

# Understanding infant feeding practices of new mothers: findings from the Healthy Beginnings Trial

## AUTHORS

### Karen Wardle

RN, CM, Grad Dip PH  
Program Manager, Health Promotion Service,  
South Western Sydney & Sydney Local Health Districts  
Narellan, New South Wales, Australia.  
karen.wardle@sswahs.nsw.gov.au

### Maria De Domenico

RN  
Health Promotion Officer, Health Promotion Service,  
South Western Sydney and Sydney Local Health Districts  
Camperdown, New South Wales, Australia.  
Maria.DeDomenico@sswahs.nsw.gov.au

### Associate Professor Li Ming Wen

MD, MMed and PhD  
School of Public Health, University of Sydney; and  
Research and Evaluation Manager; Health Promotion  
Service,  
South Western Sydney and Sydney Local Health  
Districts  
Camperdown, New South Wales, Australia.  
lmwen@email.cs.nsw.gov.au

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## KEY WORDS

infant feeding practices, breastfeeding, solid food, health education

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## ABSTRACT

### Objective

This study aimed to explore the experiences of infant feeding of first-time mothers and identify the barriers and facilitators in relation to healthy infant feeding practices.

### Design

As part of the Healthy Beginnings Trial, descriptive analyses were conducted using data extracted from both baseline and six month surveys. Twenty five face-to-face in-depth interviews were conducted at 12 months postpartum by two trained research nurses with a series of semi structured questions to explore mother's infant feeding experience.

### Setting

The study was conducted in southwest Sydney, the most socially and economically disadvantaged area of metropolitan Sydney, New South Wales in 2007-2010.

### Main outcome measures

To understand mothers' experiences of infant feeding and identify the barriers and facilitators in relation to healthy infant feeding practices.

### Results

A total of 561 mothers completed both baseline and six month surveys. Of these, 25 agreed to participate in a face-to-face in-depth interview at 12 months postpartum. A high proportion (96%) of mothers initiated breastfeeding, only 38% continued breastfeeding at 6 months postpartum due to numerous barriers. The main barriers for breastfeeding were milk supply and unsettled baby, latching baby to the breast and pain. The main barrier for appropriate timing of introduction of solid food was confusion about the recommended guidelines. Hospital support was regarded as the main facilitator for healthy infant feeding practices.

### Conclusions

A significant proportion of mothers did not meet the WHO recommended guidelines for breastfeeding. The first week of life was the most critical time for first time mothers to establish and consolidate breastfeeding. Education around appropriate timing of introduction of solids for both mothers and health professionals would be beneficial in ensuring consistency and adherence to the guidelines.

## INTRODUCTION

Infant feeding practices including breastfeeding, infant formula and complementary foods (solids) constitute an important aspect of early child growth. The World Health Organization (WHO) recommends that parents breastfeed exclusively for the first six months of life, continue to breastfeed for up to two years or beyond and wait until the second half of the first year to introduce solid foods (NHMRC 2013). The recommendations have been adopted and endorsed by many countries including Australia.

Infant feeding practices are among the most identifiable factors contributing to the early onset of childhood obesity. One longitudinal study and one systematic review of breastfeeding and childhood overweight and obesity conclude that breastfeeding is protective against overweight and obesity, with some studies showing a dose response (Beyerlein and von Kries 2011; Grummer-Strawn and Mei 2004). There is also a growing body of evidence linking the early introduction of solids to the risk of obesity (Toschke et al 2007; Baker et al 2004; Grummer-Strawn and Mei 2004). The latest evidence from the UK Millennium Cohort Study with more than 10,000 children, found that when solids were introduced before four months, children were more likely to be overweight or obese at three and five years of age compared to babies given solid foods after four months (Griffiths et al 2009).

Challenges of breastfeeding faced by new mothers in the first few months following the birth of their child are well documented (Li et al 2008; Bailey et al 2004). The health benefits of exclusive breastfeeding for the first six months of life are significant (NHMRC 2013). However, the proportion of mothers who continue to breastfeed for the recommended period of time is low (AIFS 2008; Australian Bureau of Statistics 2003). Although Australian breastfeeding initiation rates have increased (AIFS 2008), assistance is needed to overcome the challenges thereby sustain breastfeeding over a longer period of time.

The timely introduction of solid food remains a controversial topic, particularly as over the last two decades there has been a change from commencing complementary food from 4 - 6 months to six months. Current recommendations in Australia are to introduce solids at around six months (NHMRC 2013). While debate and discussion surrounding the introduction of solids continues, a number of issues can lead to infants being given complementary food before six months of age, including advice from family and friends, parental perceptions that the infant is hungry, parental anxiety and fatigue (Scott et al 2009; Alder et al 2004).

With increasing recognition of the need to improve infant feeding practices as a means of early childhood obesity intervention, the Healthy Beginnings Trial (HBT) was conducted in southwestern Sydney, New South Wales, Australia in 2007-2010, to test the effectiveness of an early childhood obesity intervention in the first two years of life. The intervention uses a home-visiting strategy to promote healthy feeding of babies among first-time mothers. One of the aims of this trial was to improve mothers' infant feeding practices through a home-based intervention (Wen et al 2007). This study was part of the HBT aiming to explore the experiences of infant feeding of first-time mothers in the HBT and identify the barriers and facilitators in relation to healthy infant feeding practices.

## METHODS

The main study of the HBT was a randomised controlled trial and conducted in southwest Sydney, in 2007-2010. The study was approved by the Ethics Review Committee of Sydney South West Area Health Service. Women were eligible to participate if they were living within the local area, expecting their first child, aged over 16 and able to communicate in English. For this particular study, both quantitative and qualitative methods were used.

### Quantitative study

Data for quantitative study were extracted from the HBT baseline survey conducted by face-to-face interviews with a total of 667 first-time mothers at 24-36 weeks of pregnancy in their home prior to randomisation. The questionnaire included a range of questions relating to general demographics, health, nutrition and physical activity from the NSW Health Survey (Centre for Epidemiology and Research 2004). To assess mothers' knowledge of and intended breastfeeding practices before giving birth specific questions were asked:

*"What do you understand to be the recommended age to which you should continue to exclusively breastfeed your child?"*

*'Do you plan to breastfeed your child?'*

*"To what age do you plan to exclusively breastfeed your child?"*

*"To what age do you plan to breastfeed your child whilst also giving them other foods?"*

To understand mothers' infant feeding practices at six month postpartum a telephone survey with both open and closed questions was conducted by one principal interviewer and lasted 30 – 45 minutes. A total of 561 mothers completed the telephone survey. Specific questions on aspects of infant feeding were taken from the NSW Child Health Survey (Centre for Epidemiology and Research 2002) along with other standard questions and included health service usage, physical activity and smoking (Centre for Epidemiology and Research 2004).

An Access database was created to store all quantitative data collected for the HBT. Data were imported into Statistical Package for the Social Sciences for descriptive analysis.

### Qualitative study

To gain understanding of the individual experience of first time mothers, participants were invited to undertake a face-to-face in-depth interview. Two research nurses were trained to interview participants and were guided by a series of semi structured questions to explore their infant feeding experience, nutrition, active play, physical activity, family functioning and the impact of the HBT interventions.

### Sample selection

Purposive sampling was used in order to focus on the selection of information rich cases for in depth study which facilitates the examination of meanings, interpretations and processes (Liamputtong and Ezzy 2005). Inclusion criteria guided the sample selection which ensured a mix of intervention and control participants, infant feeding methods and demographics including age, marital status and income. Mothers were invited to participate in an interview at the HBT 12 month survey; those accepting signed written consent. Data saturation was reached at 25 interviews.

### Data Analysis

Interviews were audio-taped with the participant's permission and transcribed. Transcript accuracy was checked by comparing the transcript to the audio-tapes. The computer software NVIVO was used to support data management, coding and thematic analysis to facilitate the identification of emerging themes and issues (Green and Thorogood 2009). Interview transcripts were reviewed by two researchers through the process of reading, coding and identification of common and divergent themes and triangulated with matching some questions with the six month phone survey.

A two stage coding process was used. At first stage 'Topic Coding' was used to allocate passages of text to topics requiring little interpretation. The interview questions formed an initial coding framework subsequently refined through the second stage coding process of 'Analytic C coding' with the interpretation and reflection on meaning (Richards 2009).

## RESULTS

### Retention rate

A total of 667 first-time mothers were recruited into the HBT. Sixteen percent (106) of participants were lost to follow-up at six months. The main reasons were unable to be contacted (70%), too busy/not interested (12%), moved (10%), illness/death (7%).

### Demographics

Participants in the HBT reflect a diverse mix of social and economic standing with baseline characteristics. Among 561 mothers remained at six month survey, mothers' ages ranged from 16 to 47 years with the majority between 20 – 29 years (64.4%). Most mothers (88.4%) reported being with a partner and 10% spoke a language other than English at home. Total annual incomes varied substantially with 19% earning less than \$40,000. Levels of educational achievement varied with just over half of the participants (55%) attaining their High School Certification or TAFE certificate/diploma and 25% attaining a university degree.

## INFANT FEEDING PRACTICES

### Intention

At baseline (n=667) the majority of mothers (94%) intended to breastfeed their baby. For some breastfeeding was a given:

*"..before I even got pregnant I was always going to breastfeed..."*

*" ..just always wanted to, even when I was a kid I was always like oh well, when I have a baby I'll breastfeed.."*

Many others acknowledged the nutritional, immunological, bonding, practical and cost effective benefits of breastfeeding:

*"....I just think it is a mother and child bonding, whatever happens nobody else can do it, just I can do it for my baby".*

*"I guess myself, I really wanted to breastfeed and everything and I knew that it was healthy for her, yes, and just mainly for health reasons."*

### Patterns of Infant Feeding

Of the participants who took part in the six month phone survey (n=561) breastfeeding initiation and duration were reported with 96% of babies having ever breastfed, 4% of babies were being exclusively breastfed, 6% were fully breastfed meaning they received breast milk as the main form of nourishment but also had been given other fluids but not infant formula or solids, 13% were being fed with breast milk and infant formulas and 63% infant formula feeding only.

### Cessation of Breastfeeding

Of the mothers who ever breastfed their infant, 38% were still giving any breast milk at six months. Within the first week of delivery 11% of mothers stopped breastfeeding. By one month an additional 18% had stopped, with a further 17% at three months and a further 12% by six months.

Data from the six month phone survey triangulated with findings from the in-depth interviews provided a broad overview of experiences and concerns which influenced mothers to stop breastfeeding. The group of mothers who breastfed their children less than six months shared many similar experiences and concerns which we have grouped into six key areas including milk supply or unsettled baby, latching or pain issues, support in hospital, health related issues, mother's preference, and the impact of work, or school, or pregnancy.

Milk supply or unsettled baby was the most common reason cited for giving up breastfeeding throughout the first six months. Expressed at six months in terms of:

*".....milk dried up....."*

*"not producing enough milk...."*

*"poor milk supply....."*

*"didn't think he was getting enough ...."*

and similarly in the in depth interviews:

*"I wanted to breastfeed. I did for three weeks, not realising I didn't have enough milk..."*

*".....to me it seemed like he wasn't getting much milk."*

Attachment, latching baby to the breast and pain associated with breastfeeding were the second most common reason cited for giving up breastfeeding within the first three months. Described at six months in terms of:

*"Baby would not latch on...."*

*"Painful nipples..."*

*"....experienced blistering and bleeding nipples"*

and again in the in depth interviews:

*"I persevered with it as long as I could but.....couldn't get him to latch."*

*"...but with me it didn't work, I was having pain and my nipples were really sore..."*

Hospital experience was another area where mothers had mixed experiences. While some mothers found initial support in hospital fantastic:

*"...hospital experience and breastfeeding in hospital was very good...midwives were very helpful."*

*“... I had a really, really good midwife...fantastic midwife and when I got to that really stressed point, like I can't feed my baby, she just took him, she said it's okay, he'll survive this, you'll survive this ...”*

Others had a different experience:

*“.....but still there are people there that just push you and push you and push you. I can understand why people get stressed out about it when it comes to feeding.”*

*“They pressured me quite a bit – as if I had to make the decision there and then whether I wanted to give the baby formula or breastfeed.”*

For others there were acute health related issues for the mother and/or baby that presented practical issues to be overcome, precipitating emotional dilemmas for some and other mothers that just didn't like breastfeeding.

The reasons for weaning babies varied at different time postpartum. Supply was cited as the most common reason for stopping breastfeeding in the first 6 months, particularly from one week to three months. Latching and pain were cited as the second most common reason to wean babies particularly in the initial post natal period.

### **Introduction of solid food**

The six month survey identified the age mothers started introducing solid food on a regular basis, i.e. at least once a day. Almost a third of mothers (32%) met the recommendations for introducing solids at 6 months (24 weeks) or later. Almost half (46%) introduced solid foods between five and six months (20 – 24 weeks). The remainder (19%) introduced solids between four and five months (16 - 19 weeks) with a small number (3%) of mothers introducing solid food before four months (16 weeks).

The key reasons given by mothers for commencing solids at different ages were analysed. At less than four months, the main reasons given were advice from family and friends and unsettled baby. The earliest recorded age for commencing solids was ten weeks. Explanations recorded for commencing solids at less than four months at the six month survey included:

*“Other friends did same. Tried it and they liked it”.*

*“Mother advised her to start”.*

*“Child wanted more infant formula. This stopped when solids were introduced”.*

One mother reported her rationale for this action at the six month survey:

*“Baby still hungry after bottles. Once started more satisfied and started sleeping through the night, previously waking every 3 hours”.*

and again an opportunity to recall her experience as a participant in the in-depth interviews:-

*“He would cry, he was feeding every two hours, I was told to stretch him out to three, then to four hours. He was always hungry. He was a big baby and was just always hungry and I made the decision to try him on Farex at a very early age and it was the best decision I ever made. ....He was 10 weeks”.*

At 4 - 5 months, mothers felt their baby was always hungry, baby was unsettled or they had received advice from a General Practitioner, nurse, family or friends. They reported at the six month survey:

*"Feeding every 2 hours, hungry. Once started more satisfied returned to 4 hourly feeds".*

*"Mother suggested".*

*"At 4 months GP said ready to start. Showing signs".*

From the in depth interviews mothers again recalled their experiences for us:

*"D..... started on solids from about four months old, because the bottles weren't doing enough for him, so I just gave him food and he seemed a lot happier".*

*"Mainly my daughter when she saw us eat, she would make gestures that she wanted a bit of food, and the age, she was about five months when I started with solids".*

*"But T..... was hungry, he was screaming, he was feeding every hour by then. That's when my nipples started to hurt again, I just couldn't maintain it. Then one of the clinic nurses.... recommended just give it a go and see?"*

At 5 - 6 months, solids were commenced because their baby was showing signs, unsettled, appeared hungry or they had been given advice from a General Practitioner or nurse:

*"Showing interest looking at parents eating"*

*"Wants to eat grabbing mum's food. Opening mouth when seeing mum eat".*

*"Not satisfied with breastfeeding. Once started more satisfied".*

*"Nearly 6 months and her doctor suggested to start before 6 months"*

*"Nurse came at 5 months. Ready to eat."*

According to in-depth interview, we also found that mothers faced confusion about the recommended age to commence complementary food as shown in the following quotes:

*"I was a bit confused, because some of the things that I'd read, or I guess there were more materials from advertising had four months and some, the more formal reading materials, had six months. So I was a bit confused, when do you start".*

*"If I took advice from my mum and grandmother and everyone else, they all said babies go on solids at four months, because that's when we were all put on solids".*



*“Always looking at mum when she is eating. Saw infant food in supermarket for 4-6 month olds so tried it”.*

*“Six months – isn’t that from the government, the NSW Health Department or something like that”.*

## DISCUSSION

This study found that most first-time mothers understood the benefits of breastfeeding for both the baby and themselves with a high proportion (96%) of mothers initiating breastfeeding, however only 38% continued breastfeeding at 6 months postpartum due to numerous challenges faced by them.

Our findings are consistent with other studies showing that a range of social and emotional factors impact on mothers’ infant feeding practice in the postpartum period, particularly in the first 6 months. The study also provides insights into the barriers and facilitators in relation to healthy infant feeding practices and suggests that the first month following birth is critical to tackle practical issues including latching, pain, supply and initial support stated as key reasons for cessation.

This study found that many participating first-time mothers ceased breastfeeding during the first week postpartum due to common breastfeeding problems (such as pain and latching) and support in hospital. Hospital guidelines focusing on common breastfeeding problems (Taveras et al 2003) and the introduction of the Baby Friendly Hospital Initiative (BFHI) could play a role in the continuation and duration of breastfeeding, particularly in the first few days following birth. While hospitals in Australia are working towards BFHI accreditation, currently only 19% of hospitals in Australia who offer maternity services are accredited (BFHI website 2012), so further work in this area is needed.

It would be beneficial for Health Services to have breastfeeding policies that include antenatal education for women who have chosen to breastfeed. Education and support covering common breastfeeding issues like engorgement and painful nipples, the length of time these issues last and treatment may assist women tackling these challenges in the immediate postpartum period. Evidence shows specific lactation support in hospital for mothers choosing to breastfeed prolongs duration of breastfeeding (Gatti 2008; Bronuck et al 2005).

Participants had mixed experiences with clinicians in hospital; some found the care very supportive others had negative experiences. Follow-up studies with staff directly involved with mothers and newborn babies is needed to give further insight into addressing the reasons why mothers perceive they have a lack of support in hospital. While midwives have breastfeeding expertise, employed lactation consultants to assist breastfeeding mothers in the hospital setting would be useful.

Of all mothers who stopped breastfeeding, supply was cited as the most common reason for weaning, particularly in the first three months. In fact, only a very small number of mothers cannot produce enough milk for medical reasons. Although there is a 24 hour validated measure for breast milk supply, this is not commonly utilised (Schwartz et al 2002). Low supply is more often than not related to the mother’s opinion that infants are not receiving enough milk to meet their needs and other studies have supported this (Griffiths 2009; Hector et al 2005; Schwartz et al 2002). Lack of milk supply warrants further investigation. Supporting mothers to understand the lactation process, like how milk is produced and maintained, assisting with mechanical aspects of breastfeeding and ensuring mothers understand infant growth and development may assist in the issue of low supply.

The findings in this study were consistent with other studies suggesting the most common reason cited by mothers for stopping breastfeeding was that the baby was unsettled, a behaviour often interpreted by mothers



as indicating an insufficient milk supply. This perception of insufficient supply appears to be due to a lack of information or lack of confidence regarding the normal process of lactation (Wen et al 2009).

Recent studies (Li et al 2010) have also indicated breastfed infants may be better able to self-regulate their intake, meaning they will only feed until they feel full; this could also have implications for childhood obesity as breastfed babies will only eat what they need. Also educating new mothers on understanding these infant cues around feeding is important as each feed will be different depending on the baby's needs.

The introduction of complementary food to infants often presents a dilemma for new mothers today; they receive information and advice from a range of health professionals and also have easy access to a diverse range of information, advice and support platforms. Family and friends are also very influential when mothers are making decisions about introducing solids. With infant feeding guidelines changing over the last decade and continued discussion and debate about the introduction of complementary foods it can be a confusing time.

Those mothers who commenced solids early were greatly influenced by family and friends, having a baby who was unsettled and the amount of conflicting information on the introduction to solids. Educating and empowering mothers in understanding the reasons for the current introduction to complementary food recommendations may assist them when receiving advice from others. Education in the second to fourth months postpartum would be an ideal time to develop this, along with incorporating an intervention for mothers in understanding baby cues and techniques for dealing with babies that appear hungry or unsettled may alleviate the issue of early introduction of solids. Parents should also be educated in the different environmental factors that can relate to a baby being unsettled, which can subsequently affect growth and development. These can include changes in parental circumstances, returning to work, childcare arrangements and even the feelings associated with being a new parent.

Ensuring adequate infant feeding guidelines and training packages for health professionals that deal with new mothers is necessary. This should incorporate hospital and community staff, paediatricians, general practitioners and pharmacists. Advocating for appropriate labelling on infant food packaging is also an area where future work could take place.

However, this study had limitations. The generalisability is limited due to the locality of the study area since southwest Sydney is the most socially and economically disadvantaged area of metropolitan Sydney. The analysis did not take into account method of milk feeding and if this influenced the introduction of solids and did not take into account socio-demographic data or lifestyle behaviours such as smoking and exercise which may have given a different insight into groups who commence solids prior to 6 months. The questionnaire and in depth interviews only asked why mothers started solids early, it would be beneficial to find out the reasons mothers waited until six months, as this may have given insight into the development of further interventions to assist mothers when making decisions about introducing solids.

## CONCLUSION

This study found that a significant proportion of mothers did not meet the WHO recommended guidelines for infant feeding. It highlighted that the first week postpartum was the most critical time for first time mothers to establish and consolidate breastfeeding. The specific barriers regarding breastfeeding faced by first time mothers were milk supply and confusion about the recommended guidelines for exclusive breastfeeding and the introduction of complementary foods.

## RECOMMENDATION

By placing emphasis on supporting mothers with breastfeeding in the first weeks postpartum may result in a longer duration of breastfeeding. Education around the timely introduction of solids for both mothers

and health professionals would also be beneficial in ensuring consistency and adherence to guides. Further studies on the link between obesity and introduction of solids should be explored. Translating the results of this study into policy and practice will be a challenge and further studies about this are needed.

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