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Professional and non-professional sources of formula feeding advice for parents in the first six months

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Abstract

Breastfeeding is beneficial to both the mother and infant, yet many infants are either partially or fully fed with formula milk. Those parents feeding with formula receive less support from professional sources than those breastfeeding and may rely on more non-professional sources for advice, and this contributes to negative emotional experiences such as guilt. This paper explores the sources of advice for formula feeding, factors associated with using professional or non-professional sources and compares these sources with those used for breastfeeding advice. A secondary analysis of Australian survey data from 270 mothers was performed. Mothers of six-month-old infants participated in an online survey, providing information on advice they received or read about formula feeding and/or breastfeeding from professional and non-professional sources. A fifth of mothers who were formula feeding did not receive any formula feeding advice from professional sources, and only a small fraction (4.5%) of mothers breastfeeding did not received any breastfeeding advice from professional sources. Compared with those mothers breastfeeding receiving breastfeeding advice, fewer mothers formula feeding receive formula feeding advice from both professional and non-professional sources. The tin of formula was the most used source of formula advice. Mothers feeding with formula at six months were more likely to have received formula feeding advice from professional sources if they had been fully formula feeding before their infant was under the age of three months. Further research is needed to understand the specific barriers to accessing formula feeding advice and what other factors influence access to formula feeding advice.

KEYWORDS
child health services, community health, infant formula, Infant Nutritional Physiological Phenomena, midwifery, nurses, parenting

1 | INTRODUCTION

Breastfeeding provides many health benefits to both the mother, such as reduced risk of diabetes, breast and ovarian cancer, and infant, such as reduced risk of ear and respiratory tract infections, dermatitis, asthma and diabetes (Ip, Chung, Raman, Trikalinos, & Lau, 2009). Breastfeeding exclusively for the first six months of life and continuing breastfeeding alongside solid foods up to two years of life is the

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current recommendation from the World Health Organization (World Health Organization, 2018). Yet, many infants are fed with infant formula, alongside or in place of breast milk. In the most recent national infant feeding survey in Australia it is reported that at age one month 40.3%, and at six months 55.1%, of infants had consumed non-human milk or infant formula (Australian Institute of Health and Welfare, 2011), but the report did not specify a difference between formula and any other non-human milk (Amezdroz, Carpenter, O'Callaghan, Johnson, & Waters, 2015). More recent Australian studies based in two different states provide more specific data of the frequency of formula. In one study from the state of Victoria (*n*=466), 60% of infants aged between one and three months and 75% of infants aged between six and eight months were consuming formula (Amezdroz et al., 2015). In another study from the state of Queensland (*n*=202), at six months of age, 46.3% of infants were consuming formula (Newby & Davies, 2015).

Considering this high prevalence of formula feeding it is important that parents who are formula feeding their infants are provided with advice on both correct preparation and best practice formula feeding. This is important as formula feeding is related to adverse health outcomes such as rapid weight gain (RWG; Appleton, Russell, et al., 2018; Mihrshahi, Battistutta, Magarey, & Daniels, 2011) and overweight or obesity (Wen, Baur, Rissel, Xu, & Simpson, 2014). It is not clear what proportion of parents formula feeding follow preparation guidelines correctly. Research from the United States (*n*=1533) found that up to 55% of parents reported incorrect practices (Labiner-Wolfe, Fein, & Shealy, 2008), and research from the United Kingdom (*n*=15 724) found that up to 51% of parents reported incorrect practices (McAndrew et al., 2012). There is no recent research from Australia. Regarding the relationship between formula feeding and RWG, a recent systematic review found that formula with higher protein content, adding cereals into the formula or providing more frequent or larger feeds than an infant requires, could contribute to an infant experiencing RWG (Appleton, Russell, et al., 2018). The review also found that unresponsive feeding practices such as putting an infant to bed with a bottle and feeding to a schedule rather than infant demand may also contribute to an infant experiencing RWG (Appleton, Russell, et al., 2018). Providing information to parents on correct preparation and best practices to implement when feeding with formula may reduce the risk of these negative health outcomes.

Parents rely on a number of sources for advice on infant feeding, including their own experience, non-professional sources (such as family, friends and online) and professional sources (such as doctors, nurses, midwives and pharmacists; Chouraqui et al., 2018; Eisenberg et al., 2015; Gildea, Sloan, & Stewart, 2009). Evidence suggests that first time, younger mothers and those with infants less than 12 months old were most likely to seek health professional advice (Chouraqui et al., 2018). Generally, in Australia, breastfeeding information is readily available and accessed (Newby, Brodribb, Ware, & Davies, 2015) and increasing breastfeeding rates is a public health priority (Council of Australian Governments Health Council, 2019). However, some have argued that this important focus on breastfeeding has contributed to a lack of information about formula (Hvatum & Glavin, 2017; Lagan, Symon, Dalzell, & Whitford, 2014; Lakshman et al., 2012). Many of those parents who are formula feeding do not get information from health professionals (Lagan et al., 2014; Lee, 2007a) and may instead rely on other information sources such as family, friends (Berry, Jones, & Iverson, 2011) or the tin (Smith et al., 2016). In a study in Australia, mothers of six-month-old infants were asked about a range of professional and non-professional sources of information for their infant feeding. Although 51% were formula feeding or mixed feeding (with breast and formula milk), only 38% had ever obtained information about formula feeding from health professionals (Newby et al., 2015). In an Irish study, parents who were formula feeding indicated that they relied upon more non-professional sources as their main sources of infant feeding information compared with those who were mixed feeding; 72.3% of mothers formula feeding used non-professional sources compared with 58.6% of mothers mixed feeding (Tarrant, Sheridan-Pereira, McCarthy, Younger, & Kearney, 2012). Similarly, other studies in the United Kingdom have found that those mothers currently breastfeeding feel more supported by health professionals compared with those mothers mixed feeding (Komninou, Fallon, Halford, & Harrold, 2017) and those mothers formula feeding from birth were more likely to name family as a source of information (Fallon, Komninou, Bennett, Halford, & Harrold, 2016). A lack of information contributed to mothers feeling uncertain and unsafe in their practice when they first started using formula (Ellison et al., 2017; Hvatum & Glavin, 2017) and contributed to a feeling of guilt for not breastfeeding (Hvatum & Glavin, 2017; Lagan et al., 2014; Lee, 2007a).

Other studies suggest that there is a gap in the provision of infant formula feeding advice and support within some health services (Berry et al., 2011; Dykes, Richardson-Foster, Crossland, & Thomson, 2012; Hegedus & Mullan, 2015). A qualitative study with health professionals in two maternity or primary health care sites in North-west England found a focus on breastfeeding promotion and a lack of

Key messages

- A fifth of mothers formula feeding their infant did not use professional sources of advice. This might be due to perceived barriers such as the attitudes of health professionals towards formula feeding, or a lack of formula feeding resources available at health services.
- Mothers feeding with formula at six months were more likely to have received formula feeding advice from professional sources if they had been fully formula feeding since their infant was under the age of three months.
- Further research should a) assess barriers to mothers seeking formula advice and support from professional sources and b) assess the accuracy of formula feeding advice given to parents from both professional and non-professional sources.

resources, such as time and access to information, impeded their ability to provide support to those mothers who were formula feeding (Dykes et al., 2012). A qualitative discourse analysis of group antenatal education classes run by midwives in Australia found that formula feeding was only portrayed negatively and specific formula feeding information was not discussed (Fenwick, Burns, Sheehan, & Schmied, 2013). In another study of maternal and child health nurses (MCHNs) from two local health districts in the Australian state of Victoria, all were "very confident" in providing both breastfeeding and formula feeding advice, but although 59.3% routinely provided advice and support on breastfeeding, only 37% routinely provided advice on correct formula preparation (Laws et al., 2015).

Non-professional sources of formula feeding advice include the family, friends (Berry et al., 2011; Cairney & Barbour, 2007; Nevo, Rubin, Tamir, Levine, & Shaoul, 2007), advertising (Berry et al., 2011) and the tin/packet (Labiner-Wolfe et al., 2008; Lakshman et al., 2012; Smith et al., 2016). Importantly, these sources may not provide evidence-based information and could be inaccurate. A recent review of infant care and feeding found around 20% of infant care and feeding advice given by family was not in line with current health care recommendations (Eisenberg et al., 2015). Furthermore, advertising and the information on the tin/pack are formula marketing, which aims to influence attitudes and social norms in communities to promote the use of their products (Piwoz & Huffman, 2015) and is therefore lest trustworthy than health professional advice. Although some of the information on the tin is regulated, such as the ingredients and nutrients lists, preparation table and warning statement (about correct preparation and that breastfeeding is the optimal infant nutrition), other information found on the tin, in stores or on the formula manufacturers' website are not (Food Standards Australia New Zealand, 2017). This marketing will be biased in favour of their particular brand of formula. This marketing may also influence the advice provided to parents. Indeed, research about perception of formula advertising indicates that mothers, grandmothers and health professionals alike trust advertised health messages (Berry et al., 2011).

Parents expect that health professional will be a source of support for infant feeding (Sheehan, Schmied, & Barclay, 2009). In Australia, health professionals such as MCHN and midwives provide information, advice and resources to parents as a core part of their role in caring for infants and their parents during the infant's first year. Midwives primarily work within the hospital setting and so they see women and infants in the early postnatal period, although some work in primary health care community settings. MCHN primarily work in primary health care community settings; they can provide routine vaccination, infant health checks (which include discussing infant feeding) and support to new parents; this may include home visiting, but this varies within the different states and territories. Similarly, practice nurses (PNs), who work alongside General Practitioners, may also see infants during their routine vaccinations and infant health checks as parents can choose to do these with the MCHN service or at their general practice. Pharmacists may also come in contact with parents during their infant's first year, particularly with those using formula, as this is one of the places formula can be purchased as well as in the grocery store or online.

There are potential negative health outcomes for infants fed with formula (Appleton, Russell, et al., 2018; Mihrshahi et al., 2011) and negative emotional experiences for mothers (Hvatum & Glavin, 2017; Lagan et al., 2014; Lee, 2007a) that could possibly be avoided or diminished if these mothers are provided formula feeding advice and support. Health professionals such as MCHN or midwives are well placed to give this advice and support (Eronen, Pincombe, & Calabretto, 2010; Redsell et al., 2013; Redshaw & Henderson, 2012). However, some parents feel unsupported by these professional sources (Komninou et al., 2017; Thomson, Ebisch-Burton, & Flacking, 2015) and may rely on non-professional sources (Tarrant et al., 2012). One recent Australian study found that only 38% of mothers had ever obtained information about formula feeding from health professionals, and overall the mothers sought less formula feeding advice than breastfeeding advice (Newby et al., 2015). But this study did not investigate any difference between professional and non-professional advice or difference in advice seeking between those breastfeeding and those formula feeding. The aim of this paper is to explore the sources of advice (professional and non-professional) used by parents using formula to feed their infants, to explore factors associated with receiving formula feeding advice from professional or non-professional sources and to compare the sources of advice used by those formula feeding and those breastfeeding their infants. To meet these aims, a secondary data analysis of an Australian cohort study was conducted.

2 | METHODS

2.1 | Study setting and design

This study is a secondary analysis of an Australian longitudinal cohort, Baby's First Foods (BFF). The BFF cohort was the comparison arm for a non-random quasi experimental feasibility trial The Growing healthy study (Denney-Wilson et al., 2015). The participants in the BFF cohort were provided with no intervention and were recruited separately from the Growing healthy cohort (Denney-Wilson et al., 2015). Participants were recruited when their infant was under three months of age and completed three surveys, on enrolment then when their infant was six and nine months (Denney-Wilson et al., 2015).

2.2 | Participants

Parents were recruited into BFF cohort through advertising on websites, parenting forums and Facebook pages during February to April 2015. Eligibility criteria included a parent/main carer of an infant aged under three months, able to speak and read English, aged 18 years or older and living in Australia. Eligible participants who completed the first survey were enrolled in the study and followed up

when their infant was six months (T2 age range 24–32 weeks) and nine months (T3 age range 34–50 weeks; Denney-Wilson et al., 2015). Participants received a $40AUD gift card following the completion of the final survey as compensation for their time (Denney-Wilson et al., 2015). Exclusion criteria at time point one included incomplete survey, prematurity (<37-week gestation), infant morbidity that affected feeding or weight gain, infant low birthweight (<2,500g) and/or parent reported an inconsistent date of birth (where the date of birth was inconsistent at all three time points). Exclusion criteria at the further two time points were if the infant's age at the time of the survey was outside the specified age range and/or if the survey was incomplete.

2.3 | Data collection

The online survey included demographic questions, formula or breastfeeding practice and formula and breastfeeding advice received. Participants were classified as formula, breastfeeding or mixed feeding at each time point by asking them if they were breastfeeding or formula feeding or both breastfeeding and formula feeding. These groups were exclusive, so those in the formula group were giving no breast milk and those in the breastfeeding group were giving no formula; anyone giving both was in the mixed feeding group. Formula and breastfeeding advice received was asked only at time point two (T2) when the infant was around six months old (Denney-Wilson et al., 2015). Participants who were formula or mixed feeding were asked "If you received/read advice on formula feeding, we would like to know which advice you found helpful" (*very helpful; somewhat helpful; not helpful at all; did not receive advice*) from eight potential sources of advice: four professional sources: midwife, MCHN, PNs at their general medical practice and pharmacy, and four non-professional sources: friends, family, formula packet/tin and online (app/website/forum). Similarly, participants who were breastfeeding or mixed feeding were asked "If you have received/read advice on breastfeeding at any time, we would like to know which advice you found helpful" (*very helpful; somewhat helpful; not helpful at all; did not receive advice*) from seven potential sources: professional sources: midwife, MCHN and PN, a national peer support group: the Australian Breastfeeding Association and non-professional sources: friend, family and online (app/website/forum). An open response option was provided for all participants to list any other sources of information or advice.

2.4 | Data analysis

Chi-square and *t* tests were used to compare those included and not included in the T2 sample. Descriptive statistics were used to describe the frequency of responses to the source of formula advice for those formula feeding and mixed feeding. Pearson's chi-square were run to test if there was a difference between formula feeding advice or breastfeeding advice received or read from six types of sources. To do so, the variable regarding advice from these six sources was dichotomised to compare those receiving advice (*very helpful*, *helpful* or *not helpful*) and those not receiving advice (*did not receive advice*). Multivariate modelling using logistic regression was performed to identify factors associated with source of formula advice (professional or non-professional). Odds ratios with 95% confidence intervals were calculated. Assumptions for all statistical tests were explored and were met (Field, 2009). Statistics showing a significance of <0.05 were considered significant.

2.5 | Multivariate model

Variables included in the model were mother's age, education (dummy coded into dichotomous category), number of children (dichotomous category, one and two or more) and T1 feeding group. Mother's age and education were included as these are known to be associated with accessing general parenting advice (Eisenberg et al., 2015). Primiparous, compared with multiparous, was included as second time mothers may rely on knowledge gained previously and not seek any additional advice (Chouraqui et al., 2018). The feeding group at T1 was included as this accounts for the mother's recent feeding experience; that is, those formula feeding at T1 (when their infant was under three months) have been feeding in this way for a longer time than those that were breastfeeding at T1.

2.6 | Ethics

The BFF study was granted approval through the Deakin University low risk Human Ethics Advisory Group (HEAG-H 162_2014) and ratified by the University of Technology Sydney Human Research Ethics Committee (UTS HREC 2015000668).

3 | RESULTS

3.1 | Participants

In total, 513 parents met the eligibility criteria and commenced the study. On analysis of baseline survey data, 180 participants were not included in the final sample due to either incomplete survey data (*n*=92), infant was older than three months at enrolment (>15 weeks; *n*=41), infant was premature (born earlier than 37-week gestation; *n*=24), infant had a morbidity affecting feeding or weight gain (*n*=4), infant had a low birthweight (<2,500g; *n* = 2) or missing birthweight data (*n*=9) or the parent reported an inconsistent date of birth (where the date of birth was inconsistent at all three time points; *n*=8). This left a baseline (T1) sample of 333 (64.9% of initial sample). At T2, 63 participants were not included in the analysis due to loss to follow up (*n*=27), incomplete survey (*n*=30) and infant outside age range (24–32 weeks; n=6; 81.1% of those included at T1).

The final sample included mothers, mostly born in Australia (90.4%) and living in the eastern states of Australia (New South Wales 28.2%, Victoria 24.3% and Queensland 14.4%). The majority of mothers described their daily activities as "keeping the house/raising children full time" at T1 (85.6%); this reduced to 74.3% at T2. They

TABLE 1 Sample characteristics

Variable	*n* (%) or mean (standard deviation); range	
	T1 sample (*n*=333)	T2 sample (*n*=270)
Milk feeding group T2		
Formula feeding[a] (FF)	46 (13.8%)	81 (30%)
Mixed feeding[b] (MF)	51 (15.3%)	32 (11.9%)
Breastfeeding[c] (BF)	236 (70.9%)	157 (58.1%)
Mother's education		
High school or no formal qualification	56 (16.8%)	41 (15.2%)
Trade or diploma	110 (33%)	84 (31.1%)
University or higher	167 (50.2%)	145 (53.7%)*
Number of children		
First born	128 (38.4%)	112 (41.5%)*
Two or more	205 (61.6%)	158 (58.5%)*
Infant gender		
Male	161 (48.3%)	134 (49.6%)
Female	172 (51.7%)	136 (50.4%)
Mother's age (years)	31.16 (4.38); 19–5 (*n*= 327)	31.22 (4.24) 19–45 (*n*=264)
Infant age (months)	7.9 (3.8); .33–14.9	27.13 (1.1) 23.7–32.2

[a]At six-month survey, only formula feeding (no breast milk).
[b]At six-month survey, using both formula and breastfeeding/milk.
[c]At six-month survey, breastfeeding (no formula milk).
*p <0.05, comparison of those included and excluded at T2.

had an average age of 31 years and around half had a university education (Table 1). The majority of participants were in the breastfeeding group (T1 70.9%, T2 58.1%), but this decreased over time; the formula feeding group number increased over time (T1 13.8%, T2 30%), and the mixed feeding group was similar over time (T1 15.3%, T2 11.9%; Table 1). Of those in the T1 FF group, 17.4% of their infants (*n*=8) had never had breast milk.

The total sample at T2 (*n*=270) was 81.1% of the initial sample (*n*=333). Of those participants included at T2, there were no significant differences in mother's age, child gender or T1 feeding group compared with those not included; however, there were significantly more first time and university educated mothers included in T2 than those not included (Table 1). Of the 270 participants at T2, only one (in the T2 FF group) did not respond to the all the questions on advice, leaving 112 responses to the formula feeding advice questions (T2 FF *n* = 80; T2 MF *n*= 32) and 189 responses to the breastfeeding advice questions.

3.2 | Formula feeding advice

The mothers received or read advice on formula feeding from all eight sources. Considering all eight sources, over half the participants reported receiving advice from the packet/tin (90.2%), followed by MCHN (66.1%), then friends (61.6%), family (53.6%) and midwives (52.7%). The packet/tin was also the source from which the majority found helpful advice with 38.6% and 59.4% reporting they found this advice very helpful or helpful, respectfully. There were few reports of advice being unhelpful; the sources with the most reports of unhelpful advice was from family (20%), pharmacy (17%), midwives (13.6%) and online (11.1%; Table 2).

Of these eight sources, over half the participants reported that they had *not* received advice from the pharmacy (63.4%), PNs (60.7%) or from an app/website or online forum (51.8%). Of the remaining two professional sources, 33.9% and 46.3% of participants reported *not* receiving advice from MCHN and midwives, respectively.

When assessing the responses across all eight sources, 78.6% (*n* = 88) mothers reported advice from at least one professional source (MCHN, midwife, pharmacist and PN), with 74.1% (*n* = 83) reporting that this was *helpful advice*. Only 3.6% (*n* = 4) reported receiving no advice from any of the sources. Some 8% (*n* = 9) reported that the only advice (*n*=8) or only *helpful* advice (*n*=1) was the tin/packet; 14.3% (*n* = 16) reported that the only advice (*n*=11) or only *helpful* (*n*=5) advice was from non-professional sources (friend, family and online). Participants had the option of adding any further sources of advice to the list; no one added any further sources of formula feeding advice.

TABLE 2 Formula feeding advice received or read from sources (*n* = 122)

Source of advice	*n* (%)		*n* (%) of those receiving advice		
	Did not receive any advice	Received advice	Advice was very helpful	Advice was somewhat helpful	Not helpful at all
MCHN	38 (33.9%)	74 (66.1%)	26 (35.1%)	42 (56.8%)	6 (8.1%)
Midwife	53 (47.3%)	59 (52.7%)	20 (33.9%)	31 (52.5%)	8 (13.6%)
PN	68 (60.7%)	44 (39.3%)	12 (27.3%)	29 (65.9%)	3 (6.8%)
Pharmacy	71 (63.4%)	41 (36.6%)	14 (34.1%)	20 (48.8%)	7 (17.1%)
Family	52 (46.4%)	60 (53.6%)	16 (26.7%)	32 (53.3%)	12 (20%)
Friends	43 (38.4%)	69 (61.6%)	17 (24.6%)	46 (66.7%)	6 (8.7%)
Packet/tin	11 (9.8%)	101 (90.2%)	39 (38.6%)	60 (59.4%)	2 (2%)
Online	58 (51.8%)	54 (48.2%)	10 (18.5%)	38 (70.4%)	6 (11.1%)

3.3 | Formula feeding advice from professional or non-professional sources

Potential differences between those who received or read formula advice from professional sources (77.8%, *n* = 84) compared with either not receiving any advice or only advice from non-professional sources (22.2%, *n* = 24) were examined using logistic regression. The total number included in this analysis was 108 as four participants did not provide mother's date of birth to calculate age.

Overall, the tested variables (mothers age, education, number of children and T1 feeding group) had minimal influence on whether the mothers accessed formula advice from professional or non-professional (or no advice) sources, with the model only accounting for between 8.8% and 13.5% of variance. Only one variable in the model was statistically significant; those in the T1 FF group had higher odds of using professional sources compared with the BF group. Thus, the only factor significantly associated with the use of professional sources of advice on formula was if the mother was not breastfeeding at baseline (T1 FF group) when the baby was less than three months of age (Table 3).

3.4 | Formula feeding and breastfeeding advice

Six sources were compared as these were those sources asked of both formula feeding and breastfeeding participants. There were differences in the frequency of receiving advice for breastfeeding and formula feeding from three sources: mothers formula feeding were more likely to receive advice from PNs and less likely to receive advice from midwives and online compared with mothers breastfeeding (Table 4). When considered together, breastfeeding participants were more likely to have received advice from at least one professional and one non-professional source than those who were formula feeding (Table 4). Those who were mixed feeding could not be included in the chi-square analysis due to violation of the independence of observation assumption as these participants answered both questions about breastfeeding and formula feeding advice.

TABLE 3 Regression analysis of predictors of sources of formula advice (professional or nonprofessional)

Variable	Odds ratio	95% CI
Mother's age	1.07	0.95–1.2
Feeding group		
T1BF[a]	1.0	-
T1 MF	1.4	0.48–4.06
T1 FF	6.59*	1.5–28.7
Mother's education		
High school, trade or diploma[a]	1.0	-
University or higher	1.16	0.4–3.4
First born child		
No[a]	1.0	-
Yes, first child	0.97	0.33–2.85

Note. Cox and Snell R square = 0.088; Nagelkerke R square = 0.135.
[a]Referent group.
*$p < 0.05$.

TABLE 4 Comparison of receiving breastfeeding or formula feeding advice

	Yes n (%)		
Source of advice	Breastfeeding advice (*n*=157)	Formula feeding advice (*n*=80)	Chi-square
MCHN	118 (75.2%)	52 (65%)	2.22
Midwife	132 (84.1%)**	46 (57.5%)**	18.62
PN	45 (28.7%)*	34 (42.5%)*	3.97
Advice from at least one professional source[a]	150 (95.5%)**	62 (77.5%)**	16.42
Family	107 (68.2%)	45 (56.3%)	2.77
Friends	116 (73.9%)	50 (62.5%)	2.75
Online	126 (80.3%)**	40 (50%)**	21.7
Advice from at least one non-professional source[b]	143 (91.1%)**	61 (76.3%)**	8.53

[a]MCHN, midwife or PN.
[b]Family, friends or online.
*$p<0.05$.
**$p<0.01$.

4 | DISCUSSION

Four fifths of mothers who were formula feeding their infant at six months of age received advice from both professional and non-professional sources. However, a fifth of mothers formula feeding reported receiving no advice from any professional sources, and almost all reported that the tin/packet of formula was the predominant source of advice. For a minority the tin/packet was the only source of helpful advice. This supports other studies showing that parents feeding with formula depend on marketing and commercially provided information (Berry et al., 2011; Tarrant et al., 2012; Trickey & Newburn, 2014). It is unclear which aspects of the information on the tin parents use, but it may be both the regulated information and advertising. Previous research has identified that neither mothers nor health professionals regard the information on the tin as advertising, but rather as a source from which you can check the advertised claims by reading the information provided on the tin (Berry et al., 2011). This information on the tin as well as other marketing does influence formula feeding practices: information from the feeding tables, which provide estimates of the amount and number of feeds an infant needs, influence how much formula parents offer (Appleton, Laws, et al., 2018; Lakshman et al., 2012; Russell et al., 2016) and marketing via health professionals and direct to consumer influences the choice of formula (Appleton, Laws, et al., 2018; Huang, Labiner-Wolfe, Huang, Choiniere, & Fein, 2013).

Although it is unsurprising that the information on the tin is used, because it is readily accessible, it is an important finding to highlight. The Marketing in Australia of Infant Formulas (MAIF) agreement, which is the enactment of many of the principles of the WHOs' International Code of Marketing of Breast Milk Substitutes (World Health Organization, 1981), regulates advertising of formula, including what is on the tin (Australian Government Department of Health and Ageing, 2003). Under the MAIF agreement, which is voluntary, infant formula (for infants up to age 12 months) advertising is regulated and advertising to the general public is banned, but toddler formula is not included. Toddler formula advertising is often interpreted as advertising for all types of formula (Berry et al., 2011; Cattaneo et al., 2015). Further research is need to understand how all the information on the tin is interpreted by parents and how it influences their formula feeding practices, with policy implications about how successfully the MAIF attains its aim of the "… protection and promotion of breastfeeding.. by ensuring the proper use of breast milk substitutes, when they are necessary, on the basis of adequate information and through appropriate marketing and distribution" (Australian Government Department of Health and Ageing, 2003, p. 1).

Other non-professional sources identified in this research were family, friends and online. Reports of how helpful or unhelpful these sources of advice were were mixed: advice from friends was found to be helpful for just over half the participants, but family was reported as the most unhelpful source. This may reflect the mothers' trust or distrust in the quality of the advice given by these sources. Other research about general infant feeding information sources found that parents trusted other parents (Bramhagen, Axelsson, & Hallström, 2006) and family often gave out-dated advice that was not in line with current recommendations (Redsell et al., 2013). Regarding advice from online sources, the current study found that around 80% of mothers breastfeeding used advice from online sources but only around 50% of mothers formula feeding used advice from online sources. These are higher proportions compared with other recent studies (Eisenberg et al., 2015; Newby et al., 2015). This is likely due to the nature of our sample strategy, which was based on online advertising. Given this, it was interesting that there were still significantly fewer reports of using online sources for formula feeding advice than breastfeeding advice. This is similar to a recent Australian study where 59% of mothers used general internet searches for breastfeeding information, but only 30% used this for formula feeding information (Newby et al., 2015). This study also showed that overall the mothers sought less formula feeding advice than breastfeeding advice (Newby et al., 2015), which was also found in the current study. That formula feeding advice is less sought after may be related to the confidence some parents feel in their formula feeding practice. If parents do not have any problems, they may not seek further information, advice and support (Bramhagen et al., 2006; Russell et al., 2016).

Although many of the participating mothers received advice from professional sources, a fifth did not. It is important to understand the enablers and barriers to using professional sources of advice so these professionals can be best enabled to meet the needs of all parents. In a French national survey, mothers were more likely to use professional sources (i.e., medical advice) to inform their infant feeding practice if they were younger (less than 30) and first time mothers (Chouraqui et al., 2018). The current study did not find these associations with age and parity for formula advice, which indicates that these differences do not impact whether mothers used professional sources for formula feeding advice. Although, being secondary analysis, the study may have been underpowered to find these differences. When considering the source of formula feeding advice (professional or non-professional), only one of the included variables was significant in the model; those who were fully formula feeding when infants were aged less than three months were more likely to access professional advice than those who were breastfeeding at baseline. This might reflect that those mothers who had been formula feeding longer had more time to access advice from professional sources or that accessing these professional sources occurred when infants were younger. There is often greater contact with health professionals in the early months, particularly MCHN, and these health professionals may be more attentive in giving advice to those using formula with younger, rather than older, infants. On the other hand, it may reflect perceived barriers to accessing formula feeding advice from health professionals. Qualitative interviews with a subsample of the BFF cohort, reported elsewhere, found that two perceived barriers to getting formula advice from health professionals were (a) that health professionals did not talk about formula (Appleton, Laws, et al., 2018), which is in line with previous research (Lagan et al., 2014; Lee, 2007b), and (b) that health professionals only focus on breastfeeding (Appleton, Laws, et al., 2018), which is also in line with other research (Russell et al., 2016; Sheehan et al., 2009). Similar to previous findings on general infant feeding advice (Gildea et al., 2009), formula advice from the pharmacy was uncommon. That this is the case of formula advice is surprising considering that this might be a place formula was purchased (Berry et al., 2011).

Differences in the professional support or advice given to, or accessed by, those who are breastfeeding and formula feeding have been described in many recent studies (Laws et al., 2015; Newby et al., 2015; Tarrant et al., 2012). In the current study we found that although both breastfeeding and formula feeding groups reported comparable support with advice from MCHNs, this was not the case for the other professional groups examined, midwives and PNs. In the case of midwives this may reflect that mothers do not feel comfortable discussing formula with midwives because of the barriers discussed above. Or it may be that midwives do not have the resources or knowledge (Battersby, 2010; Dykes et al., 2012) or do not believe it their role to discuss formula with mothers (Battersby, 2010). Alternatively, it may simply reflect the time period in which parents interact with midwives, which is generally in the perinatal period the participants may have been still exclusively breastfeeding when they had an interaction with midwives. Considering Australia's high breastfeeding initiation rate of 96% (AIHW, 2011) this is likely, indeed, in the BFF cohort only, eight (2.4%) infants were fully formula fed from birth.

It is interesting that for PNs, it was in fact formula advice that was more frequent than breastfeeding advice. It is likely that this reflects the timing of mother interaction with PNs, which is around

infant immunisation visits (around six week, four months and six months of age). These visits may coincide with parents considering moving to mixed or formula feeding. Perhaps it is also that PNs are considered a more neutral or general source of advice on infant feeding compared with midwives or MCHN that may be seen as more supportive of breastfeeding and unsupportive of formula feeding (Lagan et al., 2014; Lee, 2007b). It may also reflect the scope of practice for PNs. In a survey in the United Kingdom, general practitioners (GPs) and PNs provided infant feeding advice less often and were less confident than health visitors (similar to MCHN in Australia; Redsell et al., 2011). Some also described infant feeding advice as the health visitor's role, not the GP or PN (Redsell et al., 2011). PNs do not necessarily have professional education in infant feeding or breastfeeding (Redsell et al., 2011), and it is possible that PNs may perceive providing advice about formula feeding as less complex and within their scope than advice for breastfeeding. Further research exploring and observing midwives', MCHN's and PN's knowledge and practice of providing infant feeding advice is needed to understand this.

4.1 | Study strengths and limitations

Strengths of this study are the detailed collection of infant feeding methods and lengths of breast, formula and mixed feeding. Limitations to the study are the nature of secondary analysis, where the data collection tools are not finely tuned to the question. For this study the question was limited to “advice received/read” from a limited list of sources, with an option for participants to add further sources to the list. The professional sources were limited to MCHN, PN, midwives and pharmacy. Pharmacy was placed with the professional sources, but we do not know if the participant interpreted this question as the pharmacist specifically or any worker in the store. It would also have been beneficial to have other professional sources, such as GPs and paediatricians on the list of potential information sources as this would have ensured participants did consider these sources. It would have also been beneficial to ascertain if participants sought out this advice or if it was given unsolicited or as routine practice from health professionals. Additionally, the term “advice” was used, which can evoke the sense of a once-off disconnected encounter with the source. Mothers perceived this type of disconnected infant feeding advice giving as ineffective (Schmied, Beake, Sheehan, McCourt, & Dykes, 2011). Although the intention of the question was to understand the use of sources of information and advice, the way “advice” was interpreted by participants may have influenced their response. Also, the actual advice was not assessed so there is no information about the accuracy of advice or if it is evidence-based. The participants were also not asked if the hospital they birthed in was WHO/UNICEF baby friendly health initiative (BFHI) accredited, which may have influenced the advice they received. Although BFI been in Australia since 1993, the uptake is low; for example, in 2013, only 19% of all maternity care facilities were accredited (Atchan, Davis, & Foureur, 2013). Another limitation is that the sample was self-selected and was more highly educated than the population of women at child bearing age (Australian Bureau of Statistics, 2018). This may limit the generalisability of the findings.

4.2 | Implications for practice, policy and research

There are a number of implications for practice, policy and research arising from this study.

Most mothers who were formula feeding used a mix of both professional and non-professional sources. The non-professional sources included the tin. Further research is needed to understand how the information on the tin is incorporated into knowledge and practice for parents. This is important to evaluate considering the current restriction under the MAIF agreement and if this agreement successfully enacts the principles of the WHOs' International Code of Marketing of Breast Milk Substitutes (World Health Organization, 1981).

This finding is also important for health professionals, such as MCHN and midwives, who are key sources of infant feeding information. All the professions included in this study provide care or services to parents and their infants during the first year and are well placed to support parents formula feeding. Both professional and non-professional sources are also at risk of providing advice that is not evidenced based or biased. A recent review of infant care and feeding found that around 17% of advice from doctors and 15% of advice from nurses was not in line with current health care recommendations (Eisenberg et al., 2015), and health professionals report that one of their sources of formula information is from formula companies, which may be biased (Battersby, 2010; Berry et al., 2011). As mentioned above, this study did not assess the advice that was given so is unable to assess the accuracy or if it was evidence-based advice. Further research should assess the accuracy of advice provided by professional and non-professional sources. Health services can consider if they need to address gaps in their service that may include providing evidenced-based infant formula feeding resources for both parents and health professionals to use.

Around a fifth of those mothers formula feeding their six-month-old infant did not receive formula feeding advice from professional sources. It is important to consider why it may be that parents are not accessing professional advice at an important transition in the early feeding of their children. It is possible that barriers, such as their perceptions of professionals view about formula feeding, might stop mothers seeking formula advice from professional sources and/or the professional sources do not have the resources necessary to provide this information. Feeding support for all parents needs to be more individual to feeding type, empathetic to parents' choices (Fahlquist, 2016) and family centred (Hoddinott, Craig, Britten, & McInnes, 2012). For example, in the United Kingdom, the revised standards for the implementation of the BFHI have moved toward an emphasis of supporting the development of the relationship between parents and their infants, which is important for both those breastfeeding and

formula feeding (Entwistle, 2013). This type of policy and practice orientation is important so that those parents feeding with formula use health professionals as a source and do not have to rely on commercial information. Further research in Australia investigating the exchange of advice between parents and health professionals is needed to understand if similar types of policy and practice changes are necessary for this context.

5 | CONCLUSION

The findings of this study suggest that some parents who are feeding their infants formula are underserviced by health professionals and rely on non-professional sources of advice to inform their infant feeding. There is opportunity for health professionals to improve the provision of up to date evidence based infant formula feeding information and advice to parents feeding with formula. This may in turn have positive impacts on infant's current and future health.

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

CONTRIBUTIONS

JA, RL, CGR, KJC and EDW were part of the Growing healthy; the Growing healthy team designed the survey and collected the data. The analysis was conducted by JA with input from CGR, RL and EDW. JA led the drafting of the manuscript with input from RL, CGR, CF, KJC and EDW. All authors have read and approved the final version of this manuscript.

ETHICAL STATEMENT

The Baby's First Foods study was granted approval through the Deakin University low risk Human Ethics Advisory Group (HEAG-H 162_2014) and ratified by the University of Technology Sydney Human Research Ethics Committee (UTS HREC 2015000668).

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