A Rapid Evidence Assessment of Best Practice Literature on the Care of Infants with Prenatal Substance Exposure in Foster Care

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Executive Summary

Background

Foster care encompasses the temporary placements and services provided to children and families when children are removed from their homes. Infants in foster care may have experienced prenatal substance exposure, neglect and maltreatment as well as disruptions in their relationships with primary caregivers. They are vulnerable to the effects of disruption of primary attachments and multiple placement moves that can have lifelong implications if not addressed. They also have the greatest capacity for overcoming early adversities.

Objective

This scoping review sought to locate and describe literature that addressed the characteristics of interventions and programs that support the health and development of infants with prenatal substance exposure in foster care, foster care providers, and birth families.

Inclusion criteria

Types of participants: This scoping review considered sources that included foster care situations with infants who were less than 12 months of age. For the purposes of this review substances included (tobacco, alcohol, marijuana, crystal methamphetamine, cocaine, heroin, illicitly used prescription opioids, solvents if used for the purpose of intoxication). This review did not include studies related to environmental exposure to substances (food, lead, pollution) or medications used as prescribed by health care providers.

Phenomena of interest: The concept examined by this scoping review was programs that were designed specifically to support foster care providers who care for infants with prenatal substance exposure and their birth families.

Types of studies: This scoping review considered quantitative, qualitative, mixed methods and economic studies for inclusion. In addition grey literature such as literature reviews, policy documents, quality improvement and program evaluation reports, theses and dissertations that met the inclusion criteria were retrieved.

Context: This scoping review considered studies that were conducted in countries with similar resource and social service contexts.

Search strategy

A three-step search strategy identified published studies in the English language from January 2006 to December 2016.

Methodological quality

This review is a scoping review to provide a broader picture of the existing literature on this topic. Assessment of methodological quality was therefore not conducted.

Data extraction

Two independent reviewers used the Joanna Briggs Institute data extraction tools that were specific to the methodology in each source.

Data synthesis

Findings were aggregated and categorized on the basis of similarity in focus. Findings are presented in narrative and visual forms, including tables and figures to aid in data presentation when appropriate.

Results

63 sources published in English were included in this review. Categorization of the focus of each source resulted in identification of four core themes: (1) infant mental health promotion for infants in care; (2) child welfare program elements; (3) identification of infants and families at risk of requiring foster care; and (4) outcomes for infants in care and their families.

Conclusions

Infants represent a significant proportion of children in foster care. The experience of foster care for infants has been identified as an adverse event or risk factor for optimal development later in life. The aim of this scoping review was to explore the evidence that is currently available to support infants in foster care, keep birth parents connected to their infants, and support foster care providers caring for these infants and their families. A developmental perspective is needed for child welfare service planning to address the unique needs of infants in foster care. Research studying those services and new interventions is also limited. Intervention during the early years holds significant potential for promoting positive developmental pathways and family preservation.

Keywords

Infant; Foster care; Out-of-home care; Substance exposure; Program evaluation; Intervention; Program; Evidence-based practice; Best practices.

Review question/objective

The objective of this review is to identify and describe within the existing literature caregiving practices and program elements that support optimal outcomes for infants with prenatal substance exposure in foster care. This review seeks to answer the following research question: *What are the characteristics of interventions and programs that support the health and development of infants with prenatal substance exposure in foster care*?

Background

Foster care

Foster, or out-of-home, care encompasses the temporary placements and services provided to children and families when children are removed from their homes due to safety concerns, as a result of serious parent-child conflict or to treat serious physical or behavioral health conditions which cannot be addressed within the family.[1] This term is often used to describe a number of placement settings, including kinship or relatives' homes, family foster homes, treatment foster homes, or group and residential care.

The practice of foster care emerged at the turn of the 19th century in North America from concerns about immigrant children sleeping in streets and the conditions that poor children were exposed to such as indentured service or living in almshouses.[2] Social agencies and state governments became involved in developing services to promote the well being of children and to care for abused and neglected children, forming early roots of the foster care system. Currently in Canada child welfare services are organized at provincial and territorial levels and provide mandated services directed by provincial and territorial child welfare statutes.[3] Looking after children in foster care is one of those mandated services.

Foster care was originally intended to be a temporary measure of support for children while their biological families dealt with the social and economic issues that contributed to their parenting difficulties. However, as poverty, other social issues, and expectations for family functioning and parenting continue to increase in North American society the number of children in foster care and the length of time in which they require services continue to increase.[2] The reasons that children come into foster care have generally been related to neglect and maltreatment.[4] However, studies report that underlying social determinants also influence this association, including poverty, homelessness, mental health, violence and trauma, and substance use.[3,5]

A strong association has been reported between parental substance use and child protection concerns.[6] Parental substance use has become a critical public health issue in many countries and it is estimated that up to 80% of infants and children coming into foster care are there because of prenatal or continued use of substances by one or both parents.[7,8] More recently, the significant increase in prescription opioid use has precipitated a further increase in the number of infants and young children entering care.[9]

Reported numbers of children in foster care in Canada vary from 29,590 as reported in the 2011 Canadian census[10] to 62,428 in 2013 as estimated by Jones, Sinha and Trocme[11] from Statistics Canada and provincial child welfare data. Determining the number of children in foster care continues to be difficult, as there are provincial and territorial variations on how foster care is

defined and how data is collected.

Child advocates suggest that there are also cultural and racial biases in which children are represented in the child welfare/ foster care system For example, Indigenous children are disproportionately represented in the child welfare system in Canada. Although Indigenous children comprise less than 6% of the child population, they make up an estimated 26% of the children placed in care.[12] This overrepresentation is attributed to the historical context of colonization and legacy of residential schools.[13]

Many children now entering foster care have been significantly traumatized and have special medical, psychological, and social needs that traditional child welfare and foster care services were not designed to address.[14,15] Research shows that children receiving foster care in general have an increased incidence of chronic medical conditions.[16,17] Overall, 30% to 80% of children in care have at least one physical health concern, 46% to 60% of children younger than six years have a developmental disability, and up to 80% have a significant mental health problem.[15] In addition, it is estimated that in Canada, 6% of children in foster care have Fetal Alcohol Syndrome (FAS), and an additional 16.9 % have Fetal Alcohol Spectrum Disorder (FASD).[18] Popova et al. calculate that there are currently 2,225 to 7,620 children in foster care with FASD.[19]

Infants and young children in foster care

In the United States, the percentage of young children coming into care has been steadily increasing over the past ten years. In 2014, over one third of children coming into care were infants and young children under five, the largest age group of children coming into care.[20] Higher placement rates are seen in this population due to concerns about the particular vulnerabilities of this developmental age group.[21] Infants and young children also tend to stay longer in care and have higher rates of re-entry into foster care.[22]

The first three years of life is the period of time when the most rapid physical and developmental growth takes place. Infants and toddlers who are able to develop secure relationships and attachments demonstrate stronger positive social and emotional development.[23] Infants and toddlers in foster care have typically experienced maltreatment as well as disruptions in their relationships with primary caregivers at a point where these relationships are critical for mental health development.[24] Because their healthy development is interrupted by the lack of security and attachment from their primary caregivers, infants and toddlers in foster care are extremely vulnerable to the effects of neglect, maltreatment and multiple placement moves which can have lifelong implications if not properly addressed.[23, 25]

Prenatal exposure to drugs and/or alcohol is associated with higher risks of physical, emotional and developmental problems.[15,26] Infants with prenatal substance exposure may also have spent prolonged periods in a neonatal intensive care unit being cared for by multiple health care providers. Alternatively younger children may have entered foster care from the home of substance using birth parents and may have experienced irregular and inconsistent daily care.[27] Birth parents, foster care providers, health professionals and other caregivers report specific challenges in caring for infants with prenatal substance exposure, including irritability, inconsolability, difficulty with feeding, difficulty settling and being soothed, and sensitivity to change and stimulation.[28,29]

Supporting foster care providers who care for infants

Enhanced foster care has been identified as a key caregiving variable that has an influence on the early development of vulnerable children.[21,24,30] Foster care for children younger than five should be considered as an intervention in and of itself that is fundamentally different from the experiences of older children.[30] In addition to making placement decisions in which children's developmental needs are primary, health and child welfare providers must help foster care providers develop parenting skills that support children's attachment, and recruit foster care providers who can commit to the care of both young children and their birth families.

With the recent emphasis on family reunification foster care providers are increasingly being expected to provide support and training for the birth parents of the child in their care with the goals of supporting early attachment and relationships, building parental confidence, and promoting family preservation.[31] Many foster care providers do not feel comfortable or qualified to manage the social and emotional issues of these complex birth families.[32] Prenatal substance exposure (including supporting children and adolescents with FASD) adds to these complexities.

Gibbs, on behalf of the US Department of Health and Human Services, found that as many as one in five of foster care providers withdrew from fostering within the first 12 months, with a median length of service ranging from 8 to 14 months.[33] Foster care providers cited unsatisfactory interactions with social workers and agency insensitivity as primary reasons for leaving. A Canadian survey reported that two-thirds of foster care providers had considered quitting, due to reasons such as conflict with a child's social worker, red tape, lack of support services including respite, and the heartbreak of seeing a child return to a difficult situation.[34]

Although children in foster care spend more time with foster care providers than with any other person in the health or child welfare system, these parental substitutes often inadequately are not prepared for or supported in their demanding responsibilities.[31] The challenge for child welfare and health professionals is to develop services that meet the needs of the children, birth families, and foster care providers. Limited evidence is available about how to develop programs that both educate and support foster care providers who care for infants with prenatal substance-exposure and their birth parents, despite the number of infants requiring this specialized foster care.

Purpose

Infants represent a significant proportion of children in foster care. They also have the greatest capacity for overcoming early adversities. Intervention during the early years holds significant potential for promoting positive developmental pathways and family preservation. Because of the importance of attachment in the early years, interventions may be targeted toward infants, foster care providers and birth families. The specific questions addressed in this review are:

1. What are the characteristics of strategies and programs that support optimal physical, cognitive and social-emotional development for infants with prenatal substance exposure in foster care?
2. What are the characteristics of strategies and programs that improve the satisfaction and retention of foster care providers caring for infants with prenatal substance exposure?
3. What are the characteristics of strategies and programs that help foster care providers support birth parents with substance use issues to stay connected to their infants and gain confidence in their parenting role?

Preliminary search

A preliminary search for existing published or underway scoping reviews on the topic was conducted. The databases searched included JBISRIR, Cochrane Database of Systematic Reviews, CINAHL, PubMed, EPPI, and PSYCHINFO. No systematic or scoping reviews were located in this topic. During this search additional terminology to support development of the search strategy was also identified. The purpose, search strategy and methods of analysis for this review were specified in advance and documented in a protocol.*

Keywords

Infant; foster care; out-of-home care; substance exposure; program evaluation; intervention; program; evidence based practice; best practices

Methods

A scoping review was chosen as the methodology for this review for three reasons: (1) to provide a broad overview of this area; (2) to report on the types of evidence that address and inform practice in this area; and (3) because scoping reviews are more inclusive of a diverse range of forms of evidence. This scoping review will adopt the methodology for JBI scoping reviews as described in the *Joanna Briggs Institute Reviewers' Manual 2015: Methodology for JBI Scoping Reviews*.[35,36] Scoping reviews typically do not include a quality assessment of included studies. With this methodology, rather than conducting a formal assessment of the quality of the individual, a narrative summary of core themes is provided.

Inclusion criteria

Participants

This scoping review considered sources that included foster care situations with infants who were less than 12 months of age and where these infants had been exposed to substances considered harmful from a child protection perspective. For the purposes of this review substances will include (tobacco, alcohol, marijuana, crystal methamphetamine, cocaine, heroin, illicitly used prescription opioids, solvents if used for the purpose of intoxication). This review will not include studies related to environmental exposure to substances (food, lead, pollution) or medications used as prescribed by health care providers.

Concept

The concept examined by this scoping review was interventions and programs that were designed specifically to support foster care providers who care for infants with prenatal substance exposure, their birth families, and foster care providers. These interventions and programs were identified in a range of sources, including research reports, program development and evaluation reports, and policy documents. The following definitions that have been developed in the child welfare field are similar to the definitions for evidence-based practice and best practices developed by the Joanna Briggs Institute:

*Marcellus, L., Shaw, L., MacKinnon, K. & Gordon, C. (under review). Identifying best practices in the care of infants with prenatal substance exposure in foster care: A scoping review. *JBI Database of Systematic Reviews and Implementation Reports*.

Evidence-based child welfare practice is defined by the American Public Human Services Association[37] as a combination of: (1) the best research evidence; (2) the best clinical experience; and (3) practice that is consistent with family/client values. In child welfare services there are also other compelling sources of information including: agency policies, legislation, regulations, best practice standards, and client rights.

Best practices are defined by the American Public Human Services Association[37] as a continuum of practices, programs and policies ranging from cutting edge, emerging, promising, to those that have been extensively evaluated and proven effective, best practice. A best practice results from a rigorous process of peer review and evaluation that indicates effectiveness in improving outcomes.

Interventions are defined as specific activities intended to bring about change in some aspect of the status of the target population.[38]

Programs are defined as overarching responses, generally including a set of interventions and activities, to some aspect of the status of the target population.[38]

Context

This scoping review considered studies that were conducted in countries with similar resource and social service contexts. For example, sources were not included that addressed orphanage/congregate based care, as this model of care is not similar to the current Canadian context.

Study types

This scoping review considered quantitative, qualitative, mixed methods and economic studies for inclusion. In addition literature reviews, policy documents, quality improvement and program evaluation sources that met the inclusion criteria were retrieved. Grey (unpublished literature) including theses and dissertations were also included.

Search strategy

The search strategy aimed to find both published and unpublished studies over the past eleven years between 2006 and 2016. Since the study stakeholders conducted a previous literature review in 2006, studies published between January 2006 to December 2016 were considered for inclusion in this review. A three-step search strategy was utilized in this review.

Stage 1

An initial limited search of MEDLINE, PsychINFO, Cochrane Database of Systematic Reviews, Academic Search Complete, Social Work Abstracts, Proquest Dissertations and Theses, Sociological Abstracts, and CINAHL was undertaken using the following search terms:

- Infant – also infant*; baby; babies; newborn*; neonatal; perinatal
- Foster care – also foster parent; foster mother; foster father; foster family; foster care giver; foster carer; kinship; kin; out of home care
- Prenatal substance exposure – also prenatal substance abuse; prenatal substance exposure; substance related disorder; drug us*; drug abuse; prenatal exposure; Neonatal Abstinence Syndrome (NAS); Fetal Alcohol Spectrum Disorder (FASD); drug exposed; alcohol exposed;

cocaine related disorder; alcohol related disorder; amphetamine related disorder; impaired parent

Stage 2

The text words contained in the title and abstract of relevant sources, along with the controlled language index terms used to describe the sources, were then analysed to develop keywords for this stage. A second search using these identified keywords and index terms was then conducted across all included databases. The databases that were searched included: MEDLINE, CINAHL and PsychINFO. The search terms included infant, foster care, out-of-home care, foster parent, foster caregiver, foster family, kinship caregiver, prenatal substance exposure, neonatal abstinence syndrome, fetal alcohol spectrum disorder, drug exposed, alcohol exposed, best practice, research and program evaluation. The preliminary search strategy is appended (See Appendix I).

The search for relevant grey literature included: Canadian federal and provincial government child welfare sites and key Canadian and US websites for child welfare and foster parenting (Canadian Centre of Excellence in Child Welfare, Zero to Three, Child Welfare Information Gateway, Child Welfare League of America, Canadian Child Welfare League of Canada, and Ontario Practice and Research Together). Grey literature is defined as *information produced on all levels of government, academia, business and industry in electronic and print formats not controlled by commercial publishing ie. where publishing is not the primary activity* (International Conference on Grey Literature (Luxembourg 1997, expanded in New York 2004).[39]

Stage 3

The reference lists of all retrieved reports and articles were searched for additional sources in the final stage of the process. In addition members of the project advisory group, including knowledge users, were consulted and asked to identify literature (in particular grey literature) that met the review inclusion criteria. Only studies published in English were considered for inclusion in this review.

Reference software was used to manage the list of all the retrieved citations and all duplicates were removed. If retrieved theses or dissertations were related to a peer reviewed publication, the theses or dissertations were removed. Articles were then assessed for relevance to the review based on the information provided in the title, abstract and descriptor/MESH terms by two independent reviewers. When relevance was not clear after this review, the full article was retrieved. Disagreement was resolved by discussion with a third reviewer. In accordance with the JBI review manual, the four sources that were identified during searching for inclusion in this scoping review that were authored by one of the review authors (LM) were assessed for inclusion by two other reviewers to limit bias.

Data extraction

Data was extracted by two independent reviewers from papers included in the scoping review using a data extraction tool developed for this review (Appendix II). The data extracted included specific details about the populations, concept, context, and study methods of significance to the scoping review question and specific objectives. Both a primary reviewer and a secondary reviewer reviewed each source. Any disagreements that arose between the reviewers was resolved through discussion, or with a third reviewer. The draft data extraction tool was modified and revised as necessary during the process of extracting data from each included study.

Data mapping

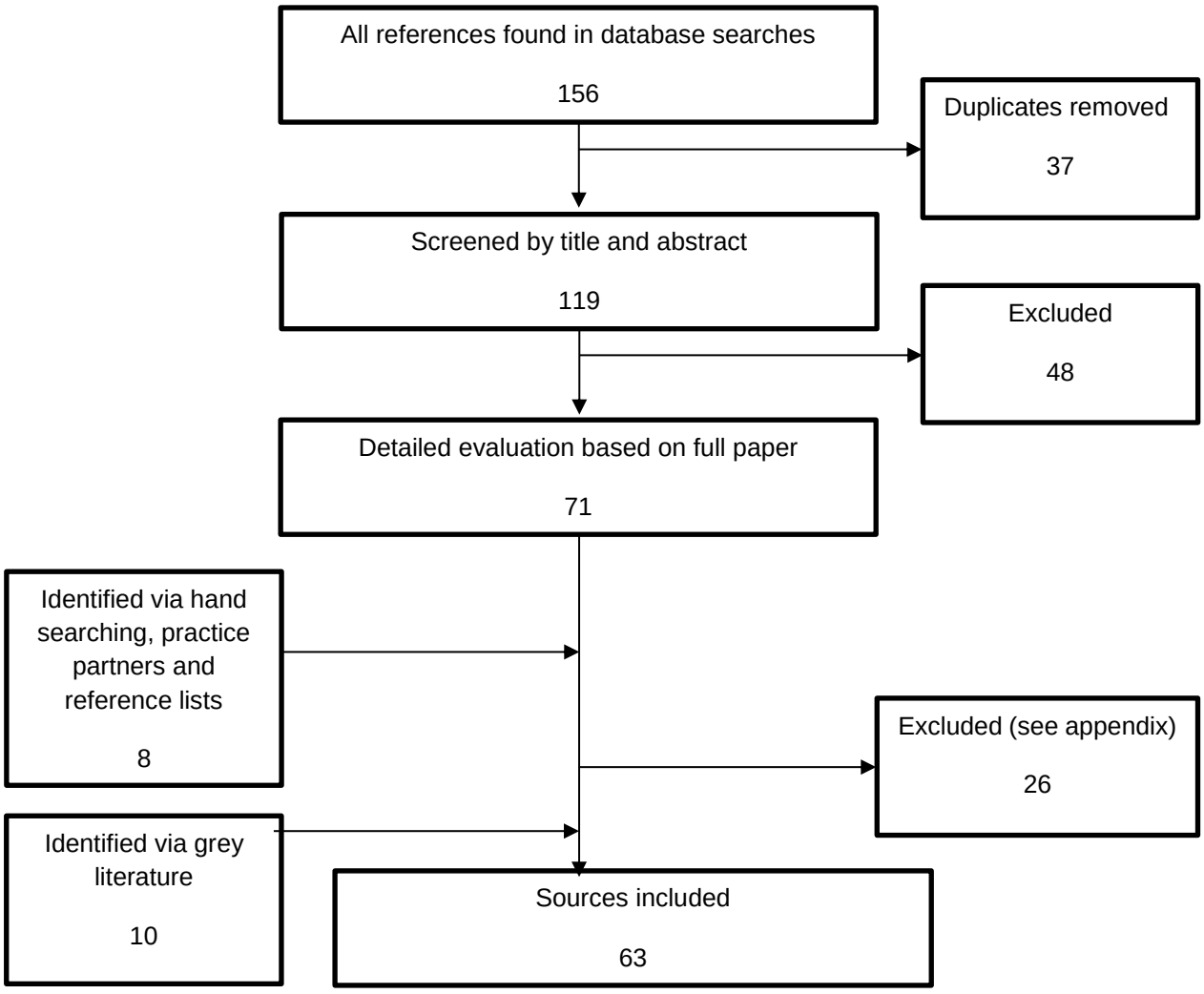
An overview of all the included material was summarized in tables and figures, which mapped the literature. Literature was tabulated using the following headings: type of source, area of focus/intervention, country of publication, methodology, primary aim of article, sample size and characteristics, key findings, and recommendations for practice, policy and research. A narrative summary and visual map of key themes are provided.

Review results

Description of studies

The database searches produced a total of 119 citations after duplicates were removed. The titles and abstracts for these citations were screened and 71 citations were considered for full text review. Following this step 45 sources were identified for inclusion. 26 sources were excluded at this stage, primarily due to the age of the sample and the articles not being accessible. A further 16 sources were identified from reference list review and practice partners. A flow chart showing the number of citations is detailed in Figure 1. A summary table identifying excluded studies with rationale for exclusion is provided in Appendix III. In total, 63 sources are included in this review.

Figure 1: Flow chart of source selection

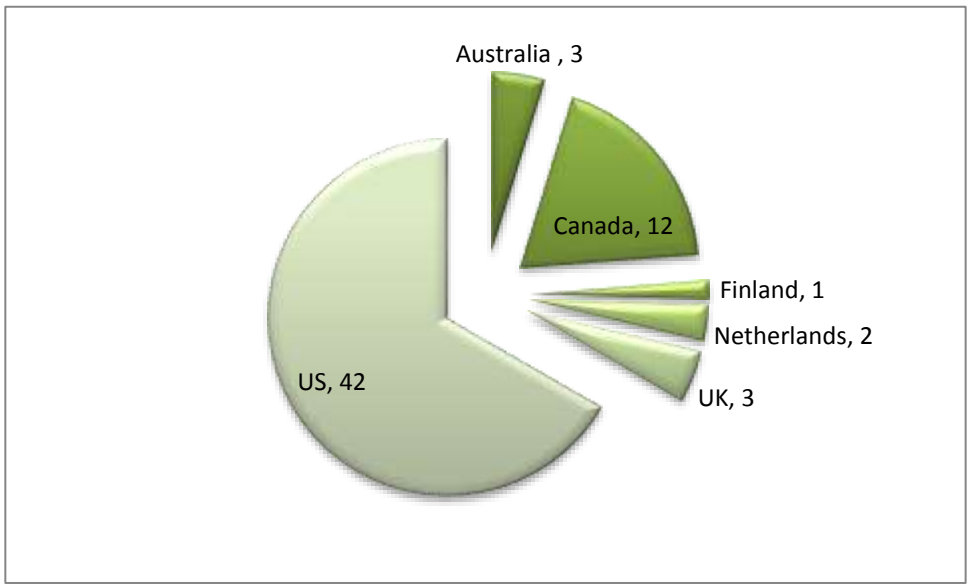


Extraction results

Source characteristics

Country of publication. The sources included in this review were published in the following six countries: United States (42), Canada (12), Australia (3), the United Kingdom (3), the Netherlands (2) and Finland (1). Of the 12 sources published in Canada, six were specific to British Columbia, five to Alberta and one to Manitoba. Of note, one source of the three Australian sources compared child welfare systems in Australia, Canada, Scotland and the United States. This source was included as Australian as it was published through an Australian institution.

Figure 2: Location of publications



Type of source. The following types of sources were included in this review: primary research articles (35), peer reviewed non-research literature (narratives (11), and grey literature, including literature reviews (5, including 4 general and 1 systematic), practice guidelines and information sheets (5), narratives (4), policy (6), training programs geared to foster care providers (3), commentaries (2), and a Master's Thesis (1). Of the 61 articles, 38 were from peer-reviewed sources.

Research design. A range of methodologies was employed in the 33 research articles and 9 narrative articles. At times, it was difficult to determine the research design, as it was not clearly stated or explained. 15 sources were qualitative, including: grounded theory (2), narrative (9) and case study (3). 18 sources were quantitative, including: randomized control trials (5), cohort studies (8), cross-sectional (1), longitudinal (5), on line survey (1), descriptive (5). 2 studies were mixed methods.

Data collection approaches. The following approaches to data collection were employed in the primary research articles: psychometric instruments (15), interviews (12), biological testing (8, with 4 cortisol), semi-structured interviews (7), case study or case series (6), surveys or questionnaires (6), observation (5), open-ended interviews (3), structured interviews (2), and focus groups (1). Many researchers employed multiple data collection methods**.**

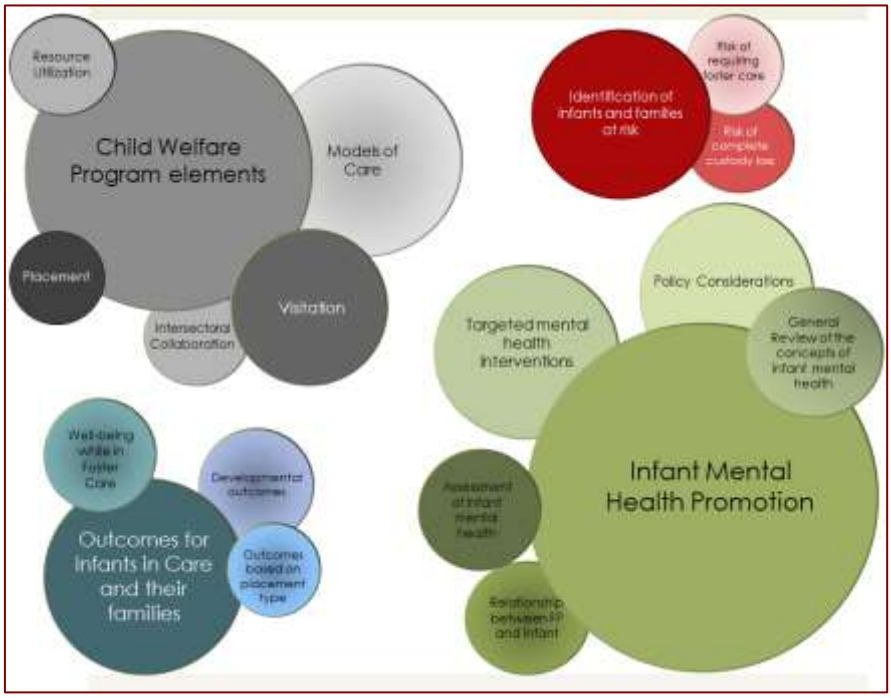
Sample characteristics.

The focus population for this review was infants under 12 months of age. During the course of the review it was noted that use of the term “infant” in studies and reports varied depending on the country of origin. For example, in the UK the term “infant” is used for children up to six years of age. Infants were grouped in with toddlers (up to age three) in many sources. Studies and reports were included in this review if there was a significant focus on or approximately half of the sample was infants less than one year of age. In the included research studies, age characteristics included: under the age of two (6), under the age of one (4) and under the age of three (2). One source examined infants and children under the age of five, but was included in this review as half of the sample was under the age of one. Three sources examined infants and toddlers, but did not specify age. Three sources examined infants longitudinally, with recruitment beginning during infancy. Four sources examined foster caregivers or foster families, and four sources specifically examined the foster caregiver-infant dyad. Four sources examined the biological mother or the biological mother – infant dyad.

Primary aim of source

Mapping the aim of each source resulted in identification of four core themes: (1) infant mental health promotion for infants in care; (2) child welfare program elements; (3) identification of infants and families at risk of requiring foster care; and (4) outcomes for infants in care and their families

Figure 3: Thematic map of sources



Key themes

(1) Infant mental health promotion for infants in care

This theme was developed from 27 sources that included the following categories: general review of the concept of infant mental health (6), the importance of the relationship between foster care provider and infant in supporting infant mental health (5), descriptions of specific targeted infant mental health interventions (7), assessment of infant mental health (4), and policy considerations for supporting the mental health of infants in foster care (5).

a. General review

Sources included three information sheets[97-99] and an evidence review[55] from public organizations (Canadian Centre for Children's Well Being, Harvard Center for the Developing Child), one peer reviewed article and one thesis. The review sources all summarized key concepts from emerging brain science and highlighted the importance of the first three years in life for socio-emotional development, in particular for infants and young children who are considered vulnerable. Infants in foster care were specifically identified as a vulnerable population. Guidance and advice for addressing issues such as trauma and stress was provided for foster care providers and social workers.

Key strategies included: addressing other family adversities (such as violence, mental health issues, poverty, lack of safe housing); minimizing the number of placements to support stability and attachment; collaborating with health and early childhood specialists; addressing attachment and dysregulation; supporting foster care providers to build effective relationships with infants and young children; and maintaining attachment with birth families.

b. Importance of relationship between foster care provider and infant

Five sources addressed the importance of the relationship between foster care provider and infant in supporting mental health. All three sources were peer-reviewed articles reporting on quantitative research studies (two experimental and one cross-sectional).

The first experimental study by Bick et al.[49] studied the association between oxytocin production, electrophysiological brain activity, and expressions of delight (as a measure of commitment to the infant) during a videotaped play interaction of 43 foster mothers in response to their foster infants two times during the first 60 days of placement. The researchers noted positive physiological responses for these non-biologically related dyads. They suggested that biological systems might be associated with the development of a maternal attachment to foster infants for foster mothers. The second experimental study by Bernard and Dozier[47] examined how 70 foster care providers (65 females and 5 males) communicated their expressions of delight to infants and young foster children in their care. Foster care providers completed a short interview on their relationship with the child and caregiver (depression) and infant (time with caregiver) characteristics were measured. The dyads were videotaped during a play interaction and displays of delight were coded. Foster care providers who were more committed to their children showed greater delight during play.

The third source was a cross-sectional study by Cole[59] that described the quality of relational and environmental factors in 46 foster relationships (12 kin and 34 unrelated care providers) at two points of time. In spite of a number of medical and physical problems (including prenatal substance exposure), 67% of the infants displayed secure attachment behaviors. Of those infants who displayed insecure attachment, 87% displayed disorganized/disoriented attachment styles. Both

positive (well-organized home environment, secure caregivers, adequate learning materials) and negative (care provider's own childhood abuse experiences) factors were proposed that influence the quality of early attachment relationships.

Two qualitative sources from Marcellus[77,78] describe the experiences of families taking on the role of foster care provider for infants with prenatal substance exposure. A three-phase model was developed to represent this process and support recruitment and retention. Recommendations were developed for the child welfare system. The capacity of foster care providers to provide sensitive and consistent care was identified as a key strategy for supporting the well-being and development of infants who may be vulnerable already related to their substance exposure.

Key findings across these studies were that strong caregiver commitment, responsive and sensitive caregiving, stable placements, and the availability of developmentally appropriate learning materials were important for secure infant-caregiver relationships and attachment.

b. Specific targeted infant mental health interventions

For the purposes of this review, an intervention was defined as *specific activities intended to bring about change in some aspect of the status of the target population.* Seven peer-reviewed articles described the impact of four different interventions that were developed specifically to support the mental health of infants in foster care: the Attachment and Bio-behavioral Catch-Up (ABC) intervention, the Foster Family Intervention (FFI), the New Orleans Intervention Model, and the Promoting First Relationships (PFR) intervention. The interventions were tested on samples ranging in size from 46 to 210. Improvements were noted across attachment and behavior dimensions for infants and relational dimensions for caregivers and parents. All researchers concluded that the interventions needed further testing and testing in different contexts. Information about the interventions is summarized in Table 1.

Table 1: Summary of targeted infant mental health interventions

Intervention	*Lead researcher*	*Description*
ABC (Attachment and Bio-behavioral Catch-up)[47,48,65]	Mary Dozier	ABC is an attachment-based intervention that was developed to help caregivers provide nurturing care and engage in synchronous interventions with their infants. It was designed to help caregivers provide nurturance when they would not naturally do so, and when infants do not signal their needs. It has been used with both foster caregivers and birth families. The target population for this intervention is caregivers of infants six months to two years old who have experienced early adversity. The intervention helps caregivers re-interpret behavioral signals, provide a responsive, predictable environment, and decrease their own behaviors that could be overwhelming or frightening to a young child. The intervention is manualized with 10 weekly sessions. Sessions are implemented by parent coaches who provide home-based training. The intervention includes: videotaping of parent-infant interactions, reflective practice principles, "in the moment" feedback and homework. The ABC is rated by the California Evidence-Based

		Clearinghouse for Child Welfare as a program with strong research evidence (Scientific rating 1, well supported) and a high child welfare system relevance level. Parents and foster caregivers demonstrated enhanced synchronous behaviors, and children demonstrated improved attachment, cortisol production and executive functioning.
FFI (Foster Carer-Foster Child Intervention)[92,93]	Hans van Andel	The FFI was developed from a preventative perspective to help foster carers recognize and cope with the stress that foster children under the age of five experience. The FFI focuses on interaction in the first weeks of placement, when the child and foster carer are building their relationship. It is based on principles from attachment theory, psycho-education, mindfulness therapy and video reflection. The intervention is composed of six specific and interrelated themes: getting to know your child; emotional security; management of emotions; dealing with feelings of insecurity and trauma; giving trust; and surroundings and blind spots. Research shows positive effects on child domains of responsiveness and involvement and parent domains of sensitivity, structuring and non-intrusiveness.
New Orleans[50]	Charles Zeanah (Scotland adaptation by Kathleen Boyd)	The New Orleans intervention is a comprehensive community-based program targeting synchrony, nurturance, stability, and commitment within a large systems framework. It was designed to provide integrated assessment and mental health services to children under the age of two in foster care and their birth and foster families. An intensive assessment phase is followed by implementation of the court-ordered plan. The relational-based intervention incorporates attachment-based assessment, the Circle of Security, parent-infant psychotherapy, and video-interaction guidance. The intervention was developed in response to federal legislation that mandated faster resolution of foster placement to implement a permanent plan. The following outcomes were noted: terminations of parental rights increased and return of children to birth parents decreased; length of time in foster care did not change overall; and maltreatment recidivism was reduced. *Note:* There is an RCT of an adapted version of this intervention underway in Glasgow.

PFR (Promoting First Relationships)[87]	Jean Kelly Susan Spieker	PFR is an attachment-based training program for service providers who work with parents and other caregivers of young children from birth to three years. The program helps nurture young children's social and emotional development through enhancing the relationship quality between caregiver and child. Program elements include videotaping of caregiver-child interactions, providing positive feedback, focusing on the feelings and needs that underlie distress and negative behaviors in children and their caregivers, and promoting a wondering stance in parents and caregivers. The program has been implemented with homeless families, childcare organizations, Early Head Start programs, children with disabilities and their families, low-income grandmothers who provided care to their grandchildren, foster caregivers, and family support workers. Providers with PFR training experienced the following: learned to be more empathetic, learned new strategies for dealing with behavioral issues, used more positive, instructive and reflective behavior to coach caregivers during interactions, and appreciated the role they played in the child's social and emotional development. Foster caregivers who received a 10-week home-based intervention from PFR-trained providers demonstrated the following: greater understanding of socio-emotional needs of child, increased sensitivity, and more understanding of child's competence. No significant changes were noted in children. Dyads were still intact at 6-month follow-up.

c. Assessment of infant mental health

Three peer reviewed articles and one public information sheet were included that described the importance of regular assessment of mental health for infants and young children in foster care. The peer-reviewed articles included narrative description of a collaborative program and description of specific clinical guidelines. The collaborative program reported by Wotherspoon, O'Neill-Laberge and Pirie[100] was based on transactional and developmental theoretical frameworks and developed to target infants and young children up to the age of three that are at risk of mental health disorders. A consultation model was developed for this program that is employed with child welfare teams to provide developmental and emotional screening and promote the integration of attachment and trauma based strategies for addressing behavioral challenges, rather than using behavioral approaches alone. The program has been evaluated and received high satisfaction ratings (7.13 to 9.83 out of 10).

A retrospective child welfare chart review methodology was employed by Williams et al.[96] to examine the impact of improvements in an assessment process that was embedded in a hospital-based model program (Foster Care Hub Clinic) designed to screen young foster children and link them to infant mental health services. A before and after evaluation (151 children before and 281 infants after modifications were made to infant mental health services) found that these improvements led to strengthened linkages to infant mental health services; 80% of children were

appropriately referred and received services compared to 61%. Improvements included: training all clinicians working in the clinic instead of relying on a few specialists; consistent use of a mental health screening tool; directly referring all infants with prenatal substance exposure from the Hub Clinic to the Early Childhood Mental Health Program (a focus on development was seen by parents as less stigmatizing than a focus on mental health); and developing a protocol that specifically identified logistical steps that reduced barriers and gaps in the referral process.

The third peer reviewed article by Silver and Dicker[84] summarized existing practice guidelines for mental health assessment of infants in foster care and provided modifications based on legal requirements and other issues related to foster care. Crucial elements of infant assessment included: using a developmentally appropriate perspective, employing an interdisciplinary approach, and involving caregivers in the assessment process to reduce distress. Multiple points of assessment were recommended in the first three years because of rapid development. Mental health evaluations must take into account the unique circumstances of infants in foster care and the complexity of circumstances related to multiple stakeholders. Assessment should have a prevention focus and contribute to permanency planning.

The public information sheet was produced through the Canadian Centre of Excellence for Children's Well Being[97] and focused on describing emotional trauma in infancy. Components of an effective case plan for traumatized infants and their parents were identified. For foster care, careful planning and concurrent planning is recommended for infants to avoid multiple placements.

Recommendations for future program development related to assessment across these sources included: providing inclusive mental health screening and referral to attachment and relationship-based services as part of a comprehensive cross system interdisciplinary program; integrating family members in planning and activities; and approaching care from a developmentally appropriate perspective.

d. Policy considerations

Seven sources addressed policy issues related to infant mental health. Five were published by government, non-profit, research center or public advocacy organizations (Harvard Centre for the Developing Child, U.S. Department of Health and Human Services, Zero to Three). Two were peer-reviewed sources that summarized the current state of evidence in this field and provided recommendations specifically for policy makers and government funders.

The Centre for the Developing Child at Harvard has played a leadership role in the US in the past 10 years in translating emerging brain science for a range of child focused audiences, including child care, parents, and health and social care providers. This recent document was developed specifically for child welfare teams, agencies and systems.[55] Developmental science was applied to potential system improvements. Three ways identified to improve outcomes for child welfare included: strengthening core life skills (related to self-regulation and executive skills); developing responsive relationships; and reducing external sources of stress. For infants this results in healthy development and for adults (both birth and foster care providers) this results in safe and responsive caregiving. Child welfare-specific strategies were outlined in each of thee areas.

Zero to Three is a leading US organization that translates the science of early childhood into evidence informed practical resources to help parents and early childhood professionals support healthy development. A number of policy and practice resources have been developed specifically related to infants in foster care. In this review, three sources were included from this organization. The first was a policy agenda for infants and toddlers in foster care, including guiding principles, policies and practices.[42] The second was a state-by-state review of child welfare initiatives and

policies that guide work in addressing the needs of maltreated infants and toddlers.[56] Significant challenges were identified related to meeting this goal. The third was a call to action to invest in and focus on infants in foster care.[79] Key elements of a policy agenda were identified that focused on relationships, early intervention, family support and a developmental perspective in all child welfare policy development.

The US Department of Health and Human Services document reviewed state child welfare policies related to prevention, intervention, identification and treatment of prenatal substance exposure.[101] A five-point intervention framework was included, and foster care was addressed within the neonatal and early childhood periods of time. Although this was specific to the US context, some of the key points were relevant to the Canadian context: there was variation across states in practice and policy; there was inconsistent data collection across states, and programs were overwhelmed by volume.

The two peer reviewed sources included a commentary and a policy review, both highlighting the importance of the early years, a continued lack of movement and progress in creating developmentally responsive programs and policies, and a scarcity of available, feasible evidence-based practices. Cohen[57] reviewed the science of early social emotional development and the interventions that research showed were effective for infants and toddlers in foster care to thrive. Although often having more fragile health and being at greater risk of developing mental health disorders, infants in foster care were less likely to receive developmentally appropriate health care. Visitation was specifically identified as one of the best predictors of successful family reunification. Barth[43], a leading researcher in the child welfare field, addressed the continuing inadequacy of child welfare systems over the past twenty years to refocus services on the needs of very young children and their families in as part of his commentary on the Promoting First Relationships Intervention. He noted that there continued to be a scarcity of available evidence-based practices for parents. In particular he focused on the importance of developing programs and interventions that were feasible to implement.

Key findings across these peer reviewed and policy sources included: there is a wide variation in policies and practices across regions; data is inconsistent; there is a key need to refocus child welfare services on the youngest children; child welfare services have not kept pace with programs to keep up with volume or science to address the needs of this young population; developmentally appropriate supports are key; systems are underfunded; and intensive cross-sectoral collaboration is required. In particular, these sources identified that it is important to note there are distinct developmental needs in this population and programs and services need to be tailored this way. Developmental practices for infants that need to be addressed in policy included: promoting parental contact, understanding brain development, integrating principles of brain development and infant mental health into practice and policy, and providing responsive and stable caregiving relationships.

(2) Child welfare program elements

This theme was developed from 23 sources that included the following categories: visitation (5), placement (1), models of care (15), and resource utilization (1).

a. Visitation

Parent-child visitation was the focus of five sources. One was a practice and policy brief from Zero to Three (developed in partnership with law organizations) and four were from peer-reviewed journals, including three review articles and one research article. The Zero to Three resource was designed for judges and attorneys to assist them in understanding the impact of attachment,

separation and visitation on infants and young children.[85] Judges and attorneys were encouraged to explore how they could safely expand opportunities for visitation. Strategies for successful visitation were provided, including exemplars of promising practices such as: therapeutic visitation programs, supervised visitation centers, and around-the-clock visitation.

The review article by Miron et al.[81] compared visitation practices across four countries (Canada, Australia, US, and Scotland). Using a human rights perspective, they compared and contrasted the benefits and disadvantages of visitation for infants and their parents. They concluded that there needed to be greater consideration of the development and mental health of the infant during the development of visitation plans. The second review article by Schofoeld and Simmons[83] explored the issue of parent contact throughout care proceedings and found that contact plans need to take into account both the developmental needs of the infant and the rights and capacity of the parents to develop as parents. Factors were identified that need to be considered together when developing contact plans, including the frequency and length of visits, the location quality for visits, and skilled parent support during visits. The third review article by Burry and Wright[53] examined the use of visitation as a child welfare mechanism for contributing to permanency planning for children under the age of two with prenatal substance exposure. The researchers suggested that although visitation remains an important intervention, there are many factors that contribute to its productivity and effectiveness. The involvement of foster care providers was identified as a key component of successful visitation as they faced many of the same challenges as social workers in working with families. Suggestions for parent teaching were provided.

A mixed method study by Humphries and Kiraly[68] studied the practice of visitation as a child welfare intervention in Australia. They audited the case files of 119 infants less than one year of age in foster care and interviewed 118 participants, including foster care providers, social workers and other team members. Visitation was identified as an important, but complex and contentious intervention, particularly when continued parental substance use was a factor. In this study high frequency visiting (four or more visits per week) did not improve rates of reunification, however participants suggested that frequent visiting that took place without skilled support and within the context of adversarial processes was not likely to be effective. Knowledge of attachment and the impact of addiction was required by social workers to be able to understand these complex dynamics and develop optimal and individualized visitation schedules.

Recommendations for visitation across these sources included: ensuring the stage of development is considered when developing plans, ensuring that visitation is in the best interests of the infant; providing education to all involved providers about infant mental health, prenatal substance exposure, and the impact of complex family conditions such as addiction on parenting (including social workers, early childhood workers, visit supervisors, judges and attorneys), ensuring high quality visitation in safe environments, developing individualized plans that are clear to everyone involved and as least restrictive as possible, balancing quality and quantity in visitation, and overcoming barriers to visitation (such as transportation, child care, schedules that accommodate both the infant and parent needs).

Of note, the Zero to Three source indicated that the child welfare field was trying to move away from the term visitation to terms that more adequately describe the quality and quantity of time that is needed to support attachment.[85] These terms included: family time, family access, and family interaction.

b. Placement

One source was identified with a focus on placement. This literature review by Miron, Sujan and Middleton[82] described issues for child welfare workers for infant placement when there are older

siblings. Theoretical approaches of attachment and infant mental health framed this review. Literature was reviewed in relation to balancing the need to support attachment with keeping siblings together. Recommendations were provided to support child welfare workers in their decision-making, including careful consideration of the costs and benefits of disrupting a primary attachment to place a child with their siblings.

d. Models of care

15 sources were identified related to different models of supporting infants in foster care. Seven sources were articles in peer-reviewed journals (five research and three narrative) and three were foster care provider education documents.

A grey literature review by Beckman, Knitzer, Cooper and Dicker[46] examined the issue of mandated parent training programs for parents of young children associated with the child welfare system. A number of challenges were noted, including inconsistency and inflexibility. Recommendations for improvement are provided. One qualitative research article described the experiences of eight foster mothers in providing foster services for mother-infant dyads.[40] Although this type of placement was felt to be valuable, participants felt that there was little infrastructure in place to inform this care, including assessment of the caregivers, policies and procedures, training and supervision. Key factors influencing success and implications for practice focused on developing this infrastructure. Johnson[69] describes a process developed in the UK to support infants in their transition from hospital to foster home. Infants in care stayed twice as long in the hospital, suggesting they had a more severe form of NAS. Resources were developed including scoring tools, DVD of foster parent experiences, and training on home-based infant opioid medication administration.

13 sources were related to six specific established programs: the Safe Babies Program in British Columbia (6, three peer reviewed and three education documents); the Vulnerable Infants Program in Rhode Island (2); the US crisis nursery program (2), the US CASA program (1), the US Safe Babies Court Team program (1) and the Collaborative Mental Health Program in Calgary, AB (1). For the purposes of this review and to differentiate from an intervention, a program is defined as *overarching responses, generally including a set of interventions and activities, to some aspect of the status of the target population*. Descriptions of the six programs are provided in Table 2.

Table 2: Summary of specific models of care

Model of care	*Lead researcher*	*Description*
Collaborative Mental Health Program (Canada)[100]	Evelyn Wotherspoon	The Collaborative Mental Health Program is a team of community-based pediatric mental health professionals that targets pre-school children from birth to age three years who are at risk for mental health disorders. The team offers developmental and emotional screening followed by a mental health consultation. The transactional model with a developmental perspective informs the program. The program has formed a partnership with local child welfare authorities to address the complex needs and risk factors associated with child maltreatment and caregiver disruptions. Routine screening for socio-emotional delays is

		conducted with preschool foster children. After observation, team members share ideas with caregivers to help them understand behavior from different perspectives, including attachment, regulation, relational, stress and trauma.
Court Appointed Child Advocate (CASA) program (US)[95]	National Court Appointed Special Advocate Association	This organization supports and promotes court-appointed volunteer advocacy so every abused or neglected child in the US can be safe, have a permanent home and the opportunity to thrive. CASA/GAL volunteers are appointed by judges to watch over and advocate for abused and neglected children, to make sure they don't get lost in the overburdened legal and social service system or languish in inappropriate group or foster homes. Volunteers stay with each case until it is closed and the child is placed in a safe, permanent home. Research has demonstrated that children with a CASA/GAL volunteer are substantially less likely to spend time in long-term foster care and less likely to re-enter care. The article included in this review was written by a CASA volunteer and is based on their personal case study.
Crisis nurseries US)[58]	Susan Cole	Crisis nurseries are part of a continuum of care of child welfare services. They offer a range of emergency support and follow-up services for families who are at risk of their children entering out-of-home care. Most crisis nurseries offer initial crisis assessment and intervention services such as respite, child care, caregiver counselling, after-crisis interventions such as follow-up care, and/or referral to community services. Over 50% of children served are under one year of age. The US Temporary Child Care for Children with Disabilities and Crisis Nursery Act of 1986, and the Child Abuse, Domestic Violence, Adoption and the US Family Services Act and Temporary Child Care for Children with Disabilities and Crisis Nurseries Act Amendments (1992) provided federal funding for establishing crisis nurseries. Forty-seven states obtained funding to establish a total of 175 crisis nurseries and two respite centers. The complexity and severity of problems of parents has shifted over the years from school or job related issues to more serious issues such as

		home crisis, substance abuse, and domestic violence. Evaluation data shows that crisis nurseries decrease parental stress, lower the risk of abuse and neglect, and enhance parenting skills.
Safe Babies Program (Canada)[44,45,76-78]	Lenora Marcellus	The Safe Babies Program is a specialized education and support program for foster caregivers who care for infants with prenatal substance exposure. Program elements include: standardized education program, peer support, specialized social workers, trained respite support, collaboration with health providers, and recommendations for foster caregiver recruitment and placement. Learning threads for the curriculum include: resiliency, safety and fragility; infant mental health and attachment; awareness of attitudes, values and beliefs; sensory integration; family self-care; and knowing strengths, boundaries and limitations. The education program includes the following modules: understanding women and addictions; the impact of substance misuse during pregnancy; partnership with birth families; acute withdrawal in the newborn; related health issues for infants; a foster caregiver's perspective on caring for substance-exposed infants (self-care); neurodevelopmental support (infant mental health); infant CPR.
Safe Babies Court Teams (US)[73]	Zero to Three	This model has been expanding as a systems-change initiative across the US. Community-engaged approach to expedite coordinated provision of services for young children in the child welfare system that has experienced maltreatment. Each team is a public-private collaboration between Zero to Three, local courts, community leaders, child welfare agencies and other partners. Each child benefits from: child-focused medical services (including screening for developmental delays); concurrent planning; quality early learning experiences; and frequent family time (supported by trained visit coaches). A high priority is placed on the support of birth parents in what they hope is a healing journey toward reunification with their young children. In this program it is recognized that birth families are coping with multiple social challenges, including racial inequity and intergenerational trauma.

Vulnerable Infants Program (US)[90,91]	Jean Twomey	The Rhode Island Program is a statewide care coordination program designed to promote permanency for substance-exposed infants; it is associated with a family drug treatment court specific to perinatal substance use. The program offers the following: coordination of comprehensive services with court, community and state agencies; services for pregnant and postpartum women, infants and their families; and education and training to court, state and community agencies. Team members meet parents prior to hospital discharge after birth and work with them until a permanent placement is identified. More than half of the infants were reunified within six months of the initial removal. 86% of the infants were in permanent placements by 12 months of age. With a supportive collaborative infrastructure, alternatives to infant removal should be considered more carefully.

Key program elements noted across these sources included: coordinated and cross-sectoral approach to service delivery, individualized to the needs of each community and their population, intensive and long-term commitment to service delivery for birth families to optimize the potential for family preservation, and strengths based approaches to service delivery.

e. Resource utilization

One peer reviewed research article was retrieved that described resource utilization related to foster care within the child welfare system. Based on the review of resource data for 6,170 infants Franca, Mustafa and McManus[67] estimated the labour costs of caring for infants with Neonatal Abstinence Syndrome (NAS) within a local department of children and families in the US. The number of infants with NAS has increased significantly and the number of infants followed by DSC also has increased. Based on their local costs for services up to six months of age they estimated that across the state this population required $4.3 million in social work labour costs (2.5% of the state budget).

(3) Identification of infants and families at risk of requiring foster care

This theme was developed from six peer-reviewed sources. These research-based sources analyzed maternal and/or infant characteristics that were associated with a higher risk of infants entering foster care. Kalland et al.[70] identified risk factors that were associated with involvement in the Finnish foster system, with a focus on the risk of permanent loss of custody. Maternal characteristics such as smoking during pregnancy, being a teen-age mother and not being married were associated with higher rates of infants being involved in the child welfare system. Zhou et al.[103], Australian researchers, examined the case files of 5,738 infants for factors related to foster care placement. Having experienced an event of child maltreatment and having a parent which uses substances were associated with a higher risk of being placed in foster care. Similar to the Canadian context, the researchers noted there was a substantial overrepresentation of Indigenous

infants in the out-of-home care system.

A Canadian study by Brownell et al.[51] used population data sets to evaluate the efficacy of a screening tool (*BabyFirst*) used to identify infants and families at risk of entering the child welfare system. The intention of the screening tool was to determine risk and then offer appropriate support and intervention to families with the purpose of mitigating or ameliorating risk. Similar to previous studies, factors such as financial difficulties, low maternal education level and previous interactions with the child welfare system were associated with the newborn infant entering out-of-home care.

Two sources examined the risk of loss of custody. Minnes et al.[80] studied cocaine-using mothers who did and did not maintain custody. Cocaine-using mothers who did not retain custody demonstrated higher demographic and obstetrical risks compared to mothers who did not use cocaine. Maternal characteristics associated with loss of infant custody included fewer prenatal care visits, heavier cocaine use, psychological distress, and a maternal history of childhood emotional neglect. In a similar study, Eiden, Foote and Schuetze[66] studied infant-mother dyads, with both cocaine-using mothers and non-cocaine using mothers. 19% of cocaine-using mothers lost their child within one month of birth compared to 0.02% of non-using mothers. Similar to Minnes et al., women who used cocaine had additional demographic and obstetrics risks. In the final article Larrieu et al.[72] examined predictors of permanent loss of custody of infants and toddlers in a sample of 93 mothers. They found that rather than specific risk factors (i.e. maternal education, substance-abuse history, psychiatric difficulties), the strongest predictor of loss of custody was cumulative risk. This suggests that there is not one specific risk profile of a mother who loses custody of her child and emphasizes the need for specific and intensive interventions.

A key finding across these sources was emphasis on the need for early and targeted interventions for families to enhance outcomes and reduce further involvement with the foster care system. Importantly, no one factor was identified which would categorically identify the risk of involvement in the foster care system or loss of custody. Intergenerational risks such as histories of abuse were noted. Specific and early interventions were required for reducing involvement and negative outcomes when in the foster care system.

(4) Outcomes for infants in care and their families

This theme was developed from seven primary peer-reviewed research sources. These sources identified what happened to infants and their families following involvement with the foster care system and how to optimize outcomes after involvement.

Developmental outcomes

Four sources examined the developmental outcomes of infants within the child welfare system, with three focused specifically on the developmental outcomes of infants in foster care based on the environment or placement type and one focused on infants at risk of experiencing abuse following reunification. Bruskus[52] employed Bronfenbrenner's human health ecology model and Bowlby's attachment theory to describe the relationship between infant outcomes and their environment. The lived experiences and adverse events that occur in infancy and childhood can result in poor health and developmental outcomes later in life. Two sources compared the developmental outcomes of infants based on placement type. Stacks et al.[88] studied the development of language trajectories in maltreated infants over a five-year period of time in a range of placements. The language development of maltreated infants did not differ by type of placement and the language development scores of maltreated infants on the whole were

determined to be below population means. Stacks and Partridge[89] then compared the neurological functioning, cognitive development, and socio-emotional development outcomes of infants in kin and non-kin placements. Infants in non-kinship care had more developmental concerns and stayed longer in care. Non-kinship care homes were considered to be of higher caliber, and located in safer neighborhoods. The fourth source by D'Angiulli & Sullivan[60] reported on analysis of the contribution of a specialized foster care program to developmental outcomes of substance-exposed infants. No atypical psychological development amongst the infants was noted and cortisol level trends were similar to typically developing infants.

Placement stability outcomes

Three sources studied outcomes related to infant well-being during and following involvement in the child welfare system.

Casanueva et al.[54] described the incidence of caregiver instability experienced by infants in families being investigated for child maltreatment and the factors associated with this instability. 85.6% of the infants experienced at least one change in caregiver before the age of two and 40% experienced four or more changes between infancy and school entry. Predictors were identified for both caregiver instability (infants having chronic health conditions, caregivers over the age of 40) and stability (physical abuse versus other kinds of abuse, high school education of the care provider, and initial placement change at less than three months, whish was associated with adoption). The authors proposed that caregiver instability occurs not just in foster care, but also in birth family environments. An Australian study by Delfabbro et al.[61] used the family characteristics of 498 infants in care to develop a statistical model for predicting the likelihood of subsequent notifications of child abuse. Over two thirds of the children came from families where there was evidence of multiple problems including severe neglect and financial hardship, domestic violence, substance use, and housing instability. Aboriginal status was significantly associated with these reasons for entering foster care. The researchers concluded that child protection services are unable on their own to address these larger societal issues and that broader system responses are required. In the third study Dicker[62] used a case-series format to discuss the outcomes of infants and toddlers who were hospitalized while in foster care. There are significant legal and consent issues surrounding the medical care of infants, which may result in negative health and wellbeing outcomes for those in foster care.

In summary, both positive and negative outcomes were identified for infants and their families following contact with the out-of-home care system. Key findings related to promoting positive outcomes include: promoting stability for infants in a range of placements (including birth families, kinship care providers, foster care providers, and adoptive families); implementing programs and case planning policies from trauma informed, culturally safe, developmentally appropriate perspectives; and partnering with community social agencies that are able to address issues related to social disadvantage. Outcomes of infants in the out-of-home care system are influenced by both their in care experiences and their experiences prior to entering care, which include the impact of multiple family social challenges.

Discussion

The discussion is organized within the three questions proposed for this review. The four themes generated during this review have applicability across the review questions.

1. **Characteristics of interventions and programs that support optimal physical, cognitive and social-emotional development for infants in foster care**

The care strategies and interventions identified during this scoping review were primarily focused on supporting social-emotional development (often framed as infant mental health). Cognitive development was included to a lesser degree in some sources and related to neurodevelopment. The infant mental health field is described in the literature as still relatively young and continuing to develop, emerging as a developmental and clinical field a little more than 50 years ago. Scientific publications in this field have been rapidly increasing every year during this time, from 13 articles in PubMed in 1966 to 516 in 2016.

Although the intent of this scoping review was to locate resources related to infants in foster care with prenatal substance exposure, the sources most often discussed infants in general terms, and identified that a significant number of infants in care experienced prenatal substance exposure. Few sources referred to physical development other than stating that comprehensive models of care included connections to health services. The terms *Neonatal Abstinence Syndrome*, *Fetal Alcohol Spectrum Disorder* and other prenatal substance use-related terms were rarely used.

The care strategies and interventions that were identified in this review were both formal and informal and addressed both family and systems based approaches. Overall, there are still few formal evidence-based interventions and programs that have been developed specifically for infants and young children in foster care.[43] Most interventions utilized with this highly vulnerable population are under-researched, implemented by clinicians undertrained in issues of foster care, and provided in outpatient settings stressed with multiple mandates and limited resources.[104-107]

The three interventions and six programs that were identified in this review had many similarities in their theoretical underpinnings, intervention elements, and infant and caregiver outcomes. Although specific interventions and programs varied in their intent and design, several key elements were noted: attachment/relationship focused, cross-sector collaboration, service coordination, and early intervention.

A key thread across most sources was the importance of taking a developmental perspective to how interventions, practices, services, and programs are oriented. Most foster care practice documents (such as guidelines, policies, and standards) are generic from a developmental perspective even though they are applied from infancy through to older adolescence.

2. Characteristics of interventions and programs that improve the satisfaction and retention of foster care providers.

One source was identified that focused explicitly on the satisfaction and retention of foster care providers who were caring for infants with prenatal substance exposure. The peer-reviewed article by Marcellus[77] used resilience as a framework for program development and supporting recruitment, retention and satisfaction in foster care providers. Strategies were identified for during recruitment and preparation to foster, during the ongoing work of being foster care providers, and as fostering ends. Supporting the development of family capabilities and recognizing and addressing family demands can contribute to healthy and positive fostering experiences and hopefully longevity in the role. Strategies identified as contributing to the development of successful programs included: having foster care providers participate as collaborators in designing and offering services; designing services that are adaptable to a range of community contexts; involving community partners outside child welfare; and having developmentally appropriate program components.

An additional limited number of sources were located and included in this review that explored the experiences of foster care providers, but the focus was more on their process of becoming a foster

care provider,[78] perceptions of specific program models, [40] or their relationships with and commitment to foster children in their care [47,59,64] rather than their own personal satisfaction with fostering. A peer-reviewed article by Marcellus[78], because it focused on the overall process of becoming a foster care provider and the meaning they found in caring for infants with special needs, included elements related to retention – what kept them fostering and what contributed to them leaving fostering. Factors contributing to caregivers leaving fostering included: changes in personal or family circumstances; and being unwilling to deal further with the complexities of the child welfare system (including feeling a lack of respect and a lack of support).

Although not explicitly framed as satisfaction or retention, some strategies were identified and framed as contributing to overall experiences of fostering and the success of the placement, including providing comprehensive initial training, having clarity about their role, experiencing a good fit with the infant or child placed in their care, having allocated and consistent social workers; feeling like they have a voice in decision making about the infant; figuring out how to deal with their feelings of loss when children leave, and being able to access supports (such as peer networks, continued education, respite).

Literature in this area may be more likely to be located in internal government, child welfare and fostering organization documents (for example satisfaction surveys or exit interviews) and therefore not accessible for this review. Literature also may be available that is generic to fostering in general rather than being specific to the infant population.

3. Characteristics of interventions and programs that supporting birth parents with substance use challenges to stay connected to their infants and gain confidence in their parenting role

With the significant focus on infant mental health, supporting birth parents to stay attached to their infants was a key focus of the majority of sources in this review. These sources framed this concept as: commitment, delight, secure base, and sensitivity. However, this support was framed generally from a child protection perspective.

The article by Burry and Wright[53] included strategies that were explicitly focused on supporting foster care providers to work with birth families within the context of visitation, in particular those where maternal substance use continued and infants required care specific to their substance exposure. Several sources included some content on working with birth families as part of the overall experience of foster caregiving. The article by Adams and Bevans [40] on mother and baby fostering highlighted the value of being able to work closely with mothers in the early days to promote attachment and help them build skill and confidence in their parenting abilities.

The Safe Babies Program facilitator's guide [45] included two modules on partnerships with birth families, one on understanding women and addiction (with opportunities to examine personal attitudes and judgments, learn about other complex challenges experienced by women including trauma, violence and mental health issues) and one on partnering with birth families, which included content on trauma informed care, culturally safe family practices in particular related to supporting Indigenous families, and FASD informed care, as some birth parents may themselves have FASD.

Some of the sources related to infant mental health focused on interventions and practices that supported both birth parents and foster caregivers to have positive attachments and relationships with young children, but there was no content on how foster care providers could work with and support birth families.

Visitation appeared to continue to be a contentious issue, with interests varying depending on perspective. What was seen as in the best interests of the infant also varied. The sources on visitation [53,68,79,81,83,85] included broad strategies from a child welfare perspective, specific strategies for social workers, but less on foster care providers themselves. A key point for child welfare professionals working with foster care providers was to ensure that they understood the rationale for and importance of visitation in relation to attachment, reunification and permanency planning. Most of these sources focused on visitation that happened outside the foster care home, and the foster care provider role was to have the infant ready for visiting, settling the infant down after they returned from visits, and communicating effectively with birth families about infant care. Cautions are identified in literature external to this review related to interpreting study findings where higher levels of visitation were not found to be effective; researchers also identified that often the conditions, resources and supports for visitation were not optimal. Unless visiting conditions are optimal, it is not appropriate to use these studies as justification for limiting parent contact.[108]

The concept of being able to proactively identify risk factors that were associated with infants requiring foster care emerged in relation to how families could then be connected to interventions and programs that supported family preservation. A challenge with risk identification processes within resource-limited contexts is that the only intervention available may end up being foster care rather than integrated community based family supports.

Current key directions in British Columbia related to child welfare and foster care are trauma-informed approaches to care, culturally safe programs and practices, family strengths perspectives and a developmental approach to service delivery. Other than the developmental approach, these promising directions were not as visible in the literature included in this review.

Limitations of the review

This scoping review identified the current range of evidence available related to the support of infants in foster care with prenatal substance exposure and their families. Because prenatal substance exposure was frequently identified as a population characteristic rather than an explicit focus of sources, all evidence related to infants in foster care in general was included. The aim of the review was not to provide generalizable conclusions other than that related to the current state of knowledge. Quality appraisal was not conducted on the sources included in this review. The review was also limited to a ten-year period of time and three key databases. Some potentially relevant sources may not have been identified with these search strategies. Because the review focused on infants under one year of age, sources were excluded for toddlers. These sources may have included evidence that would also be relevant for this review. Studies were limited to those published in English only and in settings with resources and social service contexts similar to Canada.

Conclusion

Infants represent a significant proportion of children in foster care. The experience of foster care for infants has been identified as an adverse event or risk factor for optimal development later in life. However, infants also have a great capacity for overcoming early adversities. The aim of this scoping review was to explore the evidence that is currently available to support infants in foster care, keep birth parents connected to their infants, and support foster care providers caring for infants and their families.

Practitioners, researchers and policy makers have suggested that despite decades of data

indicating that the need to refocus child welfare services on the youngest children in foster care, services have not kept pace with programs that address both the needs of these young children and their caregivers. Over this period of time there has been an explosion in the science of early development and a growing awareness of the importance of mental health for infants and young children for developing physical and mental resiliency throughout their lives. The need for foster care for infants is also embedded within a context for families of multiple layered stressors and challenges, including substance use, mental health disorders, violence and trauma, and the root causes or determinants of health that contribute to these stressors, in particular poverty. Investing in the support of infants in foster care, their caregivers, and birth families will have long term benefits for communities and society. Intervention during the early years holds significant potential for promoting positive developmental pathways and family preservation.

Recommendations for practice and research

Implications for practice

The findings in this scoping review suggest that there are several key recommendations for practice:

- Child welfare programs, services, and interventions need to be provided from a developmental perspective. For infants in particular, all interventions, practices and policies need to consider the importance of stability and quality in relationships on early brain development;
- Consistent available data for the infant in care population is needed across provinces in Canada to appropriately plan, improve and evaluate child welfare programs, services, and interventions;
- Participatory approaches to program development, through engagement of birth, foster, and adoptive families, and Indigenous communities in partnership with Indigenous child serving agencies, may contribute to a more responsive and effective child welfare system;
- Continued education and capacity building is needed for foster care providers and social workers related to infant mental health and the effects of substance use; and
- Collaborative, interdisciplinary, cross-sectoral community-based approaches are necessary to effectively address other compounding family adversities.

Implications for research

This review highlighted a number of significant gaps in the current evidence available to guide child welfare practice in relation to foster care services for infants. Many sources included a recommendation for further research and several sources focused specifically on research gaps.

- Further research is needed in many areas, including: descriptive and evaluative study of infant-specific child welfare interventions and programs (across different contexts); qualitative research related to the experiences of birth parents, foster care providers, social workers and other health and social service professionals involved in these cases; and epidemiological research related to trends, patterns and outcomes for infants in care and their families.
- Further research is needed for the Canadian child welfare context, in particular related to Indigenous infants in foster care. Although 12 of the 59 sources included in this review were Canadian, the above gaps also apply to Canadian child welfare practice.

Conflicts of interest

The lead researcher was the primary author of articles and education materials related to the Safe Babies Program. A third reviewer examined these sources for inclusion and extraction to limit conflict of interest.

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Appendix I: Search Strategy for PubMed, PsychInfo and CINAHL

Search #	Query	Limiters Expanders	Last run via	Results
PsychInfo				
1	foster* or kinship or "out of home care"	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	50,737
2	(infan* or newborn* or baby or babies or neonatal or perinatal)	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	150,657
3	(prenatal substance abuse or prenatal exposure or fetal alcohol or substance related disorder* or neonatal abstinence syndrome or NAS or addiction or "drug usage" or prenatal exposure or "drug use" or "substance use" or substance abuse or "drug abuse*" or impaired parent* or cocaine related disorder* or alcohol related disorder* or opioid related disorder* or amphetamine related disorder*)	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	204,001
4	S1 AND S2 AND S3	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	337
5	S1 AND S2 AND S3	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	337
6	S1 AND S2 AND S3	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	337
7	ab(foster or kinship or "out of home care") or ti(foster or kinship or "out of home care") or su(foster or kinship or "out of home care")	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	5,600
8	ab(infan* or newborn* or baby or babies or neonatal or perinatal) or ti(infan* or newborn* or baby or babies or neonatal or perinatal) or su(infan* or newborn* or baby or babies or neonatal or perinatal)	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	46,474
9	S3 AND S7 AND S8	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	18

Search #	Query	Limiters Expanders	Last run via	Results
10	S3 AND S7 AND S8	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	9
11	S1 AND S2 AND S3	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	337
12	S1 AND S2 AND S3	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	337
13	S1 AND S3 AND S8	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	93
14	S1 AND S3 AND S8	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	46
15	S1 AND S3 AND S8	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - PsycINFO	45
CINAHL				
1	foster* or kinship or out of home care	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL with Full Text	15,327
2	(infan* or newborn* or baby or babies or neonatal or perinatal)	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL with Full Text	253,680
3	(prenatal substance abuse or prenatal exposure or fetal alcohol or substance related disorder* or neonatal abstinence syndrome or NAS or addiction or "drug usage" or prenatal exposure or "drug use" or "substance use" or substance abuse or "drug abuse*" or impaired parent* or cocaine related disorder* or alcohol related disorder* or opioid related disorder* or amphetemine related disorder*)	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL with Full Text	60,348
4	S1 AND S2 AND S3	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL with Full Text	191
5	S1 AND S2 AND S3	Search modes - Find all my	Interface - EBSCOhost Research Databases	191

Search #	Query	Limiters Expanders	Last run via	Results
		search terms	Search Screen - Basic Search Database - CINAHL with Full Text	
6	S1 AND S2 AND S3	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL with Full Text	191
7	ab(foster or kinship or "out of home care") or ti(foster or kinship or "out of home care") or mw(foster or kinship or "out of home care")	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL with Full Text	4,540
8	ab(infan* or newborn* or baby or babies or neonatal or perinatal) or ti(infan* or newborn* or baby or babies or neonatal or perinatal) or mw(infan* or newborn* or baby or babies or neonatal or perinatal)	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL with Full Text	238,770
9	S3 AND S7 AND S8	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL with Full Text	121
10	S3 AND S7 AND S8	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL with Full Text	72
11	S3 AND S7 AND S8	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL with Full Text	72
MEDLINE				
1	foster* or kinship or out of home care	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE with Full Text	66,485
2	(infan* or newborn* or baby or babies or neonatal or perinatal)	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE with Full Text	1,354,188
3	(prenatal substance abuse or prenatal exposure or fetal alcohol or substance related disorder* or neonatal abstinence syndrome or NAS or addiction or "drug usage" or prenatal exposure or "drug use" or "substance use" or substance abuse or "drug abuse*" or impaired parent* or cocaine related disorder* or alcohol related disorder* or opioid related disorder* or amphetamine related disorder*)	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE with Full Text	252,982
4	S1 AND S2 AND S3	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE with Full Text	556

Search #	Query	Limiters Expanders	Last run via	Results
5	S1 AND S2 AND S3	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE with Full Text	519
6	S1 AND S2 AND S3	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE with Full Text	211
7	ab(foster or kinship or "out of home care") or ti(foster or kinship or "out of home care") or mw(foster or kinship or "out of home care")	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE with Full Text	2,527
8	ab(infan* or newborn* or baby or babies or neonatal or perinatal) or ti(infan* or newborn* or baby or babies or neonatal or perinatal) or mw(infan* or newborn* or baby or babies or neonatal or perinatal)	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE with Full Text	308,271
9	S3 AND S7 AND S8	Search modes - Find all my search terms	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - MEDLINE with Full Text	44

Appendix II: Summary Table of Findings

Legend:

IMH	Infant mental health promotion (includes review, relationship, intervention, assessment, policy)
Program	Child welfare program elements (includes visitation, placement, models, resources)
Risk	Identification of infants and families at risk of requiring foster care
Outcomes	Outcomes for infants in care and their families

CITATION	SOURCE TYPE and METHODS	AREA OF FOCUS	PRIMARY AIM	SAMPLE	KEY FINDINGS	RECOMMENDATIONS
Adams & Bevan (2011) *UK*[40]	Research (qualitative, semi-structured face-to-face interviews)	Program (model)	Explore the extent and nature of mother and baby fostering within social service agencies.	N=8 foster mothers, representing three different agencies. In total participants had supported 16 placements, between one and three each.	Most entered this area of fostering as the results of specific circumstances, rather than pre-planned. 7 participants felt that they had not been assessed specifically as mother baby carers. There were no specific policies and procedures for this process in any of the agencies. Specific training or supervision was not provided. Five key factors were noted to contribute to successful placements: clarity about the foster carer's role, effective planning and good social work practice, fit between birth mother and foster family, ability of carer to recognise and manage needs of both baby and mother, and education and post-placement support. This support would ideally include peer networks, not just formal training.	Mother baby foster care was seen as a valuable type of placement to be able to offer to both young parents and parents who required assessment. Implications for practice include: effective assessment process so homes are ready to go when needed; clear written policies and procedures about assessment, roles, documentation; allocated and consistent social workers; education and training; and clear placement plan. Need to also think about how to be inclusive and supportive of birth fathers.

Alberta Government Baby Steps - Alberta version (2013) *Canada*[41]	Grey literature (education resource)	Program (model)	Resource from training program for foster caregivers of infants affected by substance exposure.	N/A	Handbook which overviews impacts of substances on infants and reviews daily care strategies related to issues such as irritability, sleeping issues, feeding issues.	N/A
American Humane Association, Center for the Study of Social Policy, Child Welfare League of America, Children's Defence Fund, Zero to Three (2011) *US*[42]	Grey literature (policy)	IMH (policy)	Reviews evidence of the importance of addressing the needs of infants and toddlers; Suggests key elements of a developmental approach for infants and toddlers in child welfare.	N/A	In the US, infants and toddlers are the largest single group of children entering foster care (31% in 2009). They stay longer and are more likely to be adopted than reunified. The science of brain development and the impact of neglect and maltreatment are reviewed. A five point agenda for addressing the developmental needs of infants and toddlers is presented and a policy checklist is included.	The effects of maltreatment have lifelong implications if not properly addressed. Key practices focus on: developmentally appropriate practices, early intervention, stable caring relationships, partnering with families and communities, and collecting data to monitor practices and outcomes
Barth (2012) *US*[43]	Grey literature (commentary)	IMH (policy)	Comment on the current state of available evidence-informed parenting interventions for child welfare	N/A	Despite two decades of data indicating the need for refocusing services on the youngest children, child welfare services have not kept pace with programs to address the needs of very young children and their caregivers. One reason is the scarcity of available, feasible, evidence-based practices to help maltreating parents caring for infants and toddlers.	Implementation and dissemination of evidence-based programs requires interventions that are: feasible in the "real world", relevant to child welfare goals of safety, permanency and well-being.

BC MCFD Baby Steps - BC version (2009) *Canada*[44]	Grey literature (education resource)	Program (model)	Resource from training program for foster caregivers of infants affected by substance exposure	N/A	Handbook which overviews impacts of substances on infants and reviews daily care strategies related to issues such as irritability, sleeping issues, feeding issues.	N/A
BC MCFD/ FPSSS Safe Babies Foster Parent Training Program (2009) *Canada*[45]	Grey literature (education resources)	Program (model)	Manual for education and support program for foster parents who care for infants with prenatal substance exposure	Infants with substance exposure	Organized in 8 modules: effects of substances, impact on women, partnering with birth families, neurodevelopment, health issues, daily care issues, self-care and CPR.	Standardized education and support programs that are evidence based, collaboratively developed and offered, and community informed provide a higher baseline for quality of foster care.
Beckman, Knitzer, Cooper & Dicker (2010) *US*[46]	Grey literature (policy)	Program (model)	Discuss the areas of improvement and challenges surrounding mandated parent training programs for parents of young children that are associated with the Child Welfare system	N/A	Generally, parent training programs are not delivered in a consistent manner, and use a “one-size-fits-all” approach, not considering the breadth of reasons as to why a parent may have a child involved in the Child Welfare system. Instead of focusing on parental-skill oriented goals, programs are strictly evaluated by attendance.	Authors recommend 7 strategies to improve parent education programs: (1) adopt an outcome-focused approach to parent education strategies on the part of child welfare agencies; (2) build collaborative partnerships among child welfare, courts, and service providers; (3) galvanize judicial leadership to create research-based parenting programs while using court orders to ensure their provision; (4) Tie parenting programs to visiting opportunities; (5) promote

						strategic state and local planning re-investment; (6) support a strategic two-pronged research strategy: system change and programming content, and (7) expand and provide requisite funding for strategies beyond training that promote healthy parenting by parents at high risk
Bernard & Dozier (2011) *US*[47]	Research (quantitative study, videotaped foster-parent infant interactions, structured "*This Is My Baby"* interview)	IMH (relationship)	To examine the association between foster parent commitment to their foster children and the displays of delight that foster parents exhibit when they interact with the young foster children.	N=70 foster parent-infant dyads. Infant age ranged from 9.4 to 28.3 months.	Caregiver commitment was associated with caregiver delight - high levels of commitment were associated with high levels of delight.	Future research should examine how the infant placement goal affects levels of foster parent commitment; and further explore caregiver factors that lead to levels of commitment and what characteristics/factors of the child impact levels of commitment.
Bick & Dozier (2013) *US*[48]	Research (randomized control trial)	IMH (intervention)	Examine the effectiveness of the Attachment Biobehavioral Catch-up (ABC) intervention amongst foster-mother infant dyads.	N=96 foster-mother infant dyads, foster children 22 months or younger. 44 dyads assigned to attachment intervention, 52 to control intervention.	The dyads assigned to the ABC group showed greater improvements in sensitivity, which is important for infant's social and emotional development.	Further research on the nuances of the ABC intervention is required, as well as getting "in the moment" feedback from dyads of the effectiveness of the intervention.

Bick et al. (2013) *US*[49]	Research (pre and post intervention experiment, biological measures - oxytocin and event related potentials brain activity)	IMH (relationship)	Investigate the relevance of oxytocin production in formation and quality of mother-infant foster care bonds. In particular, the study examined whether foster mother's oxytocin production was associated with their electro-physical brain activity in response to their foster infants, reports of commitment and displays of delight.	N = 41. Foster mother-infant dyads, Mean infant age of infants = 8.5 months.	When biological relatedness is taken away, oxytocin production is still related to bond formation. Mother's oxytocin levels were associated with behavioral delight, and patterns of brain activity. The oxytocin levels seemed to change through time. The study suggests that there are biological processes of bond formation.	Further longitudinal research needs to be conducted. Also - the role of oxytocin in fathers should be further examined.
Boyd, Balogun & Minnis (2016) *Scotland*[50]	Narrative	Program (model)	Explore the structure and cost of the current Glasgow system of addressing the mental health of infants in foster care and the New Orleans model, to inform development of an RCT and the potential adoption of this model.	N/A	The New Orleans model would likely shift resources from social services to the National Health Service. The mode is resource intensive and could increase the cost of episodes of care. However, the probability of repeated episodes is likely to fall substantially, which would reduce the coverall cost per child.	Improvements in physical and mental health for infants and young children will likely have cost-saving implications which will continue throughout their lifetime. There is potentially a very strong economic case for an improved, more intensive care system which improves child mental health. These improvements cold impact lifetime outcomes and have cost-saving benefits on numerous sectors including education, justice, child welfare, and health.
Brownell et al. (2011) *MB Canada*[51]	Research (longitudinal cohort study, population data-set analysis)	Risk	Determine the coverage of a newborn screening test (Baby First screen); examine the validity of the	Original sample N = 40,886. Analytical sample N= 37,345. Infants born in Manitoba between January 1 2000 and	The screening tool included biological, psychological and social risk factors. The intention of the screening tool was to determine risk and then offer appropriate	The researchers summarized that the screening tool had some moderate predictive validity, however caution was needed as there were also a moderate number of false positives

			screening test; determine which items on the screening test were the strongest predictors of infants entering foster care.	December 31 2002.	support and intervention to families with the purpose of mitigating or ameliorating risk. Three or more risk factors were determined to indicate that the family may need support. Infants screened “at risk” were 15 times more likely to enter out-of-home care than infants who were screened “not at risk.” Similar to previous studies, factors such as financial difficulties, low maternal education level and previous interactions with the child welfare system were associated with the newborn infant entering out-of-home care. 30% of infants were not screened, with those infants twice as likely to enter out-of-home care than their screened counterparts, indicating a need for increased screening coverage. Sensitivity and specificity of the screen were 77.6% and 83.3%, respectively.	and negatives. Further research should endeavour to examine the thoroughness, validity and access to screening tests.

Bruskas (2010) *US*[52]	Narrative using human ecology model and attachment theory	Outcomes	Apply theoretical frameworks to determine the social setting of foster care, its impacts on developmental health and the developmental needs of infants in foster care.	N/A	Experiences in infancy have lasting impacts into the lifecourse - foster care and childhood adversity is associated with increased risk of poor developmental health, cardiac disease, depression and premature death. Foster children can be genetically vulnerable, and the experiences in early childhood and infancy greatly impact later health.	There is a need for interventions to be re-examined. Best-practices are needed to include the unique developmental needs of infants and children.
Burry & Wright (2006) US[53]	Narrative	Program (visitation)	Examine and explore the use of visitation as a child welfare intervention for children with prenatal substance exposure.	Ages =birth - age 2, with prenatal exposure to drugs. Generally, the parents are still using substances while the child is in care.	Visitation is generally an effective and beneficial intervention for both the children and the biological parents that are involved in the child welfare system. There are special issues for children with prenatal substance exposure, including neurological damage that can present in infants being easily overstimulated, and not easily comforted, and biological parents having the stressor of substance abuse. It is important to take the unique context of these visitations into account, and to work with both the biological parents and the foster parents to create a safe, trusting environment for visitation to occur within. Permanency planning and decisions should be informed by careful monitoring.	Although the presence of substance use does complicate child welfare interventions, visitation remains an important intervention. The productivity of visitation is dependent on the social worker to understand dynamics of unique issues related to substance use.

Casanueva et al. (2014) *US*[54]	Research (longitudinal cohort study, statistical analysis of the National Survey of Child and Adolescent Well-Being database)	Outcomes	Describe the extent of caregiver instability, and identify the risk factors of caregiver instability	N=1,196. Infants at the time of study start, and followed for 5 to 7 years.	85.6% of infants at the time of the index maltreatment experienced at least one change in caregiver in the first 2 years of their life. 40% experienced four or more changes in caregivers between infancy and school. Caregiver instability was associated with the child having a chronic health condition and the caregiver being older than the age of 40. Children with more risk factors (i.e. neglect, caregiver substance use, exposure to violence...etc.) are more likely to have caregiver instability.	There is a need for further evidence-based programs for at-risk infants. Although there currently are some evidence-based programs responding to maltreated infants and children, the authors encourage policy makers and child welfare agencies to promote case planning which recognizes the importance of caregiver stability.
Centre on the Developing Child at Harvard (2016) *US*[55]	Grey literature	IMH (review)	Apply insights gained from new brain research to how infants in the child welfare system.	N/A	An overview is provided of key scientific concepts relevant to child welfare systems, such as the building of brain architecture, how adversity disrupts development, and protective factors can build resilience. Five organizing principles are described for how these concepts can be applied: (1)	These ideas can help to frame and communicate an agenda for change in child welfare systems, which face significant resource constraints. Distinctive needs of infants and young children are identified as promoting frequent parental contact, promoting strong relationships with foster caregivers, and providing high quality medical care, early intervention,

					reduce external sources of stress, (2) develop responsive relationships, (3) strengthen core life skills, (4) attend to the distinctive needs of infants and young children and (5) use new science to open up new ways of thinking and acting.	mental health services, and high quality early childhood education.
Child Trends and Zero to Three (2013) *US*[56]	Research (online survey)	IMH (policy)	Survey state child welfare initiatives and policies that guide work in addressing the needs of maltreated infants and toddlers	N=46 state directors of child welfare.	Three broad themes were identified: few states have policies that differentiate services or timelines for infants and toddlers versus older children; relatively few states have implemented promising approaches to meeting the unique developmental needs of infants and toddlers; and given awareness about the needs of very young children stemming from neuroscience and child development research, child welfare agencies have a long way to go in aligning policies and practices to ensure that the unique needs of infants and toddlers are met.	States are not fully addressing the complex needs of birth parents, including their own history of trauma. States lack clear policies related to services to improve the interaction between birth parents and their children, including post-reunification supports. It is critically important that child welfare policymakers and administrators understand the impact of maltreatment on infants and toddlers, so that they can systematically implement interventions and services that best meet the needs of these very young children.

Cohen (2009) *US*[57]	Policy	IMH (policy)	Review the importance of the first three years of life for development and provide guidance for infants and toddlers in foster care	N/A	Research shows us the following: in order to thrive, infants and toddlers need stable nurturing relationships; Infants and toddlers in foster care are more likely to have fragile health and less likely to receive developmentally appropriate health care; visitation is one of the best predictors of successful family reunification; and infants and toddlers in foster care are at risk for mental health disorders.	Recommendations include: ensure a permanent placement for infants and toddlers in foster care; implement frequent family visitation; pursue two concurrent permanency plans; ensure ongoing post-permanency services; ensure judges are informed about child development and use that knowledge to determine safety and permanence; assess mental health needs and provide treatment as necessary; ensure access to early intervention services; ensure comprehensive and consistent health care, expand and designate substantial funding to build preventative services to preserve and support families
Cole & Hernandez (2011) *US*[58]	Research (longitudinal outcome study with program data)	Program (model)	Describe the relationship between receiving crisis nursery services and the placement outcomes for young children leaving the child welfare system	N=198 infants and young children Approximately half of the samples were less than one year of age, maximum age 5.	Children whose families received crisis nursery services prior to foster care placement were twice as likely to be reunited with their biological families (birth or extended family members) when compared to children whose families received only foster care services. The difference in the length-of-stay in foster care was not statistically significant when the two groups were compared.	Crisis nurseries are part of a continuum of child welfare services. Receiving crisis nursery services may have positive effects on the children's ultimate placement outcome after foster care. Additional research is needed to further explore the relationship between placement outcome and crisis nursery services.

Cole (2006) *US*[59]	Research (cross sectional using interviews, observations and surveys)	IMH (relationship)	Describe the quality of the relational environment for infants in foster care.	N=46 caregiver-infant dyads. 12 kin, 34 unrelated. The infants were between 10 and 14 months of age, were placed with the caregivers within the first 3 months of life, and had been with the same caregiver continuously for at least 6 months.	67-68% of infants with both kin and unrelated caregivers displayed secure behaviours. 28% displayed disorganized behaviours. Infants entered care with an average of 3 medical problems (such as prenatal substance exposure, prematurity, digestive problems, respiratory problems, problems requiring OT or PT). Those with unrelated caregivers had more medical problems. Infants with more medical problems demonstrated lower attachment ratings. Caregivers reported higher rates of childhood trauma for themselves. No difference was noted in caregiver sensitivities. Having multiple children in the home can impact developmental domains.	Infants need responsive, sensitive caregiving that meets their developmental needs. Adequate adjustment time to allow for the infant to develop a new secure infant-caregiver relationship is required when infants move to new caregivers, back to birth families, or to permanent adoptive homes. The availability of developmentally appropriate learning materials promotes secure attachment. Enhanced training in developing secure relationships is recommended for social workers and caregivers, including addressing own state of mind and childhood histories.

D'Angiulli & Sullivan (2010) *BC Canada*[60]	Research (cohort comparison, salivary cortisol, development assessment screening tests)	Outcomes	Examine whether the postnatal environment provided by specialized early foster care such as the one provided through the Safe Babies Program would be associated with signs of positive developmental outcomes in the most vulnerable infants.	N=22 infants under the age of 24 months who had a legal status of temporary custody order or continuing custody order and for whom parental substance misuse was the main factor in the admission to foster care. 9 infants were preterm and 13 were full term. All infants entered care within 4 months after birth. There had been no placement changes for any of the infants since the initial placement.	Preterm infants showed significantly lower fine motor skills than the full term infants, at norm in all other domains. No clinically atypical development noted in either group. Developmental assessment findings suggest an association between the Safe Babies Program and positive developmental outcomes in the foster infants, especially on the preterm group. Cortisol levels indicated no disrupted neuroendocrine regulation. Cortisol trends similar to basal daily patterns in typically developing infants. The preterm group had lower mean cortisol levels which is expected gestationally.	Early specialized foster care may be associated with some attenuation of the adverse effects of prenatal substance exposure. Infants tend to be progressively more responsive and communicative in families where the foster parents have relevant professional backgrounds (ie. nursing, social work, psychology). Recommendations for practice include: careful process of screening, recruiting, educating, and supporting foster parents; coordination across agencies for placement support.
Delfabbro et al. (2009) *Australia*[61]	Research (descriptive cohort, statistical analysis)	Outcomes	Provide a detailed profile of the social and familial backgrounds of a cohort of infants entering out-of-home care; Develop statistical models that examine the extent to which family background factors can predict the likelihood of subsequent notifications of child abuse.	N=498, randomly sampled from 1155 infants less than two years of age who were referred for at least one out of home placement from 2000-2005. Mean age 1.3 years (44% of sample entering out of home care in <12 months of age).	Over two thirds of the children came from families where there was evidence of severe neglect and financial hardship. Approximately half the families were affected by domestic violence, substance abuse or physical abuse, over 40% were lacking a stable home. Infants born with teenage parents or those with an intellectual disability tended to enter the system earlier. In most cases, families experienced multiple problems. 58% experienced relatively low levels of	Problems such as domestic violence, substance use and poverty have roots in broader social and economic factors. It is unlikely that child protection casework can solely address these issues. Broader services are needed including: income support, housing, substance use treatment, domestic violence interventions. System data using these risk factors may be used to contribute to child protection decision making.

					placement instability (1-2 non-respite placement changes since entering care). Aboriginal status significantly associated with the reasons for entering care. 50% of infants were returned to families, where there was subsequent notification of abuse. Prior abuse was a reliable predictor of ongoing abuse notifications.	
Dicker (2012) *US*[62]	Research (qualitative case series)	Outcomes	Describes and discusses the unique issues facing infants and toddlers in foster care that are hospitalized.	Describes the stories of 5 infants and toddlers in Foster care and their barriers when hospitalized	It is critical to know the legal status of the child in the hospital. This will impact who makes decisions and consents to interventions for the child and how the hospital staff respond to and treat the child.	The hospital must obtain court orders of the child's legal status, and it is important that court files and orders are updated regularly.
Dozier, Zeanah, & Bernard (2013) *US*[63]	Narrative	IMH (intervention)	Argue that intervention in foster care is important for infants and toddlers. Two intervention programs are highlighted - the Attachment and Biobehavioral Catch-Up (ABC) and the New Orleans Intervention.	N/A	Targeted intervention programs can improve and enhance infant and toddler outcomes.	Research needs to continue to examine what factors support the success of interventions, and implementing interventions in different contexts.

Dozier et al. (2008) *US*[64]	Research (randomized control trial, biological tests (cortisol production), pre- and post-intervention)	IMH (intervention)	Assessing the effects of the Attachment and Biobehavioral Catch-up (ABC) intervention on infants hypothalamus – pituitary-adrenal axis.	Children who completed ABC intervention = 46, Educational intervention comparison group = 47, non-intervention non-foster care comparison group = 48. Children were 15 - 24 months.	Children whose caregivers that participate in ABC have lower levels of cortisol subsequent to the Strange Situation than children in the control intervention group. Children who had never been in foster care had the lowest levels of cortisol. This suggests a relational intervention can affect the biology of infants and toddlers, which has important implications for programs and interventions in foster care.	Recommend further research to explore cortisol levels, in particular in the form of a longitudinal study.
Dozier et al. (2006) *US*[65]	Research (randomized control trial, biological tests (cortisol production), pre- and post-intervention, and parent reports)	IMH (intervention)	Present preliminary (short term) data on the effectiveness of a caregiver intervention to enhance regulatory capacities from the Attachment and Bio-behavioural Catch-up Intervention	N=60, with an additional 104 non-foster children to allow comparisons. Age ranged from 3.6 to 39.4 months.	The intervention is manualized with 10 weekly sessions, including videotaping of parent-child interactions, that took place in the homes of foster parents. These findings are from the first follow up at one month after completion of the intervention. At this time, infants in the intervention group were found to have more typical cortisol patterns like non-foster children. Parents also reported fewer problem behaviours.	Many foster parents were relieved to learn new strategies to help with problem behaviors. The earlier that evidence-based interventions are used, the less likely there will be long-standing problems.

Eiden, Foote & Schuetze (2007) *US*[66]	Research (cohort comparison study, statistical analysis)	Risk	Describe the demographic and perinatal risk characteristics of infants and caregivers. The researchers' hypothesized that cocaine using mothers would have higher risk than compared to the comparison group; that infants of cocaine using mothers would have more negative outcomes, cocaine using would be more associated with having infants in non-parental care	N=220 infant-mother dyads. 115 cocaine-exposed and 105 non-exposed. The study was divided into three groups: (1) cocaine, parental care group, (2) cocaine, non-parental care group; (3) matched non-cocaine comparison group.	The findings of the study largely supported the hypothesis. 19% of cocaine using mothers lost their child within 1 month of infant birth (compared to 0.02% of non-cocaine using mothers); mothers who use cocaine had higher demographic and obstetric risks; infants of mothers who uses cocaine had increased perinatal risks and; cocaine-using mothers who retained custody had increased risk of childhood trauma and psychiatric symptoms.	This study highlighted the need for access and increased research on maternal interventions and support systems.
Franca, Mustafa & McManus (2016) *US*[67]	Research (descriptive cohort, estimation of labour costs)	Program	Estimate the labour costs of caring for NAS infants within the local department of children and families (DCF).	N=6,170 infants, using International Classification of Diseases code, and the Patrick et al. criteria for iatrogenic NAS.	States are experiencing increased numbers of infants with NAS, increased hospital costs. Infants are primarily cared for within suburban and community hospitals. Between 2010 and 2013 the number of infants followed monthly by DSC increased from 273 to 357. Process map developed for services that routinely flow from DCF to all substance-dependent newborns (figure available), probabilities estimated for services up to six months of age. Total amount of work	Growing burden of opioid addiction epidemic in this state is accounting for a substantial expenditure of social service resources. Opiate issue has increased dramatically during a period of economic recession. Regional differences were noted that reflect differences in drug use patterns. Additional costs would also be incurred through: foster parent payments, services beyond 6 months (which is common), criminal justice system.

					hours for DCS estimated at 10,650 hours per month (equivalent to approximately $4.3 million in social work labour costs, and 2.5% of total state budget)	
Humphreys & Kiraly (2011) *Australia*[68]	Research (mixed method, case-file audit, focus groups, case studies)	Program (visitation)	Understand current practices related to family contact for infants in protective care.	N=119 infants less than one year of age in foster care for file audit. The infant sample included an overrepresentation of Indigenous children (18%). N=118 participants for focus groups and interviews (included foster carers, foster care staff, high risk infant team members, child protection workers, legal representatives, court clinic staff). N=30 brief case studies gathered from foster carers and case managers that were developed in response to cases of concern.	Significant substance abuse was evident in the majority of cases. Most high frequency visit orders (4 or more visits per week) were made when the infant was in the earliest months of life. Scheduled high frequency visits took place 76 to 100% of the time for half of the families with this order. Reasons for visits not taking place included: illness in parent or infant, missing, jail, transportation issues, unacceptable parent behaviour. Most visits took place in DHS offices. High frequency visiting did not improve rates of reunification. Themes emerging from the interviews and focus groups included: the importance of attachment and stability, concern about too many people involved with infants, distress and disrupted routines, the amount of time infants spent in cars, the unsuitability of the environment for parent visiting, support and communication between foster carers and parents. Divergent views (a "chasm")	This is a complex and contentious issue with fears on both sides. Reunification was noted to be the same whether parents had high or lower frequency visiting. The system allowed for visiting, but did not provide the resources to do it. Systems issues often got in the way of optimal visiting: resourcing for appropriate environment for visits, transportation, consistent social work staff. Frequent visiting that is without skilled parenting support will not result in relationship or parenting capacity building. Areas to be addressed include: reducing number of strangers, exploring potential for fewer but longer visits (quality versus quantity), improving quality of visiting environment, improving support to parents, and finding ways to reduce infant travel. The current system is not conducive to supporting quality contact, and adversarial processes are also not conducive to decision making. It is still a struggle to find a balance between approaches to family relationship building and settling infants with alternative carers so they can form secure attachments.

					were noted between parent's legal advisors and the workers and carers. Tensions were often related to resourcing of the contact.	
Johnson (2014) *UK*[69]	Peer reviewed narrative	Program (model)	Describe a process developed to facilitate the discharge of infants with NAS to a home environment, including foster care	N=126 infants born to women cared for through the multidisciplinary addiction antenatal clinic. 21% (26) were discharged to foster care.	Infants in care stayed twice as long in the hospital, suggesting they had a more severe form of NAS. A training package was developed by a multidisciplinary team, including a neonatologist, midwife, and a specialized health visitor. The aim of the training package was to equip foster carers with the knowledge and skills to safely and effectively care for infants with NAS in the home environment. The package consists of: simplified scoring chart, a DVD describing foster carers' experiences, Infants may be discharged while still on Morphine, if they are they also require an apnea monitor. A regular foster carer forum is held every second month, with child care provided. Training is delivered in two sessions.	Foster carers can be trained to manage infants with NAS at home, where the environment is more likely to be suitable.

Kalland et al. (2007) *Finland*[70]	Research (retrospective cohort comparison study, population data comparing neonatal health (birth weight, length, 1 minute Apgar score, birth weight, gestational age, and discharge age)	Risk	Investigate neonatal health and maternal background of children in foster care. In particular, there was interest in analyzing the tension between medical and social risk during the neonatal period.	N=1, 668. Children born between 1987 and 1989 and on the Child Welfare Registry sometime before 1997.	Children of smoking, young and non-married mothers had a higher risk of being placed in child welfare. Single indicators do not explain the variance, and instead researchers saw a "piling effect".	Supports the need for individualized care, and further research to examine risk factors.
Kenrick (2009) *US*[71]	Research, Retrospective cohort study, open-ended questionnaire, grounded theory analysis	Program (placement)	Describe the Concurrent Planning Project at Coram (foster and adoption academy). This project works intensively on two possible outcomes for the infant: rehabilitation of the birth parents or adoption.	26 families (27 infants in total) who had adopted children though the Concurrent Planning Project. In this project, the infant is cared for by foster parents, while meeting prospective adoptive parents and having regular contact with the biological parents.	Largely, the children adopted though the program that did not have multiple placements leading to adoption did not have attachment-related difficulties. The concurrent planning program achieved placements early in the infants' life (the majority by 5 months of age).	Concurrent planning programs appear to offer conditions that offer infant mental health support. Kendrick notes that concurrency planning offers opportunities for multiple avenues that are designed to support the development and health of the infant. is important as well, to understand that there are cases where interruptions and changes in attachment will be more harmful to come infants, and focus on individualized care.

Larrieu, Heller, Smyke & Zeanah (2008) *US*[72]	Research (retrospective cohort study, statistical analysis)	Risk	Analyze and determine the risk factors that are predictors of child welfare placement outcomes and permanent loss of custody.	N = 141, analytic sample = 93. The sample is comprised of mothers who had children between birth – 60 months that had a child or children placed in foster care	The study found that cumulative risk factors are a greater predictor of loss of custody than specific risk factors.	The authors note that the results suggest there is no specific risk profile or single risk that predicts loss of custody outcomes. This highlights the need for intervention practices to be flexible and multimodal to the mother's unique context.
McCombs-Thorton (2012) *US*[73]	Research (mixed methods, statistical analysis, case review, informal conversations with case workers, one-on-one open ended interviews with program coordinator)	Program (model)	Evaluate Zero to Three's "Safe Babies Court Team Project." This project works with infants and children up to three years old. The goals of the project are: (1) reduce the time children wait for a permanent placement; (2) improve wellbeing of children in foster-care and; (3) reduce events of substantiated abuse and neglect	N = 298 children involved in the Safe Babies Court Team Project. Comparison group composed of young child welfare participants (n = 511).	The children involved in the Safe Babies Court Team Project left foster care, on average, 1 year earlier than the comparison group. Furthermore, children involved in the Safe Babies Court Team Project were more likely to exit foster care due to reunification, whereas the comparison group was more likely to exit foster care due to adoption. Components of the Project, including the role of the judge and monthly case reviews may be the stimuli for the faster exit out of foster care that the Safe Babies Court Team Project children experienced.	The results of the study speak to the Safe Babies Court Team Project meeting their first goal. Future studies are to test for variables that may account for the shortened wait times to exit foster care that children involved in the study experienced, and consider cases that experience exit and re-entry in the foster care system.
McGee (2011) *US*[74]	Grey literature (Thesis)	IMH (review)	Discuss the adverse effects trauma, abuse and neglect have on infant mental health. Provide recommendations for care and interventions for	N/A	Frequently seen health and developmental issues for infants in foster care are: attachment disorders, regulatory disorders, traumatic stress disorders, developmental delays.	Recommended interventions include: providing comprehensive medical and mental health care, improving the responsiveness of foster parents, and maintaining attachments with birth family.

			infants in foster care to promote their mental health.			
McGlade, Ware & Crawford (2009) *Australia*[75]	Research (comparison study, used Department of Child Safety child protection information system database)	Outcomes (placement stability)	Compare child protection outcomes of infants of substance-using mothers with infants of non-substance using mothers,	N=119 infants of substance using mothers, N=238 infants of non-substance using mothers, matched for gender and gestational age	Infants of substance using mothers were more likely to suffer substantiated harm and to enter foster care. Infants of mother using illicit rugs were more likely to suffer substantiated harm and more likely to enter foster are than infants of mothers who were compliant with a methadone program.	Greater interagency collaboration is urgently required to reduce this risk.
Marcellus & Nelson (2011) *BC Canada*[76]	Peer reviewed narrative	Program (model)	This article comments on the sustainability of the "Safe Babies" program, and transitioning the project to a provincial program	N/A	A model of sustainability was applied to the program including the following elements: leadership competence, effective collaboration, understanding the community, demonstrating program results, strategic funding, staff involvement and integration, and program responsivity.	Sustainability, a continuous process that takes time to plan, evaluate and build, if often not considered until much later in a program development cycle. Like evaluation, planners should address program sustainability from the beginning of the program development process. Strategic models are helpful for this planning.
Marcellus (2010) *BC Canada*[77]	Research (qualitative, constructivist grounded theory, open-ended and semi-structured	IMH (relationship)	Describes an intervention model for infants in foster care, and applies resilience theory to the model.	N=11 families, in 5 different communities. Further details on the families cannot be released, due to ethical issues. All families had 2 adult	Applying a resiliency framework to foster care allows for opportunities to develop practices that support recruitment, retention and satisfaction of foster families and infant-family matching which promotes	The protective aspects of foster care should inform future program development. It is important to involve the foster family in the development of interventions. Speaking specifically to infants with prenatal substance exposure, a life course approach is a recommended method.

	interviews)			partners, and 10 families had their own children. 3 social workers were interviewed.	optimal development of infants and satisfaction of foster families.	
Marcellus (2008) *BC Canada*[78]	Research (qualitative, constructivist grounded theory, open-ended and semi-structured interviews)	IMH (relationship)	Describe the process of becoming and providing foster caregiving in the context of caring for infants with prenatal drug and alcohol exposure	N = 11 families. Due to confidentiality, detailed characteristics of the families were not published. All families included 2 adult partners, and 10/11 families had their own children participating in the study.	(Ad)ministering love is a process which "represents the tension experienced by families that were committed to providing the love and guidance of a family to an infants with special needs, yet within the restrictions and public gaze of a government child protection system". There are three phases: (1) preparing to foster; (2) living as a foster family; (3) ending the fostering role. Three themes of experience also emerged in this study: (1) fostering as a social endeavour; (2) doing the work 24-7; (3) unwitnessed commitment.	This theoretical framework that explains a well-functioning foster family has important implications for improved practice, policy development, education and training, and research and evaluation.
Melmed (2011) *US*[79]	Grey literature (narrative)	IMH (policy)	Argues for policy changes to help meet the needs of infants in foster care who have experienced maltreatment.	N/A	Develops key elements of an agenda. Guiding principles: (1) stable caring relationships are essential for healthy development; (2) early intervention can prevent the consequences of early adversity; (3) early child welfare decision and service should have a goal of enhancing the well-being of infants, toddlers, and their families to set them on a more promising	A call to action: Zero to Three has partnered with other national organizations to develop and implement child welfare policy, based on these guiding principles. The ultimate goal is that policy is developed to reflect early childhood research.

					developmental path; (4) families and communities must be a key partners in efforts to ensure the well-being of every child; (5) child welfare administration at the federal, state and local level include a focus on infants, toddlers and their families in such functions as data collection, research and attention to special populations	
Minnes et al. (2008) *US*[80]	Research (cohort – comparison study, statistical analysis)	Risk	Determine if cocaine using women who did not maintain infant custody reported more psychological distress, domestic violence, negative coping skills, lower social support, childhood trauma than those who maintained custody; Evaluate the relative contribution of psychosocial factors to infant placement.	Cocaine using woman who did not maintain infant custody N= 144; cocaine using women who did not maintain custody N= 66	Women who lost custody reported greater overall distress, psychoticism, somatization, anxiety and hostility than the group that did not lose custody.	There is a need for tailored interventions for women who lose custody of their children.
Miron et al. (2013) *Australia (article compares Australia, Canada,*	Research (qualitative narrative comparative analysis, case-series)	Program (visitation)	Compare approaches to infant/biological parent visitation within the context of out-of-home care, from a human rights	N/A	Infant mental health warrants more attention - often, the infant is seen as a "prize for good behaviour" and the infants' needs are not considered in isolation. There needs to be more	(1) Infant mental health practitioners should offer training in infant mental health for child welfare workers and legal practitioners; (2) Infant mental health practitioners should offer consultation to the child welfare and legal systems around practical

Scotland and US)[81]			perspective. 4 contexts were examined: Canada, Australia, U.S. and Scotland. The human rights perspective was used, and a specific point of analysis was infant mental health.		consideration for the child's optimal development and mental health. Adopting a human rights approach dictates that the infants needs be subjectively considered and acted upon. Extensive discussion about the benefits and disadvantages of parental visitation. Evidence is limited in the areas of the impact of child welfare practice and legal decisions on infant outcomes.	day-to-day and global decision making about contact with biological parents from a children's rights perspective; (3) Infant mental health clinicians should offer direct services for children in out-of-home care and their caregivers to optimize contact
Miron, Sujan & Middleton (2013) *US*[82]	Peer reviewed literature review	Program (placement)	Highlight issues for child welfare workers to consider when determining if moving an infant or young child from one home to another for the purpose of placing him with his siblings would cause trauma and disruption; and consider issues for best interest if separating from siblings.	N/A	Theoretical approaches of attachment and infant mental health were used for this review. The importance of sibling relationships has been recognized in US legislation, requiring states to place siblings together. There has been variability in how this law has been carried out. Literature is reviewed related to: child welfare practice and policy, cultural considerations, reasons siblings are separated, outcomes for siblings placed together versus separately, benefits of placing siblings together, benefits of separating siblings, and limitations of research on this issue.	Recommendations for determining the best interests of an infant or young child in foster care whose siblings are already in care include: assess the presence and quality of current attachment relationships; assess the potential of the new caregiver to be a primary attachment figure to the infant; assess the quality of sibling relationships (including potential for a reciprocal relationship, the quality of interactions); consider costs and benefits of disrupting primary attachments to place a child with his or her siblings; maintain sibling contact when possible and when contact is not harmful; gradually transition (even up to a few months, and paced by infant) infants to their new home when in their best interest. Foster parents need to be involved with transitions.

Schofoeld & Simmons (2011) *UK*[83]	Peer reviewed discussion/ Narrative	Program (visitation)	Explore the issue of parent contact for infants subject to care proceedings and identify questions to consider when planning contact in pre-proceeding phase and throughout care proceedings. Specifically, the article draws from recent publications by Kenrick (2009), and Humphreys and Kiraly, 2011).	N/A	Enabling infant to achieve developmental goals of great value. It is important for the consequences of contact arrangements to be considered.	Recommendations are provided related to supporting attachment and to making contact plans. Contact plans need to take into account both the developmental needs of the infant and the rights and capacity of parents to develop as parents. The following factors all need to be considered together when developing contact plans: the purpose of contact needs to be made explicit, frequency and length of contact (consider quality, not interfere with infant's developmental needs), welcoming venue, expert supervision, practical support for birth family (transportation, emotional support), ensure foster parents understand that contact is necessary to keep door open for reunification
Silver & Dicker (2007) *US*[84]	Peer reviewed practice guidelines	IMH (assessment)	Inform the professional practice of workers involved in the mental health assessment of infants in foster care.	N/A	The article summarized guidelines for infant mental health assessment and recommends practice modifications. Special issues in the assessment of infants in foster care include: an absence of history, establishing alliance with family, and ongoing legal issues.	Assessment of mental health must take into account often adverse life experiences prior to placement. A developmental perspective is essential during the early years and interdisciplinary assessment is crucial.
Smariga (2007) *US*[85]	Grey literature (policy)	Program (visitation)	Explain why visitation is important for infants and toddlers in foster care.	N/A	This brief is geared toward judges and attorneys. Visitation is defined, connections to permanency planning made, strategies for addressing barriers provided, key elements for successful visitation plans described, and the judge's role in	Judges and attorneys are encouraged to incorporate as many of these practices as possible and to take a leadership role in their communities to explore how to safely expand visitation opportunities.

					supporting parent-child visits is reviewed.	
Smith (2007) *US*[86]	Grey literature (dissertation)	Program (model)	Create a training manual for prospective foster parents who plan to care for infants who have been physically abused and/or neglected, and to evaluate the utility of the manual by analyzing feedback from relevant stakeholders.	N=15 (5 foster parents, 5 social workers, 5 foster parent coordinators)	In this dissertation, the impact of neglect and physical abuse on infants in their first two years is described. Substance use is mentioned very briefly. Interventions and programs are described. In the second part the training is described. The training was designed as a single three hour lecture style program, with four different topics. Overall the manual was seen as a beneficial and practical resource for foster parents during a formal evaluation.	Recommendations for improvement are provided, including adding more resources, activities and scenarios, adding a cultural component, and incorporating multimedia elements.
Spieker, Oxford, Kelly, Nelson & Fleming (2012) *US*[87]	Research (RCT, Nursing Child Assessment Teaching Scale, Indicator of Parent-Child Interaction, This is my Baby, Raising a Baby, Parenting Stress Index, Toddler Attachment Sort, Brief Infant Toddler	IMH (intervention)	Study the impact of participation of parent-toddler dyads in a 10-week intervention (Promoting First Relationships – brief, strength based attachment theory based home visiting program) on foster caregiver sensitivity, understanding of toddler social-emotional needs and reports of child	N=210 between the ages of 10 and 24 months, with 105 into intervention group and 105 into an early education support comparison group. Dyads were assessed at baseline, post-intervention and a 6-month follow up after post-intervention.	Results suggest that the PFR program could improve caregiver sensitivity and understanding of toddlers. Modest effects (not statistically significant) persisted until the 6-month follow up. The PFR was not found to improve child security. Despite improving caregiver sensitivity, the intervention may be too late or too brief to result in change with this particular population. However, improving caregiver sensitivity could benefit child development in other areas.	Overall, the evidence from this study for the efficacy of PFR with infants and toddlers in foster care is limited. A challenge in this study is that placement changes disrupted over a third of the dyad relationships, affecting both the intervention itself and the statistical analysis. Recommendations related to developing interventions for infants and toddlers in foster care and their caregivers is to support them as early as possible, provide “boosters” over time to sustain impacts, develop interventions that do not overburden caregivers,

	Social Emotional Assessment, Child Behaviour Checklist, Bayley		competence. Aim to improve caregiver sensitivity and understanding that difficult toddler behaviour reflects unmet social emotional needs.		Some decline in sleep problems was noted.	
Stacks et al. (2011) *US*[88]	Research (longitudinal prospective cohort study, statistical analysis, pre-school language skill test)	Outcomes	Evaluate the language trajectories of maltreated infants over a 5-year period, and assess if placement context (kinship care, non-kinship care, remaining with biological parent) can alter the language trajectory. A 5-wave study.	N=963 infants. These infants were all under the age of one at the beginning of the study, and all had cases of substantiated maltreatment. Average age at wave one was 8.01 months. 540 infants were in the custody of their biological parents, 258 were in non-kin foster care and 158 were in kinship foster care.	No significant differences in language trajectories between groups. All groups were below population averages, and decreased after Wave 1 intake. When children were 6 years old, their language skills began to meet population baselines. This may highlight the importance of pre-school and formal schooling on language development skills.	Recommend that children who have been maltreated are connected with services to help foster language development, and caregivers need to be offered services to help them foster development in their children. Additionally, programs focused on infant development are of key importance, due to the unique needs of infants.

Stacks & Partridge (2011) *US*[89]	Research (longitudinal cohort comparison, statistical analysis and neurological, cognitive, socio-emotional development analysis)	Outcomes	Examine differences between kinship and foster placements for infants placed in out-of-home care prior to their first birthday (in developmental status at time of placement, home and community environments, and duration of time in placement)	N= 457 infants removed from parental care between birth and first birthday. Comparison group = 1,031 in kinship care. Total sample = 1, 488.	Infants placed with kin had fewer developmental concerns and spent significantly less time in placement. Foster homes were generally of better quality, somewhat more stimulating and located in safer neighbourhoods. For both groups, infants still spent a long time in care. Approximately one third of the infants in both groups (slightly longer in foster care) were still in out-of-home care three years after the initial investigation.	The youngest children, who developmentally are the most vulnerable, are still the most likely to enter care and remain in care for the longest period of time. They come with many risk factors and some are placed with families that struggle to provide an enriching and nurturing environment. Key recommendations include: provide comprehensive medical and developmental assessment and services, including infant mental health, and provide training to caregivers about the special needs of these children and the importance of relationships and responding.
Twomey et al. (2011) *US*[90]	Research (descriptive evaluation, statistical analysis, semi-structured questionnaire and interviews, standardized screens for substance use)	Program (model)	Describe a care coordination program, the Vulnerable Infants Program of Rhode Island, to promote permanency for substance-exposed infants and provide evaluation data for the final four years of operation.	203 infants, 195 mothers enrolled. All mothers of infants reported a history of substance use at tome of enrolment. Age of infants is not specified.	Success for the program is defined as reunification and a closed child welfare case. By 1 year, 86% of newborns in the program has permanent placements, and 77% were placed with biological parents or kin.	Principles of the program related to effectiveness include supporting parents to access help, advocating with social services systems systematically, ensuring programs are responsive to family need, intervening early, communicating often, and collaborating across sectors to avoid fragmentation. Although this model may require significant early investment, the potential savings across child welfare, health and other agencies are significant.

Twomey et al. (2010) *US*[91]	Research (descriptive evaluation, statistical analysis, semi-structured questionnaire and interviews, standardized screens for substance use)	Program (model)	Describe "The Vulnerable Infants Program of Rode Island," a care coordination program which works to promote permanency outcomes for substance exposed infants. The article describes the context, goals of the program and evaluates the outcomes of the first four years of the program.	203 infants, 195 mothers enrolled. All mothers of infants reported a history of substance use at tome of enrollment. Age of infants is not specified.	Involvement in the program was associated with reduced time spent in specialized nursery care. Over half the infants in the sample reached permanency with their biological parent, and 84% of infants were placed in permanent homes before their first birthday.	The program's tenants are: intervening early, connecting families with services that are matched to their needs, ongoing support, and coordinating with multiple service providers. The authors argue this has applicability to other child welfare programs, courtroom settings, and in other programs that involve perinatal substance using clientele.
van Andel et al. (2016) *Netherlands*[92]	Research (randomized control trial, pre- and post-intervention tests using Emotional Availability Scales, Parenting Stress Index, and salivary cortisol samples)	IMH (intervention)	Explore the efficacy of the Foster Family Intervention on improving the quality of the newly formed relationships between foster carers and infants/toddlers (6 weeks to 3.5 years of age), six to eight weeks after placement.	N=123 infants and toddlers, between 2009 and 2013, from a convenience sample of six foster care services in the Netherlands. This did not include children with birth defects, severe cognitive dysfunctions. 35% of the sample was younger than nine months.	A positive effect was found concerning interactions between foster caregivers and foster children after the introduction of FFI. A positive effect in sensitivity, structuring and non-intrusiveness was found amongst parents. Responsiveness and involvement increased for children. 9.6% of cases related to addiction, 44% to a history of mental health issues, 91.2% to neglect. Foster parent-child observations were videotaped: many children reacted in a sub-optimal way to their foster carer (lack of responsive behaviour), almost 40% of carers scored	The FFI may be an intervention reducing these risks for young foster children. Still the results have to be replicated in future research with larger groups. The principles used in the FFI to facilitate the relationship between foster carer and child can also be applied to the relationship between birth parent and child. Using these principles properly with birth parents and their children may help to prevent a new out of home placement in the future.

					insufficient on the sensitivity domain. A small group of caregivers recognized symptoms of stress in their foster children. Higher levels of foster carer stress were associated with higher levels of cortisol for children.	
van Andel, Grietens & Knorth (2012) *Netherlands*[93]	Peer reviewed description of intervention	IMH (intervention)	Explain the aims and principles underlying the Foster carer-Foster child Intervention (FFI); describes how the FFI is being implemented in Dutch foster care practice.	N/A	The FFI is designed for foster children under the age of 5. The main aim of the intervention is to improve or optimise the relationship between foster carers and foster child. The theoretical background and approach for the FFI includes: attachment theory, psycho-education, mindfulness therapy and video interaction training.	The FFI aims to improve the interaction between foster carer and foster child by optimizing the emotional availability, parenting skills and confidence of carers in a way that makes the child feel more secure. An RCT is being planned to test the FFI.
Wakelyn (2011) *UK*[94]	Research (case study, observation, grounded theory analysis)	IMH (assessment)	Find out about the experience of an infant or young child in care, learn about the possible reasons for under-detection of mental health and emotional difficulties, inform training and support for professionals	N=1. 3 months old at first visit, 13 months at last (observed once a week during psychotherapist appointment) plus a series of semi-structured interviews with foster carer and social workers. Followed from initial placement with foster family through to transition out to adoptive family.	The key finding was that there was a dichotomy between infant developmental organization and an anti-developmental trauma-driven organization. This was the first time fostering for this family and they were learning about the role. The social worker was also in her first experience with an infant placement. Social work was fragmented across five workers, leading to loss of continuity. It became difficult to recognise and value the mothering role. The extended wait for adoption felt like a state of	Social workers endure ongoing pressures of complex and harrowing cases. The importance of longer term foster parenting is marginalized in comparison to policy initiatives focusing on reducing numbers of children in care and length of time in care. This observation highlighted the importance of supported transitions: new roles for foster parents and social workers, from hospital to foster home, from foster to adoptive home (which includes experiences of grief and loss).

					limbo, or life on hold. In the related literature review, four themes were noted: under-referral and under-recognition of difficulties, seeing and not seeing child abuse, conceptualizations of foster care, and transitions.	
Warren (2013) *US*[95]	Grey literature (narrative, personal perspective case study)	Program (model)	Describes the benefits and tasks of being a Court Appointed Special Advocate for a baby (CASA). Warren describes the experiences of a CASA for an infant, and argues that dedicating resources into infant development and growth is an important endeavour for both the wellbeing of the infant and society.	One case is studied and reflected upon. The case follows the experience of a CASA working with a substance exposed infant, whose biological mother and father both have a history of intergenerational abuse and neglect.	Being a CASA helps meet and monitor the needs of the infant, and act as a facilitator between the court system and the infant. As a CASA holds the needs of the child first, a CASA will help the court make decisions that will benefit the child.	Being a CASA is a worthwhile endeavour, and can help create positive futures for children within the Child welfare system.
Williams et al. (2012) *US*[96]	Research (retrospective chart review, statistical analysis)	IMH (assessment)	Evaluate the effectiveness of a model program designed to screen young foster children and link them with infant mental health services.	N=151 in Phase 1 (formational) and 281 in Phase 2 (after improvements made in linkages to infant mental health services). Birth to three, DCFS detained children received care through the Foster	Training of clinicians and modifications to clinic procedures (such as having all clinicians trained rather than relying on a few specialists, inclusion of a protocol that recommends all children prenatally exposed to substances be referred to the BIB clinic for evaluation) led to significant	Model elements related to screening and referral recommended for addressing barriers to care includes: inclusive mental health screening of all foster children; consistent use of a mental health screening tool; persistent efforts to communicate with family members, courts, and children's services to facilitate linkage; access to evidence-based therapeutic services, including involving foster parents in

				Care Hub Clinic (one of 6 in LA County) that provides continuous specialized medical and mental health care services. Ethnically diverse, reflecting local population. Most common reasons for child welfare involvement were prenatal substance exposure (29%) and general neglect (31%).	improvements in linkage. 80% of children were appropriately screened in Phase 2 compared to 61% in Phase 1. Screening was conducted more appropriately when the clinician had an early childhood training background. Children with a history of prenatal substance exposure were still less likely to actually receive services.	dyadic therapy.
Wotherspoon Hawkins & Gough (2009) *AB Canada*[97]	Grey literature (information sheet geared to foster parents and caseworkers)	IMH (review)	Information sheet outlines the signs and appropriate responses to emotional trauma in infancy	Infants who experience emotional trauma	Details interventions and tips for caseworkers and parents to both combat and respond to emotional trauma. The information sheet is evidence-based.	N/A
Wotherspoon & Petrowski (2008a) *AB Canada*[98]	Grey literature (information sheet geared to foster parents and caseworkers)	IMH (review)	Information sheet offers background information and advice on the social-emotional development of children under five for foster parents and case-workers	Children under five, who are in foster care. The main population however, is infants and toddlers.	The information sheet provides numerous tips and practical advice for foster parents and caseworkers. The advice stems from the key point that infants and toddlers in Foster Care require unique support and their caregivers require specialized training.	N/A

Wotherspoon & Gogh (2008b) *AB Canada*[99]	Grey literature (information sheet geared to foster parents and caseworkers)	IMH (review)	The article outlines the importance of assessing and responding to emotional neglect in infants and toddlers	Infants and toddlers in Foster Care (specifically, the article is concerned with infants and toddlers under the age of 2, who cannot talk)	Details interventions and tips for caseworkers and parents to both combat and respond to emotional neglect. The information sheet is evidence-based.	N/A
Wotherspoon O'Neill-Laberge & Pirie (2008c) *AB Canada*[100]	Peer reviewed (narrative)	IMH (assessment)	Describes partnership between an infant mental health consultation program and child welfare authorities, with a special focus on the use of a consultation model to support infants and toddlers in foster care	N/A	Program is based on two theoretical frameworks: transactional and developmental. Assumption of all strategies is that when emotional needs are addressed, behavioural challenges will be more manageable. Program is evaluated qualitatively through patient satisfaction surveys and follow-up with case managers and foster parents	Important to integrate attachment-intervention principles into programs, not just social learning and operant-learning approaches, which are more behavioural.
Young et al. (2009) *US*[101]	Grey literature (review of state policies)	IMH (policy)	Assess state child welfare policies related to prevention, intervention, identification and treatment of prenatal substance exposure.	N/A	There is considerable variation across states in both policy and practice regarding substance exposed infants. Practices do not often conform to policies. Data is inconsistent and not collected in a way that supports program and policy development. American policies related to developmental supports are reviewed. The programs that do exist are overwhelmed by volume.	There are many opportunities to strengthen practice. A five-point intervention framework is provided to organize practices and policies comprehensively. The five points are: pre-pregnancy, prenatal, birth, neonatal, and throughout childhood and adolescence. Intensive collaboration is required.

Zeanah Berlin & Boris (2011) *US*[102]	Peer reviewed (review)	IMH (review)	Review research on attachment theory, assess attachment theory application in clinical settings, and describe several specific interventions which support the child-parent attachment relationship	Focus on infants and young children	This is a general overview for clinicians. There is a specific section on infants in foster care. Parent-child attachment is a central aspect of child development, especially in foster care contexts. Clinical intervention should begin with helping foster parents understand children's attachment and exploratory needs. Foster parents' own state of mind with respect to attachment has been identified as the strongest predictor of whether foster children will become securely attached to them.	Attachment assessment should have a central role. Foster parents' commitment to the children in their care is a critical component. A thorough understanding of attachment and its developmental course is essential in all clinical settings serving young children and their families.
Zhou & Chivers (2010) *Australia*[103]	Research (descriptive exploratory, administrative data statistical analysis)	Risk	Understand the characteristics that are related to the placement of infants in out-of-home care, including reported maltreatment, rate of entry, and duration of stay.	N=5,738 infants less than one year entering care between 1996 and 2006. Infants formed the largest group of children entering care (20%).	A high child protection reporting rate and entry rate was noted for infants and for Indigenous infants in particular. The three main issues of concern for infants who came into care were: drug/alcohol issues (40%), domestic violence (28%), and mental health issues (23%). Median length of stay in foster care was 68 days for their first "spell", and 745 days for kinship care, which were much longer durations than for other age groups. More than half the infants experienced one placement only. The longer they were in care, the more placements they experienced.	There are large disparities in terms of Indigenous status and involvement in the child welfare system that needs to be addressed. Child welfare and health programming should continue to takes into account emerging brain science, development of culturally appropriate services, and the availability of support-planning data.

Appendix 3: Excluded Sources

Source	Reason for exclusion
Anonymous (2012)	Study type
Bauer (2014)	Source type
Brown (2015)	Age of participants
Cuthbert, Raynes & Stanley (2012)	Not foster care
Diamond (2007)	Unable to access (Zero to Three)*
Dicker (2011)	Unable to access (Zero to Three)
Dierdrick (2014)	Source type
Dozier et al. (2007)	Unable to access (chapter in text)
Dozier, Bick & Bernard (2011)	Unable to access (Zero to Three)
Glangeaud-Freudenthal et al. (2013)	Participants / Context of article
Harden (2008)	Unable to access (Zero to Three)
Liberman, Francisco & Harris (2007)	Age of participants
Michael (2008)	Source type
Pallidino & Geisler (2010)	Unable to access
Pritchett et al. (2013)	Source type
Pritchett et al. (2015)	Source type
Ruff et al. (2016)	Age of participants
Scannapieco & Connel-Carrick (2007)	Age of participants
Thomas (2010)	Unable to access
Twomey & Lester (2007)	Unable to access (Zero to Three)
Wakelyn (2011)	Age of participants
Wotherspoon et al. (2008)	Unable to access (Zero to Three)
Wulczyn et al. (2011)	Unable to access (Zero to Three)

* BC Health and Human Services Library carries from 2012 on.