth
- parents (or any teenagers or adults defined as primary caregivers such as mothers, fathers, foster parents, grandparents or relatives) of infants from birth to one year of age at enrolment or study commencement.

Intervention

The overview included systematic reviews of studies evaluating parenting or parent-child interventions that met the following criteria:

- programs or services aimed at parents, caregivers, or parents/caregivers and children
- targeted infants aged under one year and commenced before or after birth (studies were included even if the intervention continued after the infant's first birthday)
- aimed to achieve one or more of the following:
  - to prevent or manage infant regulatory problems
  - to change parenting/caregiving practices
  - to provide parenting/caregiving education or support pre- and post-pregnancy
  - to improve infant social and emotional wellbeing.

Studies were eligible for inclusion irrespective of the theoretical framework underpinning the parenting intervention/program (i.e. behavioural, cognitive behavioural, humanistic etc.).

Studies were excluded if they:

- focused solely on the effects of pharmacological interventions
- were delivered solely to infants, with no focus on parenting/caregiving education, practices and/or behaviours.
- Interventions were not pre-defined, but defined and categorised according to the included systematic reviews. These included interventions with a specific goal or based on a specific practice, and interventions designed for a particular target group of parents/caregivers.

In preparing the Evidence Evaluation Report, the reviewers were guided by the approaches and reported results of the included systematic reviews. Consequently, the range of interventions for which information was available was limited to those interventions and target groups described in the report.

Publication date

Systematic reviews were eligible for inclusion if published between January 1994 and December 2014.

Prioritising systematic reviews for inclusion

After the pre-specified inclusion and exclusion criteria were applied, more systematic reviews were eligible for consideration than could feasibly be included in the overview. A process for prioritising eligible systematic reviews was undertaken to limit the number of systematic reviews to a manageable volume by prioritising those that reported primary outcome data, and excluding repetition and extraneous data.

Eligible systematic reviews excluded by this process are listed in the Technical Report, with reasons for exclusion.

The main reasons for excluding a systematic review were as follows:

- It was unclear whether the intervention commenced in infancy.
- Only parent/caregiver outcomes were reported (not infant social/emotional development/wellbeing outcomes).
- It was unclear whether the children were infants.
- Content overlapped substantially with other eligible systematic reviews (In this case, the most recent and/or comprehensive systematic reviews were retained).

Quality assessment

Included systematic reviews

The evidence reviewers assessed the quality of each included systematic review using two standardised tools:

- AMSTAR[16] evaluates review methods against 11 criteria to assess the degree to which a systematic review avoids bias.
- ROBIS tool[17] assesses the risk of bias in systematic reviews.

Notes:

Both tools were used as they take a different approach to assessing review quality. AMSTAR rates each review on a scale of 1–11, where a score of 3 or lower indicates low quality, a score of 4–7 indicates moderate quality, and a score of 8 or higher indicates high quality. ROBIS rates each review as having low, high or unclear risk of bias. Accordingly, the highest quality rating for a systematic review is 'high quality' on AMSTAR and 'low risk of bias' on ROBIS.

Included studies

The evidence reviewers extracted quality assessment data for each study as reported by the systematic reviews.

Body of evidence for each outcome

The quality of the evidence in the included systematic reviews was assessed using the GRADE approach.[15] For each reported outcome for which pooled numerical results were available, the evidence reviewers graded the quality of the body of evidence according to the following categories:

- **high** (further research is very unlikely to change confidence in the estimate of effect)
- **moderate** (further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate)
- **low** (further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate)
- **very low** (any estimate of effect is very uncertain).

Criteria for qualitative analysis of interventions

The overview reported on interventions that were associated with an improvement in at least one of the pre-specified outcome domains for which pooled numerical results were available, and for which the quality of evidence was assessed as higher than 'very low' using the GRADE approach.

Pre-specified outcome domains

Primary outcome

Infant social and emotional wellbeing and development up to one year of age (including individual or composite measures of social and emotional wellbeing and development, e.g. scores on screening or measurement tools).

Secondary outcomes

Development for the infant, as a child, and up to 18 years (e.g. normative standards for growth and development, language and cognitive development, problem-solving and decision making skills, pre-school transition, academic achievement, school engagement and retention, indicators of social and

emotional wellbeing such as mental health, identity, social competence, self-esteem, self-efficacy, coping, or emotional intelligence)

Behaviour for the infant, as a child, and up to 18 years (e.g. indicators of early infant regulatory problems such as problems with sleeping, crying or feeding difficulties, internalising and externalising behaviour difficulties, problem behaviours such as conduct disorder, positive behaviour and prosocial behaviour, law-abiding behaviour and convictions, risk avoidance and risky behaviour such as youth pregnancy, suicide, smoking and substance abuse)

Physical wellbeing and safety for the infant, as a child, and up to 18 years (e.g. indicators of optimal physical health and healthy lifestyle such as adequate nutrition, adequate exercise and physical activity, absence of preventable disease, and safety)

Parent-infant relationship (e.g. indicators of infant interaction with parent/caregiver, parent/caregiver interaction with infant, combined parent/caregiver-infant interactions such as positive interactions, emotional warmth and responsiveness or absence of hostility, and indicators of attachment quality)

Parent/caregiver psychosocial wellbeing (e.g. indicators of depression, anxiety, stress and quality of life)

Parent/caregiver knowledge, practices and behaviours (e.g. knowledge of basic infant care, behaviours and practices/skills, sense of confidence and competence in the parenting/caregiving role, harmful use or avoidance of substances such as alcohol)

Parent/caregiver views of intervention (e.g. attitudes towards intervention, including satisfaction)

Family relationships (e.g. relationship between parents/caregivers, and relationships between other family members)

Systems outcomes (e.g. notification/re-notification to agencies, documentation of maltreatment/abuse or neglect, removal of infant by authorities)

In making its conclusions for each intervention, the Working Committee decided to consider only those outcomes that were rated as critical, and not those rated as important, for the following reasons:

- to minimise the risk of being seen to evaluate outcomes outside the scope of the primary outcome of social and emotional development and wellbeing (e.g. growth, breastfeeding)
- to manage the unwieldy number of 'important' outcomes, which would have resulted in an impractical list of conclusions if the Committee had included them in the GRADE process.

Quality assurance processes

The overview (as reported in the Evidence Evaluation Report and Technical report) was reviewed by an external, independent methodological reviewer. The reviewer:

- assessed the methodological quality of the overview using the AMSTAR instrument.[16] The overview received a score of 8 out of a total of 11 and, overall met the majority of the AMSTAR methodological requirements for a systematic review.
- assessed the overview for transparency and completeness of reporting against the PRISMA Statement[18] Overall, the reporting in the overview was found to be transparent and complete.
- The reviewer advised that the overview was completed to an adequate quality standard and that the evidence reviewers adhered to the research protocol. The independent review is summarised in the Administrative Report.

The Working Committee assessed the Evidence Evaluation Report and acknowledged that the evaluation of evidence was conducted to a high quality standard.

The Evidence Evaluation Report was revised in response to comments and suggestions by the Office of NHMRC, the independent methodological reviewer, and the Working Committee.

Assessment of interventions in the Australian context

For each intervention reported in the overview, the Working Committee used the GRADE[15] approach to assess the evidence systematically and reach a consensus on its potential to promote infant and child social and emotional development and wellbeing among Australian parents/caregivers.

Following GRADE processes, the Working Committee first assigned a priority rating (critical, important, or not relevant)* to each outcome reported by the systematic reviews and, in instances when no individual outcomes were reported, to the pre-specified outcome domain. The priority rating of each outcome for which the overview reported a benefit is listed in the Summary of findings by intervention.

* For more information, refer to the GRADE handbook section 3: Selecting and rating the importance of outcomes

The GRADE approach involves assessing a body of evidence by considering all the following domains:

- overall confidence in the estimates (based on outcomes rated as critical)
- balance of benefits versus harms and burdens. Given the absence of evidence on the possible harms in the body of evidence, the Working Committee discussed potential harms of each intervention, based on their experience and expertise.
- the values and preferences of relevant stakeholders (e.g. parents/caregivers, policy makers, other guideline panels, health professionals or welfare professionals)
- resource implications of implementing the intervention
- whether (and the extent to which) implementing the intervention would improve social equity
- acceptability of the intervention to stakeholders
- feasibility of implementing the intervention.

Universal and targeted interventions

When assessing the potential value of implementing interventions in Australia, the Working Committee considered whether each intervention would be appropriate for all parents/caregivers and infants, or would be best targeted to a particular subgroup (see Summary of the Working Committee's conclusions).

Overall conclusions for each intervention

For each intervention, the Working Committee summarised its interpretation of the available evidence and other considerations, focusing on infant social and emotional development and wellbeing outcomes. The Working Committee took a systematic approach to developing these statements (see Decision tool for developing evidence-based conclusion statements). For each intervention. the wordings were derived by mapping the strength of overall quality (from very low to high) of evidence for critical outcomes for that intervention against an overall GRADE assessment rating of 'high' or 'moderate'.

For interventions that reported critical outcomes with an overall GRADE assessment of 'high', the following wordings were used, according to the quality of evidence:

- *[Intervention] might help to improve/reduce [outcome/s]*
- *[Intervention] might improve/reduce [outcome/s]*
- *[Intervention] is likely to improve/reduce [outcome/s]*
- *[Intervention] can improve/reduce [outcome/s].*

For interventions that reported critical outcomes with an overall GRADE assessment of 'moderate', the following wordings were used, according to the quality of evidence:

- *[Intervention] might help to enhance/lessen [outcome/s]*
- *Intervention] might enhance/lessen [outcome/s]*
- *[Intervention] is likely to enhance/lessen [outcome/s]*
- *[Intervention] can enhance/lessen [outcome/s.]*

For seven interventions reviewed in NHMRC's evidence evaluation, the Working Committee did not complete the GRADE process because there was insufficient evidence available to determine effectiveness and/or draw a conclusion on the intervention's effect on social and emotional development of the infant, the child and later on as an adolescent.

For these interventions where GRADE was not undertaken, the following statement is used:

There is insufficient evidence from systematic reviews with pooled results to ascertain whether [Intervention], starting before birth or in the first year of life, has any effect on infant social and emotional development and wellbeing.

See Decision tool for developing evidence-based conclusion statements.

Overview of evidence

Systematic reviews included in the overview

The overview included 51 systematic reviews, of which 32 (63%) contributed pooled results.

Of the 32 reviews that provided pooled results, 23 (72%) reported formal quantitative methods for pooling (mostly meta-analyses).

Interventions evaluated

The overview reported on the effectiveness of the following interventions for promoting social and emotional development and wellbeing:

- antenatal and postnatal education and/or support
- anticipatory guidance
- behavioural sleep interventions
- early childhood education and care interventions
- home visiting interventions
- infant massage interventions
- interventions for enhancing sensitivity and/or attachment security
- interventions for fathers
- interventions for parents in low-income and middle-income countries
- interventions for parents of preterm and low-birthweight infants
- interventions for parents of infants with or at risk of developmental delay or impairment
- interventions for parents with alcohol or drug problems
- interventions for parents who are socioeconomically disadvantaged

- interventions for preventing later antisocial behaviour and delinquency
- interventions for preventing postnatal depression
- interventions for promoting effective parenting
- interventions for teenage parents
- interventions for treating maternal depression in the perinatal period
- kangaroo care
- Neonatal Behavioural Assessment Scale (NBAS)-based interventions
- skin-to-skin care interventions.

Outcomes reported

The evidence reviewers used their discretion to match the outcomes reported in studies to the pre-specified outcome domains.

The outcomes reported by systematic reviews are listed under each intervention (see Summary of findings by intervention).

Quality of included systematic reviews

Of the 51 reviews:

- 14 (27%) were rated **high quality** on the AMSTAR tool and at **low risk of bias** on the ROBIS tool (overall 'low risk of bias')
- 17 (33%) were rated **low quality** on the AMSTAR tool and at **high risk of bias** (overall 'high risk of bias') on the ROBIS tool.
- 20 (39%) were rated as **moderate quality** on the AMSTAR tool, and **high/low or unclear risk of bias** on the ROBIS tool (overall 'intermediate risk of bias').

Quality of evidence in included systematic reviews

The quality of the body of evidence for outcome domains with reported outcomes ranged from very low to high (see *Table 4: Outcome domains by intervention/population categories, with quality of the evidence [GRADE]* in the Evidence Evaluation Report)

The quality of the body of evidence for each reported outcome is listed in the summary of findings for each intervention (see Summary of findings by intervention).

Antenatal and postnatal education and/or support

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence varied widely and were developed to educate expectant and new parents in parenting skills, on coping with stressors, promoting positive interactions between partners and stimulating child development.[19,20]

Notes:

- Bryanton (2013)[19] included postnatal education directed towards women or couples: Five RCTs tested parent education relative to parent education about sleep enhancement; 12 RCTs tested education relative to infant behaviour; three RCTS tested education relative to general post-birth health; three RCTs tested education relative to general infant care; four RCTs tested education relative to infant safety. Durations/intensities varied: (1) one postpartum session (e.g. 20-minute NBAS assessment on the third day after birth), (2) four home visits, one per week, (3) a 45-minute meeting after birth, followed by weekly phone contact for 6 weeks.
- Pinquart (2010)[20] included interventions with a parenting education component for expectant and new parents, starting during pregnancy or in the first 6 months after birth. The main goals of the interventions included teaching infant care (86% of interventions), promoting parental sensitivity and responsiveness (82%), promoting cognitive stimulation of the child (45%), counselling (38%), discussion of future planning/family planning (35%), health promotion (27%), prevention of child abuse (21%), and promotion of couple adjustment/marital adjustment (17%). Most interventions (N=86) commenced after childbirth; N=10 were exclusively in pregnancy; N=38 were in pregnancy and after childbirth; most (N=84) were delivered exclusively in parental homes; N=16 were held in hospitals; N=6 in the community; and N=26 combined home visits with other locations. Average length of intervention was 15.0 months (SD: 13.7, range 1 day to 60 months). Average number of meetings was 29 (SD: 50.4, range one meeting to 421 meetings).

Evidence sources: systematic reviews

Four relevant systematic reviews were assessed:

- **Pinquart (2010)**[20] (high risk of bias, low quality) – contributed pooled numerical results (see *Evidence table for Pinquart 2010* in the Technical Report)
- **Bryanton (2013)**[19] (low risk of bias, high quality) – contributed pooled numerical results (see *Evidence table for Bryanton 2013* in the Technical Report)
- **Gagnon (2007)**[21] (low risk of bias, high quality) – no pooled numerical results (see *Evidence table for Gagnon 2009* in the Technical Report)
- **Shaw (2006)**[22] (low risk of bias, moderate quality) – no pooled numerical results (see *Evidence table for Shaw 2006* in the Technical Report).

Primary studies reported in systematic reviews that contributed pooled numerical results

Pinquart (2010)[20]

Number of relevant studies: 133

Study design: RCT

Total number of participants: 13 300

Sample sizes (range): not reported

Publication period: 1973–2009

Place: not reported

Study populations: expectant or new parents; approximately 2/3 of the interventions worked with families at risk (N=82); the majority included only mothers (N=107); average age of participants was 24.3 years (SD: 4.7), 79% were expecting or had just given birth to their first child; 58% were married, 21% cohabitating; 58% were members of ethnic minorities; 56% had completed high school education

Intensity of intervention: average 29 visits (range one–421), average duration 15.0 months (range one day to 60 months)

see *Evidence table for Pinquart 2010* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Bryanton (2013)[19]

Number of relevant studies: 15

Study design: RCT

Total number of participants: 3310 (2922 mothers and 388 fathers)

Sample sizes (range): 30–696

Publication period: 1977–2010

Place: Australia (one RCT), Brazil (two RCTs), Canada (one RCT), Nepal (one RCT), UK (one RCT), USA (21 RCTs)

Study populations: one or both parents and an infant (excluding parents of infants in a neonatal ICU, and parents younger than 20 years old)

Intensity of intervention: varied from one 20-minute session on the third day after birth, to a 45-minute meeting after birth followed by weekly phone contact for 6 weeks

see *Evidence table for Bryanton 2013* in the Technical Report

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

Cognitive development (BSID-MDI, SB Intelligence Scales, 'other validated measures') at end of intervention and at follow-up (approximately 28.6 months after intervention)

Motor development (BSID-PDI, 'related measures') at end of intervention and at follow-up (approximately 28.6 months after intervention)

Social development (measures of social competence and behaviour regulation such as competence subscales of the BITSEA, tests for secure attachment, measures of communication and peer relation) at end of intervention and at follow-up (approximately 28.6 months after intervention)

Mental health (CBCL, assessments of child mood states, 'other validated scales') at end of intervention and at follow-up (approximately 28.6 months after intervention)

Behaviour for the infant, as a child, and up to 18 years

Infant sleep in 24 hours (total minutes) at ages 6 weeks and 12 weeks

Night-time infant sleep in 24 hours (total minutes) at ages 6 weeks and 12 weeks

Longest uninterrupted night-time infant sleep (minutes) at ages 6 weeks and 12 weeks

Day-time infant sleep in 24 hours (minutes) at ages 6 weeks and 12 weeks

Longest uninterrupted day-time infant sleep (minutes) at ages 6 weeks and 12 weeks

Infant crying time in 24 hours (minutes) at ages 6 weeks and 12 weeks

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Parenting quality (Infant-Toddler HOME; NCATS; 'other related validated scales') at end of intervention and at follow-up (approximately 28.6 months after intervention)

Parent/caregiver psychosocial wellbeing

Parenting stress (Parental Distress scale of PSI; 'other measures') at end of intervention and at follow-up (approximately 28.6 months after intervention)

Parental mental health (CES-D; STAI; EPDS; 'other validated measures') at end of intervention and at follow-up (approximately 28.6 months after intervention)

Parent/caregiver knowledge, practices and behaviours

Maternal knowledge of infant behaviour (points: on 12–15 item questionnaires) up to 4 weeks postpartum

Health promoting parental behaviour (percentage of children who received full immunisation; number of paediatric well child visits) at end of intervention

Parent/caregiver views of the intervention

No pooled results available

Family relationships

Couple adjustment (DAS; revised CTS; 'related scales') at end of intervention and at follow-up (approximately 28.6 months after intervention)

System outcomes

Child maltreatment (identified cases of child abuse (e.g. from protective service agencies); CAPI) at end of intervention and at follow-up (approximately 28.6 months after intervention)

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from very low to high

Main reasons for downgrading the quality of evidence: risk of bias (allocation concealment unclear, high attrition), inconsistency (random effects model not used, substantial heterogeneity), imprecision (small sample sizes or evidenced by wide confidence intervals)

Benefits reported

Cognitive outcomes (indicator of secondary outcome; critical)

High-quality and moderate-quality evidence from one systematic review shows that parenting education with expectant and new parents can improve cognitive outcomes post-intervention (38 RCTs: N=approximately 3800) and at follow-up (28.6 months later) (31 RCTs: N=approximately 3100).

Motor development (indicator of secondary outcome; important but not critical)

High-quality evidence from one systematic review shows that parenting education with expectant and new parents can improve motor outcomes post-intervention (22 RCTs: N=approximately 2200) and at follow-up (28.6 months later) (13 RCTs: N=approximately 1300).

Social development (indicator of secondary outcome; critical)

Moderate-quality evidence from one systematic review shows that parenting education with expectant and new parents can improve social development post-intervention (34 RCTs: N=approximately 3400) and at follow-up (28.6 months later) (21 RCTs: N=approximately 2100).

Child's mental health (indicator of secondary outcome; critical)

Moderate- and high-quality evidence from one systematic review shows that parenting education with expectant and new parents can improve the child's mental health post-intervention (40 RCTs: N=approximately 4000) and at follow-up (28.6 months later) (21 RCTs: N=approximately 2100).

Note:

Based on the rating scales used in included trials, this outcome should be considered to represent the child's mood state and behaviour rather than general 'mental health'.

Sleep (indicator of secondary outcome; critical)

Moderate- to very low-quality evidence from one systematic review shows that sleep education interventions can increase infant night-time sleep at ages 6 and 12 weeks, and day-time sleep at age 6 weeks but not age 12 weeks. These interventions do not have a clear impact on increasing length of uninterrupted sleep during the day or the night at age 6 or 12 weeks (two RCTs per outcome; N not reported per outcome).

Child maltreatment (indicator of secondary outcome; critical)

High-quality and moderate-quality evidence from one systematic review shows that parenting education with expectant and new parents can reduce child maltreatment post-intervention (29 RCTs: N=approximately 2900) with no clear effect at follow-up (28.6 months later) (seven RCTs: N=approximately 700).

Parental stress: (indicator of secondary outcome; important)

Moderate-quality evidence from one systematic review shows that parenting education with expectant and new parents can decrease parental stress post-intervention (26 RCTs: N=approximately 2600) with no clear effect at follow-up (28.6 months later) (six RCTs: N=approximately 600).

Parental mental health (indicator of secondary outcome; important)

High-to-moderate quality evidence from one systematic review shows that parenting education with expectant and new parents can improve parental mental health post-intervention (33 RCTs: N=approximately 3300) and at follow-up (28.6 months later) (12 RCTs: N=approximately 1200).

Maternal knowledge (indicator of secondary outcome; critical)

High-quality and moderate-quality evidence from one systematic review shows that interventions for education about infant behaviour can increase maternal knowledge up to four weeks postpartum (two RCTs: N=56).

Parenting quality (indicator of secondary outcome; critical)

Moderate-quality evidence from one systematic review shows that parenting education with expectant and new parents can improve parenting post-intervention (103 RCTs: N=approximately 10 300) and at follow-up (28.6 months later) (39 RCTs: N=approximately 3900).

Health-promoting parental behaviour (indicator of secondary outcome; critical)

Moderate-quality evidence from one systematic review shows that parenting education with expectant and new parents can improve health promoting behaviour post-intervention (30 RCTs: N=approximately 3000).

Note:

This outcome measure describes uptake of immunisation and number of paediatric healthcare visits, and is similar to outcomes described as 'preventive care' by systematic reviews identified for other interventions in the evidence review.

Couple adjustment (indicator of secondary outcome; critical)

High-quality evidence from one systematic review shows that parenting education with expectant and new parents can improve couple adjustment post-intervention (13 RCTs: N=approximately 1300) and at follow-up (28.6 months later) (four RCTs: N=approximately 400).

Reported outcomes for which the intervention had no clear impact

'No clear impact' means pooled numerical results showed a non-statistically significant difference between effects of the intervention and comparator(s) for the specified outcome.

Crying (indicator of secondary outcome; critical)

Low quality evidence from one systematic review suggests that sleep education interventions do not have a clear impact on crying time in infants at 6–12 weeks (two RCTs, N=NR).

See *Table 6: Antenatal and postnatal education and/or support interventions evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation.

GRADE assessment of the evidence

Overall confidence in the estimates

High

Balance of benefits versus harms and burdens

The benefits of antenatal and postnatal education/support clearly outweigh the harms/burdens,

Notes:

- In Bryanton (2013)[19] single study results showed education interventions focused on sleep enhancement were associated with significantly higher maternal stress scores (in the outcome domain of parent/caregiver psychosocial wellbeing) compared with usual care.
- Based on Working Committee experience and theoretical considerations, potential harms and burdens include inconvenience, distress to baby and parent/caregiver associated with some sleep programs, and the sense of being coerced into participating. The focus of the education and support should be selected with caution, and potential unintended effects should be considered.

- It was not possible to separate outcomes associated with antenatal interventions from those associated with postnatal interventions. Most interventions and most data were for postnatal interventions. The majority of participants were first-time parents.
- It was not possible to identify the components associated with effective programs or clearly identify program content.
- It is difficult to identify which subgroups benefited most. In one of the two systematic reviews that contributed the most data (Pinquart 2010)[20] a significant proportion of participants in included studies were from at-risk (e.g. socioeconomically disadvantaged) groups; in the other major systematic review (Bryanton 2013)[19] participants were mostly from socioeconomically advantaged groups.
- Education and support programs for parents/caregivers of infants are most likely to be effective when implemented universally.
- Parents/caregivers who are coerced into participating in education/support (e.g. as a condition of maintaining custody of a baby imposed by a family court or child protection authority) are unlikely to benefit.

Values and preferences

People are probably similar in the value they place on the critical and important outcomes.

Notes:

- Consistency of values and preferences is not assured because parents'/caregivers' values and preferences cannot be accurately ascertained, and are influenced by sociocultural factors.
- The majority of parents place high value on the health and wellbeing of their infants and are likely to engage in activities that are consistent with these values, their level of engagement, level of confidence and perceived acceptability of participation. Participation of different population groups is likely to be influenced by the way the intervention is delivered and in what setting, and whether the messages are relevant to the audience.
- Some parents/caregivers may not consider certain outcomes to be critical. Parents/caregivers may value some outcomes that are not covered in the body of evidence.
- The engagement of families in such programs is critical to success. These programs fail when parents are not engaged with the program, including its aims and methods, which are based on the priority placed on outcomes.

Resource implications

The net benefits of antenatal and postnatal education/support are worth the costs.

Notes:

- Antenatal and postnatal education/support requires considerable resources, particularly if implemented universally. However, it may be cost-effective.
- A multicentre trial evaluating behavioural strategies for infant sleep problems,[22] which was conducted in Melbourne Maternal and Child Health (MCH) centres in 2003–2004, reported that the intervention was associated with significantly reduced infant sleep problems and improved maternal mental health at ages 10 months and 12 months, compared with control, and that mean total costs per family (intervention design, delivery and use of non-MCH nurse services) were lower for intervention than control.
- A UK RCT evaluating behavioural and education interventions for infant crying and sleep problems[23] reported that the cost of interventions per interruption-free night was £0.56 for a behavioural intervention and £4.13 for the education intervention, compared with control. Data from the trial were used to estimate that the annual total cost to the UK national health service of infant crying and sleeping problems in the first 12 weeks of life was £65 million.
- This intervention can be provided by non-healthcare services such as non-government organisations, social workers, providers of day care and early childhood education and care, providers or Aboriginal services, as well as healthcare services including primary care health workers and Aboriginal Health Workers.

Equity

Implementation of antenatal and postnatal education/support would probably reduce health/social inequities.

Note:

Reduction of health inequity is not assured because, in Working Committee members' experience, parents/caregivers of the most at-risk infants (e.g. the most socioeconomically disadvantaged) are least likely to participate in these programs.

Acceptability

Acceptability of antenatal and postnatal education/support to key stakeholders would vary.

Notes:

- Acceptability of current programs varies.
- Uptake is mainly by first-time parents. In Working Committee members' experience, parents/caregivers infrequently attend parenting education programs during or after subsequent pregnancies.
- In Working Committee members' experience, uptake of current programs is lower among parents/caregivers of at-risk infants (e.g. socioeconomically disadvantaged groups). Engagement with target groups must be carefully managed after considering their needs.
- Factors that may make an antenatal or postnatal education/support program less acceptable to parents/caregivers include cross-cultural differences in parenting practices (e.g. whether or not remaining at/near home for the first month is the norm), perception of duress, composition of groups (minority groups are less likely to feel comfortable to attend e.g. teenage mothers attending with older mothers, or socioeconomically disadvantaged parents with advantaged parents or vice versa), and the potential burdens listed above (see Balance of benefits versus harms and burdens).
- Programs are likely to be most acceptable when tailored to the recipient group.

Feasibility

Antenatal and postnatal education/support is feasible to implement.

Notes:

- Antenatal and postnatal education/support programs are likely to be feasible because such programs already exist and can be provided by various workforces (see Resource implications).
- Parenting classes are common in Australia. However, the majority of education/support interventions reported in the body of evidence were delivered through home visiting, and may not have had the same goals or content and may differ in impact.

Implementation considerations

Various sectors may have the skills and capacity to deliver programs.

Notes:

- In Working Committee members' experience, parents commonly experience problems managing the transition from antenatal/maternity care services, which focus on the parent and child up to 6 weeks, to maternal, child and family health services. There is a lack of cohesion between healthcare services (including Aboriginal health services) and social services. Consistency of approach and messages is needed across the various services that participate in delivery of universal and targeted postnatal education and support programs.
- Several organisations offer early parenting services in Australia. These residential or day programs generally focus on breastfeeding and managing unsettled infants. Evidence from cohort studies is emerging to support these programs. These programs appear promising for parents/caregivers with mild-to-moderate mental health problems, excluding those with severe mental illness.[24]

- In the past, several jurisdictions provided drop-in services staffed by maternal and child nurses in community centres. These are no longer widely available.
- In the body of evidence, programs that did not explicitly identify child outcomes as goals did not always achieve child outcomes, but may have achieved parental outcomes.
- The body of evidence suggests that education delivered in the postnatal period had a stronger effect on some outcomes than interventions delivered in the antenatal period (e.g. interventions with a postnatal component showed a greater effect on cognitive development). Interventions starting after birth, and those which provide parents with information about cognitive stimulation that is appropriate to the age of the child, seem to be well suited to reducing parenting stress and promoting positive parenting and child development.

Generalisability to the Australian context

The Working Committee considered that the evidence from the study populations would be relevant to Australia, because the majority of studies were conducted in high-income or middle-income countries where health systems and sociocultural context or circumstances are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

Research implications and opportunities

Research is needed to differentiate between benefits of prenatal and postnatal programs and to identify the optimal content of programs.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Antenatal and postnatal education and support interventions, delivered by appropriately trained professionals and starting before birth or in the first year of life, can improve cognitive and social development, infant mental health, sleep*, preventive care/health-promoting behaviours, parents' knowledge of infant behaviour, and parenting quality and couple adjustment, and can reduce maltreatment.*

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- Improvements were also seen for outcomes rated by the Working Committee as important but not critical for making decisions: Parenting education with expectant and new parents can improve infant motor development, improve parental mental health, and reduce parental stress.*
*Effects were reported for multiple follow-up intervals for these outcomes. Improvements were seen for some, but not all follow-up periods.

What

Universal postnatal education and/or support programs

Focus: 'getting to know your baby as an individual', sleep (including safe sleeping), how to manage unsettled behaviour, and adjustment in a couple's relationship after the birth of a baby

Aim: prevention of and early intervention for suboptimal infant social and emotional development

Targeted postnatal education and/or support programs for parents and infants with specific needs

Structured and robust home visiting programs implementing, or based on, an educational framework

Content: solution-focused counselling, and education covering sleep (including safe sleep), how to manage unsettled behaviour, infant cognitive stimulation, and adjustment in a couple's relationship after the birth of a baby

Aim: to promote sensitivity and responsiveness of parent/caregiver

Why

Overall goal: to support parents/caregivers to maximise their child's social and emotional wellbeing and development

Objectives based on the body of evidence: to foster optimal cognitive, social and motor development, optimal infant mood/mental health, to improve sleep, to promote preventive care, prevent maltreatment, to minimise parental stress, to optimise parental mental health, to improve parents' knowledge, to optimise parenting quality, and to support family relationships.

Other objectives: to prevent problems that could delay or disrupt infant social and emotional development and wellbeing, or identify and manage such problems as early as possible.

Who

Delivered by appropriately trained professionals

Notes:

- Where reported in the evidence, interventions were delivered by professionals including nurse practitioners, research nurses or via written materials/video. Pinquart (2010)[20] reported that interventions led by professionals had stronger effects on child mental health than those led by paraprofessionals/trained lay people.
- In Australia, this intervention could be delivered by a range of disciplines and workforces, including non-government organisations, maternal and child health nurses, social workers, providers of day care and early childhood education and care, providers of Aboriginal services, primary care health workers and Aboriginal Health Workers. It could be supported by educational resources provided by midwives, GPs, paediatricians and obstetricians.

For whom

Universal programs: all parents, with a target of all first-time parents/caregivers

Targeted programs: parents/caregivers identified during pregnancy or after the birth of the baby with greater need for support

When

Universal programs: starting within the first 2 weeks after birth

Targeted programs: starting during pregnancy or early after birth

Where

Universal programs: as appropriate to ensure program is accessible to parents/caregivers

Targeted programs: in parents'/caregivers' home or in a safe appropriate place, as negotiated

Anticipatory guidance

Summary of evidence evaluation findings

Description of intervention

Anticipatory guidance for infant development involves health care workers (e.g. doctors or nurses) providing parents with advice and information about what to expect or issues to be considered within the next few weeks or month. Delivery of information is carefully timed to match the child's age. It aims to help parents and caregivers to understand the expected growth and development of their children, to promote healthy lifestyles, and to prevent disease and injury.[26] The interventions included in the available systematic reviews focused on preventive advice and information on topics including infant development, the mother-infant relationship, infant temperament, and sleep habits.[27,28]

The content of anticipatory guidance interventions is likely to overlap with that of home visiting interventions or antenatal and postnatal education and support. Anticipatory guidance differs from these other types of interventions mainly in the timing of delivery and underpinning principles.

Note:

Historically, the term 'anticipatory guidance' has been used mainly in North America, but it is increasingly used in Australia.

Evidence sources: systematic reviews

Two relevant systematic reviews were assessed:

- **Piotrowski (2009)**[27] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Piotrowski 2009* in the Technical Report)
- **Regalado (2001)**[28] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Regalado 2001* in the Technical Report).

Outcomes reported in the systematic review

No pooled results were available for any outcomes in any pre-specified outcome domain.

Working Committee's conclusions

Summary

There is insufficient evidence available from systematic reviews with pooled results to ascertain whether anticipatory guidance, starting before birth or in the first year of life, has any effect on infant social and emotional development and wellbeing.

Note:

See Decision tool for developing evidence-based conclusion statements.

Research implications and opportunities

Well-designed studies are needed that include clearly defined outcome measures for infant social and emotional development and wellbeing, with adequate follow-up; e.g. into early childhood (up to 3 years) or up to when the child starts school (approximately 5 years).

See Overall Research Implications.

Behavioural sleep interventions

Summary of evidence evaluation findings

Description of intervention

Behavioural sleep interventions for infants are parental practices or infant-care methods aiming to promote self-settling and improve sleep.[29]

Evidence sources: systematic reviews

One relevant systematic review was assessed: **Douglas (2013)**[29] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Douglas 2013* in the Technical Report).

Notes:

- Douglas (2013)[29] included parents and their healthy infants (with an upper age limit of six months).
- One RCT of a behavioural sleep intervention, delivered by Victorian Maternal and Child Health nurses for infants aged 8 months (and not included in the evidence evaluation), showed positive effects on infant sleep and maternal symptoms of depression at infant age 10 and 12 months and was also cost-effective.[23]

Outcomes reported in the systematic review

No pooled results were available for any outcomes in any pre-specified outcome domain.

Working Committee's conclusions

Summary

There is insufficient evidence from systematic reviews with pooled results to ascertain whether behavioural sleep interventions during the first year of life, have any effect on infant social and emotional development and wellbeing.

Note:

See Decision tool for developing evidence-based conclusion statements.

Research implications and opportunities

Well-designed studies are needed that include clearly defined outcome measures for infant social and emotional development and wellbeing, with adequate follow-up, e.g. into early childhood (up to 3 years) or up to when the child starts school (approximately 5 years).

See Overall Research Implications.

Early childhood education and care

Summary of evidence evaluation findings

Description of intervention

Early childhood education and care interventions provided outside the home (called 'day care' in the reviews) include the provision of non-parental, out-of-home care, including for preschool education, with aims that include promoting optimal socialisation of children and enabling parents to participate in paid work or education.[30]

Note:

Zoritch (2000)[30] included interventions that generally commenced when the child was younger than 12 months, involved in families of lower socioeconomic status and most often mixed an element of out-of-home educational centre-based day care with some home visiting and targeted parental training. Intensity and durations of day care varied, with a maximum of 8 hours per day, for 5 years.

Evidence sources: systematic reviews

Two relevant systematic reviews were assessed:

- **Zoritch (2000)**[30] (high risk of bias, moderate quality) – contributed pooled numerical results
  (see *Evidence table for Zoritch 2000* in the Technical Report)
- **Yoshikawa (1995)**[31] (high risk of bias, low quality) – no pooled numerical results.

Primary studies reported in the systematic review that contributed pooled numerical results

Number of relevant studies: four

Study design: RCT (three), qRCT (one)

Total number of participants: 1201

Sample sizes (range): 40–985

Publication period: 1982–1994

Place: USA

Study populations: varied; mainly targeted families of lower socioeconomic status; one trial started at birth; three trials started when the children were less than 1 year old

Intensity of intervention: varied, up to 8 hours per day for 5 years

see *Evidence table for Zoritch 2000* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

Intelligence (IQ; measuring tools/tests not reported) at age 36 months

Early cognitive ability (early IQ, school achievement, language development, verbal ability; actual measuring tools/tests not reported) family support programs at age 4 months to grade five (approximate age 10–11 years)

Early cognitive ability (IQ, school achievement, language development, verbal ability; actual measuring tools/tests not reported): combined early education and family support at age 12 months to 10 years

Behaviour for the infant, as a child, and up to 18 years

Antisocial/delinquent behaviour (teacher rated): family support programs at age 2 years to grade four (approximate age 9–10 years)

Antisocial/delinquent behaviour (teacher rated, self-reported delinquency, official criminality e.g. criminal acts/arrests): combined early education and family support at age 8–16 years

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Parenting (mother-child interaction, parenting behaviour, attachment, child welfare; measuring tools not reported): family support at age 4–54 months

Parenting (mother-child interaction, parenting behaviour, attachment, child welfare; measuring tools not reported): combined education and family support at age 4 months to 5 years

Parent/caregiver psychosocial wellbeing

Maternal life course (maternal education and employment; childbearing; family economic self-sufficiency): family support at age 1–4 years

Maternal life course (maternal education and employment, childbearing, family economic self-sufficiency): combined education and family support at age 1–10 years

Parent/caregiver knowledge, practices and behaviours

No pooled results available

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from insufficient information to assess quality to very low

Main reasons for downgrading the quality of evidence: risk of bias (studies with methodological limitations), inconsistency (substantial heterogeneity, random effects model not used)

Benefits reported

Intelligence (indicator of secondary outcome; important)

Very low-quality evidence from one systematic review shows that early education or day care interventions can improve IQ (measuring tools/tests not reported) at age 36 months (three RCTs, one qRCT, N=1109).

See *Table 14: Day care interventions evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

Working Committee's conclusions

Summary

There is insufficient evidence from systematic reviews with pooled results to ascertain whether early childhood education and care interventions during the first year of life have any effect on infant social and emotional development and wellbeing.

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- An improvement was also seen for one outcome rated by the Working Committee as important but not critical for making decisions: early childhood education and care interventions can improve infants' intelligence (measuring tools/tests not reported) at age 36 months.
- Intelligence is not directly relevant to social and emotional development and wellbeing.

Research implications and opportunities

Well-designed studies are needed that include clearly defined outcome measures for infant social and emotional development and wellbeing, take into account the type, duration, and quality of Early childhood education and care, and have adequate follow-up, e.g. into early childhood (up to 3 years) or up to when the child starts school (approximately 5 years).

See Overall Research Implications.

Home visiting interventions

Summary of evidence evaluation findings

Description of intervention

Home visiting interventions evaluated in the available evidence[32, 33] involved education and counselling for parents about child development, goal-setting and anticipatory guidance. Some addressed parent-child relationships/interactions and provided emotional and practical support for parents. A few also included parenting group meetings/education classes or the provision of health services.

Most visits were made across the antenatal and postnatal period, or the postnatal period alone. Most were delivered to parents of infants at high risk of suboptimal social and emotional development due to child-related risk factors (e.g. prematurity or sleep problems) or maternal risk factors (e.g. low socioeconomic status, teenage or single).[32]

Notes:

- Although some interventions included anticipatory guidance, there was no overlap with studies included in the Anticipatory guidance interventions category.
- It is appropriate for home visiting programs to include the promotion of social skills. Home visiting interventions aimed to prevent childhood behaviour problems are likely to lessen disruptive behaviour during childhood. Further information can be found on Interventions for preventing later antisocial behaviour and delinquency.
- Elkan (2000)[32] included home visiting programs (with at least one postnatal visit) ranging from one postpartum visit to one visit per week for first 3 years of the child's life.
- Reynolds (2009)[33] included child-focused and/or parent-focused primary prevention interventions that measured actual/substantiated reports of maltreatment (rather than family risk of protective factors associated with maltreatment). All but one of the programs commenced prenatally or from birth to age three years through home visits (11 studies), parent education classes (one study), or the provision of health services (two studies). Programs varied in duration, from approximately three months to 60 months or more; most commonly, interventions were 12–24 months, beginning within the first weeks after birth with 15–20 visits in total.

Evidence sources: systematic reviews

Five relevant systematic reviews were assessed:

- **Elkan (2000)**[32] (low risk of bias, high quality) – contributed pooled numerical results (see *Evidence table for Elkan 2000* in the Technical Report)
- **Reynolds (2009)**[33] (high risk of bias, low quality) – contributed pooled numerical results (see *Evidence table for Reynolds 2009* in the Technical Report)
- **Peacock (2013)**[34] (low risk of bias, moderate quality) – no pooled numerical results (see *Evidence table for Peacock 2013* in the Technical Report)
- **Segal (2012)**[35] (low risk of bias, moderate quality) – no pooled numerical results (see *Evidence table for Segal 2012* in the Technical Report)
- **Wade (1999)**[36] (low risk of bias, high quality) – no pooled numerical results (see *Evidence table for Wade 1999* in the Technical Report).

Primary studies reported in systematic reviews that contributed pooled numerical results

Elkan (2000)[32]

Number of relevant studies: 50

Study design: RCTs (38), nRCTs (12)

Total number of participants: >11 851 (one of 50 studies did not report number of participants)

Sample sizes (range): 30–2009

Publication period: 1972–1996

Place: Canada (eight studies), Ireland (two studies), Jamaica (one study), Norway (one study), Turkey (one study), UK (10 studies), USA (27 studies)

Study populations: Pregnant women and parents and their infants, including parents of preterm/low-birthweight infants, pregnant/postpartum parents 'at risk' (e.g. teenagers, low socio-economic status or low income, with lack of social support, unmarried, with drug use, with infants with failure to thrive), and pregnant/postpartum parents with no identified risk ('mothers with newborn infants')

Intensity of intervention: ranged from one visit postpartum to one visit per week for first three years of the child's life

see *Evidence table for Elkan 2000* in the Technical Report

Reynolds (2009)[33]

Number of relevant studies: 14

Study design: RCT (12), quasi-experimental design (one), matched-group design (one)

Total number of participants: 6407

Sample sizes (range): 40–1154

Publication period: 1991–2007

Place: USA (six programs), remainder not reported

Study populations: parents before birth (seven programs included prenatal participants) or shortly after birth of the infant (six programs)

Intensity of intervention: varied from approximately three months to 60 months or more; 12–24 months most commonly, beginning within the first weeks after birth with 15–20 visits in total

see *Evidence table for Reynolds 2009* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

Temperament (CITS; category not reported) at 4–16 months

Development for the infant, as a child, and up to 18 years

Cognitive development (BSID-MDI) at 9–24 months

Intelligence (SB IQ scores) at 12–48 months

Note:

The Working Committee determined that these two outcomes (reported separately in the sources) cannot be distinguished and should be considered together as a single outcome.

Motor development (BSID-PDI) at 9–18 months

Weight (up to 48 months)

Height (up to 48 months)

Behaviour for the infant, as a child, and up to 18 years

Sleeping difficulties (reported by mothers) at 6–12 months

Physical wellbeing and safety for the infant, as a child, and up to 18 years

Unintentional injuries (up to 48 months)

Uptake of immunisation (5 months to 5 years)

Uptake of preventive health services (other than immunisation) at 6 months to five years

Uptake of acute care health services: hospital admission (excluding intentional or unintentional injury)

Uptake of acute care health services: use of emergency medical services (up to 46 months)

Parent-infant relationship

Parenting quality and interaction (HOME Inventory) at 6 weeks to 36 months

Parenting quality and interaction (HOME Inventory) (time of measures not reported)

Maternal sensitivity (one study: Maternal Child Interaction-CARE Index; one study: tool not reported) (time of measures not reported)

Parent/caregiver psychosocial wellbeing

Parenting stress (PSI) at 8 weeks–12 months

Parent/caregiver knowledge, practices and behaviours

Family size (including: repeat pregnancy; births two years post-intervention; family size 10 years post-intervention) at 1–10 years post-intervention

Mothers' use of public assistance at 12–48 months postpartum

Maternal employment at 12–46 months post-intervention

Substance use (time of measures not reported)

Breastfeeding at age 3 months

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

Child maltreatment (measures of substantiated child abuse and neglect) at age 1–17 years

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from very low to moderate

Main reasons for downgrading the quality of evidence: risk of bias (studies with methodological limitations), inconsistency (substantial heterogeneity, or not reported) and imprecision (studies with small sample sizes, small number of studies, studies with wide confidence intervals)

Benefits reported

Cognitive development/intelligence (indicator of secondary outcomes; critical)

Low-quality evidence from one systematic review shows improved mental development (measured using the Bayley Scale of Mental Development) at 9–24 months with home visiting interventions (eight RCTs; N=1670). Low-quality evidence from one systematic review shows higher IQ (measured using the Stanford-Binet Intelligence Scales) at 12–48 months in children with home visiting interventions (five RCTs: N=870).

Sleeping difficulties (indicator of secondary outcome; critical)

Moderate-quality evidence from one systematic review shows fewer sleeping difficulties at 6–12 months in infants with home visiting interventions (four RCTs: N=763).

Unintentional injuries (indicator of secondary outcome; critical)

Moderate-quality evidence from one systematic review shows reduced rates of unintentional child injuries up to 48 months with home visiting interventions (six RCTs, N=1836).

Uptake of immunisation (indicator of secondary outcome; critical)

Low-quality evidence from one systematic review shows higher uptake of child immunisation (age 6 months to 6 years) with home visiting interventions (eight RCTs, one nRCT: N=2518).

Uptake of acute care health services; hospital admission excluding intentional or unintentional injury (indicator of secondary outcome; critical)

Low-quality evidence from one systematic review shows fewer children's hospital admissions (excluding injury) at 9–46 months with home visiting interventions (four RCTs, three nRCTs: N=2897).

Note:

The relationship between this indicator and infant social and emotional development and wellbeing is difficult to clarify and depends partly on access to preventive care services.

Parenting quality and interaction (indicator of secondary outcome; critical)

Moderate-to-low quality evidence from one systematic review shows improvement in the parenting quality and interaction (measured using the HOME Inventory) at 6 weeks to 36 months with home visiting interventions (ten RCTs, two nRCTs; N: 1708).

Breastfeeding (indicator of secondary outcome; important)

Moderate quality evidence from one systematic review shows that home visiting interventions can increase breastfeeding at 3 months post birth (three RCTs, one nRCT, N=938).

Child maltreatment (indicator of secondary outcome; critical)

Very low-quality evidence from one systematic review shows that child and/or parent-focused primary prevention interventions can reduce child maltreatment (measured using reports of substantiated child abuse or neglect) at 1–17 years of age (nine RCTs, one quasi-experimental study, two matched cohorts, N=5661).

Reported outcomes for which the intervention had no clear impact

'No clear impact' means pooled numerical results showed a non-statistically significant difference between effects of the intervention and comparator(s) for the specified outcome.

Infant temperament (indicator of primary outcome; important but not critical)

Moderate-to-low quality evidence from one systematic review shows no clear difference in infant temperament (measured using the CITS) at 4–16 months with home visiting interventions (five RCTs, N=814).

Motor development (indicator of secondary outcome; important)

Low-quality evidence from one systematic review shows no clear differences in motor development (measured using the BSID-PDI) at 9–18 months with home visiting interventions (four RCTs, N=390).

Weight (indicator of secondary outcome; important)

Low-quality evidence from one systematic review shows no clear differences in children's weight up to 48 months with home visiting interventions (three RCTs, N=463).

Height (indicator of secondary outcome; important)

Low-quality evidence from one systematic review shows no clear differences in children's height up to 48 months with home visiting interventions (three RCTs, N=463).

Uptake of acute care health services: use of emergency medical services (indicator of secondary outcome; important)

Moderate-quality evidence from one systematic review shows no clear differences in use of emergency services up to 46 months with home visiting interventions (four RCTs, one nRCT, N=1,193).

Family size (indicator of secondary outcome; important)

Moderate-to-low quality evidence from one systematic review suggests no clear differences in family size (repeat pregnancy; births two years post-intervention; family size 10 years post-intervention) 1–10 years post-intervention with home visiting interventions (three RCTs, one nRCT, N=1,282).

Mothers' use of public assistance (indicator of secondary outcome; important)

Low-quality evidence from one systematic review shows no clear differences in mothers' use/receipt of public assistance at 12–48 months with home visiting interventions (three RCTs, N=1,413).

Maternal employment (secondary outcome; important)

Moderate to low quality evidence from one systematic review shows no clear differences in maternal employment at 12–46 months with home visiting interventions (three RCTs, N=1,413).

See *Table 5: Home visiting interventions evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Moderate

Balance of benefits versus harms and burdens

The benefits of home visiting interventions clearly outweigh the harms/burdens.

Notes:

- Based on Working Committee members' experience and recently published studies including the Miller Early Childhood Sustained Nurse Home Visiting (MECSH) trial[37], additional benefits of home visiting programs include parent/caregiver satisfaction, sense of affirmation of parental role, improvement in confidence and coping skills, and becoming better able to enjoy their baby. In two systematic reviews (Elkan 2000 and Peacock 2013),[32,34] single study results showed poorer outcomes for indicators for health engagement and child protection. These results must be interpreted in context and with caution, as other single study results show positive results for the same outcome.
- The Working Committee identified potential harms including stigmatisation, lowering of vigilance by child protection officers/ cross-cultural problems between visitor and parent/caregiver. However most of these potential harms could be mitigated by well-designed programs delivered by appropriately skilled people.
- The Australian Nurse-Family Partnership Program (ANFPP) implemented in NT, Queensland and NSW, is being evaluated in a research study. Preventive programs delivered by the Central Australian Aboriginal Congress are based in part on the Nurse–Family Partnership.[38] Early results published since the period covered by the NHMRC evaluation of evidence is not included in this Report on the Evidence.

Values and preferences

People are probably similar in the value they place on the critical and important outcomes of home visiting programs.

Notes:

- Consistency of values and preferences is not assured because parents'/caregivers' values and preferences cannot be accurately ascertained.
- Parents/caregivers may value some outcomes that are not covered in the body of evidence.
- The engagement of families in home visiting programs (and other interventions) is a critical issue. These programs fail when parents are not engaged with the program, including its aims and methods, which are based on the priority placed on outcomes.

Resource implications

The net benefits of home visiting interventions are worth the costs.

Notes:

- Net benefits are likely to justify costs when the target recipients, goals, program components, workforce, and delivery protocols are all well-defined.
- Effective home visiting programs are likely to reduce costs of acute care. Favourable cost-benefit analyses have been reported for home visiting programs in NSW (the Sustaining NSW Families program)[39] and in other countries.[40-44]
- Home visiting programs are significantly costly (human resource-intensive, time intensive). They require a stable workforce of trained, skilled professionals to be effective and to achieve the necessary high rate of uptake by parents/caregivers in the target populations.
- A stepped program may be most equitable; a limited universal program (e.g. a single visit) with extra visits for those with greater need. However, single visit programs are not supported by evidence, and a universal program would be more costly than a targeted program.
- Alternative delivery models are currently being investigated.

Equity

Implementation of home visiting interventions would reduce health/social inequities.

Notes:

- Effective home visiting programs in selected populations are likely to improve health equity (e.g. by improving growth rates, vaccination rates, foundations of health) if delivered to a high standard.
- In Working Committee members' experience, high-risk infants are most likely to be excluded when programs are not well implemented (e.g. if planned visits are cancelled when parents/caregivers not at home, without persistent attempts to make contact and reschedule).
- The engagement of families in home visiting programs (and other interventions) is a critical issue. A key reason these programs fail is because socioeconomically marginalised parents, who might benefit most, are not engaged with the program, including its goals and methods or those of program workers.

Acceptability

Home visiting interventions are probably acceptable to key stakeholders.

Notes:

- Acceptability is likely but not certain, because may vary between parents/caregivers, sub-populations and service providers.
- While home visiting interventions were generally reported to be acceptable to recipients in the studies, we cannot be certain about acceptability to Australian parents/caregivers in target populations. Further research is needed to understand consumers' attitudes.
- Targeted home visiting might be unacceptable to intended recipients due to stigmatisation, perception of paternalism, or cultural differences (see Balance of benefits versus harms and burdens). The risk would be lessened by implementing a universal program. However, this would be less cost-effective.
- Home visiting programs for Aboriginal and Torres Strait Islander peoples may be more acceptable if delivered by Aboriginal Health Workers.
- Program success also depends on acceptability to organisations. In Working Committee members' experience, the same program may be effective in a region where the service provider supports it, but ineffective in a neighbouring region where it is not supported by staff.

Feasibility

Home visiting interventions are probably feasible to implement.

Notes:

- Home visiting programs are likely to be feasible because they are already available in many Australian regions; all states and territories offer sustained home visiting programs, (although these vary), and the Australian primary care health system would enable delivery.
- Uncertainty is due to several factors: the intervention is complex and the high standard of delivery necessary to effectiveness may be difficult to achieve. There are differences between Australian primary care and the settings in which studies were conducted. Much of the data are from UK, which has a workforce of primary care nurses. Australia lacks national policy in this area. Fragmentation of our health system is a potential barrier. Maternal and child health nurses should be the first point of contact, but these are not available in all states and territories.
- Trials now underway in some regions may provide more information about feasibility.

Implementation considerations

Australian home visiting programs that are already being used and have been shown to be effective should be expanded and adapted.

The effectiveness of any program will depend on careful implementation.

Some regions provide a universal single home visit then targeted, enhanced home visits for at-risk infants. However, the body of evidence does not support single visits.

Generalisability to the Australian context

The Working Committee considered that the evidence from these populations would be relevant to Australia, because the majority of studies were conducted in high-income or middle-income countries where health systems and sociocultural context or circumstances are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

The Elkan (2000)[32] systematic review would not represent the latest evidence.

Research implications and opportunities

More research is needed to guide design and implementation of home visiting programs in Australia.

Research is needed on home visiting programs to identify:

- parents'/caregivers' and other stakeholders' priorities and preferences
- acceptability of programs to target recipients
- effects on infant social and emotional development outcomes
- the effectiveness and cost-effectiveness of interventions delivered by para-professional or lay providers. Neglect is an important outcome in Australia, but this was not reported in the studies assessing maltreatment outcomes (Reynolds 2009).[33] Activities to promote infant social and emotional development and wellbeing should take into account the adverse effect of neglect and maltreatment (see National Framework for Protecting Australia's Children 2009–2020),[45] and these outcomes should be measured in studies assessing these interventions.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Home visiting interventions for parents with particular needs for support (e.g. due to low socioeconomic status, young age or single status), delivered by experienced professionals or trained non-professionals and starting before birth or in the first year of life, are likely to improve parenting quality and interaction, uptake of immunisation, cognitive development/intelligence, and sleeping behaviour. They are also likely to prevent maltreatment (abuse or neglect), and reduce the frequency of unintentional injury and hospital admissions.

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- The evidence also shows that home visiting interventions can increase breastfeeding (an outcome rated by the Working Committee as important but not critical for decision making).

What

Home visiting programs based on interventions already demonstrated to be effective, either in controlled trials or in current Australian usage.

Why

Overall goal: to support parents/caregivers to maximise their child's social and emotional wellbeing and development

Objectives based on the body of evidence: to foster a safe and nurturing home environment, to promote preventive care such as immunisation, to foster optimal cognitive development/intelligence, to support breastfeeding, to minimise or manage sleeping difficulties, to minimise injuries and acute health problems, and to minimise maltreatment (abuse or neglect) by supporting parents/caregivers.

Other objectives: improve parents'/caregivers' confidence, coping skills, and enjoyment of their relationship with the infant.

Who

Delivered by appropriately trained and skilled visitors.

Notes:

- Where reported in the evidence, interventions were delivered by professionals, para-professionals or trained non-professional home visitors.
- Elkan 2000[31] concluded that 'non-professional home visitors can play a role, but that they require guidance, supervision and support from professionals. The evidence suggests that some problems can be tackled effectively by non-professionals with support from professional colleagues, but other, more complex difficulties may not be suitable for non-professional home visiting.'
- In Australia, this intervention could be delivered by a range of disciplines and workforces, including maternal and child health nurses, social workers, bilingual workers and community health workers.

For whom

Parents/caregivers of infants who are at risk of maltreatment, and/or for suboptimal social and emotional development; including mothers who are single, young (< 20 years), poor, unemployed, and those with low level of education.

When

During the infant's first year of life

Where

In the infant's home

Infant massage interventions

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence involved massage (tactile stimulation of the infant with human hands) for healthy, full-term infants less than 6 months old at commencement.[46]

Notes:

- In the systematic review that contributed pooled results[46] massage was performed by parents following instruction (17 trials), researchers/nurses (five trials), or an unspecified person (12 trials).
- The intervention mostly commenced within one week of birth and was delivered in a community setting.
- The massage technique, including intensity or amount of pressure, and duration and frequency varied across the studies; two trials assessed brief interventions (single session), 10 trials assessed short-term interventions (up to 4 weeks), 19 trials assessed medium-term interventions (4–12 weeks); two trials assessed long-term interventions (12–26 weeks), and one trial was of unclear duration.

Evidence sources: systematic reviews

One relevant systematic review was assessed:

Bennett (2013)[46] (low risk of bias, high quality) – contributed pooled numerical results (see *Evidence table for Bennett 2013* in the Technical Report)

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: 34

Study design: RCT (25), qRCT (one)

Total number of participants: 3984

Sample sizes (range): 21–400

Publication period: 1998–2010

Place: Canada (one RCT), China (20 RCTs), India (one RCT), Iran (one RCT), Israel (one RCT), South Korea (one RCT), Turkey (one RCT), UK (two RCTs), USA (six RCTs)

Study populations: full-term babies of either sex, aged 6 months or younger, with no underlying health conditions other than colic

Intensity of intervention: duration varied: a single session (two trials), up to 4 weeks (ten trials), 4–12 weeks (19 trials), 12–26 weeks (two trials), unclear duration (one trial). Commenced within 1 week of birth (21 trials), within 14 days of birth (one trial), up to mean age of 6 months (12 trials).

see *Evidence table for Bennett 2013* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

Infant temperament: activity (CCTI; IBQ; RITQ) after an intervention of 4 weeks' to 3 months' duration

Infant temperament: persistence (CCTI; RITQ) after an intervention of 6 weeks' to 3 months' duration

Infant temperament: soothability (CCTI; IBQ) after an intervention of 4–6 weeks' duration

Development for the infant, as a child, and up to 18 years

Weight (g) after an intervention of 4 weeks to 6 months' duration

Length (cm) after an intervention of 4 weeks to 3 months' duration

Head circumference (cm) after an intervention of 4–6 weeks' duration

Psychomotor development (BSID-PDI; Levin PDI) after an intervention of 3–6 months' duration

Cognitive development (BSID-MDI; Levin MDI) after an intervention of 3–6 months' duration

Gross motor development (GDS; Capital Institute Mental Checklist) after an intervention of 1–2 months' duration

Fine motor development (GDS; Capital Institute Mental Checklist) after an intervention of 1–2 months' duration

Language development (GDS; Capital Institute Mental Checklist) after an intervention of 1–2 months' duration

Behaviour for the infant, as a child, and up to 18 years

Personal-social behaviour (GDS; Capital Institute Mental Checklist) after an intervention of 1–2 months' duration

Crying (crying or fussing time (hours per day) after an intervention of 1–16 weeks' duration

Sleep (sleep duration over 24 hours) after an intervention of 4 weeks to 3 months' duration

Sleep (mean increase in 24 hour sleep) after an intervention of 4 weeks' duration

Sleep (mean increase in duration of night sleep (hours) after an intervention of 4 weeks' duration

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Combined mother–infant interactions (total NCATS; Murray GRS) after an intervention of 5–16 weeks' duration

Combined mother–infant interactions (total NCATS; Murray GRS) at follow-up (12 months post-intervention or age 24 months)

Maternal sensitivity (Murray GRS subscale: warm to cold) after an intervention of 5–6 weeks' duration

Maternal sensitivity (Murray GRS subscale: 'non-intrusive' to 'intrusive') after an intervention of 5–6 weeks' duration

Infant interactions with mother (infant contribution: Murray GRS subscale: attentive to non-attentive) after an intervention of 5–6 weeks' duration

Infant interactions with mother (infant contribution: Murray GRS subscale: lively to inert) after an intervention of 5–6 weeks' duration

Infant interactions with mother (Murray GRS subscale: happy to distressed) after an intervention of 5–6 weeks' duration

Parent/caregiver psychosocial wellbeing

Parenting stress (PSI: child characteristics subscale) after an intervention of 4 weeks' to 2 months' duration

Parent/caregiver knowledge, practices and behaviours

No pooled results available

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from very low to low

Main reasons for downgrading the quality of evidence: Risk of bias (due to studies being nRCTs and/or allocation concealment being unclear or absent), inconsistency (due to substantial heterogeneity), imprecision (due to studies with small sample sizes and/or wide CIs)

Benefits reported

Weight, length and head circumference (indicator of secondary outcome; important)

Very low-quality evidence from one systematic review shows post-intervention increases in weight (18 studies: 15 RCTs, three qRCTs: N=2271), length (11 studies: nine RCTs, two qRCTs: N=1683) and head circumference (nine studies: seven RCTs, two qRCTs: N=1423) with massage interventions.

Psychomotor development (indicator of secondary outcome; important)

Low-quality evidence from one systematic review shows improved psychomotor development with massage interventions (measured using the BSID or Levin PDI) post-intervention (four studies: three RCTs, one qRCT: N=466).

Motor development (indicator of secondary outcome; important)

Low- to very low-quality evidence from one systematic review shows improved gross motor and fine motor development with massage interventions (measured using the Gessel Development Quotient and Capital Institute Mental check-list) post-intervention (two RCTs: N=237)

Personal-social behaviour (indicator of secondary outcome; critical)

Very low-quality evidence from one systematic review shows improved personal-social behaviour with massage interventions (measured using the Gessel Development Quotient and Capital Institute Mental check-list) post-intervention (two RCTs: N=237).

Crying (indicator of secondary outcome; critical)

Low-quality evidence from one systematic review shows a reduction in crying or fussing time with massage interventions post-intervention (four RCTs: N=341).

Sleep (indicator of secondary outcome; critical)

Very low-quality evidence from one systematic review shows increased infant sleep duration over 24 hours with massage interventions post-intervention of 4 weeks to 3 months' duration (four RCTs: N=634), but no mean increase in 24-hour sleep (two RCTs: N=225) or duration of night sleep (two RCTs: N=225) post-intervention.

Reported outcomes for which the intervention had no clear impact

'No clear impact' means pooled numerical results showed a non-statistically significant difference between effects of the intervention and comparator(s) for the specified outcome.

Temperament (indicator of primary outcome; important)

Low- to very low-quality evidence from one systematic review suggests no clear impact of massage interventions on infant temperament post-intervention (measured using the CCTI, IBQ and RITQ): activity post-intervention of 4 weeks' to 3 months' duration (one RCT, two qRCTS, N=121), persistence post-intervention of 6 weeks' to 3 months' duration (one RCT, one qRCT, N=81), or soothability post-intervention of 4–6 weeks' duration (two qRCTs, N=80).

Cognitive development (indicator of secondary outcome; critical)

Very low-quality evidence from one systematic review shows no clear difference in cognitive development with massage interventions (measured using the BSID or Levin MDI) post-intervention of 3–6 months' duration (three RCTs, one qRCT, N=466).

Language development (indicator of secondary outcome; critical)

Low- to very low-quality evidence from one systematic review shows no clear difference in language development (measured using the GDS and Capital Institute Mental Checklist) with massage interventions post-intervention of 1–2 months' duration (two RCTs, N=237).

Mother-infant interactions (indicator of secondary outcome; critical)

Low- to very low-quality evidence from one systematic review shows no clear differences in mother and child interactions (measured using the NCATS and Murray GRS) with massage interventions post-intervention of 5–16 weeks' duration (two RCTs, one qRCT, N=131) or at follow up at 12–24 months post intervention (one RCT, one qRCT, N=65).

Maternal sensitivity (indicator of secondary outcome; critical)

Very low-quality evidence from one systematic review shows no clear differences in maternal sensitivity (warm/cold and non-intrusive/intrusive maternal behaviours: measured using the Murray GRS) with massage interventions post-intervention of 5–6 weeks' duration (one RCT, one qRCT, N=84).

Infant interactions with mother; infant contribution (indicator of secondary outcome; critical)

Very low-quality evidence from one systematic review shows no clear differences in infants' interactions with their mothers (attentive/non-attentive; lively/inert and happy/distressed infant responses measured using the Murray GRS) with massage interventions post-intervention of 5–6 weeks' duration (one RCT, one qRCT, N=84).

Parenting stress (indicator of secondary outcome; important)

Very low-quality evidence from one systematic review shows no clear differences in parenting stress (measured using the PSI) with massage interventions post-intervention of 4 weeks' to 2 months' duration (one RCT, one qRCT, N=55).

See *Table 8. Massage interventions evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Very low

Balance of benefits versus harms and burdens

The benefits of infant massage slightly outweigh harms/burdens.

Notes:

- Subgroup analyses did not identify any particular characteristics of infant massage associated with benefits.
- Based on Working Committee members' experience and published literature, additional benefits may include improved attachment and improvement in symptoms of postnatal depression.[47]
- No harms were reported in the body of evidence. Based on Working Committee members' experience and theoretical considerations, potential harms and burdens include physical injury, particularly in infants with medical conditions. In general, physical harm is probably unlikely.

Values and preferences

People are similar in the value they place on the critical and important outcomes.

Resource implications

The net benefits are worth the costs.

Notes:

- Net benefits are likely to justify costs because resource requirements are minimal.
- Massage is provided mainly by mothers, who can learn infant massage techniques by online video.
- Potential costs include staff time if parents/caregivers are trained in massage by health professionals (e.g. registered nurses or physiotherapists), and opportunity cost if parents/caregivers use massage in place of another effective parenting practice.

Equity

Implementation of infant massage would probably not reduce health/social inequities.

Note:

Massage is very unlikely to improve health equity because it is optional.

Acceptability

Infant massage is probably acceptable to key stakeholders.

Notes:

- Acceptability would vary between parents/caregivers.
- There are cultural differences in attitudes to massage.
- Massage may cause anxiety for some parents/caregivers, particularly those with a history of childhood maltreatment by care providers.

Feasibility

Infant massage is feasible to implement.

Note:

Parents can easily provide massage if they wish.

Implementation considerations

Infant massage should not be removed from existing programs, but there is no compelling evidence to support its widespread implementation.

Generalisability to the Australian context

The Working Committee considered that the evidence from the study populations would be relevant to Australia, because a sufficient number of the studies were conducted in high-income or middle-income countries where health systems and sociocultural context or circumstances are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

Research implications and opportunities

Studies of infant massage should measure outcomes that are indicators of the quality of attachment.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Infant massage that is responsive to the needs of the infant, provided by a parent or caregiver during the first year of life, might help to enhance infant personal–social behaviour and sleep* and lessen the duration of crying or fussing.

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- Improvements were also seen for outcomes rated by the Working Committee as important but not critical for making decisions: Infant massage interventions can improve infants' physical growth, and psychomotor and motor development.
- There is very limited evidence of benefits to social and emotional development and wellbeing, but the intervention is unlikely to do harm and may have other benefits such as strengthening the parent/caregiver–child relationship (see also Interventions for enhancing sensitivity and/or attachment security).
- While infant massage should not be relied on to improve social and emotional development and wellbeing, it should not be discouraged if parents/caregivers wish to practise it.
- In Australia, parents could be trained to provide sensitive and skilled infant massage with support by workers from a range of disciplines and workforces, including maternal and child health nurses, Aboriginal Health Workers, other community workers, practice nurses, or lay educators.

*Effects were reported for multiple follow-up intervals for these outcomes. Improvements were seen for some, but not all follow-up periods.

Interventions for enhancing sensitivity and/or attachment security

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence included those aimed to enhance positive parental behaviours (e.g. responsiveness, support, sensitivity or involvement), so as to benefit children's social and emotional development, as well as attachment security.[48,49]

Notes:

- Bakermans-Kranenburg (2003)[48] included preventive interventions focusing on sensitivity alone (20 RCTs), support, representation, and sensitivity or combinations of these (31 RCTs), delivered by non-professionals (five RCTs), professionals (42 RCTs), or no intervenor (four RCTs), delivered at home (40 RCTs) or elsewhere (11 RCTs), and commencing prenatally (eight RCTs), before age 6 months (28 RCTs) or over 6 months (15 RCTs).
- Bakermans-Kranenburg (2005)[49] included preventive interventions focusing on sensitivity (five RCTs), support, representation, and sensitivity or combinations of these (ten RCTs), delivered by non-professionals (two RCTs), professionals (12 RCTs), or no intervenor (one RCT), delivered at home (13 RCTs) or elsewhere (two RCTs).
- The interventions were delivered to the general population and populations 'at risk' due to infant (e.g. prematurity, adoption, irritability), or maternal characteristics (e.g. adolescent motherhood, maternal depression, poverty or single parenthood), and at various frequencies and durations ranging from fewer than five to more than 16 sessions.

Evidence sources: systematic reviews

Three relevant systematic reviews were assessed:

- **Bakermans-Kranenburg (2003)**[48] (high risk of bias, moderate quality) – contributed pooled numerical results (see *Evidence table for Bakermans-Kranenburg 2003* in the Technical Report)
- **Bakermans-Kranenburg (2005)**[49] (high risk of bias, low quality) – contributed pooled numerical results (see *Evidence table for Bakermans-Kranenburg 2005* in the Technical Report)
- **Doughty (2007)**[50] (high risk of bias, moderate quality) – no pooled numerical results (see *Evidence table for Doughty 2007* in the Technical Report).

Primary studies reported in systematic reviews that contributed pooled numerical results

Bakermans-Kranenburg (2003)[48]

Number of relevant studies: 70 (a core set of 45 RCTs was established which reported on 51 interventions directed at sensitivity and 23 interventions directed at attachment)

Study design: RCTs (45), nonrandomised studies (25)

Total number of participants: 9957 infants and parents (core set 6282 mothers and their infants)

Sample sizes (range): not reported

Publication period: 1972–2001

Place: not reported

Study populations: not restricted; low SES and middle/high SES, adolescent and adult parents, preterm and non-preterm born infants, 'multi-risk' and non-multi risk populations, clinically referred and non-clinically referred populations. Studies reporting on maternal sensitivity commenced prenatally (ten interventions), at infant age less than 6 months (42 interventions), or at infant age greater than 6 months (29 interventions).

Intensity of intervention: varied from fewer than five sessions to more than 16 sessions

See *Evidence table for Bakermans-Kranenburg 2003* in the Technical Report

Bakermans-Kranenburg (2005)[49]

Number of relevant studies: ten

Study design: not reported; 'random' design for 11 of 15 interventions in 10 studies

Total number of participants: 842

Sample sizes (range): 30–172

Publication period: 1988–2005

Place: not reported

Study populations: clinically depressed mothers (two studies), families with infants at risk due to international adoption (one study), irritable infants (one study), extremely low-birthweight infants (one study), clinically referred infants (one study), mothers of low SES with multiple problems (three studies), insecure mothers (one study). Age at start of intervention: less than 6 months (six interventions), greater than 6 months (nine interventions). SES: middle/high (nine interventions), low (six interventions), multi-risk (six interventions), clinical risk (six interventions)

Intensity of intervention: varied from fewer than five sessions to more than 16 sessions; some interventions confined to a limited number of sessions in a short period; others included weekly individual meetings starting before birth and continuing for several years

See *Evidence table for Bakermans-Kranenburg 2005* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

No pooled results available

Behaviour for the infant, as a child, and up to 18 years

No pooled results available

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Maternal sensitivity (Ainsworth/Erickson; HOME Inventory; NCATS; other) – time of outcome measures not reported

Attachment (SSP; other) – time of outcome measures not reported

Disorganised infant attachment (Main and Solomon coding system; Crittenden's PAA) post-test; time of outcome measures largely not reported

Parent/caregiver psychosocial wellbeing

No pooled results available

Parent/caregiver knowledge, practices and behaviours

No pooled results available

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from moderate to high

Main reasons for downgrading the quality of evidence: risk of bias not reported, inconsistency (due to substantial heterogeneity)

Benefits reported

Maternal sensitivity and attachment (indicator of secondary outcomes, critical)

Moderate-quality evidence from two systematic reviews shows maternal sensitivity (measured using the Ainsworth/Erickson sensitivity rating scales, HOME Inventory, NCATS, or other tools) and attachment (measured using the SSP, or other tools) are improved with sensitivity interventions (51 interventions assessed in RCTs, N=6282 and 23 interventions assessed in RCTs, N=1255 respectively). However, high-quality evidence shows no clear impact on disorganised attachment (measured using the Main and Solomon coding system, or Crittenden's PAA); time of outcome measures not reported (ten studies (11/15 interventions assessed in RCTs), N=842.

See *Table 12. Interventions for enhancing sensitivity and/or attachment security evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Moderate

Balance of benefits versus harms and burdens

The benefits slightly outweigh the harms.

Notes:

- Based on Working Committee members' experience, additional benefits may include improved confidence in parenting and greater enjoyment of the relationship with the baby, the opportunity for

positive interaction with health services, and promoting optimal family function, given that successful attachment is understood to be protective of family function.

- Typically, at-risk families interact with child services only when there is a significant problem with their baby; increasingly, parents can only access services if the infant has a defined problem. Skilled implementation of interventions for enhancing maternal sensitivity and/or attachment security could avoid giving the impression that the services are only for struggling families and have the sole aim of preventing parent-related problems.
- No harms were reported in the body of evidence. Based on Working Committee members' experience and theoretical considerations, potential harms and burdens include harms due to delivery of the intervention by inexperienced or unskilled staff, the intervention being perceived as intrusive, inconvenient or unwelcome if time-consuming and delivered in the parent's home. The time required is not clear from the body of evidence.
- These interventions may be more effective when targeted to at-risk/vulnerable groups than when delivered universally, but the differential effects cannot be assessed from this body of evidence.
- Based on this body of evidence, it is difficult to judge whether it would be best targeted to groups in which attachment is recognised to be at risk, or whether there are universal benefits. Although these interventions seem broadly positive there is no evidence of universal benefit.
- A systematic review and meta-analysis of randomised and quasi-randomised studies evaluating interventions aimed at promoting maternal sensitivity and reflective function on maternal-child attachment security[51] concluded that, when implemented in the first year of life, these interventions are effective in promoting secure maternal-child attachments. The greatest benefits were seen in families at highest risk. This review was published since the period covered by the NHMRC evaluation of evidence, so it is not included in the Report on the Evidence.

Values and preferences

People are probably similar in the value they place on the critical and important outcomes.

Notes:

- Consistency of values and preferences is not assured because parents' values and preferences cannot be accurately ascertained, particularly those of ethno-cultural groups such as Aboriginal and Torres Strait Islander communities.
- Neonatology health professionals would probably place more emphasis on some outcomes than other health professionals or the general community.

Resource implications

There is uncertainty about costs.

Notes:

- The intervention can be delivered in the home, but requires a highly skilled workforce.
- In this body of evidence, interventions achieved enhanced maternal sensitivity whether they were delivered by a professional or other trained person. However, enhancement of attachment was only improved when interventions were delivered by professionals.
- Some interventions were intensive (up to 16 visits).
- The intervention has the potential to prevent future problems that are associated with high resource use. Therefore, the costs of not implementing the interventions should be taken into account.
- While all workers in the child health field could be trained in attachment-informed practice, more specific intervention (with greater costs) would be needed where there is already disorganised attachment.

Equity

Implementation of interventions for enhancing sensitivity and/or attachment security would probably reduce health inequities.

Notes:

- Skilled practitioners are more available in metropolitan regions. There is a need to train a broader workforce to provide attachment-informed care.
- As for other interventions, equity would not be improved if the interventions were least accessible to the most disadvantaged (or selectively accessed by the privileged). However, this is less of a risk than for some other interventions (e.g. NBAS-based interventions) because the intensity and duration means it is unlikely to be sought out by families that are already functioning well.

Acceptability

Interventions for enhancing sensitivity and/or attachment security are probably acceptable to key stakeholders.

Notes:

- Workers must be highly skilled to prevent parental perception that the intervention is punitive, scrutinising or stigmatising. Acceptability would depend on parents perceiving the intervention as positive and building on their strengths.
- Cultural factors that have not been identified (e.g. cultural sensitivities for some ethno-cultural groups) may affect acceptability.

Feasibility

Interventions for enhancing sensitivity and/or attachment security are probably feasible to implement.

Notes:

- It could be feasible to train the general workforce to provide attachment-informed care via universal low-intensity interventions.
- The feasibility of providing more intense or specific interventions is less certain.

Implementation considerations

Competencies in promoting attachment and sensitivity could be introduced into the training and credentialing of the maternal and child health workforce, so as to make attachment-informed care the norm.

Primary care services could deliver interventions to promote secure attachment. More intensive services for at-risk groups would require a highly skilled specialist workforce.

Cultural factors should be considered.

There is an opportunity to link health services to family violence services and focus on prevention and the promotion of positive messages that can enhance sensitivity and attachment. The Council of Australian Governments (COAG) Advisory Panel on Reducing Violence against Women and their Children has identified that children can be victims of violence against women and has recommended a national, long-term primary prevention strategy and early intervention initiatives that prioritise the development, validation and implementation of perinatal domestic violence screening and strengthen referral pathways within the health system.[52] There is an opportunity to integrate risk assessment into routine care.

Generalisability to the Australian context

The systematic reviews did not report where the studies were conducted. The Working Committee agreed it could be assumed that most included studies were conducted in northern America. Accordingly, the Working Committee considered that the evidence from these populations would be relevant to Australia, because health systems and social factors are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

Research implications and opportunities

More research is needed to:

- determine the effects of antenatal interventions to promote secure attachment
- identify groups who would benefit from more intensive interventions
- collect data on outcomes that directly measure infant social and emotional development
- determine which interventions are most effective in Australian communities, including specific ethno-cultural/sociocultural groups (determine if it is beneficial when implemented universally or for targeted populations).

See Overall Research Implications

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Interventions for enhancing maternal sensitivity and/or attachment security, delivered by professionals and trained non-professionals and starting in the first year of life, are likely to enhance maternal sensitivity and attachment. These benefits apply to all infants, including populations with parents of low or middle/high socioeconomic status, adolescent and adult parents, infants born preterm and full term, and those with risk factors for suboptimal attachment. However, these interventions are not likely to be effective when disorganised attachment is already established.

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- Interventions aimed at promoting maternal sensitivity and attachment could be provided by professionals and trained non-professionals as routine care.
- For at-risk infants, more intensive interventions delivered by appropriately trained staff may be necessary for effectiveness.
- The evidence does not support the use of these interventions to manage disorganised attachment that has already been identified.

What

Interventions designed to optimise maternal/caregiver sensitivity and parent/caregiver–infant attachment by promoting positive parental behaviours including responsiveness, sensitivity or involvement

Note:

Interventions of various intensity could be developed according to the needs of target sub-groups.

Why

Overall goal: to foster sensitivity and secure attachment between parents and infants to as to promote optimal family function

Objectives based on the body of evidence: to optimise maternal sensitivity and attachment

Other objectives:

- to improve parents' confidence in parenting
- to improve parents' enjoyment of their relationship with their baby

- to enable a positive interaction between child health services.

Who

Delivered by professionals and trained non-professionals

Notes:

- More intensive services targeting higher risk groups would require more highly trained/skilled workforce.
- It was unclear from available evidence whether outcomes depend on whether interventions are delivered by professionals or non-professionals. One systematic review found that the type of provider did not clearly affect outcomes,[48] while another found that benefits were shown only for interventions delivered by professionals, and not those delivered by non-professionals or via written materials.[49]
- In Australia, this intervention could be delivered by trained maternal and child health nurses, general practitioners, play group workers, community nurses, and child care workers.

For whom

All infants (more intensive interventions for at-risk infants)

When

Within the first year of life

Where

In the home and in primary care

Interventions for fathers

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence included education, observation and modelling of infant behaviour by an interventionist (e.g. through demonstration, or participation in the NBAS or APIB) before hospital discharge after the baby's birth, massage interventions (with fathers taught to massage their infants, using written instructions, demonstrations or videotapes), and kangaroo care interventions (with fathers participating in kangaroo care for preterm infants).[53]

Notes:

Interventions were assessed in predominately middle class families, with fathers of healthy or premature newborns or infants ranging from one encounter to daily encounters for a month.

Evidence sources: systematic reviews

One relevant systematic review was assessed:

Magill-Evans (2006)[53] (high risk of bias, moderate quality) – no pooled numerical results (see *Evidence table for Magill-Evans 2006* in the Technical Report)

Outcomes reported in the systematic reviews

No pooled results were available for any outcomes in any pre-specified outcome domain.

Full report on this intervention

See Evidence Evaluation Report

Working Committee's conclusions

Summary

There is insufficient evidence from systematic reviews with pooled results to ascertain whether interventions for fathers, starting before birth or in the first year of life, have any effect on infant social and emotional development and wellbeing.

Note:

See Decision tool for developing evidence-based conclusion statements.

Research implications and opportunities

At the universal level there is evidence that fathers' involvement in parenting is beneficial for children, but there is a lack of evidence on the effects of fathers' behaviours and parenting styles within specific population groups.

Well-designed studies are needed that evaluate interventions targeting fathers within specific population groups, include clearly defined outcome measures for infant social and emotional development and wellbeing, and have adequate follow-up, e.g. into early childhood (up to 3 years) or up to when the child starts school (approximately 5 years).

See Overall Research Implications.

Interventions for parents in low-income and middle-income countries

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence included structured interventions to improve the mental health of women in the perinatal period in low-income and middle-income countries.[54]

Notes:

Rahman (2013)[54] included interventions delivered by supervised, non-specialist health and community workers. The duration and intensity ranged from one to 20 sessions, with follow-up continuing up to age 18 months.

Evidence sources: systematic reviews

Four relevant systematic reviews were assessed:

- **Rahman (2013)**[54] (unclear risk of bias, moderate quality) – contributed pooled numerical results (see *Evidence table for Rahman 2013* in the Technical Report)
- **Knerr (2013)**[55] (unclear risk of bias, moderate quality) – no pooled numerical results (see *Evidence table for Knerr 2013* in the Technical Report)
- **Grantham-McGregor (2014)**[56] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Grantham-McGregor 2014* in the Technical Report)
- **Mejia (2012)**[57] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Mejia 2012* in the Technical Report).

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: 11

Study design: RCTs (nine), qRCT (one), historical matched control (one)

Total number of participants: 22 441

Sample sizes (range): 72–19 030

Publication period: 2002–2012

Place: Chile (one trial), China (two trials), India (two trials), Mexico (one trial), Pakistan (two trials), South Africa (two trials), Taiwan (one trial)

Study populations: pregnant women or women who had recently given birth

Intensity of intervention: ranged from 1–20 sessions

see *Evidence table for Rahman 2013* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

Infant growth (exact measures not reported/unclear) time of measure not reported

Infant development (GMDS; DAS) time of measure not reported

Behaviour for the infant, as a child, and up to 18 years

No pooled results available

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Mother-infant relationship (rated observations of parent-child interactions; Acholi adaptation of the HOME Inventory) at 6-12 months

Parent/caregiver psychosocial wellbeing

Maternal depression (SCID-1; CES-D; EPDS; SRQ-20; HDRS; K10; Kitgum Maternal Mood Scale) at 4 weeks to 12 months

Maternal depression (EPDS; Kitgum Maternal Mood Scale) at 3–4 months postpartum

Maternal depression (SCID-1; EPDS; SRQ-20; HDRS) at 6 months postpartum

Maternal depression (CES-D; K10) at 12 months postpartum

Parent/caregiver knowledge, practices and behaviours

No pooled results available

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from unclear to 'moderate to low'

Main reasons for downgrading the quality of evidence: risk of bias (not reported), inconsistency (due to substantial heterogeneity)

Benefits reported

Infant growth (indicator of secondary outcome; important)

Evidence of unclear quality from one systematic review shows that interventions to address maternal mental health in low-to-middle income settings improve infant growth (time of outcome measure not reported; two RCTs, one historical matched control study, N=1125).

Infant development (indicator of secondary outcome; critical)

Evidence of unclear quality from one systematic review shows that interventions to address maternal mental health in low-to-middle income settings improve infant development (measured using the GMDS or DAS-II; time of outcome measure unclear; two RCTs, N=473).

Mother-infant relationship (indicator of secondary outcome; critical)

Evidence of unclear quality from one systematic review shows that interventions to address maternal mental health in low-to-middle income settings improve mother–infant relationships (measured using rated observations of parent–child interactions and the Acholi adaptation of the HOME Inventory) at 6–12 months (three RCTs, one historical matched control study, N=1123).

Maternal depression (indicator of secondary outcome; important not critical)

Moderate-to-low quality evidence from one systematic review shows that interventions to address maternal mental health in low-to-middle income settings improve maternal depression at 4 weeks to 12 months postpartum (measured using the, SCID-1, CES-D, EPDS, SRQ-20, HDRS, K10 or Kitgum Maternal Mood Scale; 11 RCTs, one qRCT, one historical group control study, N=15 429). Evidence of unclear quality shows these interventions improve maternal depression at 3–4 months postpartum (four RCTs, one qRCT, N=943), 6 months postpartum (six RCTs, one historical matched control study, N=1945), and 12 months postpartum (two RCTs, N=12 541).

See *Table 22: Interventions for parents from low and middle income countries evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Very low

Balance of benefits versus harms and burdens

The balance of benefits and harms to the child is uncertain.

Notes:

- All benefits to the child were unclear. Lack of evidence for benefits may be due to the poor quality of the body of evidence. Other benefits may not have been captured by the overview method. It is difficult to interpret the findings because different types of interventions have been grouped in the available systematic review.
- No harms were reported in the body of evidence. Based on Working Committee members' experience and theoretical considerations, potential harms and burdens include unintended harms due to relatively low level of professional training of non-clinician workers delivering the intervention.

Values and preferences

People are probably similar in the value they place on the critical and important outcomes.

Note:

If other stakeholders understood the limitations of the outcomes reported in the evidence, they would probably agree on their priority status. Without this understanding, some stakeholders may rate more outcomes as critical.

Resource implications

There is uncertainty about the costs.

Equity

Implementation in Australia of interventions for parents in low-income to middle-income countries would probably not reduce health inequities.

Notes:

- The interventions reported in this body of evidence are unlikely to reduce inequity in Australia because of lack of evidence for their effectiveness in improving infant social and emotional development.
- In the countries for which they were designed, they may reduce inequity.

Acceptability

Implementation in Australia of interventions for parents in low-income to middle-income countries is probably acceptable to key stakeholders.

Note:

In Working Committee members' experience, similar interventions in Australian have been generally well received.

Feasibility

Interventions for parents in low- to middle-income countries are probably feasible to implement in Australia.

Notes:

- The interventions described in the body of evidence are likely to be feasible to implement in Australia because they are conducted by non-health professionals (non-specialist health and community workers).
- In some remote regions of Australia, similar programs are already used or being trialled (e.g. Indigenous home visiting programs, support for teenage and first-time Aboriginal mothers in Alice Springs, Cairns, NSW and other sites).

Implementation considerations

In the only systematic review that contributed pooled results, about half the studies involved home visiting and the other half involved group sessions, embedded in routine antenatal care or delivered in hospital.

This body of evidence is relevant to the evaluation of home visiting interventions (and possibly that of antenatal and postnatal education and support interventions).

Given that these interventions did not show clear benefits for infants, this could be taken into account when designing interventions for Australian regions with similar disadvantage or limited access to services. Interventions for these regions should be purpose-designed for the local context and include a specific focus on the infant.

Generalisability to the Australian context

The Working Committee considered that it was not possible to determine the extent to which the evidence from these populations would be relevant to Australia.

Research implications and opportunities

Research is already underway evaluating interventions for remote or disadvantaged communities that may be comparable in some ways to the populations targeted in this body of evidence. Wherever possible, studies should include outcome measures to assess effects on infant social and emotional development.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Structured interventions to improve the mental health of women in low-income and middle-income countries, starting before birth or in the first year of life, might help to enhance infant development and the mother–infant relationship.

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- Improvements were also seen for outcomes rated by the Working Committee as important but not critical for making decisions: Interventions to support maternal mental health in low-to-middle income countries can improve infant growth and maternal mental health.

Interventions for parents of preterm and low-birthweight infants

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated were for parents of infants born preterm (generally less than 37 weeks' gestation) or with a low birthweight (less than 2500 g). Interventions in the available evidence varied widely and included parent–infant interaction, home visiting, home visiting in combination with other interventions (e.g. centre-based meetings), and early education and support interventions focused on improving infant development or enhancing parenting skills.

Notes:

- Evans (2014)[58] included interventions focusing on parent-infant relationships (17 studies), using a variety of parenting interventions with varied delivery location, content, intensity, duration and delivery mode, delivered in hospital or post discharge.
- Goyal (2013)[59] included home-based preventive services for infants at medical or social risk, delivered by nurses, development specialists, trained paraprofessionals or graduate students. Duration ranged from 8 weeks to 3 years. Visit frequency was mostly weekly/bi-weekly in early infancy.
- Spittle (2012)[60] included interventions focusing on infant development and milestones, understanding behavioural cues, infant stimulation, physiotherapy, occupational therapy, early educational intervention and enhancement of the parent–infant relationship. The frequency and duration of the intervention programs ranged from four sessions over approximately 1 month, to weekly sessions for 12 months, followed by bi-weekly sessions for a further 2 years.
- Vanderveen (2009)[61] included teaching/enhancing parent's skills and/or involving parents in aspects of care for their infant: NIDCAP intervention (one trial), kangaroo care (one trial), or other developmental interventions (19 trials). Intervention durations ranged from the length of in-hospital stay (ending at NICU discharge) to 3 years. Intensity of interventions ranged from daily to monthly.

Evidence sources: systematic reviews

Five relevant systematic reviews were assessed:

- Spittle (2012)[60](low risk of bias, high quality) – contributed pooled numerical results (see Evidence table for Spittle 2012 in the Technical Report)
- Vanderveen (2009)[61] (low risk of bias, high quality) – contributed pooled numerical results (see Evidence table for Vanderveen in the Technical Report)
- Evans (2014)[58] (low risk of bias, moderate quality) – contributed pooled numerical results (see Evidence table for Evans 2014 in the Technical Report)
- Goyal (2013)[59] (low risk of bias, moderate quality) – contributed pooled numerical results (see Evidence table for Goyal 2013 in the Technical Report)
- Brett (2011)[62] (low risk of bias, moderate quality) – no pooled numerical results (see Evidence table for Brett 2011 in the Technical Report).

Primary studies reported in systematic reviews that contributed pooled numerical results

Spittle (2012)[60]

Number of relevant studies: 21

Study design: RCT (17), qRCT (four)

Total number of participants: 3100

Sample sizes (range): 24–985

Publication period: 1979–2011

Place: not reported

Study populations: infants born preterm (range of gestational ages from < 37 weeks) or birthweight < 2500 g

Intensity of intervention: (range) four sessions over approximately 1 month, to weekly sessions for 12 months followed by bi-weekly sessions for a further 2 years

See *Evidence table for Spittle 2012* in the Technical Report

Vanderveen (2009)[61]

Number of relevant studies: 25

Study design: RCT (24), qRCT (one)

Total number of participants: 3509

Sample sizes (range): 24–985

Publication period: 1980–2006

Place: not reported

Study populations: preterm infants (< 37 weeks) or infants < 2500 g at birth

Intensity of intervention: ranged from daily to monthly. Duration ranged from the length of in-hospital stay (ending at NICU discharge) to 3 years

See *Evidence table for Vanderveen* in the Technical Report

Evans (2014)[58]

Number of relevant studies: 17

Study design: RCT (11), qRCT (six)

Total number of participants: 1940

Sample sizes (range): 16–327

Publication period: 1984–2013

Place: not reported

Study populations: all studies preterm infants (< 37 weeks); three studies included very preterm infants ≤ 32 weeks

Intensity of intervention: ranged from six 45-minute weekly sessions during hospital stay only, to tapered over 12 months (one session at 1 week prior to discharge, then five sessions at 1 month, 3 months, and 5 months post-discharge, at 9 months and 12 months' corrected age)

See *Evidence table for Evans 2014* in the Technical Report

Goyal (2013)[59]

Number of relevant studies: 17

Study design: RCT (14), qRCT (1), quasi-experimental design (one), cohort study (one)

Total number of participants: 2859

Sample sizes (range): 45–985

Publication period: 1980–2010

Place: USA and Canada

Study populations: (range) preterm (< 37 weeks) in most programs, < 36 weeks (two programs), < 35 weeks (one program), < 34 weeks (one program) infants or low birthweight infants (< 1500–2000 g) with mean gestational age of 30–35 weeks, and mean birthweight of 1200–2400 g across studies. Interventions were delivered either during birth hospitalisation or soon after discharge.

Intensity of intervention: duration of home visiting ranged from 8 weeks to 3 years; visit frequency varied (mostly weekly/bi-weekly in early infancy)

See *Evidence table for Goyal 2013* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

Cognitive development in infancy (BSID MDI; GMDS) at age 6 months

Cognitive development in infancy (BSID MDI) at age 8–13 months

Cognitive development in infancy (BSID MDI; GMDS) age 0–2 years

Cognitive development in infancy (BSID MDI; GMDS) at age 12 months and 24 months

Cognitive development at preschool age (SB; MSCA) at age 36 months

Cognitive development at preschool age (SB; MSCA; BSID MDI) at age 3 years to less than 5 years

Cognitive development at school age (WPPSI-R; BAS) at age 5 years

Cognitive development at school age (WISC; KBIT) age 5 years to less than 17 years

Motor development in infancy (BSID PDI) at ages 6, 12 and 24 months

Motor development in infancy (BSID PDI; GMDS locomotor subscale) at age 0–2 years

Motor development at preschool age (GMDS locomotor subscale; PEDI) at age 3 to less than 5 years

Cerebral palsy (infancy to age 6 years)

Behaviour for the infant, as a child, and up to 18 years

No pooled results available

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Mother-infant interaction (NCAST); also known as the NCAST Parent-Child Interaction Feeding Scale" data-html="true">NCAFS or NCATS effect on mother; one NCAST); also known as the NCAST Parent-Child Interaction Feeding Scale" data-html="true">NCAFS prior to discharge,

one NCAST); also known as the NCAST Parent-Child Interaction Feeding Scale" data-html="true">NCAFS at 1.5 months' corrected age and one NCATS at 3 months' corrected age)

Parenting quality and interaction (HOME Inventory) at age 8–12 months

Parent/caregiver psychosocial wellbeing

No pooled results available

Parent/caregiver knowledge, practices and behaviours

No pooled results available

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from very low to moderate

Main reasons for downgrading the quality of evidence: risk of bias (unclear methods for allocation concealment), imprecision (wide CIs, small sample sizes), inconsistency (substantial heterogeneity), publication bias (funnel plot asymmetry, studies from North America only)

Benefits reported

Cognitive development in infancy (indicator of secondary outcome; critical)

Mostly low-quality evidence from three systematic reviews shows that home visiting, parenting skills and developmental interventions each improve cognitive outcomes (measured using the BSID or Griffiths Mental Development Scale) from age 6 months up to age 2 years in infants born preterm (47 studies: 41 RCTs, five qRCTs, one cohort study: N=7315).

Cognitive development at preschool age (indicator of secondary outcome; critical)

Moderate-quality evidence from two systematic reviews shows that parenting skills and developmental interventions each improve cognitive outcomes (measured using the Stanford-Binet Intelligence Scales, McCarthy Scales of Children's Abilities, Wechsler Preschool and Primary Scale of Intelligence and British Abilities Scale) at age 3–5 years in children born preterm (eight RCTs: N=2237).

Motor development in infancy (indicator of secondary outcome; important)

Moderate- to low-quality evidence from two systematic reviews shows that parenting skills and developmental interventions each improve motor outcomes (measured using the BSID PDI and Griffiths Locomotor Scale) from 6 months, up to age 2 years in infants born preterm (27 studies: 25 RCTs, two qRCTs: N=4265).

Parenting quality and interaction (indicator of secondary outcome; critical)

Very low-quality evidence from one systematic review shows an improvement in parenting quality and interaction (measured using the HOME Inventory) with home visiting interventions at age 8–12 months for infants born preterm (six studies: four RCTs, one cohort and one quasi-experimental study: N=336).

Reported outcomes for which the intervention had no clear impact

'No clear impact' means pooled numerical results showed a non-statistically significant difference between effects of the intervention and comparator(s) for the specified outcome.

Cerebral palsy (indicator of secondary outcome; important)

Low-quality evidence from one systematic review suggests no clear effect of developmental interventions on the rate of cerebral palsy up to age 6 years in children born preterm (four RCTs and one qRCT, N=737).

See *Table 20: Interventions for parents of preterm and low birthweight infants evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Moderate

Balance of benefits versus harms and burdens

Benefits may outweigh harms, but it is not possible to ascertain this.

Notes:

- In Brett (2011)[62] single study results show parents of preterm infants who used kangaroo care considered that they received significantly less support from health professionals (within the outcome domain of parent/caregiver views of intervention) for intervention compared with control. The evidence reviewers were unable to grade outcomes from this systematic review as it did not provide pooled numerical results.
- In Evans (2014),[58] single study results show significantly poorer outcomes for mother–infant interaction (within the outcome domain of parent infant relationship) for intervention compared with control.
- In Goyal (2013),[59] single study results show significantly poorer outcomes for aspects of child health (within the outcome domain of physical wellbeing and safety for the infant, as a child, and up to 18 years) for intervention compared with control.
- The single study results favouring control over intervention must be interpreted in context and with caution, as other single study results show positive results for the same outcome.
- The Working Committee identified no particular potential harms based on members' experience or theoretical considerations.

Values and preferences

People are similar in the value they place on the critical and important outcomes.

Resource implications

The net benefits are worth the costs.

Notes:

- Net benefits are likely to justify costs because there was evidence of effectiveness for several relevant outcomes which may have lasting benefits for the rest of the infant's lifespan. Effective interventions might have significant population benefits through prevention of disability.

- Interventions for parents/caregivers of preterm infants are resource-intensive. They require delivery by skilled professionals.

Equity

Implementation of interventions for parents of preterm infants would reduce health/social inequities.

Notes:

- These interventions are likely to improve health equity because there are higher rates of preterm birth among disadvantaged subgroups.[63,64]
- However, these interventions would be difficult to implement in remote regions, because most are currently provided through metropolitan tertiary care (teaching) hospitals.

Acceptability

Interventions for parents of preterm infants are probably acceptable to key stakeholders.

Notes:

- Acceptability is likely but not certain, because the preferences of some subgroups are unknown.
- In Working Committee members' experience, there are low rates of attendance for these kinds of interventions for some groups (e.g. Aboriginal parents/caregivers), possibly due to access and transport problems when the intervention is not delivered near home or requires parents to attend a centre far from the family's support network.
- Parents/caregivers may be distressed by attending a hospital where they see other full-term babies thriving.

Feasibility

Interventions for parents of preterm infants are probably feasible to implement.

Notes:

- Neurodevelopmental programs are already available in all states and territories.
- Early intervention for preterm infants to optimise development is very important, but might be difficult to implement in rural and remote regions.
- Specialised services are currently not available in many places and are mainly offered through teaching hospitals.

Implementation considerations

The evidence showing benefits was derived from studies evaluating home visiting interventions, or parenting skills and developmental interventions.

These interventions may be difficult to implement in remote regions.

Programs should be implemented sensitively to maximise parental engagement with the intervention.

Generalisability to the Australian context

The Working Committee considered that the evidence from these populations would be relevant to Australia, because the majority of studies were conducted in high-income or middle-income countries where health systems and sociocultural context or circumstances are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

Research implications and opportunities

Well-designed studies are needed to determine the effects of these interventions and to determine whether or not the apparent harms reported in individual studies (see Balance of benefits versus harms and burdens) were attributable to the interventions.

Studies evaluating interventions for preterm and low-birthweight infants should include outcome measures that are indicators of social and emotional development outcomes, including tools that are more sensitive measures of the quality of relationships than NCATS or NCAST); also known as the NCAST Parent-Child Interaction Feeding Scale" data-html="true">NCAFS.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Interventions designed for parents/caregivers of preterm/low birthweight infants, delivered by multidisciplinary teams/skilled trained professionals during the first year of life, are likely to improve infant cognitive development* and parenting quality and interaction.*

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- Improvements were also seen for outcomes rated by the Working Committee as important but not critical for making decisions: Parenting skills and developmental interventions can improve motor development* in infants born preterm.
- Reported benefits for which there was moderate-quality evidence were for cognitive and motor development only. No direct effects on social and emotional development were demonstrated in this body of evidence.

  *Effects were reported for multiple follow-up intervals for these outcomes. Improvements were seen for some, but not all follow-up periods.

Why

Overall goal: to optimise the development of preterm and low birthweight infants

Objectives based on the body of evidence: to foster optimal home environment, to optimise cognitive development in infancy and at preschool age, and to optimise motor development in infancy.

What

Multicomponent, evidence-based psychoeducation programs designed by multidisciplinary teams.

Who

Delivered by multidisciplinary teams/skilled trained professionals

Notes:

- Benefits on cognitive and motor developmental outcomes were reported for interventions with moderate or substantial parental involvement[61] and for interventions that were delivered mainly by nurses and physiotherapists (also, but less often by psychologists, occupational therapists, doctors and speech pathologists).[60]
- In Goyal et al (2013),[59] benefits for the parent–infant relationship were reported for interventions delivered by infant development specialists, nurses, a graduate students, or teams consisting of a

registered nurse and occupational therapist. However, in Evans (2014),[58] no clear benefits for the parent–infant relationship were seen for interventions delivered by 'examiners', neonatal nurses and public health nurses.

- In Australia, this intervention could be delivered by neonatal and maternal and child health nurses, physiotherapists, psychologists, occupational therapists, and speech pathologists.

For whom

Parents/caregivers of preterm infants

When

Starting during hospital admission soon after birth and continuing into early childhood

More intensive in early postpartum period

Where

Hospital (initially) and within the community, including the parents'/caregivers' home

Interventions for parents of infants with or at risk of developmental delay or impairment

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence were designed for infants/toddlers with developmental impairments or at risk of such impairments (prematurity, developmental delay including Down syndrome, and risk of intellectual disability).[65]

Notes:

- Interventions were designed to improve developmental outcomes, and included those based on responsive interaction. However, the content and structure of the interventions was not well described.
- Where reported, the duration and intensity varied from three sessions in NICU to age six–12 weeks, to five days per week for five years.

Evidence sources: systematic reviews

Three relevant systematic reviews were assessed:

- **Wallace (2010)**[65] (high risk of bias, moderate quality) – contributed pooled numerical results (see *Evidence table for Wallace 2010* in the Technical Report)
- **Kong (2013)**[66] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Kong 2013* in the Technical Report)
- **Kemp (2014)**[67] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Kemp 2014* in the Technical Report)

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: 32

Study design: RCT (23), qRCTs (3), nRCT (six)

Total number of participants: 5168

Sample sizes (range): 16–985

Publication period: 1973–2009

Place: not reported

Study populations: infants with developmental impairments or significant risk of such impairments, including prematurity (24 trials), developmental delay (five trials) or risk of intellectual disability (three trials)

Intensity of intervention: varied from three sessions in NICU to five days per week from age 6–12 weeks to 5 years

See *Evidence table for Wallace 2010* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

Overall developmental ability (BSID, GMDS, SB); Infants with developmental delays (at age 15 months–16 years)

Overall developmental ability (BSID, MSCA, SB); Infants at risk for intellectual disability (at age 18–54 months)

Overall developmental ability (BSID, BAS, GMDS, MSCA, SB, WPPSI); preterm infants (at age 3–60 months)

Behaviour for the infant, as a child, and up to 18 years

Social-communication behaviours (e.g. vocalisation, gestures, eye contact, turn-taking, intentional communication, utterance, target words, vocabulary words, different word roots, mean length of utterance, language development, cooperation, non-compliant/aggressive behaviours (tools not reported)) (time of measures not reported)

Emotional behaviours (e.g. positive affect and negative affect (tools not reported) (time of measures not reported)

Cognitive behaviours (e.g. complex play skills (tools not reported) (time of measures not reported)

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Parental responsive behaviours (measured using observation systems (tools not reported) (time of measures not reported)

Parent/caregiver psychosocial wellbeing

No pooled results available

Parent/caregiver knowledge, practices and behaviours

Parental emotional behaviours (measured using observation systems (tools not reported) (time of measures not reported)

Parental social/verbal behaviours (measured using observation systems (tools not reported) (time of measures not reported)

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from 'low-to-very low' to low

Main reasons for downgrading the quality of evidence: risk of bias (studies with methodological limitations), inconsistency (wide ranges indicating probable heterogeneity or not reported), imprecision (studies with small sample sizes)

Benefits reported

Overall developmental ability (indicator of secondary outcome; critical)

Low-quality, and low- to very low-quality evidence from one systematic review shows improved overall developmental ability (using standardised measures such as Stanford-Binet Intelligence Scale) from interventions for infants with developmental delays at age 15 months to 18 years (five studies; designs not reported; N=194), infants at risk of intellectual disability at age 18–54 months (three studies; designs not reported; N=234) and preterm infants at age 3–60 months (13 studies; designs not reported; N=2508).

See *Table 19: Interventions for parents of infants at risk of developmental delays evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Very low

Balance of benefits versus harms and burdens

Benefits may outweigh harms, but it is not possible to ascertain this.

Notes:

It is difficult to identify other potential benefits because interventions were poorly specified in the systematic reviews.

- No harms were reported in the body of evidence. Based on Working Committee members' experience and theoretical considerations, potential harms include: burden for parent/caregivers with no change in outcome for infant, false hope (parental/caregiver perception of benefit when there is none), stigmatisation, parental/caregiver frustration, and unknown effects associated with non-evidence-informed interventions.

Values and preferences

People are probably similar in the value they place on the critical and important outcomes.

Notes:

- Consistency of values and preferences is not assured because parents'/caregivers' values and preferences cannot be accurately ascertained.
- In Working Committee members' experience, parents/caregivers rate the critical outcomes highly.

Resource implications

There is uncertainty about the costs

Notes:

- The resource implications cannot be estimated because the interventions were not well described in the available evidence.
- Some interventions evaluated in included studies (e.g. responsive interaction) are likely to be resource-intensive because they are provided frequently over a long duration and would require a highly skilled provider.

Equity

Implementation of interventions for parents of infants with or at risk of developmental delay or impairment would reduce health/social inequity.

Notes:

- The intervention is likely to improve health equity because developmental vulnerability is more prevalent among children from socioeconomically deprived subgroups (e.g. from families with lone, unemployed, or less educated parents, or with lower incomes).[68] Furthermore, some socioeconomically deprived subgroups are less likely to receive interventions.
- In general, fewer interventions are available in remote and rural regions.
- Achieving and maintaining enrolment in mainstream schools is a significant equity issue for children with developmental delays.

Acceptability

Interventions for infants with or at risk of developmental delay or impairment are acceptable to key stakeholders.

Note:

In Working Committee members' experience, parents/caregivers of infants with developmental delay desire and readily accept help.

Feasibility

Interventions for infants with or at risk of developmental delay or impairment are probably feasible to implement.

Notes:

- Feasibility is likely but not certain.
- At present, resources for interventions for infants with or at risk of developmental delay or impairment are generally available only in research settings.
- The National Disability Insurance Scheme may make these more accessible.

Implementation considerations

Factors to consider when implementing interventions or programs for parents of children with or at risk of developmental delay or impairment cannot be identified until there is more conclusive evidence on effective components.

Generalisability to the Australian context

The Working Committee considered that it was not possible to determine the extent to which the evidence from these populations would be relevant to Australia.

Research implications and opportunities

Research evaluating interventions for infants with or at risk of developmental delay or impairment (or their parents/caregivers) should include outcomes to measure effects on infant's social and emotional delay and wellbeing.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Interventions for parents of infants with or at risk of developmental delays or impairment, starting in the first year of life, might help to improve overall infant development.

Note:

See Decision tool for developing evidence-based conclusion statements.

Interventions for parents with alcohol or drug problems

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence include home visiting, institution-based interventions (such as in inpatient drug rehabilitation facilities, schools or acute care settings) and outpatient interventions, with the primary aims of improving child safety and the general health of parents and their infants, including through promoting parent-infant attachment and responsiveness, enhancing caregiving skills, and facilitating linking in parents in with health care.[69-71]

Notes:

Turnbull (2012)[69] included home visits for women (predominately commencing in the postpartum period, by midwives, nurses, paraprofessionals and 'lay' women) with the aim of educating, supporting and empowering women (and often encouraging women to enrol in drug treatment programs.

Evidence sources: systematic reviews

Four relevant systematic reviews were assessed:

- **Turnbull (2012)**[69] (low risk of bias, high quality) – contributed pooled numerical results (see *Evidence table for Turnbull 2012* in the Technical Report)
- **Bowie (2004)**[70] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Bowie 2004* in the Technical Report)
- **Suchman (2006)**[71] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Suchman 2006* in the Technical Report)
- **Niccols (2012)**[72] (low risk of bias, moderate quality) – no pooled numerical results (see *Evidence table for Niccols 2012* in the Technical Report)

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: Seven

Study design: RCT (six), qRCT (one)

Total number of participants: 950

Sample sizes (range): 60–227

Publication period: 1994–2006

Place: Australia (one trial), USA (two trials), unclear (four trials)

Study populations: women with high psychosocial risk and had a high rate of alcohol and drug use (> 50%), enrolled during pregnancy (three trials) or post- partum (four trials). In four trials, most women were African-American

Intensity of intervention: two antenatal home visits for 2 weeks before delivery (one trial), postpartum visits only (six trials), visits continued beyond 6 months (four trials). Four trials involved weekly visits for at least part of the home visiting period.

See *Evidence table for Turnbull 2012* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic reviews

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

Cognitive development (BSID MDI) at latest time measured (18–36 months)

Cognitive development (BSID MDI) at age 6–18 months

Psychomotor delay (BSID PDI) at latest time measured (18–36 months)

Development (BSID) at age 6–36 months

Behaviour for the infant, as a child, and up to 18 years

No pooled results available

Physical wellbeing and safety for the infant, as a child, and up to 18 years

Incomplete vaccination schedule at 6 months

Infant death at up to 6 months

Parent-infant relationship

No pooled results available

Parent/caregiver psychosocial wellbeing

No pooled results available

Parent/caregiver knowledge, practices and behaviours

Continued illicit drug use at 6–36 months

Continued alcohol use at 6–36 months

Failure to enrol in drug treatment program (time of measure not reported)

Failure to remain in drug treatment program at latest time measured at 3–18 months

Women being drug free at 12–18 months

Not breastfeeding at 6 months

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

Infant not in care of biological mother (including involuntary foster care) at 12–36 months

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from very low to low

Main reasons for downgrading the quality of evidence: risk of bias (studies with methodological limitations), imprecision (studies with small sample sizes and/or wide CIs), inconsistency (substantial heterogeneity)

Benefits reported

No benefits reported

See *Table 24: Interventions for parents with alcohol or drug problems evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

Working Committee's conclusions

Summary

There is insufficient evidence from systematic reviews with pooled results to ascertain whether interventions for parents with drug or alcohol problems, starting before birth or in the first year of life, have any effect on infant social and emotional development and wellbeing.

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- The Working Committee agreed that interventions for parents with drug or alcohol problems may achieve their primary purpose in improving maternal and child health/wellbeing and child safety, and that they may play a role in infant social and emotional development and wellbeing.

Research implications and opportunities

Well-designed studies are needed that include clearly defined outcome measures for infant social and emotional development and wellbeing, with adequate follow-up, e.g. into early childhood (up to 3 years) or up to when the child starts school (approximately 5 years).

Studies evaluating interventions for parents/caregivers with alcohol and/or other substance problems should collect long-term data on infant outcomes, either via researcher observation or reported by parents/caregivers.

See Overall Research Implications.

Interventions for parents who are socioeconomically disadvantaged

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the systematic review included community or home-based programs designed to improve child development and relationship-based programs.[73]

Note:

Interventions for parents who have low incomes or are living with social or economic disadvantage commonly aim to reduce the increased risk of developmental problems and poorer health that is associated with socioeconomic deprivation.

Evidence sources: systematic reviews

Three relevant systematic reviews were assessed:

- **Mortensen (2014)**[73] (high risk of bias, moderate quality) – contributed pooled numerical results (see *Evidence table for Mortensen 2014* in the Technical Report)
- **Miller (2011)**[74] (low risk of bias, high quality) – no pooled numerical results (see *Evidence table for Miller 2011* in the Technical Report)
- **Maulik (2009)**[75] (high risk of bias, moderate quality) – no pooled numerical results (see *Evidence table for Maulik 2009* in the Technical Report).

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: 17

Study design: RCT (13), nonrandomised studies (four)

Total number of participants: 6039

Sample sizes (range): 16–2799

Publication period: 2000–2012

Place: Australia (one intervention), Canada (one intervention), Netherlands (two interventions), South Africa (two interventions), UK (two interventions), USA (nine interventions)

Study populations: pregnant women and/or parents of children aged 0–48 months, mainly with low SES, low parental education, or aged less than 20 years

Intensity of intervention: duration 1.5–36.0 months (mean: 13.93), number of intervention sessions ranged from 2.8–64.0 (mean: 26.8)

See *Evidence table for Mortensen 2014* in the Technical Report)

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic reviews

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

Cognitive development (GMDS; Brunet-Lezine Development Test; WISC) at 15 months to 14 years

Cognitive and psychomotor development (Child Development Center of China Scale; BSID MDI and PDI) at up to 24 months

Psychomotor development (BSID PDI) 7.5–24 months after the intervention

Behaviour for the infant, as a child, and up to 18 years

Behaviour (observation; CBCL) at up to age 5 years

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Observed supportive parent–child interactions (observational measures, e.g. EA Scale; HOME; MBRS; NCATS) after an intervention of 1.5–36 months' duration

Parent-child interaction (qualitatively assessed; HOME Inventory; Caregiver-Child Interaction Rating Scale) at up to 21 months

Parent/caregiver psychosocial wellbeing

No pooled results available

Parent/caregiver knowledge, practices and behaviours

No pooled results available

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): low (one outcome only; remainder could not be assessed)

Main reasons for downgrading the quality of evidence: risk of bias (studies with methodological limitations), inconsistency (substantial heterogeneity)

Benefits reported

Supportive parent-child interactions (indicator of secondary outcome; critical)

Low-quality evidence from one systematic review shows that relationship-based interventions for low income/socially disadvantaged parents can improve parent-child interactions (using observational

measures, e.g. EA Scale, HOME, MBRS, NCATS) after an intervention of 1.5–36 months' duration (19 interventions; mostly RCTs, N=6807)

See *Table 23: Interventions for low-income/socially disadvantaged parents evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Low

Balance of benefits versus harms and burdens

The balance of benefits versus harms and burdens is uncertain.

Notes:

- The Working Committee considered that there may be benefits not identified by the overview because some benefits were observed in the included reviews that did not contribute pooled numerical data.

  In Maulik 2009,[75] single study results show significantly poorer outcomes for maternal depression (within the outcome domain of parent/caregiver psychosocial wellbeing) in studies that used basic maternal and/or child care as an important component of the intervention. However, the evidence reviewers were unable to grade the outcomes reported by this review, as it did not provide pooled numerical results.
- Based on Working Committee members' experience and theoretical considerations, potential harms and burdens include stigmatisation, given intervention is likely to be targeted to 'at risk' parents.

Values and preferences

People are probably similar in the value they place on the critical and important outcomes.

Note:

Consistency of values and preferences is not assured because parents' values and preferences cannot be accurately ascertained.

Resource implications

The costs are uncertain.

Notes:

- It is not possible to estimate costs because of uncertainty about the content and structure of interventions, the target recipients, staff delivering the intervention, setting and duration.
- Playgroups may be a more cost effective way of delivering these services.
- A group program could be relatively low-cost way to support this target group. Relative to home visiting interventions, which are resource intensive, some of these interventions may be low-cost and have advantages for parents who do not need an intensive intervention.

Equity

Implementation of interventions for parents who are socioeconomically disadvantaged would probably reduce health inequities.

Notes:

- Interventions for this target group are likely to improve health equity, given the socioeconomic gradient associated with suboptimal infant social and emotional development.

- Increasing children's access to, and participation in, early education is likely to have the greatest effect on social and emotional development.

Acceptability

Interventions for parents who are socioeconomically disadvantaged are probably acceptable to key stakeholders.

Notes:

- Acceptability will depend on how the interventions are framed: the idea that the activity encourages free play between parent and child and gives children the best possible opportunities is likely to be acceptable to most parents, though not all, but there is a risk of stigmatisation.
- If established in a region, it is more likely a program would be valued by the community.
- In Working Committee members' experience, people who might need the most assistance are likely to be those least engaged.

Feasibility

The feasibility of implementing interventions for parents who are socioeconomically disadvantaged would vary between regions and target groups.

Notes:

- The substantial variability in the intensity and duration of the interventions makes it difficult to make a clear assessment of feasibility.
- Feasibility depends on local factors. In Working Committee members' experience:
- The feasibility of such interventions depends on local commitment and resources, because they are resource-intense. To be effective it would need to be implemented in a structured way by skilled providers. However, some potentially effective interventions (e.g. play groups) are not resource intensive.
- Community-run, volunteer services may be more feasible than professional services. They do need to be facilitated and set up, particularly in remote and regional areas. Once they have been established, they can be self-sustained by the community and allow parents to take ownership.
- Social disadvantage correlates with regions where there is less access to services (e.g. rural areas).

Implementation considerations

This limited evidence should be considered when designing interventions or programs for parents where recipients may include disadvantaged groups.

Generalisability to the Australian context

The Working Committee considered that the evidence from these populations would be relevant to Australia, because the majority of studies were conducted in high-income or middle-income countries where health systems and sociocultural context or circumstances are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

Research implications and opportunities

There is a need for well-designed systematic reviews of potentially effective interventions such as music play and parent-child interactions, infant-stimulation interventions. These were evaluated in studies included in systematic reviews, but no pooled data were available.

See Overall Research Implications.

Working Committee’s conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Interventions for parents who are socioeconomically disadvantaged, starting before birth or in the first year of life, might enhance parent–child interactions.

Note:

See Decision tool for developing evidence-based conclusion statements.

Interventions for preventing later antisocial behaviour and delinquency

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence were mostly home visiting programs that aimed to prevent childhood behaviour problems and had parental education and/or family support as a major component.

Note:

Piquero (2008)[74] included home visiting programs (eight RCTs) and parent training (two RCTs; note: one RCT also had home visiting component). Interventions were delivered to families from both general and high risk populations, with infants aged 1 year or younger.

Evidence sources: systematic reviews

Three relevant systematic reviews were assessed:

- **Piquero (2008)**[74] (unclear risk of bias, moderate quality) – contributed pooled numerical results (see *Evidence table for Piquero 2008* in the Technical Report)
- **Bernazzani (2001)**[75] (high risk of bias, moderate quality) – no pooled numerical results (see Evidence table for Bernazzani 2001 in the Technical Report)
- **Yoshikawa (1995)**[30] (high risk of bias, low quality) – no pooled numerical results (see Evidence table for Yoshikawa 1995 in the Technical Report).

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: 10

Study design: RCT

Total number of participants: 5070

Sample sizes (range): 64–1139

Publication period: 1979–2008

Place: Australia (2 RCTs), New Zealand (1 RCT) and USA (7 RCTs)

Study populations: parents of infants ≤ 1 year of age at commencement of intervention (7 RCTs targeted infants from birth; 1 RCT targeted infants aged 6–7 months; 2 RCTs targeted infants aged 1 year old)

Intensity of intervention: not reported

see *Evidence table for Piquero 2008* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

Early cognitive ability (early IQ, school achievement, language development, verbal ability; actual measuring tools/tests not reported): family support programs at age 4 months to grade 5 (aged approximately 10–11 years)

Early cognitive ability (early IQ, school achievement, language development, verbal ability; actual measuring tools/tests not reported): combined early education and family support at age 12 months to 10 years

Behaviour for the infant, as a child, and up to 18 years

Child disruptive behaviour outcomes (CBCL, ECBI, hitting others) time of measure not reported

Antisocial/delinquent behaviour (teacher rated, self-reported delinquency, official criminality e.g. criminal acts/arrests): family support programs at 2 years to grade 4 (aged approximately 9–10 years)

Antisocial/delinquent behaviour (teacher rated, self-reported delinquency, official criminality e.g. criminal acts/arrests): combined early education and family support at age 8–16 years

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Parenting (mother–child interaction, parenting behaviour, attachment, child welfare): family support at age 4–54 months

Parenting (mother–child interaction, parenting behaviour, attachment, child welfare): combined education and family support at age 4 months to 5 years

Parent/caregiver psychosocial wellbeing

Maternal life course (maternal education and employment, childbearing, family economic self-sufficiency): family support at age 1–4 years

Maternal life course (maternal education and employment, childbearing, family economic self-sufficiency): combined education and family support at age 1–10 years

Parent/caregiver knowledge, practices and behaviours

No pooled results available

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from not assessed to moderate

Main reasons for downgrading the quality of evidence: risk of bias (studies with methodological limitations)

Benefits reported

Child disruptive behaviour (indicator of secondary outcome; critical)

Moderate quality evidence from one systematic review shows that home visiting interventions to prevent later antisocial behaviour and delinquency can reduce child disruptive behaviour (measured using the CBCL, ECBI, or by the number of children 'hitting others'); time of outcome measure not reported (eight RCTs, N not reported)

See *Table 13: Interventions for preventing later antisocial behaviour and delinquency evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Moderate

Balance of benefits versus harms and burdens

Harms/burdens slightly outweigh benefits.

Notes:

- Based on Working Committee members' experience, the benefits are likely to outweigh the harms only in at-risk groups.
- Based on Working Committee members' experience, additional benefits of home visiting programs that may contribute to infant social and emotional development may include parent/caregiver satisfaction, a sense of affirmation of parental role, improvement in confidence and coping skills, and parents becoming better able to enjoy their baby. The Working Committee also noted that promoting prosocial behaviour among young children is likely to have long lasting benefits.
- In Yoshikawa 1995[30], single study results show significantly poorer outcomes for antisocial/delinquent behaviour at school entry (within the outcome domain of behaviour for the infant, as a child, and up to 18 years) with early education programs. However, the evidence reviewers were unable to grade the outcomes reported by this review, as it did not provide pooled numerical results. The evidence reviewers noted that these single study results must be interpreted in context and with caution, as other single study results show positive results for the same outcome.
- Based on Working Committee members' experience and theoretical considerations, potential harms and burdens of home visiting programs (particularly if targeted to at-risk infants) include: stigmatisation, parents'/caregivers' perceptions of being judged or scrutinised, parents'/caregivers' perceptions of a visiting program as intrusive, punitive or coercive (particularly if in contact with child protection authorities), lowering of vigilance by child protection officers/staff of other services responsible for identifying maltreatment risk, parents'/caregivers' dependency on the relationship with the visitor, with perception of loss at the end of the program, distraction from other effective programs and services, conflict between parent/caregiver receiving the visits and partner, and cross-cultural problems between visitor and parent/caregiver. Most of these potential harms and burdens could be mitigated by well-designed programs delivered by appropriately skilled people.

Values and preferences

People are probably similar in the value they place on the critical and important outcomes.

Note:

Values are likely to be similar between recipients, policy makers and other expert groups.

Resource implications

The costs are uncertain

Notes:

- For high-risk groups, benefits are likely to outweigh costs.
- However, costs are uncertain and the available evidence does not clearly indicate that these interventions would lead to optimal infant social and emotional development.
- The cost-benefit balance may be best if interventions were targeted to at-risk groups. However, costs would not be justified if programs were not acceptable to target at-risk parents (e.g. if participation was seen as being stigmatising).
- Costs would be limited by incorporating the intervention into existing programs.

Equity

Implementation of intervention for preventing later antisocial behaviour/delinquency would probably reduce health inequities.

Note:

Any intervention that was effective in preventing later antisocial behaviour would have major impact on inequities. However, the body of evidence does not support this assumption.

Acceptability

Interventions for preventing later antisocial behaviour/delinquency are probably acceptable to key stakeholders.

Notes:

- Acceptability to parents would depend on how the aims of the intervention are described. If interventions are targeted to at-risk groups, it is important to avoid describing them as being intended to prevent antisocial behaviour/delinquency because this implies prejudice and unfair targeting of infants as potential criminals. Interventions are more likely to be accepted when their aims are explained as being to promote social skills and wellbeing (‘to get on well with people’)
- Acceptability to parents would also depend on who provides the intervention. It may be more acceptable if provided by a health professional who is trusted and known.
- Acceptability to funders (e.g. government) would be higher when interventions were very specifically targeted to achieve the greatest effects.

Feasibility

Interventions for preventing later antisocial behaviour/delinquency are probably feasible to implement.

Notes:

- These interventions could readily be integrated into existing home visiting programs or antenatal support programs.
- This approach may be more feasible than standalone programs.

Implementation considerations

The only evidence for a benefit was drawn from studies where the intervention was home visiting. Therefore, this limited evidence is relevant for consideration when designing home visiting interventions.

Generalisability to the Australian context

The Working Committee considered that the evidence from these populations would be relevant to Australia, because the majority of studies were conducted in high-income or middle-income countries where health systems and sociocultural context or circumstances are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

Research implications and opportunities

Studies evaluating home visiting interventions should include outcome measures to detect social emotional development as an early indicator of antisocial conduct problems. To obtain useful data, interventions need to be very well defined and the outcomes need to be followed up as long as possible.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Home visiting interventions to prevent later antisocial behaviour and delinquency, starting in the first year of life, are likely to lessen disruptive behaviour during childhood.

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- The early prevention of antisocial behaviour and delinquency is an important goal. However, the only benefit observed for interventions to prevent later antisocial behaviour and delinquency was a reduction in child disruptive behaviour (measured using the CBCL, ECBI, or by the number of children 'hitting others'), when interventions were delivered via home visits (Piquero 2008).[74]
- Another systematic review (Yoshikawa 1995),[30] which evaluated family support programs and combined education and family support interventions, reported benefits for the child's early cognitive ability (such as early IQ, school achievement, language development, verbal ability), parenting (such as mother-child interaction, parenting behaviour, attachment, and child welfare and aspects of the maternal life course (such as maternal education and employment, childbearing, family economic self-sufficiency). However, these results were mixed and the quality of evidence for outcomes reported by this review could not be assessed.

Interventions for preventing postnatal depression

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence included non-pharmaceutical psychosocial or psychological interventions including antenatal and postnatal classes, professional and lay-based home visits, telephone support, early postpartum follow-up, debriefing, cognitive behaviour therapy and interpersonal therapy.[78]

Notes:

- Psychosocial interventions (17 RCTs), included antenatal and postnatal classes/groups (7 RCTs), professional home visits (two RCTs), lay-based home visits (three RCTs), lay-based telephone support (one RCT), early postpartum follow-up (one RCT), and continuity/models of care (three RCTs).
- Psychological interventions (11 RCTs), including: debriefing (five RCTs), cognitive behavioural therapy (one RCT), interpersonal psychotherapy (five RCTs).
- The interventions were delivered to 'at-risk' women (based on factors considered to increase their likelihood of developing postpartum depression), as well as women from the general population.
- Interventions were provided by a variety of professionals (nurses, physicians, midwives, mental health specialists, lay individuals). Interventions were provided to groups of women in 11 RCTs.
- The majority of RCTs (24/28) provided multiple contacts. Four RCTs provided an intervention in antenatal period only; 12 in the antenatal and postnatal period, and 12 in postnatal period only.

Evidence sources: systematic reviews

One relevant systematic review was assessed:

Dennis (2013)[78] (low risk of bias, high quality) – contributed pooled numerical results (see *Evidence table for Dennis 2013* in the Technical Report)

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: 30

Study design: RCT (including three cRCTs)

Total number of participants: 51 369

Sample sizes (range): 37–19 193

Publication period: 1995–2011

Place: Australia (9 RCTs), Canada (one RCT), China (two RCTs), Germany (one RCT), India (one RCT), UK (seven RCTs), USA (eight RCTs), and an unknown place (one RCT).

Study populations: women in the general population (16 RCTs), women 'at risk' based on various factors associated with increased likelihood of developing postpartum depression (14 RCTs)

Intensity of intervention: multiple contacts (24 RCTs), during antenatal period only (four RCTs), antenatal and postnatal period (12 RCTs), or postnatal period only (12 RCTs)

see *Evidence table for Dennis 2013* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

No pooled results available

Behaviour for the infant, as a child, and up to 18 years

No pooled results available

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Maternal–infant attachment (Dysfunction Interaction Scale of PSI in one RCT; one RCT: not reported) at final study assessment (24-52 weeks after birth)

Parent/caregiver psychosocial wellbeing

Depression (symptomatology) (BDI, EPDS, HADS, K10) at final study assessment (3–52 weeks after giving birth)

Depression (scores) (BDI, CES-D, EPDS, HADS, SF-36) at final study assessment (6–52 weeks after giving birth)

Clinical diagnosis of depression (SCID, SCAN) at final study assessment (12–24 weeks after giving birth)

Anxiety (HADS subscale; STAI) at final study assessment (24–52 weeks after giving birth)

Parental stress (PSI) at final study assessment (52 weeks after giving birth)

Parent/caregiver knowledge, practices and behaviours

No pooled results available

Parent/caregiver views of the intervention

Maternal dissatisfaction with care provided (measuring tool(s) not reported) 0–8 weeks after giving birth

Maternal dissatisfaction with care provided (measuring tool(s) not reported at final study assessment (8–24 weeks after giving birth)

Family relationships

Marital discord (1 item question, VAS development by researcher) at final study assessment (24–52 weeks after birth)

Perceived social support (Duke FSSQ, maternal health service contact) at final study assessment (12–24 weeks after birth)

Perceived social support (maternal views, SRS, Duke FSSQ, SSQ6, subscale of Satisfaction with Motherhood Scale) at final study assessment (24–52 weeks after birth)

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from very low to high

Main reasons for downgrading the quality of evidence: imprecision (studies with small samples sizes; wide CIs), inconsistency (very substantial heterogeneity)

Benefits reported

Maternal depression and anxiety (indicator of secondary outcome; critical)

High-quality evidence from one systematic review shows that psychological and psychosocial interventions can prevent postnatal depression at 12–24 weeks postpartum (five RCTs: N=939) and anxiety at 24–52 weeks postpartum (four RCTs: N=815). Moderate-quality evidence indicates these interventions can reduce depressive symptoms at 3–52 weeks postpartum (20 RCTs: 14 727). However, moderate-quality evidence also shows no clear effect on depression scores at 6–52 weeks postpartum (19 RCTs: 12 376).

Reported outcomes for which the intervention had no clear impact

'No clear impact' means pooled numerical results showed a non-statistically significant difference between effects of the intervention and comparator(s) for the specified outcome.

Maternal–infant attachment (indicator of secondary outcome; critical)

Moderate quality evidence from one systematic review shows that psychological and psychosocial interventions do not have a clear effect on maternal-infant attachment (measured using the Dysfunction Interaction Scale of the PSI) at 24–52 weeks postpartum (two RCTs, N=268).

Marital discord / Satisfaction in relationship with partner (indicator of secondary outcome; critical)

Moderate quality evidence from one systematic review indicates that psychological and psychosocial interventions do not have a clear effect on reducing marital discord (measured using one question, or a VAS developed by a researcher) at 24–52 weeks postpartum (three RCTs, N=291).

Parental stress (indicator of secondary outcome; important)

Moderate quality evidence from one systematic review indicates that psychological and psychosocial interventions do not have a clear effect on reducing stress (measured using the PSI) at 52 weeks postpartum (three RCTs, N=465).

Maternal dissatisfaction with the care they received (indicator of secondary outcome; important)

Very low quality evidence from one systematic review indicates that psychological and psychosocial interventions have no clear effect on reducing maternal dissatisfaction with care provided (tool(s) for measurement NR) at 0–8 weeks postpartum (two RCTs, N=825), but may decrease dissatisfaction at 8–24 weeks postpartum (four RCTs, N=3,014).

Perceived social support (indicator of secondary outcome; important)

Moderate quality evidence from one systematic review indicates that psychological and psychosocial interventions do not have a clear effect on perceived social support at 12–24 weeks postpartum (two RCTs, N=718; measured using the Duke FSSQ and maternal health service contact) and at 24–52 weeks postpartum (seven RCTs, N=8,290; measured using maternal views, the SRS, Duke FSSQ, SSQ6, and a subscale of Satisfaction with Motherhood Scale).

See *Table 9: Interventions for preventing postnatal depression evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Low

Balance of benefits versus harms and burdens

Benefits may outweigh harms, but there is an absence of evidence regarding infant/child outcomes.

Notes:

- No evidence of direct benefits or harms to infants was available.
- No harms were reported in the body of evidence.

Values and preferences

It is uncertain whether people place a similar value on the outcomes assessed as critical or important.

Resource implications

The balance between costs and direct benefits for infant/child social and emotional development and wellbeing is unknown.

Notes:

- Psychological preventive interventions are resource-intensive. They generally require trained, supervised health professionals providing structured, appropriately designed programs. Some programs involve peer support, but these still require training and supervision for people delivering the intervention.
- For the purposes of promoting infant social and emotional development and wellbeing, overinvestment in this intervention, rather than interventions that directly target the infant, may result in misallocation of resources.

Equity

Implementation of interventions to prevent postnatal depression would probably reduce health/social inequities.

Note:

Intervention is likely to improve health equity because marginalised and disadvantaged groups are at increased risk of perinatal mental disorders such as depression and anxiety.[79] Effective prevention is likely to have particular benefit for these parents/caregivers and, potentially, their children.

Acceptability

Interventions to prevent postnatal depression are probably acceptable to key stakeholders.

Note:

Acceptability is likely, but is not certain because the attitudes and preferences of all subgroups of mothers are not known.

Feasibility

Interventions to prevent postnatal depression are feasible to implement.

Implementation considerations

Interventions targeting 'at-risk' mothers may be more beneficial and feasible than those including a general maternal population

Generalisability to the Australian context

The Working Committee considered that the evidence from these populations would be relevant to Australia, because the majority of studies were conducted in high-income or middle-income countries where health systems and sociocultural context or circumstances are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

Research implications and opportunities

As a crucial research priority, infant health and wellbeing outcomes should be included in research studies evaluating interventions to prevent maternal anxiety and depression. More complex studies are needed to examine the effect on infant social and emotional development when interventions to prevent maternal anxiety and depression are supplemented by:

- interventions to enhance quality of parenting
- strategies to ensure that social support and appropriate clinical management are continued postnatally in response to any indication of anxiety and depression.

An economic evaluation now underway, which is being conducted as part of an ongoing Australian cluster-randomised controlled trial of a psychoeducational intervention for the primary prevention of postnatal mental health problems in first-time mothers[80] will provide relevant cost–benefit data.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Interventions for preventing postnatal depression, starting before birth or in the first year of life, might enhance maternal mental health (lessen depression* and anxiety*). It is reasonable to expect effective prevention of postnatal depression to be beneficial. However, in this review, there was insufficient evidence for interventions focusing on preventing postnatal depression as a primary intervention for optimising infant social and emotional development and wellbeing.

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- In the Working Committee's experience, it is reasonable to expect that effective prevention of postnatal depression is necessary, but not sufficient, for achieving optimal infant social and emotional development and wellbeing, given the well-documented association between untreated maternal depression/anxiety and adverse infant development outcomes.[81]

- Based on the body of evidence, preventive interventions are effective in resolving depressive symptoms and improving the quality of parenting behaviour. No results were available to determine whether interventions for preventing postnatal depression can improve the social and emotional development of the child.
- The evidence evaluation did suggest that psychological and psychosocial interventions for preventing postnatal depression can prevent the mother's depression and anxiety after birth. While effects on maternal-infant attachment and marital discord were unclear, these interventions may have a positive impact on other health and psychosocial outcomes for the mother that were out of scope for this evidence evaluation, which only considered outcomes relevant to infant social and emotional development and wellbeing.
- Perinatal mental disorders are highly prevalent worldwide including in Australia, and depression is the most common and best recognised of these. These disorders cause suffering and economic and social problems for women and their families and communities.[2]
- It is highly important to prevent or treat depression and other perinatal mental disorders in mothers because of the well-documented consequences for the development of the child.[81] Effective preventive interventions would enable mothers to maintain full mental health, as a foundation for optimal social and emotional development of the infant.
- However, managing depression in mothers is not sufficient to ensure optimal mental health outcomes for the infant. Interventions to enhance quality of parenting and ensure continued long-term social support are also required, in addition to or as part of the intervention.

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*Effects were reported for multiple follow-up intervals for these outcomes. Improvements were seen for some, but not all follow-up periods.

Interventions for promoting effective parenting

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence included individual and group education and support programs, home visiting and parent-infant attachment and relationship interventions, focused on facilitating or strengthening the mothering processes or behaviours such as infant caregiving, awareness of and responsiveness to infant interactive capabilities, maternal–infant attachment, maternal/social role preparation and therapeutic nurse–client relationships. The interventions were assessed in the general population of pregnant women or mothers with infants.[82,83]

Evidence sources: systematic reviews

Two relevant systematic reviews were assessed:

- **Gardner (2006)**[82] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Gardner 2006* in the Technical Report)
- **Mercer (2006)**[83] (high risk of bias, low quality) – no pooled numerical results (see *Evidence table for Mercer 2006* in the Technical Report).

Outcomes reported in the systematic reviews

No pooled results were available for any outcomes in any pre-specified outcome domain.

Full report on this intervention

See Evidence Evaluation Report

Working Committee's conclusions

Summary

There is insufficient evidence available from systematic reviews with pooled results to ascertain whether interventions to promote effective parenting, starting before birth or in the first year of life, have any effect on infant social and emotional development and wellbeing.

Note:

See Decision tool for developing evidence-based conclusion statements.

Research implications and opportunities

Well-designed studies are needed that include clearly defined outcome measures for infant social and emotional development and wellbeing, with adequate follow-up, e.g. into early childhood (up to 3 years) or up to when the child starts school (approximately 5 years).

See Overall Research Implications.

Interventions for teenage parents

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence included individual or group-based parenting programs focused on improving parenting attitudes, practices, skills/knowledge or wellbeing. Interventions ranged from 15-minutes video sessions to 1-hour visits. The duration of the programs ranged from one interaction to a number of visits over a year. Programs where the parenting program was combined with a home visiting intervention were excluded.[84]

Notes:

- Barlow (2011)[84] included programs that were delivered to mothers aged 20 or under from clinical or population samples and their infants, in community settings (four RCTs), participants' homes (two RCTs), in both the community and outpatient setting (one RCT) or an unspecified place (one RCT).
- The interventions commenced during pregnancy or after birth.
- The duration of interventions ranged from one session to 10–12 weeks. Evaluations were reported for group-based parenting programs over 4–12 weeks (four RCTs), briefer interventions (mostly observation of video tape interactions) over one to two sessions (three RCTs), and brief interventions over 6–7 weeks (one RCT).

Evidence sources: systematic reviews

Two relevant systematic reviews were assessed:

- **Barlow (2011)**[84] (low risk of bias, high quality) – contributed pooled numerical results (see *Evidence table for Barlow 2011* in the Technical Report)
- **Coren (2003)**[85] (low risk of bias, moderate quality) – no pooled numerical results (see Evidence table for Coren 2003 in the Technical Report).

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: eight

Study design: RCT

Total number of participants: 513

Sample sizes (range): 20–164

Publication period: 1977–2002

Place: Canada (two RCTs), USA (six RCTs)

Study populations: mothers and pregnant women under the age of 20 (mean age 17 years), and their infants. Age of infants/very young children unclear in two studies.

Intensity of intervention: group-based parenting programs over 4–12 weeks (four RCTs), brief interventions (four RCTs). Number of brief interventions varied from one or two sessions watching video (three RCTs) to 6–7 weeks (one RCT).

see *Evidence table for Barlow 2011* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

No pooled results available

Behaviour for the infant, as a child, and up to 18 years

No pooled results available

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Parent interaction with child (NCATS parent subscale) up to 6 weeks post-intervention and at 3-month follow-up

Child interaction with parent (NCATS baby subscale) at 3-month follow-up

Combined parent-child interaction (NCAST); also known as the NCAST Parent-Child Interaction Feeding Scale" data-html="true">NCAFS total score) up to 6 weeks post-intervention and at 3-month follow-up

Parent/caregiver psychosocial wellbeing

No pooled results available

Parent/caregiver knowledge, practices and behaviours

Sense of competence in parenting role (AAPI, appropriate developmental expectation of children) at 4-7 weeks post-intervention

Sense of competence in parenting role (AAPI, empathic awareness) at 4-7 weeks post-intervention

Sense of competence in parenting role (AAPI, nonbelief in corporal punishment) at 4-7 weeks post-intervention

Sense of competence in parenting role (AAPI, lack of parent child role reversal) at 4-7 weeks post-intervention

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from very low to low

Main reasons for downgrading the quality of evidence: risk of bias (studies with methodological limitations), inconsistency (very substantial heterogeneity), imprecision (studies with small sample sizes)

Benefits reported

Parent-child interactions (indicator of secondary outcome; important but not critical)

Low quality evidence from one systematic review shows that teenage parenting interventions can improve combined parent-child interactions post-intervention and at 3-month follow-up, children's interactions with parents at 3-month follow-up, and parents' interactions with children post-intervention. Very low-quality evidence shows no clear effect on parents' interactions with children at 3-month follow-up (all measured using the NCATS total score, parent or baby subscale; two RCTs, N=47).

Reported outcomes for which the intervention had no clear impact

'No clear impact' means pooled numerical results showed a non-statistically significant difference between effects of the intervention and comparator(s) for the specified outcome.

Sense of competence in parenting role (indicator of secondary outcome; critical)

Low- to very low-quality evidence from one systematic review indicates no clear impact of teenage parenting interventions on sense of parenting competence (measured using the AAPI) at 4–7 weeks post-intervention (two RCTs, N=70).

See *Table 21. Intervention for teenage parents evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Very low

Balance of benefits versus harms and burdens

The balance of harms and benefits is uncertain due to uncertainty about both the benefits and the harms.

Notes:

- No harms were reported in the body of evidence. Based on Working Committee members' experience and theoretical considerations, potential harms and burdens include stigmatisation, parents' perceptions of being judged or scrutinised, misunderstandings arising from a false assumption that all teenage parents have low socioeconomic status and poor parenting skills.
- The balance of benefits and harms may depend on targeting the intervention to at-risk groups.
- It should not be presumed that teenage parents are incompetent. These parents are able to thrive with standard care and adequate support (outside of the parenting role), particularly if they have family support and interventions are consensual.
- It is not possible to determine the balance of benefits and harms, given that harms are not reported and the evidence for benefits is unclear.

Values and preferences

People are probably similar in the value they place on the critical and important outcomes.

Notes:

- Cultural values and preferences should be considered.
- In Australia, rates of teenage pregnancy are higher than average in remote regions and among mothers who identify themselves as Aboriginal and/or Torres Strait Islander.[86] Program design should take into account the outcomes for parents and children that specific target populations consider to be critical.

Resource implications

Costs and benefits are uncertain.

Notes:

- There is uncertainty about the benefits for the mother, infant, and community.
- These interventions require delivery by highly skilled professionals.
- The benefits are probably worth the cost, but the balance is uncertain.

Equity

Implementation of interventions for teenage parents would probably reduce health inequities.

Notes:

- Rates of teenage pregnancy are higher in those living in socioeconomically disadvantaged areas relative to those living in areas of less disadvantage.[86] Teenage pregnancy also affects socioeconomic outcomes for parents, so any effective intervention to improve infant social and emotional development would probably reduce inequality.
- Some young parents would be unable to access services without support.

Acceptability

Interventions for teenage parents are probably acceptable to key stakeholders.

Notes:

- In Working Committee members' experience, teenage parents have different attitudes to group-based interventions than older parents, and interventions can be more effective when the group is comprised of only teenage parents
- Rates of teenage pregnancy are higher than average in remote regions and among Indigenous Australians.[86] Cultural values and preferences need to be considered when delivering interventions to these women and girls.

Feasibility

The feasibility of implementing interventions for teenage parents is uncertain.

Notes:

- There are already similar programs in several Australian jurisdictions.
- The feasibility depends on the intensity and duration, which differed in the included studies.

Implementation considerations

Programs to promote optimal social and emotional development and wellbeing for infants of teenage parents should be designed and delivered with consideration of the target outcomes, the specific needs of teenage parents, and local social and cultural factors to ensure relevance and equitable access.

Generalisability to the Australian context

The Working Committee considered that the evidence from these populations would be relevant to Australia, because the majority of studies were conducted in high- or middle-income countries where health systems and sociocultural context or circumstances are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

Research implications and opportunities

Australian cohort studies are needed, particularly those including Aboriginal and Torres Strait Islander women.

The Working Committee is aware of effective programs in various states and territories, which have not been included in the body of evidence (possibly because they have not been evaluated in a formal study that met inclusion criteria for the overview). The outcomes of existing programs designed for teenage parents, including outcomes related to parenting skills of the teenagers as well as social and emotional outcomes for the infant, should be evaluated.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Interventions for teenage parents, starting before birth or in the first year of life, might help to enhance parent–child interactions.*

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- This limited evidence should be considered when designing interventions or programs for parents where recipients may include teenage parents.
- There was some evidence that individual or group-based parenting programs delivered to teenage parents over 4–12 weeks in the community or home can improve combined parent-child interactions. However, these interventions did not have a clear impact on parents' sense of competence in their parenting role. The Working Committee considered this outcome to be critical for teenage parents because it has a substantial impact on infant outcomes. In Working Committee members' experience, teenage parents may have inappropriate developmental expectations of their children's developmental stage and abilities. However, the Working Committee acknowledged that competence-related outcomes are difficult to measure.

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*Effects were reported for multiple follow-up intervals for this outcome. Improvements were seen for some, but not all follow-up periods.

Interventions for treating maternal depression in the perinatal period

Summary of evidence evaluation findings

Description of intervention

Interventions evaluated in the available evidence were non-pharmaceutical approaches for treating severe maternal depression, including psychotherapeutic interventions aimed at reducing the severity of depressive symptoms (e.g. cognitive behaviour and interpersonal therapies/approaches, psychodynamic and non-directive supportive therapies), and (in fewer studies) psychoeducational and extended-care interventions.[87]Interventions were mainly delivered in the postnatal period.

Notes:

- Interventions based on psychotherapeutic models aimed at reducing severity of depressive symptoms (15 trials) included cognitive-behavioural therapy (eight trials), interpersonal therapies/approaches (four trials), psychodynamic therapy (two trials), and non-directive supportive therapies (three trials).
- Other interventions were based on a psychoeducational model (one trial) and extended care (one trial).
- Of included trials, 15 of 17 were aimed predominately/solely at depressed parents (only two delivered an active/structured intervention to the infant).
- Interventions were mainly delivered individually and face- to-face by a broad range of healthcare and social work professionals, in the home (five trials), in the community/clinic (nine trials), mixed setting (one trial) or an unclear setting (two trials).
- Interventions ranged in session number and length; total intervention contact (where reported) was 4–24 hours. Total duration of interventions (where reported) ranged from 5–8 weeks to 11 months.

Evidence sources: systematic reviews

Two relevant systematic reviews were assessed:

- **Bee (2014)**[87] (low risk of bias, high quality) – contributed pooled numerical results (see *Evidence table for Bee 2014* in the Technical Report
- **Poobalan (2007)**[88] (unclear risk of bias, moderate quality) – no pooled numerical results (see *Evidence table for Poobalan 2007* in the Technical Report.

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: 17

Study design: RCT (12), cRCT (one), qRCT (four)

Total number of participants: 2293

Sample sizes (range): 20–903

Publication period: 1989–2011

Place: Australia (three), Canada (two), Chile (one), France (one), Pakistan (one), Sweden (one), UK (three) and USA (five)

Study populations: Mothers with depression: mothers of children under 1 year (15 trials) or mothers with major depressive disorder diagnosed in the antenatal period (2 trials); > 50% of mothers with confirmed clinical diagnosis of major depressive disorder according to American Psychiatric Association

Diagnostic and statistical manual of mental disorders third or fourth editions (DSM-III, DSM-IV)[89,90] (15 trials) or unreported proportion of mothers with confirmed clinical diagnosis (2 trials).

Intensity of intervention: total intervention contact 4–24 hours (where reported); total duration of interventions ranged from 5–8 weeks to 11 months (where reported)

see *Evidence table for Bee 2014* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

Children's emotional well-being (observer ratings of infant affect, PCERA) at 0–6 months post randomisation

Children's behaviour and social function (observer ratings of infant behaviour, PCERA) at 0–6 months post randomisation

Development for the infant, as a child, and up to 18 years

No pooled results available

Behaviour for the infant, as a child, and up to 18 years

No pooled results available

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

Parent-child interactions: parenting behaviours (PCERA, MAI) at 0–6 months post randomisation

Parent/caregiver psychosocial wellbeing

Parental mental health (parents' depressive symptom outcomes: BDI, EPDS, HDRS) at 0–6 months post randomisation

Parental mental health (parents' depressive symptom outcomes: EPDS, HDRS) at 6–12 months post randomisation

Parental mental health (parents' depressive symptom outcomes: BDI, EDPS) at greater than 12 months post randomisation

Parent/caregiver knowledge, practices and behaviours

No pooled results available

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from very low to low

Main reasons for downgrading the quality of evidence: risk of bias (studies with methodological limitations), imprecision (studies with small sample sizes, wide CIs), inconsistency (substantial heterogeneity)

Benefits reported

Quality of parenting behaviours (indicator of secondary outcome; critical)

Very low-quality evidence from one systematic review shows an improvement in the quality of parenting behaviours (measured using the PCERA and Maternal Attachment Inventory up to 6 months post randomisation) when maternal depression in the perinatal period is treated (three RCTs, two qRCTs: N=359).

Parental mental health (indicator of secondary outcome; critical)

Low- to very low-quality evidence from one systematic review shows an improvement in parental mental health (parents' depressive symptoms measured using the BDI, EPDSor HRSD at up to 6 months post randomisation) when maternal depression in the perinatal period is treated (11 RCTs, three qRCTs: N=1698), but no clear effect at 6–12 months post randomisation (two RCTs: N=975) or at more than 12 months post randomisation (one RCT, one qRCT: N=273).

Reported outcomes for which the intervention had no clear impact

'No clear impact' means pooled numerical results showed a non-statistically significant difference between effects of the intervention and comparator(s) for the specified outcome.

Infant emotional wellbeing (indicator of primary outcome; critical)

Low-quality evidence from one systematic review indicates no clear effect on children's emotional wellbeing (measured using observer ratings of infant affect: PCERA) up to 6 months when maternal depression in the perinatal period is treated (one RCT, two qRCTs, N=152).

Behaviour and social function (indicator of primary outcome; critical)

Low-quality evidence from one systematic review indicates no clear effect on children's behaviour or social function (measured using observer rating of infant behaviour: PCERA) up to 6 months when maternal depression in the perinatal period is treated (one RCT, two qRCTs, N=151).

See *Table 10. Interventions for treating maternal depression in the perinatal period evidence profile* in the Evidence Evaluation Report

Full report on this intervention

Link to Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Low

Balance of benefits versus harms and burdens

Benefits slightly outweigh harms/burdens

Notes:

- The Working Committee noted there was no clear effect on the primary outcomes (children's emotional wellbeing assessed at 0–6 months post randomisation).

- In Working Committee members' experience, there has been a general belief that treatment of maternal depression will automatically improve infants' and children's outcomes. This body of evidence suggests that treatment of the mother's mental health problem alone is not enough; there is also a need to focus on improving the mother's caregiving capability. It cannot be assumed that symptomatic improvement in a mother will benefit her baby.
- No harms were reported in the body of evidence. Based on Working Committee members' experience and theoretical considerations, potential harms and burdens include unintended effects on attachment security (e.g. by pharmacological treatment that blunts affect or requires cessation of breastfeeding, or a treatment program that required travel or inpatient care). The Working Committee noted that no pharmacological treatments were assessed in the body of evidence, possibly because most clinical trials do not measure and report the type of infant outcomes on which this evaluation focused.
- The interventions focused on children of parents with a serious mental illness, a factor associated with significant risk to infants. Any intervention for these significantly disadvantaged mothers would be expected to benefit their infants, compared with no intervention.
- The study population may not be representative of all women with perinatal depression.
- Overall, the benefits slightly outweigh the harms, given the limitations of the evidence and the potential harm if the mother is not treated for depression.

Values and preferences

People are similar in the value they place on the critical and important outcomes.

Note:

Values are likely to be similar between recipients, policy makers and other expert groups.

Resource implications

There is uncertainty about the costs.

Notes:

- There is uncertainty about the costs of interventions because no information was provided in the systematic reviews.
- Lack of evidence on costs makes it impossible to judge whether the expected benefits outweigh the costs. The interventions evaluated are likely to be costly, because they were delivered face-to-face by a broad range of professionals and ranged in duration from 5 weeks to 11 months.
- The Working Committee noted that most treatment for depression is delivered face-to-face over a medium duration, and therefore incurs substantial costs.
- There is potential opportunity cost if resources are allocated to treatment incorrectly assumed to benefit infants.

Equity

Implementation of interventions for the treatment of maternal depression in the perinatal period would probably not reduce health inequities.

Notes:

- Wide variation between the types of interventions makes it difficult to predict effects on equity.
- Interventions delivered in the parents' home would be relatively easy to deliver to disadvantaged women but not to those in remote regions, while those delivered in clinics may not be accessible to those of low socioeconomic status and those living in rural and remote regions.
- In Working Committee members' experience, there is low uptake for these kinds of interventions among groups with low socioeconomic status and culturally and linguistically diverse groups.
- Given the generally low-quality evidence for benefits, it is unlikely to reduce inequity even if implemented.

Acceptability

Acceptability to key stakeholders of interventions for the treatment of maternal depression in the perinatal period would vary.

Note:

Some women do not want to undertake intensive face-to-face psychotherapy.

Feasibility

The feasibility of implementing interventions for the treatment of maternal depression in the perinatal period would vary between regions.

Notes:

- Making such interventions available for all groups of women with perinatal depression would be resource-intensive and would require a highly skilled and trained workforce.
- Availability of psychologists to provide interventions differs between metropolitan and rural/remote regions.
- Working Committee members noted that some perinatal initiatives have been difficult to implement and have resulted in partial, inconsistent uptake. Sustainability and feasibility are linked; such interventions require a lot of resources to ensure equal access to all Australian women.

Implementation considerations

Families and children affected by mental illness require greater support, including interventions directed at the child. Needs will differ between families and may be complex, so implementation may require a multidisciplinary approach (e.g. including health, education and social care services).[87]

Generalisability to the Australian context

The Working Committee considered that the evidence from these populations would be relevant to Australia, because the majority of studies were conducted in high-income or middle-income countries where health systems and sociocultural context or circumstances are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

However, the populations may not be generalisable to the main clinical population of women with perinatal depression because some of the trials targeted parents with a serious mental illness (i.e. schizophrenia, psychosis, borderline personality disorder and personality disorder).

Research implications and opportunities

High-quality trials are needed to determine the effects of treatment for maternal perinatal depression on infant social and emotional development. Such studies should be based on well-theorised models that are expected to improve child outcomes, and include outcome measures specifically for infant social and emotional development as well as measuring costs.

More complex studies are also needed to examine the effect on infant social and emotional development when interventions to treat maternal depression in the perinatal period are supplemented by (a) interventions to enhance quality of parenting and ensure social support, and (b) ongoing interventions to treat the mother's depression.

Longitudinal data from trials already completed should be analysed.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Interventions for treating maternal depression in the perinatal period might enhance maternal mental health (lessen depression* and anxiety*) and quality of parenting behaviours. It is reasonable to expect effective treatment of perinatal depression to be beneficial. However, in this review, there was insufficient evidence for interventions focusing on treating maternal depression as a primary intervention for optimising infant social and emotional development and wellbeing.

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- In the Working Committee's experience, it is reasonable to expect that effective treatment of a mother's perinatal depression is necessary, but not sufficient, to achieving optimal infant social and emotional development and wellbeing, given the well-documented association between untreated maternal depression/anxiety and adverse infant development outcomes.[2]
- These interventions may have achieved benefits for other maternal health and psychosocial outcomes out of scope for this evidence evaluation, which only considered outcomes relevant to infant social and emotional development and wellbeing.
- Perinatal mental disorders are highly prevalent worldwide including in Australia, and depression is the most common and best recognised of these.[2]
- It is highly important to manage depression and other perinatal mental disorders in mothers because of the well-documented consequences for the development of the child.[2] Effective preventive interventions would enable mothers to maintain full mental health, as a foundation for optimal social and emotional development of the infant.
- However, managing depression in mothers is not sufficient to ensure optimal mental health outcomes for the infant. Interventions to enhance quality of parenting and ensure continued long-term social support are also required, in addition to or as part of the intervention.[2]

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*Effects were reported for multiple follow-up intervals for these outcomes. Improvements were seen for some, but not all follow-up periods.

Kangaroo care

Summary of evidence evaluation findings

Description of intervention

'Kangaroo care' interventions promote skin-to-skin contact (usually between a mother and her newborn), frequent breastfeeding and sometimes, where possible, earlier discharge from hospital.[91] Kangaroo care is practised while the mother is awake and does not involve co-sleeping.

Kangaroo care interventions evaluated in the body of evidence involved low-birthweight (less than 2500 grams) infants (often born preterm), being carried or held in close body contact by the mother after birth, and the encouragement of breastfeeding.[91]

The interventions were delivered mostly to mothers cared for by doctors and nurses, in the neonatal intensive care units of hospitals or specific 'kangaroo wards' in hospitals.[91]The studies were conducted in low-, middle- and high-income countries.

Evidence sources: systematic reviews

Two relevant systematic reviews were assessed:

- **Conde-Agudelo (2014)**[91] (low risk of bias, high quality) – contributed pooled numerical results (see *Evidence table for Conde-Agudelo 2014* in the Technical Report
- **Dodd (2005)**[92] (high risk of bias, low quality) – no pooled numerical results (see Evidence table for Dodd 2005 in the Technical Report.

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: 18

Study design: RCT

Total number of participants: 2751

Sample sizes (range): 28–777

Publication period: 1989–2012

Place: Australia (one RCT), India (six RCTs), USA (three RCTs), Colombia (one RCT), Ecuador (one RCT), Ethiopia (one RCT), Indonesia (one RCT), Madagascar (one RCT), Malaysia (one RCT), UK (one RCT), and in multiple countries (Ethiopia, Indonesia and Mexico; one RCT)

Study populations: low-birthweight infants after stabilisation (16 RCTs), low-birthweight infants before stabilisation (one RCT), relatively stable low-birthweight infants (one RCT)

Intensity of intervention: mean/median duration of kangaroo care per day < 2 hours (six RCTs), 4–7 hours (two RCTs), 8–14 hours (five RCTs), ≥ 20 hours (three RCTs), continuous (two RCTs)

see *Evidence table for Conde-Agudelo 2014* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

Weight gain (g/day) for stabilised infants ‘at latest follow-up’ (at discharge, 40 weeks postmenstrual age up to age 6 months, or 6-month follow-up)

Length gain (cm/week) for stabilised infants ‘at latest follow-up’ (40 weeks’ postmenstrual age to age 3 months)

Head circumference gain (cm/week) for stabilised infants ‘at latest follow-up’ (at discharge or 40 weeks’ postmenstrual age to age 3 months)

Behaviour for the infant, as a child, and up to 18 years

No pooled results available

Physical wellbeing and safety for the infant, as a child, and up to 18 years

Mortality at discharge or 40–41 weeks’ postmenstrual age

Mortality at age 6 months or 6 months’ follow-up

Mortality ‘at latest follow-up’ (at discharge or 40–41 weeks’ postmenstrual age up to 12 months’ corrected age)

Severe infection/sepsis in stabilised infants ‘at latest follow-up’ (discharge or 40–41 weeks’ postmenstrual age to 6 months’ corrected age)

Nosocomial infection/sepsis in stabilised infants at discharge or 40–41 weeks’ postmenstrual age

Mild/moderate infection or illness in stabilised infants ‘at latest follow-up’ (40–41 weeks’ postmenstrual age to age 6 months)

Parent-infant relationship

No pooled results available

Parent/caregiver psychosocial wellbeing

No pooled results available

Parent/caregiver knowledge, practices and behaviours

Any breastfeeding (stabilised infants) at discharge or 40–41 weeks’ postmenstrual age

Any breastfeeding (stabilised infants) at 1–2 months’ follow-up

Any breastfeeding (stabilised infants) at 3 months’ follow-up

Any breastfeeding (stabilised infants) at 6 months’ follow-up

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from low to high

Main reasons for downgrading the quality of evidence: inconsistency (substantial heterogeneity), publication bias (funnel plot asymmetry), and imprecision (wide confidence intervals)

Benefits reported

Weight gain (indicator of secondary outcome; important)

Low-quality evidence from one systematic review shows that weight gain at latest follow-up (at discharge or 40 weeks' postmenstrual age up to age 6 months or 6 months' follow-up) is increased with kangaroo care (10 RCTs: N=1072).

Length (indicator of secondary outcome; important)

High-quality evidence from one systematic review shows that length gain at latest follow-up (40 weeks' postmenstrual age to age 3 months) is increased with kangaroo care (two RCTs: N=251).

Head circumference (indicator of secondary outcome; important)

Moderate-quality evidence from one systematic review shows that head circumference gain at latest follow-up (at discharge or 40 weeks' postmenstrual age to age 3 months) is increased with kangaroo care (three RCTs: N=369).

Mortality (indicator of secondary outcome; critical)

Moderate-quality evidence from one systematic review shows that infant mortality is reduced at discharge or 40–41 weeks' postmenstrual age (eight RCTs: N=1736) and at latest follow-up (discharge or 40–41 weeks' postmenstrual age up to 12 months' corrected age) (11 RCTs: N=2167) with kangaroo care. However, the effect of kangaroo care at age 6 months or 6 months' follow-up is unclear (two RCTs: N=354).

Infection (indicator of secondary outcome; critical)

High-quality evidence from one systematic review shows that severe infection/sepsis at latest follow-up (discharge or 40–41 weeks' postmenstrual age to 6 months' corrected age; seven RCTs: N=1343) and nosocomial infection/sepsis at discharge or 40–41 weeks' postmenstrual age (three RCTs: N=913) are reduced with kangaroo care. Low-quality evidence from the same systematic review indicates no clear effect of kangaroo care on mild/moderate infection or illness at latest follow-up (40–41 weeks' postmenstrual age to age 6 months) (four RCTs: N=1266).

Breastfeeding (indicator of secondary outcome; important)

Low-quality evidence from one systematic review shows that breastfeeding at discharge or 40–41 weeks' postmenstrual age is increased with kangaroo care for low-birthweight infants (nine RCTs, N=1576), and moderate-quality evidence shows a probable increase at one to 2 months' follow-up (six RCTs, N=538) and at 3 months' follow-up (five RCTs, N=924), though high quality evidence shows that the effect at 6 months' follow-up is unclear (six RCTs, N=952).

See *Table 7. Kangaroo care interventions evidence profile* in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

High

Balance of benefits versus harms and burdens

The benefits of kangaroo care clearly outweigh harms/burdens.

Notes:

- Based on Working Committee experience, benefits in addition to those reported in the overview may include improved social and emotional wellbeing and development.
- No harms were reported in the body of evidence. Based on Working Committee members' experience and theoretical considerations, potential harms and burdens include risks associated with removing a premature baby from an incubator. However, these risks are minimal in well-equipped Australian neonatal centres under expert supervision.

Values and preferences

People are similar in the value they place on the critical and important outcomes.

Note:

Growth and physical safety are established goals for preterm and low-birthweight newborn infants.

Resource implications

The net benefits of kangaroo care are worth the costs.

Notes:

- Kangaroo care requires minimal resources (nurses trained to supervise and manage safely).
- Kangaroo care may actually spare resources because parents (rather than hospital staff) care for babies for up to several hours per day.

Equity

Implementation of kangaroo care would probably reduce health/social inequities.

Note:

Preterm and low birthweight are more prevalent among disadvantaged populations,[86]so any benefits might favour these groups if high uptake was achieved.

Acceptability

Kangaroo care is acceptable to key stakeholders.

Note:

Kangaroo care is currently well accepted and strongly promoted.

Feasibility

Kangaroo care is feasible to implement.

Note:

Kangaroo care is already widely practised in Australia.

Implementation considerations

No special considerations; kangaroo care could readily be implemented.

Generalisability to the Australian context

The Working Committee considered that the evidence from these populations would be relevant to Australia, because a sufficient number of the studies were conducted in high-income or middle-income countries where health systems and sociocultural context or circumstances are generally comparable. Additionally, the intervention itself is easy to implement and not dependent on these specific health

settings. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

Research implications and opportunities

More information about social and emotional effects of kangaroo care is needed before it can be recommended specifically to promote social and emotional development and other domains of child development.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

Kangaroo care in the first year of life, performed by parents/caregivers and supervised by trained health professionals, as appropriate to the infant's clinical needs, can reduce the risk of mortality* and infection/sepsis.*

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- Improvements were also seen for outcomes rated by the Working Committee as important but not critical for making decisions: Infant growth and breastfeeding* can improve with kangaroo care.
- There is an absence of evidence in the evaluation for direct measures of social and emotional developmental benefits. Relative to other outcomes, it was the Working Committee's expert opinion that mortality and infection/sepsis were the best indicators of infant social and emotional wellbeing and development.
- A strong statement is justified, despite small effect sizes, because the intervention is well accepted and easy to implement.

*Effects were reported for multiple follow-up intervals for these outcomes. Improvements were seen for some, but not all follow-up periods.

What

Either parent carries or holds the baby in close body contact for minutes to hours each day.

Note:

The term 'kangaroo care' generally applies to interventions for preterm/low birthweight infants. In comparison, 'skin-to-skin care' interventions apply to full-term or late preterm infants.

Why

Overall goal: to promote infant growth and development

Objectives based on the body of evidence: to optimise gains in weight, length and head circumference, to promote breastfeeding, to reduce infection risk, and to reduce the risk of death during first year

Other objectives: to promote social and emotional wellbeing and development

Who

Performed by parents/caregivers, supervised by trained health professionals as appropriate to the infant's clinical needs

Notes:

- In most of the studies included in the overview, participating mothers and their babies were cared for by both doctors and nurses. In two studies, mothers in the kangaroo care group were supervised by nurses.[91]
- In Australia, this intervention could be facilitated by a range of disciplines and workforces, including maternal and child health nurses, Aboriginal Health Workers, other community workers, practice nurses, or lay educators.

For whom

Premature or low-birthweight babies

When

When sufficiently clinically stabilised, up to discharge from hospital

Where

Neonatal facilities

Neonatal Behavioural Assessment Scale (NBAS)-based interventions

Summary of evidence evaluation findings

Description of intervention

The NBAS is a neuro-behavioural assessment designed to measure a newborn's interactive capabilities, and which can be used as an intervention tool to facilitate parent–infant interactions. During administration of the NBAS, parents become aware of the infant's developmental and interactive capabilities, with the aim of improving parental responsiveness and parent-infant interactions.[93] NBAS-based interventions evaluated in the body of evidence included training parents to administer the NBAS to their infant or parents observing an examiner administer the NBAS.[93]

Notes:

- Interventions were delivered to parents and their infants.
- The timing, duration and frequency of interventions was not clearly stated (only 4 of 13 studies used repeated intervention episodes) and follow-up ranged from 8–10 days post-intervention to 9 months after birth.

Evidence sources: systematic reviews

One relevant systematic review was assessed:

Das Eiden (1996)[93] (high risk of bias, low quality) – contributed pooled numerical results (see *Evidence table for Das Eiden 1996* in the Technical Report)

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: 13

Study design: RCTs (11), qRCTs (two)

Total number of participants: 688

Sample sizes (range): 20–125

Publication period: 1980–1995

Place: not reported

Study populations: parents and their infants (predominately middle-class mothers and their healthy, term/preterm infants; three studies included preterm/low birthweight infants; two studies specifically included fathers; two included mothers and fathers; nine included mothers only)

Intensity of intervention: duration not reported; one session (seven trials) more than one session (four trials)

see *Evidence table for Das Eiden 1996* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic review

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

No pooled results available

Behaviour for the infant, as a child, and up to 18 years

No pooled results available

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent–infant relationship

Parenting quality (e.g. rated observations of parent-child interactions, self-report measures of parenting, four scales from the Cohler MAS) at follow-up of 8–10 days after the intervention to 9 months after birth)

Parent/caregiver psychosocial wellbeing

No pooled results available

Parent/caregiver knowledge, practices and behaviours

No pooled results available

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): low

Main reasons for downgrading the quality of evidence: risk of bias (assumed; inclusion of qRCTs), indirectness (outcome measures varied widely across studies)

Benefits reported

Parenting quality (indicator of secondary outcome; critical)

Low-quality evidence indicates that parenting quality (measured using outcomes including observations of parent-child interactions, self-report measures of parenting, and four scales from the Cohler MAS) is enhanced with NBAS-based training at 8 days post-intervention to 9 months after birth (11 RCTs, two qRCTs, N=668).

See Table 11. NBAS-based interventions evidence profile in the Evidence Evaluation Report

Full report on this intervention

See Evidence Evaluation Report

GRADE assessment of the evidence

Overall confidence in the estimates

Low

Balance of benefits versus harms and burdens

Benefits probably outweigh harms/burdens considerably, but there is some uncertainty.

Notes:

- Based on Working Committee members' experience (including that of colleagues who have used NBAS), additional benefits may include:

    1. the opportunity to engage at-risk families with the health system/child and family services by interacting with them in a positive, non-judgemental way; NBAS is a tool for health professionals to begin an educational relationship with parents, which can be developed as the parents engage with child services later,
    2. the opportunity to provide new parents with general knowledge about babies, given that many Australian parents have never had, or have had only limited experience caring for babies before they have their own children and have very little understanding of infants' needs; for example, typically parents are aware that infant brain development is important, but see this as a goal-driven one-way interaction of teaching the baby, rather than appreciating the baby's inherent abilities and responding, and
    3. helping parents to learn to delight in their baby and enjoy interacting with their baby in a productive way.

- No harms were reported in the body of evidence. Based on Working Committee members' experience and theoretical considerations, potential harms and burdens include (1) identifying a deficit during the assessment; parents may find this unexpected and distressing, (2) misunderstandings and confusion that may arise when NBAS interventions are delivered by workers who make cultural assumptions that do not apply to certain sociocultural groups (e.g. migrants from cultures where babies are raised differently and different expectations of infant behaviour and parent–child interactions apply), given that the NBAS has inherent assumptions about normal infant development, and (3) harms arising from delivery of the intervention by inexperienced staff; the NBAS must be conducted by an experienced practitioner with an understanding of psychology as well as neonatology.
- The intervention must be delivered by highly skilled and experienced staff. The effects would depend on the provider.
- Most of the evidence was for healthy, full-term babies in middle-class families.
- Despite the fact that the Working Committee generally values this intervention highly, it could not state unequivocally that the benefits outweigh the harms. The overall balance of harms and benefits is uncertain due to the limited evidence for benefits, lack of evidence for harms, and the lack of evidence for specific cultural groups.

Values and preferences

People are probably similar in the value they place on the critical and important outcomes.

Notes:

- Consistency of values and preferences is not assured because parents' values and preferences cannot be accurately ascertained, particularly those of ethno-cultural groups such as Aboriginal and Torres Strait Islander communities.
- Neonatology health professionals would probably place more emphasis on some outcomes than other health professionals or the general community.

Resource implications

There is uncertainty about the costs.

Notes:

- The NBAS was originally designed to be delivered by neonatologists or paediatricians, but has since been delivered by specifically trained allied health professionals.
- It requires specific training and a high degree of skill and experience.
- Costs are uncertain because they depend on who administers the NBAS (e.g. primary care or hospitals).
- Costs would depend on whether the intervention was targeted or universal, and whether used as a screening tool or with the goal of promoting optimal social and emotional development.
- Wherever administered, the intervention would add to the workload of staff.
- Costs would include time for training and administration.

Equity

Implementation of NBAS-based interventions would probably reduce health inequities.

Notes:

- The benefits for cultural minorities are uncertain.
- Engaging with parents very early and appropriately helps reduce inequality. A history of difficulties in the first year of life is recognised as a precursor to significant problems during childhood and adolescence.
- However, if not delivered universally or targeted to at-risk families, there is a risk of widening social inequality because the most advantaged families are more likely to receive the intervention.
- There is a lack of evidence about medium-term and long-term effects.

Acceptability

NBAS-based interventions are probably acceptable to key stakeholders.

Notes:

- Specialists in the field may endorse the intervention more strongly.
- If administered skilfully, it is likely to be well accepted by parents, particularly if framed as a way to help ensure optimal development.
- There is uncertainty about acceptability to culturally and linguistically diverse groups, or to at-risk groups. Before implementing this intervention in Australia, it would be necessary to consult with Aboriginal and Torres Strait Islander peoples.
- Acceptability may depend on adapting the intervention to the target group.

Feasibility

NBAS-based Interventions are probably feasible to implement.

Notes:

- Feasibility is likely but not certain.
- Every Australian jurisdiction has child and family health infrastructure.
- The intervention requires specifically trained, experienced staff (See Resource Implications). It is usually done in hospital as part of a neonatal assessment, and is probably most feasible for infants at risk of poor parent–infant bonding (e.g. premature infant or infant who is medically unwell). It is unlikely to be feasible for all infants discharged early from maternity facilities. It would be best administered by a practitioner with a relationship to the family (e.g. child health staff, GPs). It may need to be adapted to primary care.
- It may not be feasible to add extra workload for staff. It may be less feasible in rural and remote regions. If recommended universally, a broader workforce would need to be trained to deliver this intervention. In a trial in Soweto, South Africa, local senior women in the community were trained to administer NBAS. This indicates it is potentially adaptable to a wider workforce.

- The NBAS should be part of the core training of people working with at-risk families so that there is a high level of competence amongst workforce. This would allow near-universal implementation as a screening tool in this population, to trigger further action if needed (stepped approach).

Implementation considerations

Whilst the review focused on delivering the NBAS during home visits, the intervention could be administered at hospital prior to discharge, or in the primary care setting (e.g. by GPs or Maternal and Child Health nurses).

This intervention could be adapted to accommodate cultural differences, but this would require further evaluation of its effectiveness in different cultures.

More recent neurobehavioral assessments are available that are derived from the NBAS and which target specific population groups, including premature infants. Providers need to select an assessment tool appropriate for the infant's gestational age and age at assessment, taking into account the goal of the assessment and how much training is required to implement the assessment.[94]

Generalisability to the Australian context

This systematic review did not report where the studies were conducted. The Working Committee noted that the systematic review was authored by the originators of this intervention and that it can be assumed that most studies were conducted in the USA. Accordingly, the Working Committee considered that the evidence from these populations would be relevant to Australia, because health systems and sociocultural context or circumstances are generally comparable. However, the findings may not be directly generalisable to some Australian populations, such as rural and remote communities, some Aboriginal and Torres Strait Islander peoples, and some culturally and linguistically diverse communities.

Research implications and opportunities

Australian research is needed to determine the benefits. Well-designed studies should be conducted to measure specific outcomes to assess infant social and emotional development.

See Overall Research Implications.

Working Committee's conclusions

Summary

All observed benefits were for outcome measures that are indicators of secondary outcomes.

NBAS-based interventions, delivered within a few weeks of birth by trained professionals or by parents with the assistance of trained professionals, might enhance parenting quality.

Notes:

- See Decision tool for developing evidence-based conclusion statements.
- In the systematic review that contributed the pooled numerical data on which this conclusion was based (Das Eiden 1996),[93] 'parenting quality' was described as including parental responsiveness to the child, father reciprocity, maternally sensitivity, mother-infant feeding interactions and father involvement with the infant. Observing parenting quality was limited to the timing of the intervention (i.e. the time between administering the tool shortly after birth, until follow-ups ranging from 8–10 days but no longer than 9 months after birth).
- Available evidence showed no clear pattern in effect sizes for reported benefits according to whether trained professionals demonstrated the NBAS to parents (nine studies) or whether mothers administered the NBAS directly to their infants (three studies).[93] A single study that compared demonstration of the NBAS by trained professionals with parental administration of NBAS reported increased mother–infant contingent interactions during home visits when mothers administered it.[93]
- In Australia, this intervention could be facilitated by a range of disciplines and workforces, including hospital staff (midwives, paediatricians, infant mental health workers) and primary care health professionals (maternal and child health nurses, general practitioners).

Skin-to-skin care

Summary of evidence evaluation findings

Description of intervention

Early skin-to-skin care involves placing the naked baby prone on the mother's bare chest at birth or soon afterwards, with the aims of promoting mother–infant interactions and general infant health.[95]

Evidence sources: systematic reviews

One relevant systematic review was assessed:

Moore (2012)[95] (low risk of bias, high quality) – contributed pooled numerical results (see *Evidence table for Moore 2012* in the Technical Report)

Primary studies reported in systematic reviews that contributed pooled numerical results

Number of relevant studies: 34

Study design: RCT

Total number of participants: 2177

Sample sizes (range): 8–204

Publication period: 1977–2010

Place: Canada (one RCT), Chile (one RCT), Germany (one RCT), Guatemala (four RCTs), Iran (one RCT), Israel (one RCT), Italy (one RCT), Japan (one RCT), Nepal (one RCT), Poland (one RCT), Russia (one RCT), South Africa (one RCT), Spain (two RCTs), Sweden (two RCTs), Taiwan (three RCTs), Thailand (one RCT), UK (two RCTs), USA (nine RCTs)

Study populations: healthy full-term or late preterm newborns

Intensity of intervention: varied from 15 minutes to a mean of 37 of the first 48 hours after birth

See Evidence profile for *Moore 2012* in the Technical Report

Note:

This information provides an overview of primary studies included in relevant systematic reviews. The number of studies, study design and number of participants differed for each reported outcome (details in the Evidence Evaluation Report)

Outcomes reported in the systematic reviews

Infant social and emotional wellbeing or development up to one year of age

No pooled results available

Development for the infant, as a child, and up to 18 years

Infant body weight change (day 14 post birth)

Behaviour for the infant, as a child, and up to 18 years

No pooled results available

Physical wellbeing and safety for the infant, as a child, and up to 18 years

No pooled results available

Parent-infant relationship

No pooled results available

Parent/caregiver psychosocial wellbeing

No pooled results available

Parent/caregiver knowledge, practices and behaviours

Breastfeeding (1–4 months post birth)

Duration of breastfeeding (days)

Breastfeeding (1 year post birth)

Parent/caregiver views of the intervention

No pooled results available

Family relationships

No pooled results available

System outcomes

No pooled results available

Quality of evidence for outcomes with pooled results

Quality of the body of evidence for individual outcomes (GRADE method): ranged from very low to moderate

Main reasons for downgrading the quality of evidence: imprecision (small sample sizes and wide confidence intervals), inconsistency (substantial heterogeneity), high risk of bias assessed by systematic reviews, publication bias (evidenced by funnel plot asymmetry)

Benefits reported

Breastfeeding (indicator of secondary outcome; important)

Very low-quality evidence from one systematic review shows that skin-to-skin care for healthy newborns can increase breastfeeding at 1–4 months post birth (13 RCTs, N=702), though low-quality and very low-quality evidence suggests no clear impact at 1 month post birth (two RCTs, N=62) or on duration of breastfeeding in days (7 RCTs, N=304).

See *Table 15. Skin-to-skin care interventions evidence profile* in the Evidence Evaluation Report

Full report on this intervention

Link to Evidence Evaluation Report

Working Committee's conclusions

Summary

There is insufficient evidence available from systematic reviews with pooled results to ascertain whether skin-to-skin care interventions in the first year of life have any effect on infant social and emotional development and wellbeing.

Notes:

- See Decision tool for developing evidence-based conclusion statements.

- Improvements were also seen for outcomes rated by the Working Committee as important but not critical for making decisions: Skin-to-skin interventions for healthy newborns can increase breastfeeding outcomes.*
- The Working Committee note that skin-to-skin is often common practice in maternity wards and antenatal information/classes, and that the World Health Organization recommend that newborns without complications should be kept in skin-to-skin contact with their mothers during the first hour after birth to prevent hypothermia and promote breastfeeding.[96]

*Effects were reported for multiple follow-up intervals for these outcomes. Improvements were seen for some, but not all follow-up periods.

Research implications and opportunities

Well-designed studies are needed that report any harms, include clearly defined outcome measures for infant social and emotional development and wellbeing, and have adequate follow-up, for example into early childhood (up to 3 years) or up to when the child starts school (approximately 5 years).

See Overall Research Implications.

DISCUSSION

Scope of the evidence evaluation

It is important to note that the scope of this evidence evaluation was limited to outcomes relevant to infant social and emotional development and wellbeing. It did not evaluate the overall effectiveness of parent/caregiving interventions/practices across all possible outcomes. Therefore, the intervention/population categories considered in this Report on the Evidence may have demonstrated benefits for other areas of infant/child development or may achieve other intended outcomes (e.g. for the parent).

Limitations of the evidence evaluation

Methodological limits

While the overview method captures evidence that has been included in systematic reviews, it does not provide an exhaustive evaluation of evidence. Relevant data on infant social and emotional development and wellbeing may be available in primary studies, but not yet captured in systematic reviews.

The overview did not assess results from single studies because there were too many to be feasibly included, and many were underpowered and poorly reported. Relevant single studies identified by the evidence reviewers are listed in the Technical Report.

Restriction of the analysis to outcomes for which pooled numerical results were available excluded potentially relevant results from single studies or from multiple studies that had not been pooled. However, the evidence reviewers advised that including only pooled results had minimal effect on the findings of the overview.

Limitation of the scope of the reviews to interventions that commenced before a child's first birthday excluded some available evidence on the effects of parenting interventions on children's social and emotional development and wellbeing.

Limits of the body of evidence

Lack of data for infant outcomes

Very few data were available for outcomes in the primary outcome domain (infant social and emotional wellbeing or development up to one year of age).

Limited follow-up

Only short-term follow-up data were available for most interventions that showed benefits.

Lack of data on harms

There was a lack of information about harms associated with interventions reported in the systematic reviews included in the overview, as documented in the Evidence Evaluation Report. Given the absence of evidence on harms, the Working Committee discussed potential harms of each intervention as part of the GRADE process, based on members' experience and expertise.

Publication and reporting bias

Many of the systematic reviews reported only (or predominately) positive results. It is possible that null results or harms have been omitted from these reviews. Accordingly, the body of evidence may be skewed towards a more optimistic view of interventions than may be warranted.

Alignment with pre-specified outcome measures

Most of the individual outcomes (as reported in the individual systematic reviews) did not match the Working Committee's pre-specified outcome domains. For most intervention/population categories, pooled data was only available for one to two outcome domains.

Therefore, it is difficult to see an overall picture of the effectiveness of each intervention for infant social and emotional wellbeing and development, or compare findings between systematic reviews for a given outcome domain.

Overall research implications

The Working Committee agreed that a significant benefit of undertaking this evidence evaluation was the opportunity to identify knowledge gaps requiring future research. Implications and opportunities for further research are outlined for each intervention in the Summary of findings by intervention. Those should be read in conjunction with the following points, which are applicable for most interventions.

Need for purpose-designed studies

For most interventions, well-designed studies are needed that include clearly defined measures for infant social and emotional development and wellbeing, with adequate follow-up, and cost-effectiveness evaluations.

Follow-up of infants into childhood and adolescence will assist in assessing the duration of the benefits and/or harms of interventions.

For interventions found to be effective for optimal social and emotional development of infants, additional research is required to determine the specific characteristics that contribute to their effectiveness. Ideally, studies to determine how interventions/programs/messages should be framed, along with those factors impeding or facilitating parent/caregiver engagement with interventions should be embedded within future intervention studies. To determine these factors (e.g. who should deliver these interventions, where they should be delivered, when, how and to whom), intervention studies (and systematic reviews) should, where possible, consider subgroup or regression analyses. Large, well-designed qualitative studies to determine these characteristics are also required.

Need for more thorough reporting of studies

Many systematic reviews could not be included in the overview due to poor reporting. The utility of evidence from systematic reviews would be enhanced by adequate reporting of characteristics (e.g. ages of children at intervention onset) and through the conduct and reporting of rigorous risk of bias assessments. Use of formats and guidelines, similar to those of the Cochrane Collaboration may help to ensure better risk of bias assessments and their reporting.

Need for standardisation of definitions and outcomes

There is a need to standardise definitions and outcomes for assessing infant social and emotional development and wellbeing, along with a need for agreement on the preferred scales/tools to measure these outcomes.

Need for cost-effectiveness evaluations

Given that efficiency in healthcare service delivery is a key priority for planners, policy makers and providers, the economic evaluation of clinically effective prevention and early intervention strategies is increasingly important.[97] Achieving the most cost-effective outcomes is likely to be a high priority for governments and policy makers. The current body of research on costs, cost-effectiveness, and cost-benefits of preventive mental health interventions in children and adolescents is limited.[97]

The scope of NHMRC's evidence evaluation did not include cost-effectiveness evaluations. The Working Committee agree that economic evaluations will become even more important when deciding which interventions should be implemented and included in future Australian programs.

APPENDICES

Evidence Evaluation Report and Technical Report

Independent Evaluation of the Evidence

The draft *NHMRC Report on the Evidence Parenting/caregiving practices and behaviours to promote the social and emotional development and wellbeing of infants* (draft Report on the Evidence) is based on the findings of a comprehensive evaluation of the evidence. The Australian Research Centre for Health of Women and Babies (ARCH), the University of Adelaide, was commissioned by NHMRC to undertake this evaluation of evidence. The review focused on the effectiveness of interventions and messages for parenting practices and behaviours that are delivered at a population level to infants up to 12 months of age and which aim for optimal social and emotional development.

The final report of the evaluation, titled *Evaluation of evidence on the effectiveness of interventions for caregiving practices and behaviours for optimal social and emotional development of infants: an overview of systematic reviews* (Evidence Evaluation Report) is available as a background document to accompany the draft Report on the Evidence during targeted consultation. Please note that the Evidence Evaluation Report is not subject to consultation and will be officially released on publication of the final Report on the Evidence.

The evaluation of evidence included:

1. an overview of 51 systematic reviews (the overview)
2. a qualitative analysis of selected systematic reviews (those that contributed pooled numerical results, evaluated interventions that were associated with an improvement in at least one of the pre-specified outcome domains for which pooled numerical results were available, and for which the evidence reviewers assessed the quality of evidence to be higher than 'very low' using the GRADE approach).

The Evidence Evaluation Report comprises the research questions (and sub-questions) using the PICO approach (population, intervention, comparator, outcomes); the methods used to identify, select, appraise and summarise the evidence; and evidence statements.

The Technical Report comprises the search terms and detailed search strategies for the evidence evaluation, including Evidence Tables for each included systematic review, full details of the quality assessment for each review, and references of relevant but excluded reviews.

Administrative Report

The *Administrative Report* provides a brief summary of the processes underpinning the evidence evaluation and development of the *Report on the Evidence: Promoting social and emotional development and wellbeing of infants in pregnancy and the first year of life.*

The GRADE approach

The GRADE approach is used to rate the strength of recommendations based on systematic reviews and synthesis of evidence. For this Report on the Evidence the Working Committee applied the GRADE process as a systematic approach to considering implications of the evidence for implementation in Australia, but did not make recommendations.

Overview

The GRADE approach involves assessing a body of evidence by considering all the following domains:

- overall confidence in the estimates
- balance of benefits versus harms and burdens
- values and preferences
- resource implications
- equity
- acceptability
- feasibility.

For more information, refer to the GRADE handbook (section 6.2 Factors determining direction and strength of recommendations.

Overall confidence in the estimates of effect

For this step, the Working Committee considered only outcomes that met three conditions:

- rated as critical
- pooled numerical data available
- quality of the evidence could be graded.

Note:

Pre-specified outcome domains (where no pooled results were available for any outcome within this domain) and individual outcomes reported in the body of evidence that fell within the pre-specified domains and were confirmed as critical by the Working Committee.

In rating this item, the Working Committee took the following approach:

- If the quality of evidence was the same for all critical outcomes, then that rating became the overall quality of the evidence supporting the answer to the question.
- It is logical that the overall confidence in effect estimates cannot be higher than the lowest confidence in effect estimates for any outcome that is critical for a decision. Therefore, if the quality of evidence differed across critical outcomes, the lowest quality of evidence for any of the critical outcomes determined the overall quality of evidence.
- If there was higher quality evidence for some critical outcomes to support a decision, then the quality of evidence need not be rated down merely because of lower confidence in estimates of effects on other critical outcomes that support the same recommendation.
- The Working Committee rated this item by choosing one of following descriptors:
    - very low
    - low
    - moderate
    - high.

Balance of benefits versus harms and burdens

In rating this item, the Working Committee considered the following:

- the effect estimates for outcomes
- absence of evidence on the possible harms, in that none of the included systematic reviews provided pooled results regarding harms within the pre-specified outcome domains
- potential harms of the intervention, based on their experience and expertise
- the size and direction of effects (benefits and harms or burdens for recipients of the intervention). Large effects consistently pointing in the same direction are more likely to warrant a strong recommendation. Large effects pointing in opposite directions are more likely to warrant a weak recommendation.
- whether separate recommendations were needed for subgroups due to differences in baseline risk.
- The Working Committee rated this item by choosing one of following descriptors:
- Benefits clearly outweigh harms/burdens
- Benefits slightly outweigh harms/burdens
- Benefits and harms/burdens balanced
- Harms/burdens slightly outweigh benefits
- Harms/burdens clearly outweigh benefits.
- Where necessary, the Working Committee devised an additional category to account for uncertainty due to the lack of reporting of harms in the body of evidence captured in the included systematic reviews.

Values and preferences

Based on their own experience and expertise, the Working Committee considered the following factors in rating this item:

- recipients' values, potential burdens or side effects and the relative importance of desirable versus undesirable outcomes
- whether all members agreed on the value placed on critical and important outcomes
- whether other relevant stakeholders (patients, policy makers or other guideline panels) are likely to be similar in the value they place on the critical and important outcomes.
- If any of these factors vary between groups considered, it is more likely that a weak recommendation is warranted.

The Working Committee rated this item by choosing one of following answers to the question '*Are people similar in the value they place on the critical and important outcomes*?':

- not similar
- probably not similar
- uncertain
- probably similar
- similar.

Resource implications

Based on their own experience and expertise, the Working Committee considered the following factors in rating this item:

- resources required to implement the intervention (personnel, time, money)

- opportunity costs (whether implementation of the intervention would restrict or prevent allocation of resources to other interventions).

The higher the costs of an intervention or the more resources consumed, the less likely a strong recommendation is warranted.

The Working Committee determined that resource use should be considered as part of the recommendations for all intervention or population categories, because most are not currently part of usual care. The Working Committee considered that the implementation of most evaluated interventions would incur significant costs, particularly for those that require delivery and support by highly trained personnel such as health professionals, and those for which effectiveness is likely to require significant planning to ensure adequate structure, resourcing and allocation of human resources.

The Working Committee rated this item by choosing one of following descriptors:

- The net benefits are worth the costs
- The costs are probably not justified by the expected benefit
- Uncertainty about the costs.
- Where necessary, the Working Committee devised a different category to account for uncertainty.

Equity

Based on their own experience and expertise, the Working Committee considered the following factors in rating this item:

- whether implementation of the intervention would reduce or increase health inequities within the Australian context
- existing inequities in the Australian setting
- whether the prevalence of risk factors differs across any subgroups.
- Interventions that might reduce inequities are more likely to be recommended than those that do not (or those that increase inequities).

The Working Committee noted that, in this review, social and cultural factors are also relevant. The Working Committee rated this item by choosing one of following answers to the question '*Would the implementation of the intervention reduce health/social inequities?*':

- no
- probably no
- uncertain
- probably yes
- yes
- varies.

Acceptability

The Working Committee considered the following factors in rating this item:

- parent/caregiver views of the intervention, where they had been reported in the included systematic reviews
- uptake of similar interventions in Australia, based mainly on members' experience
- Working Committee members' experience of parent/caregivers' attitudes and preferences.

- The less acceptable an option is to key stakeholders, the less likely it is to be a strong recommendation.

The Working Committee rated this item by choosing one of following answers to the question '*Is the option acceptable to key stakeholders?*':

- no
- probably no
- uncertain
- probably yes
- yes
- varies.

Feasibility

Based on their own experience and expertise, the Working Committee considered the following in rating this item:

- whether the intervention is already widely available in Australia
- whether similar interventions are being implemented in Australia
- whether feasibility would vary between jurisdictions or regions.

The Working Committee rated this item by choosing one of following answers to the question '*Is the option feasible to implement?*':

- no
- probably no
- uncertain
- probably yes
- yes
- varies.

Decision tool for developing evidence-based conclusion statements

	Overall Quality of Evidence for critical outcomes is Very low	Overall Quality of Evidence for critical outcomes is Low	Overall Quality of Evidence for critical outcomes is Moderate	Overall Quality of Evidence for critical outcomes is High
Overall GRADE Assessment rated as high	[Intervention] **might help to improve** Whilst the confidence in the effects of the intervention is very low, • desirable effects outweigh the undesirable effects, • health inequities could be reduced, • it is probably acceptable and feasible for implementation; and • net benefits are usually worth the costs <u>Interventions in this category include:</u> • Interventions for parents of infants with or at risk of developmental delay or impairment	[Intervention] **might improve** There are not any interventions that fall within this category.	[Intervention] **is likely to improve** There is moderate confidence in the effects of the intervention, and • desirable effects outweigh the undesirable effects • health inequities could be reduced • it is probably feasible and acceptable for implementation • net benefits are worth the costs <u>Interventions in this category include:</u> • Home visiting interventions • Interventions for parents of preterm and low birthweight infants Interventions within this category include information on characteristics of the intervention that might optimise infant social and emotional development (What, why, who, for whom, when, where?)	[Intervention] **can improve/reduce** There is a high confidence in the effects of the intervention and • desirable effects outweigh the undesirable effects • health inequities would be reduced • implementation is feasible • acceptability varies, but is mostly acceptable • net benefits are worth the costs Interventions that fall within this category have the strongest wording in the Working Committee Summary Statements. <u>Interventions in this category include:</u> • Kangaroo care • Antenatal and postnatal education and/or support interventions Interventions within this category include information on the 6Ws (What, why, who, for whom, when, where?)
Overall GRADE Assessment rated as moderate	[Intervention] **might help to enhance** The confidence in the effects of the intervention is very low, but • the desirable effects probably outweigh the undesirable effects • there may be some uncertainty about whether the net benefits are worth the costs. Interventions that fall within this category	[Intervention] **might enhance** The confidence in the effects of the intervention is low but: • the desirable effects probably outweigh the undesirable effects • the intervention is most likely to reduce health inequities (except for treatment for maternal depression)	[Intervention] **is likely to enhance/lessen** There is moderate confidence in the effects of the intervention, and • desirable effects probably outweigh the undesirable effects, • implementation is probably feasible and acceptable • health inequities are probably reduced,	[Intervention] **can enhance** There are not any interventions that fall within this category.

	have the weakest wording in the Working Committee Summary Statements. <u>Interventions in this category include:</u> • Infant massage interventions • Interventions for teenage parents • Interventions for parents in low-income and middle-income countries	• there is uncertainty about whether the net benefits are worth the costs, and whether implementation is feasible and acceptable. <u>Interventions in this category include:</u> • NBAS based interventions • Interventions for preventing postnatal depression • Interventions for parents in low-income/ socially disadvantaged circumstances • Interventions for treating maternal depression in the perinatal period	but • there is uncertainty about costs. <u>Interventions in this category include:</u> • Interventions for enhancing sensitivity and/or attachment security • Interventions for preventing later antisocial behaviour and delinquency Interventions within this category include information on characteristics of the intervention that might optimise infant social and emotional development (What, why, who, for whom, when, where?)	
GRADE process not under taken	For seven interventions reviewed in NHMRC's evidence evaluation, the Working Committee did not complete the GRADE process because there was insufficient evidence available to determine effectiveness/ draw a conclusion on the intervention's effect on social and emotional development of the infant, the child and later on as an adolescent. As noted in the Limitations of the Evidence Evaluation (p123 in Report on the Evidence), relevant data on infant social and emotional development and wellbeing may only be available from primary studies, but not yet captured in systematic reviews, and hence not captured as part of NHMRC's evidence evaluation. Interventions where GRADE was not under taken include: 1.Day care interventions: benefits were seen for only one outcome where the GRADE system could be used to assess the quality of evidence, and this evidence was judged to be of very low quality, 2. Skin-to-skin care interventions (as above), 3. Interventions for parents with alcohol or drug problems: there was no clear difference in any outcome with pooled results, 4. Behavioural sleep interventions, anticipatory guidance interventions, interventions for promoting effective parenting and interventions for fathers: pooled numerical results were not available for any outcome and therefore the quality of the evidence could not be assessed. For all interventions listed above, the Working Committee Summary Statement is: *There is insufficient evidence from systematic reviews with pooled results to ascertain whether [Intervention], starting before birth or in the first year of life, has any effect on infant social and emotional development and wellbeing.* For (1) and (2) above, in the notes under the Working Committee Summary Statement, the outcome's benefit has been reported, even when it was rated as important and the evidence is very low quality.			

Glossary notes

See also List of abbreviations

Attachment

Attachment is the term to describe the emotional bond between an infant and a primary caregiver. Experiences of care gradually lead to ways of thinking, behaviours, beliefs, expectations and emotions about the self and others which are referred to as an attachment style. Parents' capacity to respond sensitively and consistently to their infant's needs influences the baby's attachment style. Securely attached infants are confident that their parents will be responsive to their needs and communications. They are able to explore their world knowing that their caregiver provides a secure base to return to, including in times of heightened need. Experiencing sensitive care and comfort strengthens the baby's sense of security, and provides a model for relationships into the future. Secure attachment is the healthiest most adaptive attachment style. Infants with insecure anxious or disorganised attachment styles may have had experiences in which their efforts to seek care, comfort and proximity have been discouraged, rejected or responded to inconsistently. Insecure attachment styles are associated with increased risks of subsequent behavioural, emotional or interpersonal difficulties.[98]

Infancy

In this Report on the Evidence, infancy refers to the first 12 months of life. Definitions vary between authors and contexts.

Insufficient evidence

'Insufficient evidence' to determine effectiveness of an intervention means the Working Committee determined that there was not enough information available from systematic reviews with pooled results to ascertain whether or not the intervention has any effect on infant social and emotional development and wellbeing because any of these situations applied:

- No pooled numerical results were available for any outcome (anticipatory guidance; behavioural sleep interventions; interventions for fathers).
- Pooled numerical results were available, but there was not enough information to determine the quality of evidence so the GRADE process could not be applied (interventions for promoting effective parenting).
- Pooled numerical results were available for only one secondary outcome with very low quality evidence (early childhood education and care interventions; skin-to-skin care interventions).
- Pooled numerical results were only available for secondary outcomes that showed no clear differences between intervention and comparator based on low or very low-quality evidence (interventions for parents with alcohol or drug problems).

Nursing Child Assessment Satellite Training (NCAST) scales

Includes two related instruments developed by NCAST , which were used in clinical trials included in this Report on the Evidence:
The NCAST Parent-Child Interaction Feeding Scale (NCAST); also known as the NCAST Parent-Child Interaction Feeding Scale" data-html="true">NCAFS) records observable behaviours that describe the caregiver-child communication and interaction during a feeding situation at age 0–12 months.

The NCAST Parent-Child Interaction Teaching Scale (NCATS) records observable behaviours that describe the caregiver-child communication and interaction during a teaching situation, birth to age 36 months.

Perinatal period

In this Report on the Evidence, perinatal refers to the period from conception to 12 months after birth. Definitions vary between authors.

Strange situation procedure (SSP) or assessment

A procedure used in child psychology research, where a researcher observes a child's reactions when the child’s mother or carer briefly leaves her child alone in an unfamiliar room, and when the mother/carer returns. The strange situation procedure was designed to study children’s attachment styles. Note that this term is sometimes referred to as the Strange Situation Protocol.

List of abbreviations

AAPI	Adult Adolescent Parenting Inventory
AMSTAR	A Measurement Tool to Assess Systematic Reviews
APIB	Assessment of Preterm Infant Behavior
BAS	British Abilities Scales
BDI	Beck Depression Inventory
BITSEA	Brief Infant Toddler Social and Emotional Assessment
BSID	Bayley Scales of Infant Development
BSID-MDI	Bayley Scales of Infant Development – Mental Development Index
BSID-PDI	Bayley Scales of Infant Development – Psychomotor Development Index
CAPI	Child Abuse Potential Inventory
CBCL	Child Behavior Checklist

CBT	cognitive behavioural therapy
CCT	controlled clinical trial
CCTI	Colorado Child Temperament Inventory
CES-D	Center for Epidemiological Studies Depression Scale
CITS	Carey Infant Temperament Scale
CI	Confidence Interval
cRCT	cluster-randomised controlled trial
CTS	Conflict Tactics Scale
DAS	Dyadic Adjustment Scale
DASII	Developmental Assessment Scales for Indian Infants
EA Scale	Emotional Availability Scale
ECBI	Eyberg Child Behavior Inventory

EPDS	Edinburgh Postnatal Depression Scale
FSSQ	Functional Social Support Questionnaire
GDS	Gessell Developmental Schedules
GMDS	Griffiths Mental Development Scales
GRADE	Grading of Recommendations Assessment, Development and Evaluation
GRS	Global Rating Scale
HADS	Hospital Anxiety and Depression Scale
HOME	Home Observation for Measurement of the Environment
HDRS	Hamilton Depression Rating Scale (also Hamilton Rating Scale for Depression)
I^2	Measure of Statistical Heterogeneity
IPT	interpersonal therapy
IQ	Intelligence Quotient

IBQ	Infant Behavior Questionnaire
KBIT	Kaufman Brief Intelligence Test
K10	Kessler Psychological Distress Scale
MAI	Maternal Attachment Inventory
MAS	Maternal Attitude Scale
MBRS	Maternal Behavior Rating Scale
MDI	Mental Development Index
MHPWC	Mental Health and Parenting Working Committee
MSCA	McCarthy Scales of Children's Abilities
N	number
NBAS	Neonatal Behavioral Assessment Scale
NCAFS	Nursing Child Assessment of Feeding Scale developed by the Nursing Child Assessment Satellite Training organisation (NCAST); also known as the NCAST

	Parent-Child Interaction Feeding Scale
NCATS	Nursing Child Assessment Teaching Scale developed by the Nursing Child Assessment Satellite Training organisation (NCAST); also known as the NCAST Parent-Child Interaction Teaching Scale
NCAST	Nursing Child Assessment Satellite Training (organisation)
NHMRC	National Health and Medical Research Council
NIDCAP	Newborn Individualized Developmental Care and Assessment Program
nRCT	Non-randomised controlled trial
PAA	Preschool Assessment of Attachment System
PCERA	Parent-Child Early Relational Assessment
PDI	Psychomotor Development Index
PEDI	Paediatric Evaluation of Disability Inventory
PICO	Patient/Participant/Population; Intervention; Comparison/Control; Outcomes

PSI	Parenting Stress Index
qRCT	Quasi-randomised controlled trial
RCT	randomised controlled trial
RITQ	Revised Infant Temperament Questionnaire
ROBIS	Risk Of Bias in Systematic reviews tool
SB	Stanford-Binet (Intelligence Scale)
SCAN	Schedule for Assessment in Neuropsychiatry
SCID	Structured Clinical Interview for DSM Disorders
SD	standard deviation
SES	Socioeconomic Status
SF-36	36-Item Short Form Health Survey
SMD	standardised mean difference

SRQ-20	20-item Self-Reporting Questionnaire
SRS	Social Relationship Scale
SSP	Strange Situation Procedure
SSQ6	Social Support Questionnaire 6
STAI	State–Trait Anxiety Inventory
VAS	visual analogue scale
WISC	Wechsler Intelligence Scale for Children
WPPSI	Wechsler Preschool and Primary Scale of Intelligence

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