

1 “Expectant parents’ views of factors influencing infant 2 feeding decisions in the antenatal period: a systematic 3 review”

4 **Abstract:**

5 **Objective:** To explore the factors that influence expectant parents’ infant feeding
6 decisions in the antenatal period.

7 **Design:** Mixed Method Systematic Review focussing on participant views data.

8 **Data Sources:** CINAHL, Medline, Embase and PsychInfo databases were
9 interrogated using initial keywords and then refined terms to elicit relevant studies.
10 Reference lists were checked and hand-searching was undertaken for 2 journals
11 (‘Midwifery’ and ‘Social Science and Medicine’) covering a 3 year time period
12 (January 2011 to March 2014). Key inclusion criteria: studies reflecting expectant
13 parents’ views of the factors influencing their infant feeding decisions in the antenatal
14 period; Studies in the English language published after 1990, from developed
15 countries and of qualitative, quantitative or mixed method design.

16 **Review Methods:** A narrative interpretive synthesis of the views data from studies of
17 qualitative, quantitative and mixed method design. Data were extracted on study
18 characteristics and parents’ views, using the Social Ecological Model to support data
19 extraction and thematic synthesis. Synthesis was influenced by the Evidence for
20 Policy and Practice Information and Co-Ordinating Centre approach to mixed
21 method reviews.

22 **Results:** Of the 409 studies identified through search methods, 17 studies met the
23 inclusion criteria for the review. Thematic synthesis identified 9 themes:
24 Bonding/Attachment; Body Image; Self Esteem/Confidence; Female Role Models;
25 Family and Support Network; Lifestyle; Formal Information Sources; Knowledge; and
26 Feeding in front of others/Public. The review identified a significant bias in the data
27 towards negative factors relating to the breastfeeding decision, suggesting that infant
28 feeding was not a choice between two feeding options, but rather a process of
29 weighing reasons for and against breastfeeding. Findings reflected the perception of
30 the maternal role as intrinsic to the expectant mothers’ infant feeding decisions.
31 Cultural perceptions permeated personal, familial and social influences on the
32 decision-making process. Expectant mothers were sensitive to the way professionals
33 attempted to support and inform them about infant feeding choices.

34 **Conclusions:** By taking a Social Ecological perspective, we were able to explore
35 and demonstrate the multiple influences impacting on expectant parents in the
36 decision-making process. A better understanding of expectant parents’ views and
37 experiences in making infant feeding decisions in the prenatal and antenatal periods

1 will inform public health policy and the coordination of service provision to support
2 infant feeding activities.

3

4 Key terms: antenatal, bottle feeding, breast feeding, choice, decision-making,
5 fathers, infant feeding, mothers, parents, social ecological model.

6

1 **Introduction:**

2 Empirical evidence has provided a strong association that exclusive breastfeeding
3 reduces infant mortality and morbidity relating to childhood disorders such as atopic
4 eczema, acute otitis media, upper respiratory tract infections, and gastrointestinal tract
5 infections (Renfrew et.al. 2012, Duijts, et.al. 2010, Greer et.al., 2008). Recent attention
6 has turned to whether infant feeding choice has an implication for the development of
7 obesity in childhood (Horta et al 2007). Reducing obesity has become an urgent
8 priority with International recognition of the detrimental health and economic effects of
9 obesity on populations throughout the world (Keats and Wiggins 2014). Evidence
10 identifies that breastfeeding may be a protective factor which contributes to the
11 reduction in obesity and associated chronic morbidities throughout the lifespan
12 (Koletzko et.al. 2009).

13

14 Within the UK, infant feeding has become a public health priority since the early 21st
15 Century (NICE, 2008) as a response to the Innocenti Declaration in 1990 which
16 significantly influenced the commitment to increase breastfeeding rates internationally
17 (WHO 2003). In the UK there has been a steady increase in the initiation and
18 continuation of breastfeeding, although there continues to be a reduction in the
19 numbers of women maintaining breastfeeding at six weeks postnatally (McAndrew et
20 al 2012, Renfrew, et al 2005). Subsequently researchers have focussed on the
21 consideration of factors influencing the initiation and continuation of breastfeeding in
22 the postnatal period in order to identify ways to support mothers to breastfeed for
23 longer (Sloan, et al , 2006, Bishop, et al, 2008, Agboado, et al, 2010).

24

1 Nevertheless it is argued that influences on infant feeding decision-making occur pre-
2 pregnancy and are formalised in the antenatal period. Indeed studies have identified
3 that maternal feeding intentions prior to birth are closely linked to actual feeding
4 practices (Scott, et al, 2004, Donath & Amir, 2003). There is an increasing body of
5 research suggesting parents are influenced by multiple sociocultural factors which
6 interact to guide their infant feeding decisions (Symon, et al 2013, Barona-Vilar, et al
7 2009). To further our understanding of the underlying factors that influence parents'
8 infant feeding decisions in the antenatal period, a mixed methods systematic review
9 including eligible studies of qualitative, quantitative and mixed method designs was
10 conducted with the aim of exploring the expectant parents' perspectives. Including
11 studies of different designs was intended to widen the capture of data relevant to the
12 aim of this review, enhance the applicability of the results and had the potential to
13 inform policy and service developments to support mothers to breastfeed for longer.

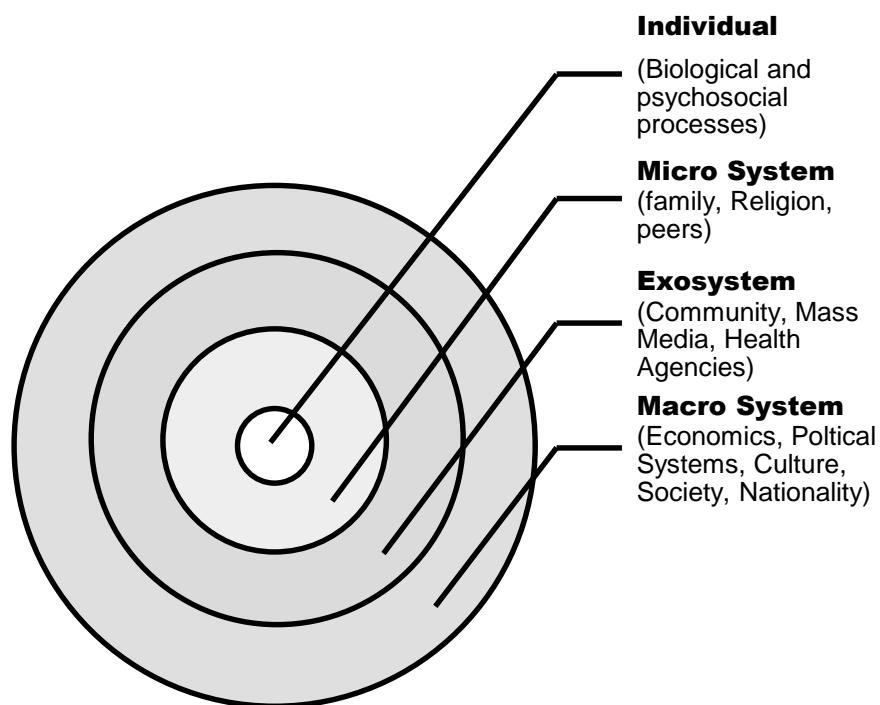
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15 **Method**

16 As a narrative interpretive synthesis no *a priori* outcomes were specified (Dixon-
17 Woods et al., 2006). Outcomes that emerged from the data reflected the broad focus
18 of the review question and were categorised in accordance with the relevant
19 categories of the Social Ecological model (figure 1). The Social Ecological model was
20 employed to provide a framework for data extraction and data synthesis.
21 Internationally the model has been utilised in breastfeeding policy development
22 (Australian Capital Territory, 2010, Raffle, et al, 2011) although is not overtly evident
23 in UK guidance (NICE, 2008). The model considers individuals as inherently linked to,
24 and interacting with, a complex array of 'systems' that ultimately shape their

1 development and understanding of the world around them. These systems range from
2 influences deriving from the individual themselves (the 'Individual' System), their
3 immediate environment and significant others (the 'Micro' System), the wider
4 environment including the community and health agencies (the 'Exo' system) and
5 finally societal and cultural influences (the 'Macro' system) (Rayner & Lang, 2012).
6 Subsequently the reported views of parents within each of the included studies were
7 explored in the context of their relationship to these social ecological 'systems'.

8 **Figure 1: Social Ecological Model (adapted from Rayner & Lang 2012)**



9

10

11 Due to the differing methods employed in the included studies, synthesis of the parent
12 views data required specific consideration. The UK Evidence for Policy and Practice
13 Information and Co-Ordinating (EPPI) Centre's original approach, promotes parallel
14 data extraction and synthesis of qualitative and quantitative data prior to a combined
15 synthesis. The main data is derived from Randomised Controlled Trials, supported by

1 qualitative data (Thomas & Harden, 2008, Harden et al., 2004). However the review
2 presented in this paper was a narrative interpretive synthesis of qualitative themes
3 derived from parent views data from studies of varying design. Hence a combined
4 synthesis of the whole data was undertaken immediately after parallel qualitative and
5 quantitative data extraction from the included studies.

6

7 *Study Selection:* The following search terms were used: antenatal, bottle feeding,
8 breast feeding, choice, decision-making, fathers, infant feeding, mothers, parents.
9 The Medline, CINAHL, Embase and PsychInfo databases were searched for the
10 periods January 1990 to March 2014. Two journals ('Midwifery' and 'Social Science
11 and Medicine') were chosen on the basis of initial findings that they frequently
12 included papers on the topic of infant feeding and breastfeeding. The journals were
13 hand searched (January 2011 to March 2014) and reference lists checked for further
14 studies not identified through database searches.

15

16 *Eligibility criteria:*

- 17 • The primary focus of the study was to explore parents' views of the factors
18 influencing their infant feeding decisions in the antenatal period.
- 19 • Participants included expectant mothers of childbearing age of any parity,
20 fathers or 'parents'.
- 21 • In recognition that the 1990 'Innocenti' declaration (WHO 2003) has influenced
22 subsequent International policy, research articles from developed countries,
23 published in English and conducted from January 1990 to March 2014.

- 1 • Primary data-collection period from the antenatal period up to 1 week
2 postnatally. Where studies presented both antenatal and postnatal data, the
3 postnatal data after 1 week were excluded. In recognition of the possibility of
4 recall bias, postnatal studies that focussed on antenatal influences were
5 carefully considered before inclusion to ensure they met the inclusion criteria
6 and that data were collected in the immediate postnatal period.
- 7 • Studies that focused on parents whose infant feeding decision would be based
8 on specialist clinical advice were excluded.
- 9 • Dissertations and unpublished research were also excluded.

10

11 *Risk of bias assessment:* Quality appraisal tools for qualitative data (CASP, 2013)
12 and quantitative data (EPHPP 1998) were adapted to ensure the assessment of
13 quality of qualitative and quantitative studies were assessed in relation to key criteria
14 (see figures 3a/3b). Tools were piloted prior to use in the review. Studies were
15 assessed against quality criteria according to the study design and presentation of
16 the findings. Each criterion was rated high to low depending on assessment of the
17 available information and the quality of the design, methodology and results within
18 each study. Mixed method studies were assessed with both tools and given an
19 overall rating. Overall ratings were judged on the combination of ratings with studies
20 rating 'high quality' attracting ≥ 7 'high quality criteria' in qualitative & mixed method
21 studies or ≥ 6 in quantitative studies (reflecting the difference in the number of
22 criterion) and studies rating 'Low quality' attracting ≥ 2 'low' quality criteria (see
23 figures 3a and 3b). No studies were excluded on the basis of the quality appraisal.

1 However the significance of thematic codes were considered in conjunction with the
2 strength of the quality rating for the studies contributing to that code.

3

4 *Data collection:* Data extraction tools were devised and piloted. Tools were created to
5 reflect the Social Ecological model 'systems' (Rayner & Lang 2012). For each study
6 phrases, key words and metaphors were extracted and entered into the data extraction
7 tools and were mapped to the specific 'system' of the Social Ecological model,
8 depending on the source of the influence on the expectant parents' views. In the case
9 of quantitative and mixed method studies that compared different groups within
10 samples (e.g. age, ethnicity, method of feeding choice), the quantitative data were
11 considered in relation to both the frequency of the response for each question within
12 the sub group, as well as the strength of the direction of the evidence for a particular
13 sub group.

14

15 *Synthesis:* Thematic synthesis was undertaken (Gough, 2007). Thematic codes
16 emerged following several iterations between the extracted data and each study in
17 order to focus in on the context and meaning of the parents' views. The data were also
18 explored in conjunction with the 'systems' descriptors of the Social Ecological model
19 to situate the source of the influence on expected parents' views. The emerging
20 thematic codes were further categorised in relation to whether the data related to a
21 positive or negative focus in relation to breastfeeding or bottle feeding choices,
22 reflecting the emotive and practical considerations of the infant feeding decision. The
23 synthesis focussed these thematic codes into firstly nine descriptive categories that
24 reflected the nature of the codes in relation to a combination of the decision-making

1 activity and the source of the influence (Bonding/Attachment; Body Image; Self-
2 Esteem/Confidence; Female Role Models; Family and Social Network; Lifestyle;
3 Feeding in front of others/in public; Knowledge; Formal Information Sources) leading
4 to the final analytical interpretation (Figure 4). An expert researcher was consulted
5 throughout the review to reduce the risk of bias and strengthen reliability.

6

7 **Results**

8 Despite the intention to include studies that included both parents as sources of views
9 data, 16 of the 17 studies included samples of expectant mothers with only Lothian
10 (1994) briefly reporting fathers' views, therefore the review principally addresses
11 expectant mothers' views of the influences on their infant feeding decisions.

12

13 The PRISMA diagram (Moher et al 2009) shows the flow of studies through the
14 review (Figure. 2). Full text review identified 17 eligible studies including 2 mixed-
15 method (Kong & Lee, 2004, Dyson, et al, 2010), 10 qualitative (Alexander et.al.
16 2010, Barona-Vilar et al., 2009 Earle, 2002, Hannon, et al, 2000, Hoddinott & Pill,
17 1999, Lothian 1994, Moore & Coty, 2010, Sheehan, et al, 2003, Stewart-Knox, et al,
18 2003, York & Hoban, 2013) and 5 quantitative studies (Gage et al., 2012, Gielen et
19 al 1992, Humphreys et al 1998, Maehr et al 1993, Weimann et al 1998). As intended,
20 the studies were located in various developed countries including the UK, America,
21 Australia, Spain, Hong Kong and one study (Gage et al 2012) was a multi-centre
22 European study (Finland, Hungary, Germany, England, Spain).

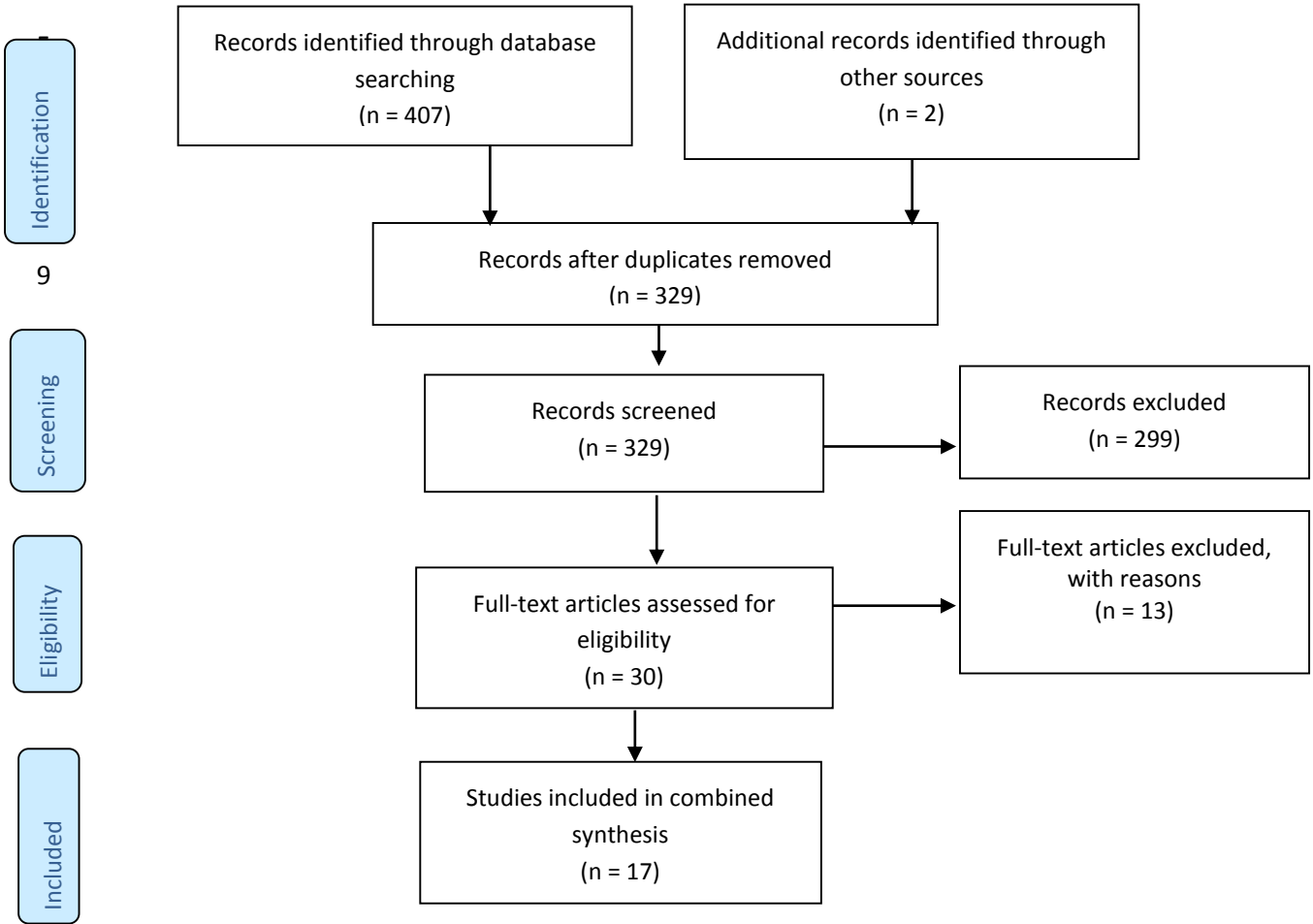
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3 **Figure 2:** PRISMA Flow Diagram

4



9

1 Across the 17 included studies there were a total of 4,767 expectant parents, the
 2 significant majority (4,762) being expectant mothers. 4,205 were included in
 3 quantitative studies, 344 in qualitative studies and 318 in mixed method studies.

4

5 *Risk of Bias:*

6 Figures 3a/3b below identify the results of the quality appraisal assessments.

7 **Figure 3a Qualitative studies quality appraisal**

Quality rating categories	Aims/design	Recruitment strategy	Data collection process	Researcher/participant relationship	Ethical issues	Data analysis	Credibility of findings	Statement of findings	Transferability	Overall rating
Alexander et.al. (2010)	✓	✓	✓	X	✓	✓	✓	✓	•	High
Barona-Villar et.al. (2009)	✓	✓	✓	X	✓	✓	✓	✓	•	High
Earle (2002)	✓	✓	✓	X	✓	•	•	✓	•	Medium
Hannon et.al. (2000)	✓	✓	✓	•	•	✓	✓	✓	•	Medium
Hoddinott & Pill (1999)	✓	✓	✓	✓	•	✓	✓	✓	•	High
Lothian (1994)	•	X	X	X	X	X	X	•	•	Low
Moore & Coty (2006)	✓	✓	✓	•	✓	✓	✓	✓	•	High
Sheehan et.al. (2003)	✓	✓	✓	•	•	✓	•	✓	•	Medium
Stewart-Knox et.al. (2003)	✓	•	•	X	X	•	✓	•	•	Low
York et.al. (2013)	✓	✓	✓	X	✓	✓	•	✓	•	Medium

Key: ✓ = Present/High quality • = Present/Medium quality X = present or absent from text/low quality

8

9

Figure 3b. Quantitative and Mixed method Studies quality appraisal.

Quality rating categories	Representative sample	Study Design	Data collection methods	Withdrawals/ drop outs	Data analysis	Credibility of results	Statement of results	Generalizability	Overall Rating	
Gage et.al. (2012)	✓	✓	✓	•	✓	✓	✓	•	High	
Gielen et.al. (1992)	✓	✓	✓	✓	✓	✓	•	•	High	
Humphreys et.al. (1998)	•	✓	•	✓	•	•	•	•	Medium	
Maehr et.al. (1993)	X	•	X	•	•	•	•	X	Low	
Weimann et.al. (1998)	•	✓	✓	•	✓	✓	•	•	Medium	
	Quantitative quality rating									
Mixed Method Studies								Overall Qualitative quality rating	Overall rating	
Dyson et.al. (2010)	•	✓	✓	X	✓	✓	✓	•	✓	Medium
Kong & Lee (2004)	✓	✓	✓	✓	✓	✓	✓	•	•	High

Key: ✓ = Present/High quality • = Present/Medium quality X = present or absent from text/low quality

Overall Ratings: 'High' = majority 'high quality' rated criterion (≥ 7 in qualitative & mixed method studies or ≥ 6 in quantitative studies reflecting the difference in number of criterion). 'Medium' = mixture of 'high' and 'medium' quality criterion. 'Low' = ≥ 2 'low' quality criterion.

2

3 Comparison of the quality assessment with the initial categorisation of themes
 4 identified that the 'Low quality' rated studies of Lothian (1994), Maehr et.al. (1993) and
 5 Stewart-Knox et.al. (2003) produced data within many thematic codes common with
 6 high quality and medium quality rated studies. This suggests that studies rated as low
 7 quality produced themes that were very similar to the studies whose data were
 8 considered to be more robust.

9

1 The findings are now described and will be presented within the descriptive themes
2 that emerged from the thematic synthesis (also see supplementary information figure
3 6). The context and terminology participants used in these studies is suggestive of the
4 emotional and psychological complexities of the decision-making process. The data
5 suggests that decisions are as much to do with biological, emotional and psychological
6 factors as the consideration of other's opinions and the practicalities of feeding their
7 infant at home, at work and in public.

8

9 *Bonding and Attachment:* The majority of studies identified bonding between mother
10 and infant as a positive influence on breastfeeding decisions (Alexander et.al. 2010,
11 Earle 2002, Gielen et.al. 1992, Hannon et.al. 2000, Hoddinott & Pill 1999, Humphreys
12 et.al. 1998, Kong & Lee 2004, Lothian 1994, Maehr et.al. 1993, Moore & Coty 2006,
13 Sheehan et.al. 2003, Stewart-Knox et.al. 2003). Bonding was often mentioned in
14 positive terms relating to the emotional attachment with the infant and an essential
15 part of the maternal role.

16

17 *Body Image:* This theme identified a concentration of data towards negative
18 perceptions of breastfeeding (Alexander et.al. 2010, Dyson et.al. 2010, Earle 2002
19 Hannon et.al. 2000, Hoddinott & Pill 1999, Kong & Lee 2004, Moore & Coty 2006,
20 Sheehan et.al. 2003, York & Hoban 2013). The negative responses voiced within the
21 studies in relation to expectant mothers' perceptions of breastfeeding and body image
22 was both emotive and conveyed a sense of insecurity and dislike regarding the
23 physical act of breastfeeding. Negative comments were by participants considering
24 either feeding option. In contrast many studies reflected the 'naturalness' of

1 breastfeeding as a factor in deciding to breastfeed (Gielen et.al. 1992, Hoddinott & Pill
2 1999, Kong & Lee 2004, Lothian 1994, Maehr et.al. 1993, Sheehan et.al. 2003).

3

4 *Self Esteem/Confidence:* Determination was a consistent sub-theme reflecting
5 women's desire to breast or bottle feed (Barona-Villar et.al. 2009, Dyson et.al. 2010,
6 Hannon et.al. 2000, Lothian 1994, Moore & Coty 2006, Sheehan et.al. 2003, York &
7 Hoban 2013). However for potential bottle feeding mothers there was an
8 acknowledgement that the decision was not without cost (Dyson et.al. 2010, Earle
9 2002, Moore & Coty 2006, York & Hoban 2013). Guilt and failure was portrayed as
10 both a concern if mothers were to fail to succeed at breastfeeding, and if they were to
11 eventually decide to bottle feed (Dyson et.al. 2010, Sheehan et.al. 2003). Indeed one
12 study suggested that mothers may conceal their real intention to bottle feed to avoid
13 negative judgements from others (Sheehan et.al. 2003). Common to several studies
14 was the intention to try to breastfeed (Alexander et.al. 2010, Barona-Villar et.al. 2009,
15 Earle 2002, Hoddinott & Pill 1999, Kong & Lee 2004, Lothian 1994, Sheehan et.al.
16 2003, York & Hoban 2013). This tentativeness appeared in the context of waiting to
17 see if expectant mothers 'liked' breastfeeding, whilst others held beliefs that it was
18 important to try to breastfeed for health reasons. The data indicated that expectant
19 mothers' decisions to breastfeed were driven by both moral and personal factors
20 intrinsic to their view of the maternal role.

21

22 *Female role models:* The data suggested that female role models have a powerful
23 impact on maternal perception of feeding options. Several studies highlighted that the
24 degree of exposure to breastfeeding mothers throughout the expectant mothers' life

1 had a positive influence on their decision to breastfeed (Hoddinott & Pill 1999, Kong &
2 Lee 2004, Moore & Coty 2006, Sheehan et.al. 2003, Stewart-Knox et.al. 2003).
3 Disadvantaged adolescents were more likely to establish negative perceptions from
4 observing role models who breastfed, compared to those who bottle fed their infants
5 (Alexander et.al. 2010, Hannon et.al. 2000). Interestingly the potential for mixed
6 messages from breastfeeding mothers who shared both positive experiences and
7 'horror stories' (e.g. descriptions of nipple deformities) were reflected in some studies
8 (Alexander et.al. 2010, Lothian 1994, Moore & Coty 2006). The importance of
9 significant female role models in the transfer of information and experiences was a
10 positive factor in both breast and bottle feeding categories.

11

12 The *Family and Social Network* theme identified the importance placed on significant
13 individuals in the expectant mothers' environment, reflecting the significant importance
14 of the baby's father in supporting and 'encouraging' the expectant mother in the
15 breastfeeding decision (Alexander et.al. 2010, Barona-Villar et.al. 2009, Gage et.al.
16 2012, Humphreys et.al. 1998, Kong & Lee 2004, Lothian 1994, Moore & Coty 2006,
17 Stewart-Knox et.al. 2003, Weimann et.al. 1998, York & Hoban 2013). The social
18 network was also important, but conveyed both negative and positive influences
19 highlighting the potentially conflicting nature of the support. Interestingly of the studies
20 that included adolescent participants, only one conveyed positive breastfeeding views
21 relating to their family or social network (Alexander et.al. 2010).

22

23 *Lifestyle:* This theme reflected positive factors influencing bottle feeding decisions.
24 These related to practical aspects of infant feeding, including considerations of future

1 work and educational needs of the expectant mother, whilst others acknowledged the
2 option of complementary feeding to have greater flexibility (Barona-Villar et.al. 2009,
3 Earle 2002, Gielen et.al. 1992, Lothian 1994, Moore & Coty 2006, Stewart-Knox et.al.
4 2003, Weimann et.al. 1998). Convenience as a positive aspect was reflected in both
5 breast and bottle feeding, with more of the data attributing this aspect to breastfeeding
6 (Alexander et.al. 2010, Dyson et.al. 2010, Gielen et.al. 1992, Maehr et.al. 1993,
7 Weimann et.al. 1998). Negative breastfeeding factors almost exclusively focussed on
8 the perceived restrictions to family and social life. The perceived lack of facilities to
9 breastfeed or express breast milk both in public and at work was important and created
10 a potential barrier to how the expectant mother was able to visualise herself continuing
11 breastfeeding outside the home (Kong & Lee 2004, Dyson et.al. 2010, Stewart-Knox
12 et.al. 2003). Indeed some participants reflected a belief that breastfeeding would
13 isolate them from their social sphere (Gielen et.al. 1992, Hannon et.al. 2000, Stewart-
14 Knox et.al. 2003).

15

16 *Feeding in front of others/public* was almost entirely focussed on breastfeeding. It was
17 clear that cultural perceptions of the function and perception of the breast permeated
18 every aspect of the infant feeding decision. The majority of thematic codes originated
19 from negatively focussed data relating the 'embarrassment' of breastfeeding
20 (Alexander et.al. 2010, Dyson et.al. 2010, Earle 2002, Gielen et.al. 1992, Hoddinott &
21 Pill 1999, Kong & Lee 2004, Lothian 1994, Moore & Coty 2006, Stewart-Knox et.al.
22 2003, Weimann et.al. 1998, York & Hoban 2013). Expectant mothers reflected on their
23 own feelings witnessing breastfeeding mothers, and projected this embarrassment to
24 how they perceived others may feel when observing their breastfeeding activity. The

1 data suggested that adolescent and disadvantaged expectant mothers appeared less
2 comfortable and more critical of women breastfeeding in public (Hannon et.al. 2000).

3

4 *Knowledge:* The knowledge of participants throughout the majority of studies
5 demonstrated that health promotion activities have raised the awareness of the
6 breastfeeding health benefits for mothers and babies. The thematic codes identified
7 that this knowledge is tempered with awareness of the more negative aspects relating
8 to breastfeeding problems (Alexander et.al. 2010, Hannon et.al. 2000, Moore & Coty
9 2006, Weimann et.al. 1998). Studies that focussed on adolescent and disadvantaged
10 expectant mothers cited views data in the context of personal justification and
11 rationalisation to defend the bottle feeding choice (Hannon et.al. 2000, Weimann et.al.
12 1998). Knowledge supporting bottle feeding decisions reflected the influence of
13 personal observations and the individual's social network (Barona-Villar et.al. 2009,
14 Hannon et.al. 2000, Sheehan et.al. 2003).

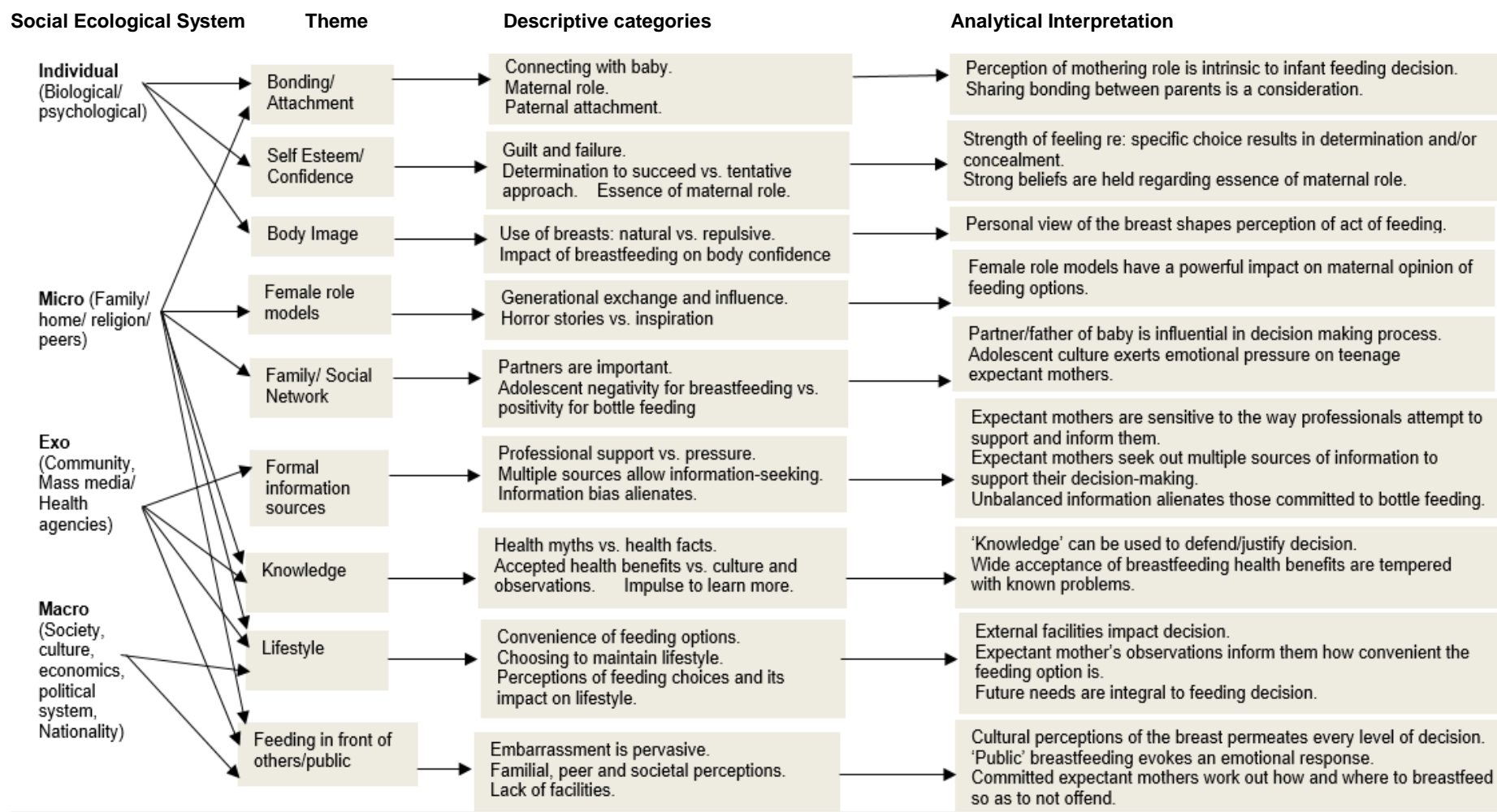
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16 *Formal Information sources:* The importance of professional knowledge and support
17 regarding breastfeeding decisions, was tempered with expectant mothers' perceptions
18 of the more negative consequences of professional involvement. Over-zealous or
19 judgemental approaches served to concern and alienate expectant mothers (Dyson
20 et.al. 2010, Moore & Coty 2006, Sheehan et.al. 2003, Stewart-Knox et.al. 2003). Some
21 mothers considered the provision of health information was biased towards
22 breastfeeding which prevented them from making a balanced decision and alienated
23 those who were considering bottle feeding (Sheehan et.al. 2003, Stewart-Knox et.al.
24 2003, York & Hoban 2013).

1

2 As the Social Ecological Model was integral to the thematic synthesis it was possible
3 to map the descriptive themes to the 'systems' of the model in order to visualise the
4 interactions between each theme and across each 'system' (fig. 4). This identified that
5 family members and the immediate home environment (the 'Micro' system) had an
6 influence on six of the nine themes (Bonding/Attachment; female role models;
7 family/social network; Knowledge; lifestyle; feeding in front of others/in public). This
8 was followed by the 'Exo' system (community, media and health agencies) which
9 influenced four themes (Formal information sources; knowledge; lifestyle; feeding in
10 front of others/in public). Influences from within the individual themselves (the
11 'Individual' system) contributed to three themes (Bonding/attachment; self-
12 esteem/confidence; body image) whilst societal, wider cultural and governmental
13 policies (the 'Macro' system) influenced two themes (lifestyle; feeding in front of
14 others/in public).

Figure 4: Interpretive Synthesis



1 **Discussion**

2 This review aimed to identify the range of factors influencing infant feeding decisions
3 as voiced by expectant parents. These factors all merge at varying levels and degrees
4 depending on the expectant mothers' specific circumstances.

5

6 The seventeen studies reflected qualitative, quantitative and mixed method studies.
7 To our knowledge there are no similar reviews on this topic. It is possible that some
8 potentially eligible studies were missed in the study selection process, although a
9 comprehensive search strategy was employed including reference checking and
10 hand-searching. Reliability was strengthened by piloting the quality appraisal and data
11 extraction tools and consulting an expert researcher throughout the review process.
12 Three studies were included that collected data in the immediate postnatal period
13 (Kong & Lee 2004, Maehr et al 1993, Weimann et al 1998) as they were considered
14 to have valuable data of relevance to the review. However it is acknowledged that
15 recall bias is a potential issue for these studies.

16

17 Whilst the EPPI Centre approach (Thomas & Harden, 2008, Harden et al., 2004) was
18 a strength in that it was more suitable for data synthesis in a mixed method review, it
19 was not possible to be wholly consistent with the process due to this review's exclusive
20 focus on parent views data. Nevertheless, the approach adopted enabled detailed
21 exploration of the data as a whole from the outset. The decision to include studies with
22 varying designs in order to capture the full range of evidence applicable to the review
23 question was a strength, and the diversity of study designs and the varying age groups,
24 socio-economic status, ethnicity and culture of the expectant mothers enabled a broad

1 perspective of the data in order to address the review question. Furthermore the use
2 of the Social Ecological model throughout the review provided a theoretical
3 consistency to the data extraction and interpretive synthesis.

4

5 By taking a Social Ecological perspective, we were able to explore and demonstrate
6 the multiple influences impacting on expectant mothers in the decision-making
7 process. Whilst there exists cultural differences due to the expectant mothers' country
8 of residence and ethnicity, there are some key commonalities in the views of infant
9 feeding voiced by participants across all 17 studies. Their responses create a picture
10 of the challenges and emotional investment inherent in the infant feeding decision. It
11 highlights the juxtaposition of expectant mothers' knowledge of the health benefits of
12 breastfeeding and the realities of cultural, familial and generational influences and
13 practical considerations that impact on her choice.

14

15 The findings suggest that the concept of the maternal role is intrinsic in the
16 breastfeeding decision. Consistent with other research (Schmied & Lupton, 2001), to
17 some expectant mothers breastfeeding was central to their perceptions of
18 motherhood, echoed in terminology that defined the expected naturalness and
19 importance of the emotional connection with their baby. Similarly the perception of the
20 maternal role is linked with an expectant mother's beliefs system (Dennis, 1999,
21 Mossman, et al 2008). Commitment and determination were identified by expectant
22 mothers favouring either infant feeding option. However some of the data were also
23 suggestive of insecurities in the breastfeeding decision, and of the guilt or failure
24 should breastfeeding be discontinued or bottle feeding be the primary choice. Indeed

1 this belief may impact on the mother postnatally. A recent study found that whilst
2 postnatal depression (PND) was lower in women who breastfed, those who were
3 unable to continue yet wished to do so had higher rates of PND, impacting on their
4 long term health and wellbeing (Borra, et al, 2014).

5

6 The review identified that the participants' views contributed more data to the negative
7 views of breastfeeding than bottle feeding. This gave a sense that infant feeding was
8 not a balanced choice between two feeding options, but rather a process of weighing
9 reasons for and against breastfeeding. The paucity of data in relation to expectant
10 mothers' negative perceptions of bottle feeding is perhaps evidence of the continuing
11 cultural acceptance of bottle feeding (Dennis, 1999).

12

13 Findings further reflected the disparity between the knowledge of health benefits of
14 breastfeeding and the impact of years of culturally established doubt as to an
15 expectant mother's ability to successfully breastfeed. This is evidenced by the many
16 studies in this review that identified expectant mothers being willing to 'try' to
17 breastfeed and others that reflected the numerous negative thematic codes relating to
18 breastfeeding evident in all the themes. Research suggests that there is a possibility
19 that mothers initiate breastfeeding with positive intentions or to briefly appear to try as
20 a response to pressure from professionals and family members and their own
21 perceptions of being a good mother (Murphy, 1999). Certainly studies continue to
22 show a decrease in breastfeeding in the early postnatal period due to various reasons
23 including difficulties experienced by the mother (McAndrew et al 2010, Scott, et al
24 2004).

1

2 An expectant mother's perceptions of the support from various individuals within her
3 environment was also a major factor highlighted by the data in this review. Support, or
4 the lack of it, transcended many of the themes that reflected the external influences
5 on the infant feeding decision. Consistent with other studies the father of the baby
6 played a significant role in supporting and encouraging expectant mothers in their
7 breastfeeding decision-making (Avery & Magnus, 2011, Matich & Sims, 1992).

8

9 The peer network and the influence of significant others was of specific importance to
10 adolescent expectant mothers. Data suggested that for some adolescents, peer-
11 pressure influenced negative perceptions of breastfeeding and contributed to
12 maintaining bottle feeding as 'normal' within their group culture. Nevertheless for
13 others, their own mothers and professionals were considered supportive in the
14 breastfeeding decision. It is potentially suggestive of the importance placed on the
15 opinion of peers and significant others linked to the stage of development and the
16 willingness of adolescents to conform to social group norms within adolescent culture
17 (Swanson, et al, 2006).

18

19 The relationship between socio-economic and educational status and the infant
20 feeding decision is well-known (Dyson, et al, 2005, Shepherd, et al, 2000, Persad &
21 Mensinger, 2008). This review concurred, with data suggesting that socio-
22 demographic, educational and cultural factors influenced expectant mothers'

1 perception of the infant feeding choice and their commitment to learn more in order to
2 inform or confirm their decisions.

3

4 Perhaps an important factor enabling expectant mothers to assimilate knowledge was
5 the opportunities to observe breastfeeding. Female role models had a clear supportive
6 role in influencing breastfeeding decisions. Findings of the review suggest several
7 expectant mothers within the adolescent and disadvantaged groups saw bottle feeding
8 as 'normal', whilst expectant mothers in other studies rationalised bottle feeding within
9 the context of their historic observations and the transfer of knowledge and practices
10 down the generations or within social groups. Evidence suggests that expectant
11 mothers of any age who had the opportunity to observe breastfeeding in their family
12 and social spheres are more likely to hold positive views and intentions to breastfeed
13 themselves (Mossman et al., 2008, Shortt, et al, 2013).

14

15 This review has highlighted that some mothers seeking information about bottle
16 feeding felt alienated by the overt promotion of breastfeeding. Clearly this reflects the
17 International policy changes that have taken place following the 1990 Innocenti
18 declaration (WHO 2003) and the International Code into the Marketing of Breast-Milk
19 Substitutes (WHO, 1981). There is an acknowledgement by most of the expectant
20 mothers considering breastfeeding that professionals were supportive and essential
21 sources of information. However some expectant mothers perceived that
22 professionals pressurised them, or judged them for considering bottle feeding. This
23 sensitivity may reflect how public health policy is challenging cultural norms.

1

2 Thematic codes also strongly highlighted the negative factors of embarrassment and
3 the unacceptability of feeding in public. This may relate to the cultural expectations
4 and generational exchange of information between families and social groups that
5 consider either feeding option the 'norm'. Prevailing cultural perceptions of the lack of
6 acceptability of breastfeeding in front of others or in public may have had a
7 counteractive influence on breastfeeding decisions (Shepherd et al., 2000). It is
8 acknowledged that the data would have reflected the societal norms at the time, as
9 some of these studies were conducted prior to breastfeeding in public being protected
10 by law in many countries (National Conference of State Legislatures 2014,
11 Government Equalities Office 2010, Australian Breastfeeding Association 2014).

12

13 ***Implications for practice***

14 Whilst there is extensive policy focus on increasing breastfeeding rates (PHE 2012),
15 the findings of this review have drawn attention to expectant mothers' negative
16 perceptions of breastfeeding. This demonstrates the continuing challenge to engage
17 a variety of approaches to establish breastfeeding as 'normal' (UNICEF 2009).
18 Mapping the Descriptive themes to the 'systems' of the Social Ecological Model
19 identified the sources of influences on the infant feeding decisions of expectant
20 mothers which highlighted the key role expectant fathers and female role models play
21 in the decision-making process. Front-line staff continue to be pivotal in not only
22 understanding what influences the expectant mother in her decisions, but also being
23 able to extend the support to her significant others who are pivotal to the decision-

1 making process. Through innovations in practice delivery, engaging women and their
2 families in service provision will ensure resources are targeted effectively.

3

4 Finally it is suggested that research into expectant fathers' views of infant feeding
5 decisions antenatally is an area for further study. Building an evidence base of
6 expectant parents' views will enable researchers to triangulate data with observational
7 studies and also has the potential to map cultural changes in parental views of both
8 breast and bottle feeding.

9

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