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Infant feeding nutrition policies in Australian early childhood education and care services: a content and qualitative analysis

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Abstract

Early infant feeding practices are a critical part of education and care programs within Early Childhood Education and Care (ECEC) settings. With an increasing number of children attending ECEC services from a young age, adherence to best practice infant feeding will improve long-term health outcomes. This paper uses inductive and deductive thematic analysis informed by Social Cognitive Theory and inductive content analysis, to describe Australian infant feeding nutrition ECEC policy environments. Key Australian ECEC policy documents were analysed, revealing the invisibility of infants generally, and infant feeding specifically, in current quality standards. This was followed by analysis of 28 nutrition or infant feeding policies from 19 centre- and home-based ECEC services impacting over 1500 children in Queensland Australia. Five key themes characterising the content of service policies impacting infant feeding emerged: documentation, values, curriculum and pedagogy, supportive environments, and working in partnerships with parents. Service policies are required by legislation and set the foundation for a safe, supportive environment for infant feeding. The lack of infant feeding practice examples and invisibility of infants in legislation increase ambiguity, and health and safety risks. Opportunities exist to adopt separate infant feeding policies which will assist the provision of quality practice for the short-term and long-term optimal health of infants in ECEC settings.

Keywords: Infant feeding, Nutrition, Policy environment, Early childhood education and care, Educator, Social cognitive theory

Background

Early childhood education and care (ECEC) settings have always been recognised as important sites of learning; however, with an increasing number of children attending these services their role in optimal infant and child health is increasingly significant (Petitclerc et al. 2017; Scully et al. 2017; World Health Organization (WHO) 2016a). In Australia, formal, approved ECEC services provide education and care for infants and children from birth to 5 years prior to school entry. The ECEC system includes centre-based long day care and home-based family day care, which operate for extended hours to support parent workforce participation¹. 14% of Australian children under 5 years attend long day

¹ In LDC, educators work in teams to design and deliver an educational program for children within a purposefully designed centre. In FDC, an educator generally works alone, to design and deliver an educational program for a small group of children in their own home. In Queensland, FDC educators need to belong to a FDC Scheme, which employs staff to monitor and support individual educators within their homes.

care and 8% of these children are under the age of 12 months with 9% spending more than 35 h per week in these environments (Australian Bureau of Statistics [ABS] 2011; Marinelli et al. 2012). This increasing reliance on ECEC services has highlighted the important role of educators in establishing life-long healthy practices including those around eating and physical activity. Early infant and young child feeding is recognised as a principal contributor to optimal health, wellbeing and growth (Ishimine et al. 2009). Infant as defined in Australia is a child under age of 12 months of age. Optimal feeding refers to infants and young children to two years and beyond. In particular, breastfeeding and appropriate introduction of safe and adequate complementary foods are identified as early, cost-effective strategies for obesity prevention and health maximisation (Ammerman et al. 2007; Kim and Peterson 2008; Victora et al. 2016). Therefore, with an increasing number of infants attending ECEC a focus on early infant feeding in these settings is warranted.

For the purpose of this paper, early infant feeding in ECEC includes: the promotion, protection, and support of breastfeeding; the safe and optimal delivery of breast milk to infants; the safe and adequate optimal delivery of formula to infants; and the appropriate introduction of complementary foods with respect to types of food and timing. The term *parent* or *caregivers* is used interchangeably.

The WHO Global Strategy for Infant and Young Child Feeding (WHO-IYCF) describes the obligations of both services and educators in ECEC to provide appropriate infant feeding programs, information and support (WHO 2003). However, international research has indicated that nutrition policies and practices have been inadequate in ECEC services, particularly in the area of infant feeding (Blaine 2015; Foster et al. 2015; Gerritsen et al. 2016; Smith et al. 2012). In addition, there is evidence that ECEC educators need additional support to work with infants (Recchia et al. 2015; Salamon 2011) to improve their knowledge, and develop positive attitudes to create supportive environments (Clark and Waller, 2007; Koh et al. 2012). Additional guidance is also required to enhance safe, social and physiological environments for feeding (Birch and Doub 2014; Lally 2013; Recchia et al. 2015; Tarrant et al. 2012). In particular, there are calls for a renewed emphasis on breastfeeding support and the reduction of direct and indirect breastfeeding discrimination, through changes to attitudes, environments, policies, training and practices (Gonzalez-Nahm et al. 2017; Javanparast et al. 2012; Koh et al. 2012; Smith et al. 2013). This includes protecting breastfeeding to two and beyond in line with the resolution of the World Health Assembly, which defines products marketed for children birth-36 months as breastmilk substitutes covered by the WHO code; “toddler” or “growing-up” milks are unnecessary and potentially harmful despite wide use in ECEC (WHO 2013; WHO 2016b). Adopting the WHO code in full in Australia to protect breastfeeding has been advocated for (Hull et al. 2017)

The National Quality Framework (NQF) in Australia is the main public policy guiding ECEC practices. It defines quality expectations and structures for centre- and home-based ECEC services, and provides guidance on service policies, procedures and practices within a context of continuous quality improvement (Australian Children’s Education and Care Quality Authority (ACECQA) 2017a, b). The centrepiece of the NQF is the *National Quality Standard* (NQS). This is underpinned by legislation and regulation, and drives quality through demonstration and assessment of seven integrated quality standards: (1) educational program and practices linking to the national Early Years Learning Framework (EYLF); (2) children’s health and safety; (3) physical environment;

(4) staffing arrangements; (5) relationships with children; (6) collaborative partnerships with families and communities; and (7) governance and leadership. It is important to note that the NQF is performance based rather than prescriptive, providing broad guidance on best practice and enabling services to determine how best to meet the quality standards within their local context (ACECQA 2017a, b).

In the definition of curriculum, the EYLF makes clear that learning and teaching reach across everyday care routines with activities such as feeding seen as opportunities to build trusting and reciprocal relationships with children and parents, and to promote healthy development and learning (ACECQA 2017a, b; Davis and Degotardi 2015; DEEWR 2009; Salamon and Harrison 2015). These expectations require individual educators to have core early childhood knowledge and skills spanning child development, health and pedagogy. This includes strategies for remaining up-to-date with new ECEC research and community standards. There is also an increasing focus on educator agency and autonomy to exercise professional judgment and make independent decisions on a daily basis (Irvine and Price 2014).

Recent research has outlined the invisibility of infants and toddlers in the EYLF and the subsequent challenges with interpreting the EYLF in practice, particularly as infants have specialised needs compared to older children (Davis and Degotardi 2015; Salamon 2011). These needs include their developing agency in feeding, healthy eating, and physical activity. In Australian ECEC, educator practice in these areas is also guided by the National Healthy Eating and Physical Activity Guidelines (HEPA). The HEPA guidelines are an ECEC-specific resource and are referenced in the NQS as a community standard. The HEPA is underpinned by the Australian Dietary Guidelines for Children, the Australian Infant Feeding Guidelines (AIF) and the Australian Physical Activity Guidelines for Children. The AIF provides referenced technical guidelines for Australian health workers working with infants which are generally aligned with the World Health Organization recommendations for infant and young child feeding (WHO-IYCF). The WHO gives global recommendations for a wider audience including ECEC educators and families (NHMRC 2012; WHO 2003). There are minor technical differences within the WHO-IYCF and AIF, for example, breastfeeding duration and infant feeding handling/storage/sterilisation some of which are outlined in Table 6.

Seeking to build educator knowledge and capacity to implement the HEPA guidelines, the Queensland Government funded the Learning Eating Active Play and Sleep (LEAPS) state-wide professional development program from 2013 to 2016. LEAPS training engaged 3375 educators working across centre-based and home-based ECEC services and comprised three modules, including (1) pre-reading, (2) face-to-face or online workshop and (3) development of a quality improvement plan to strengthen healthy eating and physical activity in participating ECEC services (Cleland et al. 2016). The LEAPS program included a detailed mixed-method evaluation, informed by Social Cognitive Theory (Bandura 2004), encompassing pre/post-surveys of 765 educators participating in the LEAPS training and qualitative case studies of 12 LEAPS services. This study is nested within the LEAPS evaluation (Cleland et al. 2018), contributing to initial policy documents collected during the qualitative case studies and analysis of related national ECEC public policy in Australia.

Why Social Cognitive Theory?

Social Cognitive Theory (SCT) provides the theoretical framework for this study. SCT is a popular theory for describing behavioural change and is used widely in health and

education in the investigation of barriers and enablers to ECEC nutrition best practice (Bandura 1977; Cleland et al. 2018; Ward et al. 2008). SCT's Triadic Reciprocal Determinism model allows exploration of the complexities of educator behaviour, agency, and knowledge in ECEC. The theory enables consideration of three fluid cognitive, behavioural and environmental factors or determinants of behavioural change which include important motivations of self-efficacy, goal setting and outcome expectancies (Bandura 1977). The theoretical focus is the investigation of cognitive (within-person) processes such as knowledge and beliefs in conjunction with other between-person processes (environment and behavioural determinants). Consideration of the relationships between these factors enables further insight into behavioural change in health theories than other methods such as the Ecological Model or the Theory of Planned Behavior (Bandura 2001; Nutbeam and Harris 2004). In this study, SCT provided a useful framework to investigate the policy environment that impacts educators' work with infants and provision of a supportive infant and young child feeding environment in ECEC.

Why focus on policy relating to infant feeding?

Policy is designed for "distinctive and formal purpose for organisations and governments: to codify and publicise the values which are to inform future practice and thus encapsulate prescriptions for reform" (Ranson 1995, p. 440). As such, policies set expectations and assist organisations to develop and implement practices that are informed and consistent with regulatory requirements and contemporary community standards. In the Australian ECEC context, there are two interrelated levels of policy impacting on practice within services: public policy and service policy. Public education and health policies impact on professional practice and societal expectations of practice to promote social values, and healthy and safe environments (Weimer and Vining 2017). At the service policy level, implementation of effective practices requires evidence-based guidance which defines the intent, organised behavioural frameworks and procedures to be followed by staff. In ECEC, there is reliance on educator agency for the interpretation of public policy, communication of service policies and everyday practice (Davis et al. 2015; Salamon 2011).

ECEC policies provide a vehicle for the translation and operationalisation of information contained in the NQF to be available at an operational service level, to be regularly updated and co-developed in collaboration with parents and other stakeholders, to provide the legal context on which practices are based, to translate evidence into practical strategies for implementation, and to reflect and communicate the current standards and guidelines. How these policies are documented is flexible and the current trend is towards brief policy statements supported by additional procedural information and resources.

While the NQF specifies the need for service policies in some areas (for example, nutrition, food and beverages, dietary requirements), there is no requirement under the NQF for a separate infant and young child feeding policy. Consequently, there is little information available about the policy and practice environment around infant feeding in ECEC within the Australian context. Understanding this policy environment is important to influence the role of ECEC in establishing life-long healthy eating practices. As such this research aims to:

Table 1 Criteria used for stratification of ECEC

Criteria	Categories
Type of ECEC	Family day care Long day care
Remoteness Based on Accessibility/Remoteness Index of Australia (ARIA) which provides an indicator of access to services (ABS 2005)	Metropolitan areas Regional areas
Socioeconomic advantage Postcode where service was located. The Socio-Economic Indexes for Areas (SEIFA) is used to define economic advantage or disadvantage. Scored based on deciles (ABS 2011)	SEIFA was categorised as: Low (Deciles 1–3) Mid (Deciles 4–7) High (Deciles 8–10)

1. Analyse the NQF, including legislation, practice guides, and the approved learning framework—the EYLF, as an example of public policy, for the inclusion of infant and young child feeding;
2. Analyse and describe the inclusion and accuracy of infant feeding in current service policy within ECEC services using the World Health Organization/UNICEF Global Strategy for Infant and young child Feeding (WHO-IYCF) and Australian Infant Feeding (AIF) guidelines as benchmarks.

Method

This qualitative study investigated the policy context informing and supporting infant feeding in Australian ECEC services, including centre-based long day care and home-based family day care. Reflective of the current Australian ECEC context, the study examined a selection of key national ECEC policy documents (i.e., legislation, quality standards and curriculum) to determine the inclusion of infant feeding, followed by analysis of a sample of ECEC service policies to consider translation at the local level. Analysis of written texts such as legislation and service policies provides an independent unobtrusive method in qualitative research (Silverman 2011). Content analysis was utilised for NQF legislation while the framework method supported both inductive and deductive thematic analysis of service policies underpinned by SCT.

Setting

A list of services providing education and care to infants was collated from The Australian Childcare Index (<http://www.echildcare.com.au>) and Mychild (<http://www.mychild.gov.au>) websites. Services located in remote and very remote areas, and that did not cater for infants under 12 months were excluded. Eligible services were stratified as per Table 1 and ECEC services were randomly selected from each strata to participate; 50 services were approached to participate. Given the potential influence of LEAPS on policy development, services were recruited that had completed LEAPS and those who had not undertaken LEAPS (Cleland et al. 2016). A total of 19 services were included in the study. A family day care service represented a number of individual self-employed educators operating a family day care business within their home.

Data collection

The focus for public policy was the NQF (ACECQA 2017a, b) and the most recent relevant policy documents were downloaded from the relevant websites for review. Documents selected were the NQF consisting of the Education and Care Services National Law Act (2010), Education and Care Services National Regulations (2016), Guide to the Education and Care Services National Law and the Education and Care Services National Regulations 2011 (Australian Children's Education & Care Quality Authority (ACECQA) 2017a, b), *Belonging, Being and Becoming, The Early Years Learning Framework for Australia* (DEEWR 2009) and Guide to the National Quality Standard (ACECQA 2017a, b)².

As noted, the collection of ECEC service policies was part of a broader collection of data contributing to the LEAPS case studies that included a 5-h site visit to the service, comprising interviews with the director/coordinator, professional conversations with staff and an environmental audit. Policies identified as relevant by the service on health, food, nutrition and infant feeding were collected from the director/coordinator or their delegate on the day of the site visit. Policies not available on the day were requested via email. A follow-up request to confirm that all relevant policies were submitted was sent after all site visits had been completed.

Data analysis: content analysis of the NQF

Key NQF documents were identified and subjected to content analysis (Hsieh and Shannon 2005) to examine infant feeding support. Content analysis enabled systematic coding of infant feeding inclusion in the NQF, which, in turn, provides the basis for infant feeding policy and practice within individual services. The identified NQF documents were examined for references to infant feeding using textual word searches (Silverman 2011). A systematic search was undertaken using developed categories or phrases of infants/babies, toddlers and young children/child: "birth" or "born" or "babies" or "infants" or "toddlers" pertaining to infant feeding and nutrition. Content analysis was utilised to examine the textual data to establish patterns or trends of words and themes or relationships (Grbich 2007) while allowing for emergence of meaning from the text from constant revisions (Bryman 2012). Words embedded in the relevant phrases were systematically recorded on an excel spreadsheet. Infant feeding/nutrition was examined in the NQF for its inclusion within the seven quality areas of the NQS guided by the WHO-IYCF and AIF. Content analysis was a preferred method for a large study of the NQF in consideration of providing rigour with credibility and confirmability, reducing analytical bias between researchers (Liamputtong 2013).

Data analysis: inductive and deductive analysis of service policies

Analysis of the service policies was informed by the framework method (Gale et al. 2013), a method suitable for large studies allowing collaboration across teams. The framework method has seven stages of analysis which can be summarised as: Transcription, Familiarisation, Coding, Development of the analytical framework, Applying the analytical framework, Charting data and Interpreting data (Gale et al. 2013). In this second phase of the study, the framework method was used inductively and deductively,

² A 2017 review of the NQS resulted in minor revisions to the NQS, effective in January 2018. These do not change this analysis nor address the implications raised for consideration by this study.

underpinned by SCT, to establish key themes. (Gale et al. 2013; Ritchie et al. 2013). Initial inductive thematic coding provided an opportunity for emergent codes to be identified by the team of researchers prior to applying the deductive lens of SCT in developing a working analytical framework (Bryman 2012; Gale et al. 2013).

Initial coding involved individual line-by-line open coding of 10% of policies (Gale et al. 2013) by individual researchers and then collectively discussed the inductive thematic analysis (Bryman 2012; Miles and Huberman 1994). During these recorded sessions, open codes were grouped together into categories and then themes. Deductive analysis was then applied, where the open codes were regrouped into categories and themes based on the tenets (cognitive, behavioural and environmental) of Social Cognitive Theory's Triadic Reciprocal Determinism model adapted to the ECEC sector (Wood and Bandura 1989); and finally a preliminary analytical framework was developed which rationalised the inductive and deductive themes. The framework was then independently tested on two further policies informing a final analytical framework which was used to analyse the remainder of the policies. The use of the systematic framework method rationalised organised charting and consensus coding and analysis from authors of multiple fields of nutrition, education and infant feeding in independent and collaborative steps to generate a working analytical framework (Gale et al. 2013; Jennings 2005).

Ethics approval

Ethics approval was gained through Queensland University of Technology Office Human Research Ethics Committee (# 1300000625).

Results

Analysis of the NQF in relation to infant feeding

Analysis of the NQF revealed two key findings: the invisibility of infants generally, and particularly in relation to infant feeding and nutrition; and the relevance of all seven quality areas for infant feeding best practice and the need for interpretation when applying these to infant feeding practices in ECEC.

The invisibility of infants and infant and young child feeding in the NQF

The NQF broadly applies the generic terminology of "child" or "children" and more specific terms such as "infants" and "babies" are used infrequently. Analysis of the NQF points to the invisibility of infants in the underpinning legislation and regulations, supporting guides and the national EYLF. Findings indicate that more specific terminology is used only occasionally to contextualise an example of quality practice. For example, the Guide to the Education and Care Services National Law and Regulations 2011 and Guide to the National Quality Standard include some practice examples for infants mainly pertaining to sleep, toileting and supervision. However, the majority of practice examples are generically child-related. Pertinent to the focus of this study, analysis found that nutrition examples are mostly targeted at older children, with limited practice examples relating to infant and young child nutrition or feeding support. Adequate hygiene practices, safe practices for handling, preparing and storing food, menu development, healthcare and allergies and facilities for children are also aimed generically at children. Reinforcing this, the term "infant" does not currently appear in the ACECQA

glossary for understanding the NQF (see Additional file 1: Table S1). Consequently, legislative provision in the Education and Care Services National Law regarding nutrition and feeding is non-specific to infants who are encompassed in the term “children”. Instead, there is expectation that educators will draw on their professional knowledge and agency to translate these requirements to provide supportive infant feeding. Examples of this generic legislative support translated through the seven quality areas for infants are outlined in Additional file 1: Table S1.

The relevance of all seven quality areas to infant feeding and need for interpretation by educators

Infant and young child feeding is primarily addressed under QA 2, Children’s Health and Safety in the NQS. However, demonstrating the integrated nature of the NQS, quality practice in infant feeding requires consideration of all seven quality areas. The specific examples from the NQS are presented in Table 2.

The EYLF is promoted as a curriculum framework for children from birth to school entry. Searching for infant-related terms including contents and glossary sections, 22 references were identified. None of these related to infant and young child feeding or nutrition. For example, there was no specific reference to infant-related feeding topics including “mixed feeding”, “exclusive breastfeeding”, or “exclusive formula feeding” terms. As in other areas of the NQF, infants are subsumed under the generic terms “child” or “children” throughout the EYLF.

There were three domains in which infant-related references were found in the EYLF: communication; relationships; and development potential. Most phrases were linked to QA 5 Relationships with children with eight references and QA 1 Educational program and practice with six references. There was only one reference in QA 2 Children’s health and safety: “Research has shown that babies are both vulnerable and competent” (DEEWR 2009, p. 12).

The aim of the NQF is to support and strengthen quality service provision, and thereby contribute to positive outcomes for children participating in ECEC. However, key to achieving this is clarity of expectations and this analysis shows a clear gap when it comes to informing and supporting quality IYC feeding policies and practices.

Analysis of service policies

Nineteen ECEC services, reaching over 1500 children, provided 28 service policies for analysis; 58% of services had completed LEAPS training and 68% had been rated under the NQS³. Table 3 defines the service characteristics using Socio-Economic Indexes for Areas (SEIFA), Accessibility/Remoteness Index of Australia (ARIA) and type—long day care (LDC) or family day care (FDC) and infant feeding policies. All services submitted nutrition or health and safety policies, only 21% (n = 4) submitted separate infant feeding policies; most had one overarching policy addressing child nutrition, eight incorporated minor references to infants, the remainder did not. Ten services (52%) had participated

³ Services are rated under the seven quality areas through an assessment visit including discussion of an ongoing quality improvement, important to services for goal setting for best practice standards. Authorised Officers rate services on compliance, receiving ratings (provisional—not yet assessed, significant improvement required, working towards NQS, meeting NQS, exceeding NQS or excellent) which are published on government websites, informing consumer choice (<https://www.acecqa.gov.au/assessment/assessment-and-rating-process>).

Table 2 National Quality Standard and infant feeding summary (Australian Children’s Education & Care Quality Authority (ACECQA) 2017a, b)

Quality area	Element examples from the NQS:	Example of infant feeding provision from guide to the NQS:
1. Educational program and practice	<p>Standard 1.1 An approved learning framework informs the development of a curriculum that enhances each child’s learning and development</p> <p>Element 1.1.1 Curriculum decision-making contributes to each child’s learning and development outcomes in relation to their identity, connection with community, wellbeing, confidence as learners and effectiveness as communicators</p> <p>Element 1.1.6 Each child’s agency is promoted, enabling them to make choices and decisions and to influence events and their world</p>	<p>“Assessors may observe: educators and coordinators supporting and promoting babies’ and toddlers’ early attempts to initiate interactions and conversation, acknowledging and responding sensitively to babies’ and toddlers’ cues and signals, initiating one-to-one interactions with babies and toddlers during daily routines. Babies and toddlers: reaching out and communicating for comfort, assistance and companionship, being playful and responding positively to others.” p. 24</p>
2. Children’s health and safety	<p>Standard 2.1 Each child’s health is promoted</p> <p>Element 2.1.1 Each child’s health needs are supported</p> <p>Element 2.1.3 Effective hygiene practices are promoted and implemented</p>	<p>“Assessors may observe: babies being fed individually by educators, educators following the service’s procedures for the safe storage and heating of food and drink, including breast milk, a supportive environment for mothers to breastfeed...” p. 63</p>
3. Physical environment	<p>Standard 3.1 The design and location of the premises is appropriate for the operation of a service</p> <p>Element 3.1.1 Outdoor and indoor spaces, buildings, furniture, equipment, facilities and resources are suitable for their purpose</p> <p>Element 3.2.2 Resources, materials and equipment are sufficient in number, organised in ways that ensure appropriate and effective implementation of the program and allow for multiple uses</p>	<p>“Assessors may observe comfortable and protected areas both indoors and outdoors where babies can * be cuddled or held by an adult.” p. 90</p> <p>“Assessors may observe: *premises, furniture and equipment that are safe, clean and well maintained, * educators consistently conducting safety checks and monitoring the maintenance of buildings and equipment.” p. 8</p>
4. Staffing arrangements	<p>Standard 4.1 Staffing arrangements enhance children’s learning and development and ensure their safety and wellbeing</p> <p>Element 4.1.1 Educator-to-child ratios and qualification requirements are maintained at all times</p> <p>Standard 4.2 Educators, coordinators and staff members are respectful and ethical</p> <p>Element 4.2.1 Professional standards guide practice, interactions and relationships</p>	<p>“Assessors may observe: * demonstration in everyday practice of care, empathy and respect for children, colleagues and families... Assessors may discuss * the ways in which educators, coordinators and staff members access copies of: *the service’s policies and procedures * other relevant professional publications.” p. 112</p>

Table 2 (continued)

Quality area	Element examples from the NQS:	Example of infant feeding provision from guide to the NQS:
5. Relationships with Children	Respectful and equitable relationships are developed and maintained with each child Element 5.1.1 Interactions with each child are warm and responsive and build trusting relationships Element 5.1.2 Every child is able to engage with educators in meaningful, open interactions that support the acquisition of skills for life and learning	“Assessors may observe children demonstrating a sense of belonging and comfort in the environment, communicating their need for comfort and assistance...educators: comforting children who cry or show other signs of distress.” p. 127 “Educators: speaking in comforting tones and holding babies to soothe them when they are crying...” p. 137
6. Collaborative partnerships with families and communities	Standard 6.1 Respectful and supportive relationships with families are developed and maintained Standard 6.2 Families are supported in their parenting role and their values and beliefs about childrearing are respected Element 6.2.2 Current information is available to families about community services and resources to support parenting and family wellbeing Element 6.3.1 Links with relevant community and support agencies are established and maintained	“Assessors may observe: daily information being exchanged with families at arrival and departure times.” p. 150 “(Aim) The service plays an active role in supporting families in their parenting role by becoming a reliable source of practical information about resources and services within the local community.” p. 149
7. Leadership and service management	Standard 7.1 Effective leadership promotes a positive organisational culture and builds a professional learning community Standard 7.2 There is a commitment to continuous improvement Element 7.2.2 The performance of educators, coordinators and staff members is evaluated and individual development plans are in place to support performance improvement Element 7.3.5 Service practices are based on effectively documented policies and procedures that are available at the service and reviewed regularly	“Assessors may sight the following required policies and procedures available at the service, which are also available to families: health and safety policies and procedures, including: health and safety, which covers:—nutrition, food and beverages, dietary requirements... *relationships with children policies and procedures, including interactions with children...” p. 187, 188

in LEAPS training that included elements of IYC feeding yet very few policies had been updated to reflect LEAPS infant feeding information or contained references to LEAPS.

Inductive and deductive analyses of the policies revealed five themes: documentation, values, curriculum and pedagogy, supportive environments, and working in partnership with parents. These are outlined in Table 4.

Documentation

This theme encompasses how the policies were presented and communicated taking into consideration language, layout, evidence based and sources identified as informing the policies. Analysis revealed three sub-themes. The NQF underpins all policies and should guide the inclusion of current information in the policy, their collaborative development,

Table 3 Policy and audit overview

Service	Type	SEIFA	ARIA	Participation in LEAPS training	Policy name	Provides onsite food
L1	LDC	High	Major city	Yes	Food and Nutrition	No
L2	LDC	High	Outer regional	No	Food Safety, Healthy Eating and Mealtime	No
L3	LDC	Mid	Outer regional	Yes	Food and Nutrition, Health and Safety	No
L4	LDC	Low	Major city	Yes	Nutrition	Yes
L5	LDC	High	Major city	Yes	Health and Safety	No
L6	LDC	Low	Major city	Yes	Health and Safety	No
L7	LDC	High	Inner regional	Yes	Food and Nutrition, Food and Drink Safety	No
L8	LDC	Low	Inner regional	Yes	Food and Nutrition, Health and Safety	No
L9	LDC	Low	Inner regional	Yes	Food and Beverage	No
L10	LDC	High	Major city	No	Healthy Eating, Mealtime	No
L11	LDC	High	Major city	No	Nutrition	Yes
L12	LDC	High	Major city	No	Nutrition	Yes
L13	LDC	Low	Inner regional	No	Food, Nutrition and Beverage	Yes
L14	LDC	High	Major city	No	Nutrition	Yes
L15	LDC	Low	Inner regional	No	Nutrition and Dietary Requirements	Yes
F1	FDC	High	Major city	Yes	Nutrition and Food, Healthy Environment	Varied ^a
F2	FDC	Low	Outer regional	Yes	Food, Nutrition and Beverage	Varied
F3	FDC	High	Major city	No	Nutrition	Varied
F4	FDC	Low	Inner regional	No	Food, Nutrition and Beverage	Varied

^a FDC services include between 20 and 80 FDC sites and food provision varied between sites and within sites. Policies are developed for each service and so cover the sites within the service

Table 4 Emergent themes

Themes	Sub-themes
1. Documentation How the policies have been presented: language, layout and sources	(a) Ambiguity of definitions and omissions of key terminology (b) Use of primary, secondary and tertiary infant feeding information sources (c) Structural and review ambiguity
2. Values The rationale for approaches and practices	(a) Health as an underpinning value (b) Respect for diversity
3. Curriculum and pedagogy Teaching content and practice linked to the Early Years Learning Framework (EYLF), Healthy Eating and Physical Activity guidelines (HEPA)	(a) Educator modelling (b) Child autonomy (c) Professional development
4. Supportive environments How the policy represents a supportive infant feeding environment guided by the Australian Infant Feeding guidelines (AIF) and World Health Organization Infant feeding recommendations (WHO-IYCF)	(a) Risk management (lack of clarity around glove usage, handling EBM, reducing bacterial proliferation in formula & terminology, sterilisation, water intake, choking hazards, other) (b) Supportive physical & social environments feeding/satiety cues: routine or flexibility?
5. Working in partnerships with parents How partnerships with parents are understood: engaged, facilitated and communicated	(a) Communication of rules and processes (b) Communication of child-related factors to monitor care and well-being (c) Promoting agency and autonomy—interplay between educators and caregivers

Table 5 Infant feeding policy source documents (examples)

Primary sources	Secondary sources specific to ECEC sector	Tertiary: government collators	Community collators	Other websites, individuals, conferences, courses, etc.
Australian infant feeding guidelines	HEPA (Get up and Grow Guidelines)	Queensland Health	Australian Breast-feeding Association	Packing a Lunch-box 2006, Raising Children Network
World Health Organization	Early Years Learning Framework	Victorian Government Health website, nutrition	Sudden Infant Death Syndrome organisation	Children's Nutrition Kit, 2006
Reputable peer-reviewed current research papers/journal articles	National Quality Standards and Framework	Food safety policy and regulation unit	Nutrition Australia Queensland	Safe food Australia 2nd Edition 2001

adherence by educators and periodic review to maintain this currency. The Guide to the NQS describes the implementation of these approaches to effective policy as “fundamental to providing for children’s wellbeing to ensure that routines, activities and experiences support children’s individual requirements for health, nutrition, sleep, rest and relaxation” (ACECQA 2017a, b, p. 47).

(a) *Ambiguity of definitions and omissions of key terminology* There was a lack of common language and consistency in the service policies with a wide range of expressions/definitions used creating ambiguity. Some internationally standardised infant-feeding terms and global instruments referring to Infant and Young Child Nutrition in the AIF and WHO-IYCF, were absent from the NQF and were not found in the policies. Policies did not include specific definitions for key words: “infant”, “toddler”, “child”, “children”, “routine” and omitted infant nutrition-specific terms important to health and safety: “exclusively breastfed”, “mixed feeding”, “demand-fed” and “feeding/satiety cues”. Ambiguity also existed with the terms “nutrition” and “food” relating to infants. The term “food” reflects a “solids only” response in some policies while a “solids and liquid foods” for infant feeding were reflected in others. There was evidence of infant feeding policy ambiguity compounded by inconsistent use of terminology.

(b) *Use of primary, secondary and tertiary infant feeding information sources* When reviewing documents used to underpin the policies, analysis found multiple sources were used of varying quality. Sources were categorised into primary, secondary and tertiary source categories (outlined in Table 5). Primary health sources included national and international guidelines for infant and young child feeding (AIF/WHO-IYCF) or reputable current journal articles on infant feeding. Secondary sources were ECEC-specific resources that contained some information on infant feeding without the specific detail of primary health sources. Tertiary sources included other collations of infant feeding information such as government or community organisations, health websites and professional development courses. The NQF encourages services to draw on current standards and guidelines to inform practice; yet only 4 of 19 services listed a primary source document for infant feeding (see Additional file 1: Table S1).

Analysis showed a uniform listing and reliance on ECEC policy documents which were secondary IF sources and a listing of multiple public policy documents including 25 national regulations/guidelines around health and safety, curriculum or legislation

with multiple regulatory areas. A majority of listings were tertiary health sources: parenting websites, health organisations or individuals and seminars.

Many policies also omitted the dates of publication or dates of access for online resources. How ECEC services used the information from these sources was inconsistent; secondary and tertiary sources provided varying accuracy.

(c) *Structural and review ambiguity* Fifteen (78.4%) services did not have a separate policy for infants and young children. In most cases, general or detailed procedures were integrated within the policy. Key structural differences were noted between long day care and family day care, and between services that provided food and those who requested parents provide food. FDC policies included more practical sections to display in FDC homes or give to parents, for example, providing information about types of foods to bring and heating bottles of formula or cow's milk in the microwave. The use of corporate ECEC and other purchased and/or generic policy templates was evident. Individual services had made few alterations to the generic templates. Policy review times varied with mostly biannual reviews or no specified review time.

Few services listed changes from their previous reviews while others had a signature acknowledgement. Several policies had a disclaimer notice (particularly those templates provided by ECEC outsourced policy providers) releasing the document provider from any legal liability for policy omissions.

Values

This theme incorporates the rationale and support for health and healthy behaviours in educator roles and service practices. It included the service vision, underpinning values and expectations of best practice in relation to health, nutrition, infant feeding as well as respect for diversity of social background, special needs, allergies and religions.

(a) *Health as an underpinning value* There was general recognition of the role of ECEC services in valuing and promoting healthy eating. Most services clearly acknowledged that children's nutritional intake during their time in formal care was substantial:

"Many children in long day care may receive 50–70% of their food intake whilst in care therefore it is important to adhere to the following guidelines." Service code L4.

Values underpinning best practice are reinforced by the health and safety standards and legislation in the food and nutrition policies:

"To ensure all staff store, prepare, provide and cook food in a safe and hygienic manner in accordance with contemporary research, relevant food legislation and the food safety program" L9, p1.

(b) *Respect for diversity* Many policies included explicit references to values promoted in the EYLF, for example, respect for individual and family diversity. This diversity with respect to food encompassed cultural and religious food practices, as well as individual food preferences and requirements for medical reasons, such as, for example, allergies:

"The centre aims to provide nutritionally balanced, safe meals to children, incorporating a range of food groups, cultural styles, tastes and textures, and medically diagnosed dietary needs; all to encourage lifelong sound eating habits, health and wellbeing" L11, p1.

Curriculum and pedagogy

All policies promoted healthy eating as part of the educational curriculum, in line with the EYLF. Policies placed emphasis on pedagogical practices to teach and promote healthy eating in ECEC supporting desired learning outcomes in the EYLF. The policies included embedded health promotion in addition to explicit references to teaching and learning linking to the EYLF and transcending all quality areas within the NQS. For example, many policies promoted cooking with children, educator modelling as an intentional teaching strategy and the opportunity to build cultural awareness through celebrations and special events. Some promoted nutrition as another context to promote child agency and to teach other skills, including literacy and numeracy, fine and gross motor skills and social competence.

(a) *Educator modelling* Modelling was frequently identified as an intentional teaching practice in the context of mainly scheduled mealtimes for older children; however, there was no mention of infants or appropriate feeding and what constituted modelling for infants.

“Staff members will sit down with the children and discuss food nutrition and food safety, promoting healthy eating habits during mealtimes and during centre cooking experiences.” L1, p1.

Food refusal as a child development milestone was only mentioned in two policies and not in relation to infants. No policy provided educator direction in response to food refusal.

(b) *Child autonomy* Pedagogic emphasis on developing child agency is a core element of the EYLF and encourages educators to provide opportunities for children to exercise choice and autonomy, for example, using utensils to help themselves to shared fruit/foods. However, younger infants under 6 months and infant autonomy are generally omitted from examples with a generic use of “children”:

“Incorporate concepts regarding healthy food choices into the program. Build children’s agency and autonomy by supporting them to choose what and how much they eat. Model healthy-eating habits when eating with children.” L9, p1.

(c) *Professional development* Training and professional development of service staff is a core tenet under the NQF. Training in general nutrition, hygiene/food safety/handling was mentioned in 12 out of 19 services and an example of this is provided below:

“Staff will be encouraged to attend professional development on nutrition, food handling and hygiene practices.” L12, p2.

However, no specific training around infant nutrition was described in any policy such as correct feeding techniques for expressed breastmilk (EBM) and infant formula.

Supportive environments

This is the strongest theme to emerge from the review of policies, identifying a continuum from risk management to the creation of supportive environments. The main focus is on risk management, with respect to QA 2, Health and safety for infant nutrition (breastfeeding, infant formula and complementary foods). Health and hygiene is

evidenced by requirements to wear gloves, a focus on handling EBM and sterilisation procedures. Technical issues should be informed by the AIF and WHO-IYCF encompassing standards, water/nutrition intake and practices, storage, handling, feeding and heating. For most services these were not accurately informed. The theme discusses consistency or inconsistency with expert guidelines.

(a) *Risk management areas* A number of sub-themes emerged under risk management (refer Table 6). Many of the policies/procedures are inconsistent with the national and international guidelines with respect to the handling, storing and feeding of infant formula and breast milk at the specific or micro-level and are not consistent with best practice. Consistent with the previous themes on documentation there were terminology ambiguities. For example, no distinction was made between exclusively breastfed infants, those who were mixed fed or exclusively formula fed. Given the high use of formula, no distinction was made between formula types (powdered infant formula (PIF), pre-packaged or toddler) despite specific differences in age-appropriateness or preparation (NHMRC 2012; WHO 2003).

The policies also reflected a heightened focus on risk minimization around infant allergy or choking with a focus on minimising any risk of litigation or exposure to poor health for educators. There were few references to specific long-term poor physical outcomes for infants such as risk of sub-optimal growth (either above or below expected growth trajectories).

(b) *A supportive physical and social environment* According to the AIF, a supportive ECEC infant feeding environment is one that is a safe, shared positive experience for the infant, educator and parent. This includes responsiveness to cues, holding and communicating with the infant while feeding, preparing milk and complementary foods appropriate to individual developmental requirements informed by current guidelines. The environment is supportive of breastfeeding mothers and breastfed infants when there is the provision of practical facilities such as a place to express and feed. Building of relationships and effective communication are essential to a supportive infant feeding environment (National Health and Medical Research Council (NHMRC) 2012).

Policies had a strong focus on infant feeding as they aligned to the NQS requirements pertaining to children's health and safety. There was less evidence of reference to other quality areas such as educational program and practice, and relationships with children, which are considered integral to creating a positive and supportive infant feeding environment. This created less balance than the AIF and more emphasis on risk management. Infant emotional health as a key foundation for child development (Lally 2013) was not conceptualised in policies in relation to infant feeding; however, a positive supportive social environment was implied:

“Arrange meal time furniture in a safe and attractive manner. Never use food or drink as a reward or punishment. Provide meal time utensils that are age and developmentally appropriate.” L9, p2.

(c) *Feeding/satiety cues: routine or flexibility?* Routines and flexibility have been highlighted as important constructs in early infant feeding. However, policies provided no guidance on what “routine” or “flexibility” would entail while the terms “flexibility” and “demand feeding” were not mentioned in the policies in relation to infant feeding.

Table 6 risk management areas

Risk management areas	Results
(a) Lack of clarity around glove usage	<p>A majority of services required gloves for preparation of EBM, formula and food with particular emphasis on handling EBM. Some services also required educators to wear gloves while feeding. "...use a glove on the hand holding the bottle, if baby regurgitates any feed this will protect the educator" L2, p. 1. Only one service described international recommendations in ECEC—WHO-IYCF, Centre for Disease Control (CDC) and AIF guidelines which indicate that gloves are not required if hands are thoroughly washed:</p> <p>"Responsibilities of educators when bottle feeding infants: Wash and dry hands before and after feeding. There is no need to wear gloves if hands are clean and dry." L9, p. 3. The term "body fluids" does not include EBM as an example in any policies or legislation however is implied with the recommended use of gloves to handle breast milk</p>
(b) Handling EBM	<p>Few policies addressed correct heating, handling or storage for formula and EBM with protecting components or immunological properties. There is no guideline to shake for 5 s while information lacked contexts:</p> <p>"After heating, shake the bottle well (at least 5 s) to avoid hot-spots, which could cause burns to the baby's mouth and throat." L4, p. 1.</p> <p>Only one service stated the correct heating temperature "to body temperature" for EBM while one other lacked specificity: "Do not boil breast milk."</p>
(c) Reducing bacterial proliferation in formula	<p>There was only one specific reference to powdered infant formula bacterial proliferation—a potential hazard with few heating/feeding times, temperatures or testing listed. There was no warning in any policies in line with AIF and WHO recommendations regarding potentially fatal bacteria for pre-term, young, or immunocompromised infants at most risk from Cronobacter (<i>Enterobacter Sakazakii</i>) if heating/feeding guidelines are not carefully adhered to. Three services mentioned both powdered infant formula (PIF) and pre-packaged formula but omit specific heating/handling differences. Sterile foods, "...include canned foods and liquid baby formula" L2</p>
(d) Heating and microwave use	<p>Emphasis for EBM/formula concentrated on correct temperature and containers for cartage to the service rather than heating temperature and time or testing prior to feeding—all of which affect the nutritional quality of the food for infants as well as posing health and safety risks. Terminology ambiguities increase this risk</p> <p>All but three policies disallowed microwave use for heating infant formula or cow's milk while most used bottle warmers. Two allowed microwave heating in consultation with parents</p> <p>"Our service will use microwaves to heat infant formula/cow's milk unless the parents state otherwise." L13, p. 6</p> <p>In line with AIF all policies described that EBM should not be heated in the microwave while microwave or heating for complementary foods had specific temperature testing instructions</p>

Table 6 (continued)

Risk management areas	Results
(e) Sterilisation	<p>Analysis shows continued terminology ambiguity in all policies with the lack of distinction between exclusively breastfed infants who do not require sterilised bottles according to WHO international recommendations and those mixed feeding or exclusively formula feeding. The AIF recommends sterilisation for all equipment. Some services have a policy to not sterilise or clean and re-use bottles which is potentially indirect discrimination for exclusively breastfed infants if they run out of feeding containers during the course of the day. One service (part of a large chain of ECEC services) denotes the responsibilities of parents to “Ensure all bottles and teats are sterilised and cleaned before use. Educators will rinse and wash bottles after use, but are unable to sterilise.” L9, p. 5. Educators are told, “Do not attempt to sterilise bottles.” L9, p. 5. However, some service policies communicate that parents will be contacted if the infant runs out of EBM or bottles. One describes how to sterilise a bottle for re-use:</p> <p>“If a bottle needs to be used twice, staff will sterilise all parts in antibacterial solution.” L10, p. 1</p> <p>Sterilisation of any water given to infants is rarely discussed in policies.</p>
(f) Water intake	<p>All services described that water should be available to all children:</p> <p>“For All Children; provide water for children continually throughout the day.” F1 p. 2</p> <p>Only one service makes the distinction with being careful not to displace an infant’s milk intake but no service outlines why this is an important practice to reduce risks of malnutrition or hyponatremia with infant water intake particularly for infants under 6 months of age</p> <p>“Care should be taken not to replace an infant’s milk intake with water.” L5, p. 4. There is no mention of exclusively breastfed infants not requiring water. There is no direct mention of the impact upon the breastfeeding mother-infant dyad and mother’s supply</p>
(g) Choking hazards	<p>All service policies included frequent mention of health and safety policy around nuts as a choking hazard and allergies however no differentiation of crushed nuts contained in foods (or foods labelled with “traces of nuts”) which are acceptable from 6 months and advised for the reduction of allergy without fear of choking. Policies didn’t outline risks of propping bottles but two services allowed infants to feed themselves or have the bottle in the bed with supervision</p> <p>“Educators will hold the infants during feeding until such time they are physically able to safely hold their own bottles.” L14, p. 1</p>
(h) Other risks	<p>There was no mention in any policies of the clear need in AIF guidelines to avoid honey for infants until 12 months of age due to botulism; to avoid unpasteurized milks; to avoid cow’s milk as a main drink under 12 months of age due to protein and electrolyte differences and an increased risk of iron deficiency; or the documented short and long-term increased health risks of early introduction of complementary foods prior to around 6 months of age</p>

Flexibility and responsiveness to individual needs are a broad requirement in the NQF and has been identified as an enabler for infant feeding (Javanparast et al. 2012; Koh et al. 2012).

Despite the inclusion of routines within the definition of curriculum and pedagogy (Quality Area 1), feeding/satiety cues relating to infants have little mention with emphasis rather on scheduled practices:

“Parents/Guardians will be asked to provide written feeding and dietary instructions and a schedule for feeding times upon enrolment.” L14, p. 1.

One policy described the feeding cue environment for older children, giving “additional food (e.g. fruit or a sandwich)”; for staff to be “...responsive to verbal and non-verbal indications of hunger”; monitoring children to “ensure children are eating scheduled meals or snacks first” L11, p2. Mainly non-specific information was given on the use of pacifiers without reference to masking of feeding cues.

Communication and working in partnerships with parents

The analysis revealed a strong focus on working in partnerships with parents with the existence of a continuum of communication between educators and parents for infant feeding. This was evident as passive one-way engagements (e.g., giving information) with the potential for active partnerships (two-way communication and shared decision-making). Many examples related to risk management where parents were expected to respond through providing information on infant allergies or medical needs. Three sub-themes emerged:

(a) *Communication of rules and processes* There was an emphasis on one-way passive approaches evident in the communication of rules and expectations to parents in policies without expectation for parent engagement or response. Some services threatened removal from the service (staff or family) if the policy was not adhered to.

According to the NQF, a policy is a form of communication that should be based on an active partnership and continuing dialogue with families. However, in practice the policies were passive one-way communication conduit documents articulating, for example, changes in the complementary foods menu (a legislative requirement).

“Families are notified of any changes to the menu...” L11, p. 7.

Policies from centres that were part of larger chains were almost identical and services who had purchased templates rarely changed content for their local context indicating little input from families with infants. Policies were generally drafted by the service with parents invited to comment rather than an exercise in co-creation as indicated by the NQS. One-way communication was reflected in passive acceptance of practice rules with a lack of evidence for communicating with families from non-English speaking backgrounds or with disabilities (See Box 1).

(b) *Communication of child-related factors to monitor care and well-being* The need for educators to be actively responsive to medical issues, allergies, food preferences, provision of special foods, and religious/ethnic considerations is a legislative requirement and was highlighted in all policies. Nutrition and food safety information was initiated through passive to active communication in service orientation while food consumption for all children was an expected daily communication. Documentation of infant excretions—the number of wet nappies/bowel motions was not mentioned in any policies—a key way of monitoring food and fluid consumption in young infants.

Discouraged (discretionary) foods evoked passive one-way to active communication in services with particular emphasis in services not providing onsite food:

“When an entire meal or snack is inappropriate and removed, and the child has no food for the time in care, the Service will phone the parent/guardian in the first instance to request that they come to the Service with the appropriate food. If they are unreachable then the meal will be allowed and it will be discussed when the parent/guardian arrives at the Service to collect their children. Additional information will be provided to parent/guardian suggesting appropriate food.” L14, p. 1.

(c) *Promoting agency and autonomy—interplay between educators and caregivers*
Underpinning communication was the interplay of agency and autonomy around food choices, feeding practices; and assigned responsibility. The promotion of parent autonomy or avoidance of educator responsibility for risk is evidenced by food choices. The responsibility of communicating food preferences for EBM, formula or solids and timing was squarely with the parents in most policies at the passive end of the identified continuum while sterilising and bottle feeding practices were governed by service policy.

“Breast milk, cow’s milk and/or formula will be prepared in accordance with instructions provided by the family. In the absence of a clear directive, educators will follow the milk feeding procedure.” L5, p. 4.

“Solid foods will be introduced on request from parents.” L7, p. 3.

High educator self-efficacy in infant feeding was expected in policies in addition to agency in communicating with parents:

“If the service does not have enough breast milk from the family to meet the child’s needs that day, individual families will be consulted on what the service should do in these circumstances. To avoid any possible confusion, we will not store unused milk at the service.” L15, p. 5.

Expectation of communication over insufficient food provision was evident in services that did not provide food onsite; however, this punitive approach does not allow for an appetite which may be unpredictable due to infant growth variations:

“Where a child has been provided with insufficient food for his/her needs, the Educator is expected to provide the extra food required and charge the parent for the meal, as per the fee schedule.” F3, p. 2.

There was a lack of guidance on the introduction of complementary foods and a predominant focus on discretionary foods and promotion or reliance on parent agency. Appropriateness of discretionary foods (e.g. cordial, sweets, cakes, high salt content/fatty/sugar content foods, nuts, etc.) in services who provided onsite food and those who did not evoked a variety of stances on the continuum and was mostly described as one-way communication. Some services did not withdraw foods citing religious or cultural food preferences while others refused to feed the infants food that may be deemed inappropriate.

Box 1 One-way communication examples

- Heating formula in microwaves unless parents state otherwise L13, p. 6.
- Parents requested to send in sterilised bottles due to some policies disallowing onsite sterilisation.
- Rules for celebratory or unrecommended foods were communicated in most policies.
- Refusal to keep unused EBM or store frozen EBM overnight.
- Menu changes.

Discussion and implications

The research explored the guidance and support of infant feeding from birth to 12 months provided in current Australian ECEC public policy and how this is translated into service policies, providing a snap-shot of the Australian ECEC environment. As the first comprehensive analysis of NQF and infant feeding policies, this research reveals public and service policy inadequacies in infant and young child nutrition that represent opportunities for development in the sector to promote optimal infant health and wellbeing.

Infants are a discrete age group with specific age-related strengths and needs, and there is wide variation in individual strengths and needs. However, the invisibility of this age group in National ECEC policy makes it more challenging to conceptualise how the curricula relates to infants (Chazan-Cohen et al. 2017). In line with current research and the EYLF, there is a need to recognise infants as competent and capable learners while also recognising their vulnerability and dependency on adults to meet needs (Lally and Mangione 2017). At both national and service policy levels, educators require contextualised examples of quality care and education practices and supportive environments; separate IYCF policies are warranted.

Given that policies direct the operationalisation of early childhood practices, they need to be premised on the best available evidence from primary or secondary sources, reviewed on a regular basis and accessible to all stakeholders. Service policies are, however, all written documents with technical terminology and, therefore, inaccessible to many educators and parents. The existence of multiple public policy source documents around health and safety, curriculum and legislation with multiple regulatory areas also creates confusion and lack of clarity which may result in perceived or actual excessive regulation related to infants (Peterson et al. 2017). There is a need for clear articulation of infant feeding practices to facilitate the overarching goal of policies to inform supportive environments for infants, families and educators.

Supportive environments umbrella other themes with infant nutrition impacting heavily on NQS Area 2: health and safety, identifying inconsistencies and the need for training including legislative/legal requirements (Javanparast et al. 2012; Peterson et al. 2017). Standards relating to children's health and safety are privileged in this context with policies focusing on risk management perhaps due to social constructions of young children as vulnerable, needing protection with litigation frameworks supporting this, with added operational standards from many ECECs still located in the

private business sector. However, the generalised nature of the NQF and policies fail to support informed decision-making and practice across infant feeding areas. Ironically, risk management is not necessarily infant specific and fails to identify appropriate micro-practices related to EBM and formula feeding that are outlined in international and national guidelines. This was evident in some of the micro-practices of infant feeding such as use of gloves for handling expressed breast milk, sterilisation practices, heating of formula and EBM. Such a focus on risk management can reduce the emphasis on health attainment and could result in unlawful breastfeeding discrimination (Koh et al. 2012; Smith et al. 2013).

Policy needs to promote professionalism across the ECEC sector, and provide clear guidance and support for all educators, including those working with infants. This includes moving beyond the idea of child-minding to early education (Cheeseman et al. 2015; Hasan 2007) and facilitating the progression of parents and educators as partners in the education and care of children. For infants, this necessitates clear acknowledgement of their agency and autonomy, including feeding and satiety cues being weighted over a reliance on scheduling—a barrier to supportive infant feeding environments. Supportive environments currently emphasise the reduction of short-term risks such as choking and allergic reactions; however, this emphasis needs to be broadened to support optimal growth, minimising the risk of under or overweight, with the potential to influence home environments (Nicklas et al. 2001).

The analysis indicated that the underlying determinants of policy in ECEC raises questions regarding the respective roles of state and family, education, care and development (Hasan 2007). Is it the responsibility of parents or educators to ensure appropriate food and feeding practices are provided? The subversion of educator autonomy and self-efficacy through a privileging of parental wishes may be problematic for health and safety issues, and may contravene national or international guidelines despite legislation placing the health and safety of the child before any other consideration. This may leave services open to litigation if a child is adversely affected through following the advice of the parent that contravenes the NQF, or government infant feeding guidelines.

Working in partnership with parents is interconnected with the other themes, fluidly combining with risk management and supportive environments. Parents have their own beliefs about nutrition and infant feeding, and may exercise agency based on these beliefs, particularly where families provide food (e.g., EBM, formula, complementary foods). This is a tension between educator, parent and infant agency which maybe reflects societal tensions of the role of parents versus that of the government and the education versus care and development of children (Hasan 2007). The term “active partnerships” appears in policies; however, a scaffolding of communication actions is required to attain best practice. The EYLF defines genuine partnership which places emphasis on the respect of both parties’ knowledge and engagement in shared decision-making. If agreement cannot be reached, educators have a legal and ethical responsibility to act in the interest of the child (Early Childhood Australia 2016).

Infant feeding in services providing onsite food and those who facilitate lunchbox food have a shared tension between parental service expectations. Further issues arise when parental input into policy development is required. Educators need to be informed and

adept in this area to engage parents, and negotiate feeding practices in the best interest of the infant. There is still debate regarding the minimum qualifications required for ECEC educators with some recommendations potentially putting infants at risk (Productivity Commission 2014; Sumsion 2017). This analysis supports the call for specialised training for educators working with infants (Castle et al. 2016).

Infant-centred nutrition relies on effective communication partnerships between parents and educators, and attention to both verbal/non-verbal infant cues. One-way and passive partnerships or conflicts can coexist with the use of enrolment forms or information-giving conduit documents such as policies and emails, and notes home in lunchboxes. This passive two-way information highway is an attempt to minimise potential tension between educators and parents regarding infant health needs. Active partnerships may result in active conflict or power-struggles, and require greater educator and parent skill and self-efficacy to effectively articulate infant nutrition needs.

Many services relied on the one-way communication of rules with little rationale or explanation provided such as outlawing cake despite some perhaps being free of gluten, dairy, sugar or low fat. Communication of rules, regulations and preferences need to be articulated in an environment of a trusting relationship between educator and parent. The lack of specificity around infant feeding in policies may also describe the reliance on the environmental norms of the service or the individual/collective agency or training of educators detached from the passive policy (Wood and Bandura 1989). There needs to be high educator knowledge, a belief for intentions and a high self-efficacy for communication to enact outcome expectancies outlined in policies. Detail and rationale in the NQF and subsequently service infant feeding policies will increase educator knowledge, belief and, therefore, support the development of self-efficacy and quality practice (Bandura 1977). This development of self-efficacy will support developing partnerships with parents contributing to a collective agency towards improved curriculum implementation and outcomes. The research clearly identifies opportunities to strengthen policy pertaining to infant feeding, thereby positively impacting practice in ECEC.

Obtaining a formal ECEC qualification promotes the expectation that the preservice education and training will fully equip educators to care for infants or to be expert in their care (Park et al. 2014). This is not the case with some ECEC graduands lacking confidence or feeling ill-prepared even after their practicum (Garvis and Lemon 2015). The ACECQA-approved early childhood teacher education courses in Australia differ considerably with variation in the ages of children and settings covered (e.g., from birth to 8 years; from birth to 12 years). There is also some variation in professional experience days working in prior to school settings with very young children, despite the ACECQA stipulated minimum of 10 days with the age group from birth to 2 years. This results in a range of capacities or competencies with infants (Garvis and Lemon 2015; White et al. 2016). There is evidence that more qualified educators in ECEC settings are associated with positive relationships with children and families and, therefore, more optimal education and care outcomes (Norris and Horm 2016). The number of quality interactions for infants and toddlers at snack times was also impacted by educator qualifications, thus influencing infant language development (Degotardi et al. 2016). There is a call to lift quality in ECEC and adopt a wholistic approach to nurturing care (Britto et al. 2017; Torii et al. 2017). This should include changes in legislation to explicitly include infants

to reduce health and safety risks, promoting infant agency and well-being. Incentives for retaining and appropriately remunerating experienced educators in the sector to overcome other documented barriers of low wages and poor working conditions including long hours need to be addressed in the wider sector to motivate educators towards continued professional development and mentoring of less-experienced staff (Irvine et al. 2016). Currently, interpreting legislation for infant feeding best practice may be “hit and miss” for educators and in remote or rural areas where staff turnover is high; experienced educators may not be available despite the legislative requirements.

The findings of this research highlight tensions and the subsequent need for integration between care and education practices to be more overt for infants than other age groups to ensure sensitive and responsive infant feeding practices that maximise children’s agency and early learning. It portrays the immediate need for greater visibility and practical guidance for infant feeding in policies; a focused need for government support for increased, specific educator training and knowledge of infant care, terminology, guidelines, translating public policy into workable service policies and communication with families to rectify this policy shortfall. Without such guidance, evidence suggests that educators may not have sufficient knowledge to interpret current legislation, leaving the infant open to the efficacy of both parents and educators. While focusing on infant feeding in this study, findings are likely to have broader implications for policy and educators’ work with infants and toddlers in ECEC.

Limitations and future directions

This research reviewed legislation and service policies; however, the implementation of the policies and how they are supported in practice, including access to additional professional development for educators was not investigated as part of this study. These elements of practice were investigated in additional research that included interviews with directors, environmental audits, educator professional conversations and teleconferences with government officers who assess compliance of ECEC services to the NQS including remote regions of the state. This paper’s exclusion of remote areas, many of whom have Indigenous Aboriginal and Torres Strait Islander families, is a limitation. This inclusion in future LEAPS papers will be an important addition to the knowledge of policies, impact of food security, language, staffing and affiliation with large ECEC organisations.

Conclusions and recommendations

It is evident that infants are currently invisible in both overarching and service policies despite their specific needs. Recognising the role of policy in supporting quality practice, evidence for infant safety and development demands a change in ECEC legislation and practices. On a national level, incorporating the concept of infant agency and what it means in practice should be included in the National Quality Framework. This would involve incorporating more infant feeding practice examples such as responsive educator modelling for maintaining child appetite autonomy including food refusal; respect for infants’ cues rather than authoritative feeding times to help developing infant agency and nutrition intake. Quality practices require a holistic developmental approach with areas relevant to infant feeding (Hasan 2007).

The ambiguity of the infant feeding documentation in policies creates confusion in particular when supported by multiple non-primary source documents. The research highlights the need for government support to regularly update legislation and for childcare resources including policies and procedures to be more closely aligned with national and international primary infant feeding sources. This would result in the inclusion of evidence-based micro-practices of infant feeding, particularly handling, storage and heating of breast milk and formula and removing references to indirect discrimination of breastfed infants. There is merit in developing separate infant and young child feeding and nutrition policies or distinct sections on infant and young child feeding procedures in service policies. This would support best practice in ECEC and provides a focus on reducing short-term risks but also focusing on long-term health outcomes for children. Finally, policies need to include information to be the catalyst for training that will support educators to engage in active partnerships with families around infant feeding and resolve conflicts that may arise when parental infant feeding preferences are at odds with best practice. Such an approach will ensure that the short- and long-term health of infants is optimised in ECEC settings.

Additional file

Additional file 1: Table S1. National Quality Framework and infant feeding summary (ACECQA) with best practice infant feeding examples from the AIFS/WHO-IYCF, NQS and EYLF.

Abbreviations

ABS: Australian Bureau of Statistics; AIF: Australian Infant Feeding Guidelines; ARIA: Accessibility/Remoteness Index of Australia; CDC: Centre for Disease Control; DEEWR: Department of Education, Employment and Workplace Relations; EBM: expressed breastmilk; EYLF: Early Years Learning Framework; FDC: family day care; GUG: Get up and Grow Guidelines (also known as HEPA); HEPA: Healthy Eating and Physical Activity Guidelines (also known as Get up and Grow Guidelines); IYCF: infant and young child feeding; LEAPS: Learning, Eating, Active Play, Sleep project; LDC: long day care; PIF: powdered infant formula; NQF: National Quality Framework; NQS: National Quality Standard; RTO: Registered Training Organisation; SEIFA: Socio-Economic Indexes for Areas; WHO: World Health Organization; WHO-IYCF: World Health Organization/UNICEF Global Strategy on Infant and Young Child Feeding.

Authors' contributions

All authors were involved in the conceptualisation of the research and the preliminary thematic analysis. JM collected data, undertook the final analysis and drafted the paper. DG and SI contributed to analysis and drafts of the paper and reviewed the manuscript. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

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