Increasing breastfeeding rates up to six months among primiparous women: a quasi-experimental study of the effectiveness of the Milky Way Program

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Publication details
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Increasing Breastfeeding Rates Up to Six Months among Primiparous Women: A Quasi-Experimental Study of the Effectiveness of The Milky Way Program

by

Shahla Meedya

Submitted in the fulfilment of the requirements for the award of the degree

Doctor of Philosophy (Midwifery)

May 2015

School of Nursing and Midwifery
Faculty of Health and Human Sciences
Southern Cross University, NSW, Australia
Thesis Declaration

I certify that the work presented in this thesis is, to the best of my knowledge and belief, original, except as acknowledged in the text, and that the material has not been submitted, either in whole or in part, for a degree at this or any other university.

I acknowledge that I have read and understood the University's rules, requirements, procedures and policy relating to my higher degree research award and to my thesis.

I certify that I have complied with the rules, requirements, procedures and policy of the University.

Print Name: SHAHLA MEEDYA

Signature: 

Date: 29 May 2015
Abstract

Title: Increasing breastfeeding rates up to six months among primiparous women: A quasi-experimental study of the effectiveness of The Milky Way Program

Problem: The World Health Organisation recommends exclusive breastfeeding until six months postpartum for the health of all women and babies; however, after initiating breastfeeding many women do not continue any type of breastfeeding until six months postpartum. In Australia, the rate of any type of breastfeeding at six months is only 50 percent. In Sydney South West Area Health Service, where the current study was conducted, the rate of any breastfeeding was only 28.6 percent. There is no good-quality evidence that a single breastfeeding-education session is effective in prolonging breastfeeding. However, design and implementation of a multi-phased intervention with a woman-centred theoretical framework expanding from the antenatal to the postnatal period is a recommended way to prolong breastfeeding.

Research question: Is The Milky Way Program effective in increasing rates of breastfeeding to six months among Australian primiparous women?


Setting: A large tertiary, metropolitan hospital in Sydney, Australia.

Participants: Eligible participants were nulliparous women aged 19 years and above who planned to breastfeed and had basic English literacy.

Intervention: The intervention group was offered The Milky Way Program, which I conducted. I am a midwife, lactation consultant and parent educator. The program was based on the theories of Self-efficacy and Birth Territory and Midwifery Guardianship.
The program focused on changing these modifiable factors: women’s breastfeeding intention, support and self-efficacy. The program included three antenatal breastfeeding sessions, including take-home activities to share with family and friends. The antenatal educational sessions involved strategies to enhance self-efficacy. Additionally, I telephoned the women at 10 days after birth for postnatal follow-up consultation and, if they were still breastfeeding, at three months postpartum. The Milky Way Program was facilitated by a woman-centred approach, where women were actively involved in trusting themselves and creating their own ‘breastfeeding territory’ with their supportive network. The standard-care group were offered optional hospital-based antenatal breastfeeding classes and the support of a lactation consultant on the postnatal ward.

**Research Methods:** Participants were allocated to standard-care group (n = 215) or the intervention group (n = 205). Antenatal data were collected on recruitment day and postnatal data were collected via telephone interviews at one, four and six month postpartum on all participants. The primary outcome was the rate of breastfeeding at six months postpartum. Analysis was on an intention-to-treat basis. Descriptive and inferential statistics, including the chi-square test, Fisher’s exact test, logistic regression, and t-test and Mann-Whitney U test, were used to analyse the data.

**Key Finding:** The Milky Way group was successful in achieving higher rates of breastfeeding at six months compared with the standard-care group: 54.7 percent vs. 31.4 percent, \( p < .001 \). The Milky Way group also had higher rates of breastfeeding at one and four months. Assignment to The Milky Way Program was associated with increased breastfeeding likelihood even when accounting for well-known confounders: age, education, smoking and breastfeeding intention. The women in The Milky Way
group had three times more chance of breastfeeding at six months compared to the other group when the confounding variables were considered in data analysis.

**Conclusion:** The Milky Way Program was effective in prolonging breastfeeding up to six months. It is a feasible intervention that can be delivered by midwives and other health professionals as part of standard maternity care. This study recommends that breastfeeding education and support interventions like The Milky Way Program be offered to all women who want to breastfeed for the first time. This study suggests that health-service managers, who are committed to increasing breastfeeding rates, could focus more on supporting women’s breastfeeding territory by providing woman-centred programs that include strategies to enhance self-efficacy.
Dedication

I dedicate this dissertation to my husband Reza and our two beautiful daughters, Ida and Eileen, who kindly supported me by being patient and enduring the many school holidays, evenings and weekends where this study was given priority. They allowed me to take their time and spend it on women's and children's health. I also dedicate this dissertation to my father, who inspired me to go through this adventure, and to my mother, who was my Year One teacher. She taught me how to read and write and how to be patient in my life.
Acknowledgements

The 420 participants in this study each gave their time and shared their thoughts and experiences. I am deeply grateful for the major part they had in this study.

Thanks to Professor Kathleen Fahy, whose guidance and supervision through the study has been exceptional. Kathleen has challenged me to look in different directions, and given constructive criticism, ongoing support and praise. Under her support I have developed my skills in research and critical thinking, and I have also become a different person. Her editing skills were of invaluable help: barely a few days went past between a chapter being sent to her and having it promptly returned. Her magic wand provided me with wonderful and important comments and ideas. This made the writing of this thesis truly a joy. She will never know how grateful I am to her, not only for improving the quality of this thesis but also for making the whole experience an exciting adventure.

I also wish to acknowledge the input from my co-supervisors: Dr Jenny Parratt, who gave significant feedback in the final year of the project, Dr Jacqueline Yoxall, who assisted me with the results chapter, and Dr Margaret Rolf, who gave me statistical advice.

I would like to thank the women who participated in the study; without their participation we could never have added knowledge that improves care for other breastfeeding women. Many thanks go to Kylie Mortimer, nurse unit manager, and to the midwives and clerical staff in the Women and Children Health Outpatient Clinic at Liverpool hospital for their great support in the recruitment process.
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## Abbreviations

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<tbody>
<tr>
<td>ABA</td>
<td>Australian Breastfeeding Association</td>
</tr>
<tr>
<td>ACT</td>
<td>Australian Capital Territory</td>
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<tr>
<td>Adj OR</td>
<td>Adjusted Odd Ratio</td>
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<tr>
<td>BSES</td>
<td>Breastfeeding Self-efficacy Scale</td>
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<tr>
<td>BSES-SF</td>
<td>Breastfeeding Self-efficacy Scale – Short Form</td>
</tr>
<tr>
<td>CALD</td>
<td>Culturally and Linguistically Diverse</td>
</tr>
<tr>
<td>CD</td>
<td>Compact Disc</td>
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<tr>
<td>CI</td>
<td>Confidence Interval</td>
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<tr>
<td>DVD</td>
<td>Digital Versatile Disc</td>
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<tr>
<td>ECHC</td>
<td>Early Childhood Health Centre</td>
</tr>
<tr>
<td>IBCLC</td>
<td>International Board Certified Lactation Consultant</td>
</tr>
<tr>
<td>LHD</td>
<td>Local Health District</td>
</tr>
<tr>
<td>NHMRC</td>
<td>National Health and Medical Research Council</td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
</tr>
<tr>
<td>NT</td>
<td>Northern Territory</td>
</tr>
<tr>
<td>Qld</td>
<td>Queensland</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomised Controlled Trial</td>
</tr>
<tr>
<td>RR</td>
<td>Risk Ratio</td>
</tr>
<tr>
<td>RD</td>
<td>Risk Difference</td>
</tr>
<tr>
<td>SA</td>
<td>South Australia</td>
</tr>
<tr>
<td>SWSLHD</td>
<td>South Western Sydney Local Health District</td>
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<td>Tas</td>
<td>Tasmania</td>
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<td>Abbreviations</td>
<td>Description</td>
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<td>--------------------------------------------------</td>
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<tr>
<td>UNICEF</td>
<td>United Nations International Children's Emergency Fund</td>
</tr>
<tr>
<td>Vic</td>
<td>Victoria</td>
</tr>
<tr>
<td>WA</td>
<td>Western Australia</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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Award Received During the Research

An Australian Postgraduate Award

Publications Arising from This Research

Refereed Journals


Non Refereed Journal

- Meedya, S. (2014). The Milky Way Program is an innovative intervention to increase the rate of breastfeeding until six months postpartum. *Australian Nursing and Midwifery Journal, 21*(8), 40-41.
Conference Presentations

- Meedya, S. & Fahy, K. (2014). *An innovative, inexpensive program that was effective in prolonging breastfeeding to six months: Theory and Evidence Based Intervention*. Paper will be presented at the 5th International conference on Nutrition and Nurture in Infancy and Childhood: Relational, Bio-cultural and Spatial Perspectives. Western Sydney University, Sydney, Australia (abstract accepted as oral presentation in November 2014).


• Meedya, S. (2012). *Birth Territory and Results of a six-year project*. Paper presented at the International Medical Science Congress, Azad University of Tabriz, Tabriz, Iran (invited speaker).

• Meedya, S. (2012). *An innovative intervention and the results of six year project*. Paper presented at the Midwifery seminar, South Eastern Sydney Local Health District, St George Hospital, Sydney, NSW, Australia (invited speaker).


seminar, South Eastern Sydney Local Health District, St George Hospital, Sydney, NSW, Australia (invited speaker).
Chapter One: Introduction and Background

Introduction

This dissertation reports upon an intervention study that has aimed to increase breastfeeding rates up to six months postpartum. The study seeks to add to emerging evidence that can help health professionals provide woman-centred breastfeeding education and support. The intervention that was implemented in this study is called The Milky Way Program. The study used this research question: is The Milky Way Program effective in increasing rates of breastfeeding to six months among Australian primiparous women?

This chapter introduces the dissertation with key terms (Table 1) and provides the background for the study. There are four main sections. The first section outlines the significance of the study, the benefits of breastfeeding, the problem in terms of early breastfeeding cessation and my personal background and interest in the study. The second section describes the Local Health District where the study was conducted in terms of its location and infrastructure and the characteristics of the population. The third section presents the research question and the aim of the study. The last section provides an overview of the whole dissertation. Key terms are defined in each chapter and added to the Glossary in Appendix 1. The construct of The Milky Way Program is defined in Chapter Four: Methodology.

Significance of the Study

Breastfeeding is associated with reduced morbidity and mortality among infants and young children across the world (Australian Health Ministers’ Conference, 2009; World Health
Organization, 2003). Due to the health benefits of breastfeeding, exclusive breastfeeding for six months and continuation of breastfeeding with complementary food until two years of age has been recommended by the World Health Organisation (WHO) (World Health Organization, 2003, 2007). In many developed countries, supporting and promoting breastfeeding have been prioritised as health initiatives. For instance, the Centers for Disease Control and Prevention in the United States sets a goal of a rate of 60 percent of any breastfeeding at six months postpartum as one of the Healthy People 2020 objectives (National Center for Chronic Disease Prevention and Health Promotion, 2013). In Australia, supporting and promoting breastfeeding is an important national health reform (Australian Health Ministers’ Conference, 2009). A target of 80 percent fully breastfeeding at six months has been recommended as an achievable goal by the Australian National Health and Medical Research Council (NHMRC, 2003).

Despite its clear benefits, the rates of breastfeeding still continue to remain below the recommended levels (Callen & Pinelli, 2004). Low breastfeeding rates at six months have been reported globally, especially in Western countries (Callen & Pinelli, 2004; Garbarino et al., 2013; Li, Darling, Maurice, Baker, & Grummer-Strawn, 2005; National Center for Chronic Disease Prevention and Health Promotion, 2013). In Australia, there is a high breastfeeding initiation rate (90%), but only slightly more than half of these women continue breastfeeding until six months (Australian Institute of Health and Welfare, 2011; Hector, Webb, & Lymer, 2004; New South Wales Department of Health, 2006). A large longitudinal national survey in 2006-2007 demonstrated a decline in breastfeeding rates with each month post birth (Australian Institute of Family Studies, 2008). This survey reported that following the breastfeeding initiation rate of 92 percent, the rates of any type of breastfeeding were 83 percent at one month, 73 percent at three months, 63 percent at four months, 56 percent at six months, 30 percent at 12 months and 5 percent at 24 months.
Based on the current and extensive national data, breastfeeding rates in Australia have remained fairly static over the last 10 years, improving only slightly (Australian Health Ministers’ Conference, 2009). Of concern are recent findings that breastfeeding rates can differ considerably between different Local Health Districts in each Australian state and territory. For example, in the state of New South Wales (NSW) in 2001, breastfeeding rates at six months varied between 59 and 26.7 percent in different Local Health Districts. In Sydney South West Area Health Service (2001) (the study setting), the rate of breastfeeding was 28.6 percent at six months; this was the second lowest rate of any Health District in NSW (Hector, Webb, et al., 2004). The current trends of breastfeeding rates demonstrate the existing gap between the current practice and the national breastfeeding target.

The gap between the recommended national breastfeeding target and current rates indicates that standard maternity-care practices need to apply new strategies to increase breastfeeding rates effectively. The Baby Friendly Health Initiative (BFHI), which was established by WHO and the United Nations International Children's Emergency Fund (UNICEF), is known to be one of the multidisciplinary interventions that has demonstrated effectiveness in increasing breastfeeding initiation and duration. The BFHI includes the Ten Steps to Successful Breastfeeding, which takes a whole-of-organisation approach to promoting, supporting and prolonging breastfeeding (United Nations International Children's Emergency Fund [UNICEF]Australia, 2014) (Appendix 1). However, currently in Australia, there are only 66 hospitals across the whole country that are accredited to conduct the BFHI program, covering just under 80,000 births per year (30 percent of total births) (UNICEF Australia, 2014). In the absence of BFHI being enacted widely, what can maternity-care providers in hospital or community settings do to support women in prolonging breastfeeding to six months? This dissertation sets out a new professional
strategy that can be used in non-BFHI organisations to support women in breastfeeding up to six months.

**Benefits of Breastfeeding**

Long-term breastfeeding has health benefits for both mothers and babies that carry on to childhood (National Health and Medical Research Council, 2013). The incidence of several health problems, including gastrointestinal disease, upper and lower respiratory infection and otitis media, have been reported to be significantly reduced among children who were only breastfed for six months, even in developed counties (Allen & Hector, 2005). The cost of those illnesses in NSW is estimated to be $20-40 million a year (Hector, Webb et al., 2004). Being breastfed also reduces the risk of obesity (Spatz, 2014) and chronic illnesses like diabetes later in life (Allen & Hector, 2005; Pereira, Alfenas, & Araújo, 2014).

Women also enjoy benefits from breastfeeding. Evidence suggests that long-term breastfeeding reduces the risk of depression, pre-menopausal breast cancer, ovarian cancer, osteoporosis (Allen & Hector, 2005; International Lactation Consultant Association, 2012; National Health and Medical Research Council, 2013) and hypertension for women (Lupton, Chiu, Lujic, Hennessy, & Lind, 2013). There is a strong relationship between breastfeeding and positive maternal-infant bonding (Allen & Hector, 2005; National Health and Medical Research Council, 2013). According to Smith and Ingham (2005), the net economic benefit of breastfeeding in Australia has been estimated to be a minimum of $2.2 billion each year. Although the health benefits of long-term breastfeeding are well recognised, continued poor breastfeeding practice among women highlights the importance of developing new strategies and interventions to promote breastfeeding until six months and beyond.
Background to Early Breastfeeding Cessation

Health professionals, including midwives, lactation consultants, child and family health nurses and doctors, have put their efforts into supporting women to continue breastfeeding for longer, but not many of those efforts have been successful. Many women still stop breastfeeding early in the postpartum period (Australian Health Ministers’ Conference, 2009; Australian Institute of Health and Welfare, 2011; Callen & Pinelli, 2004; Garbarino et al., 2013; Li et al., 2005). Several studies in Australia have sought to identify why women wean their babies in the first few months. The most commons reasons reported by women for early breastfeeding cessation (less than six months) include: inadequate milk supply (56.3%), unsettled baby (24.2%), latching problems (25.2%), feeling pain during breastfeeding (18%), finding it hard to express milk (14%) and returning to work (8.7%) (Australian Institute of Health and Welfare, 2011). Other reasons mentioned by women for stopping breastfeeding include inconsistent advice, difficulties experienced with breastfeeding in public, maternal or infant medical problems, early introduction of infant formula or solids (Australian Health Ministers’ Conference, 2009), intention to breastfeed only in the short term (Blyth et al., 2004) and lack of support and confidence when confronting breastfeeding challenges (O’Campo, Faden, Gielen, & Wang, 1992). Many researchers suggest that these problems can be avoided by providing early education and continuous support (Hector, King, & Webb, 2005). The Australian National Health Strategy for 2010-2015 recommends antenatal breastfeeding education combined with support from pregnancy until the completion of the postpartum period (Australian Health Ministers’ Conference, 2009).

Although the government and health professionals place a high value on promoting breastfeeding through education and support, there is not enough evidence to determine how best to modify the factors that can influence women’s breastfeeding positively. The
evidence is also lacking theoretical frameworks in terms of woman-centred education and support, where women can connect to their inner power and feel supported to strengthen their embodied mother-infant bonding. In an Australian study by Fenwick, Burns, Sheehan, and Schmied (2013), the language and practices of midwives that facilitated nine antenatal group-based educational sessions were explored. They found that recent breastfeeding education and support has been more focused on the interventional strategies that convince women to breastfeed, and less focused on exploring women’s feelings and expectations of their mother-infant relationship. There is a need for further studies to identify modifiable contributing factors in women’s decision to sustain breastfeeding; such studies will ideally have a theoretical frame to aim at optimising women’s breastfeeding confidence to draw on their deep hidden capabilities as embodied selves. The Milky Way Program is one such approach. The Milky Way Program introduces a new scheme of woman-centred education and support that commences prenatally and continues postnatally. This intervention has focused on three major modifiable factors for prolonged breastfeeding: women’s breastfeeding intention, support and self-efficacy (Chapter Two). The Milky Way Program also has a strong theoretical framework, which is based on two theories: Birth Territory and Midwifery Guardianship and Self-efficacy. These theories are explained in Chapter Three.
Personal Story to the Study

I am an International Board Certified Lactation Consultant (IBCLC), an educator, a researcher, a midwife and a woman who breastfed each of her children for more than two years. As an IBCLC and parent educator, I was interested in new strategies to increase breastfeeding duration. As a researcher and midwife, I wanted to have a better understanding of women’s decisions regarding early breastfeeding cessation and their contributing factors. As a woman, I wanted to help other women to give the best gift, breast milk, to their children, but to be happy about themselves no matter what they decide.

I thought reflecting on my own journey in breastfeeding would help me address some of those issues. I questioned myself: what was the strongest power inside me that kept me breastfeeding for a long period of time? What challenges did I experience? How did I overcome them? What were the contributing factors in my success? How might I help other women in their breastfeeding decisions and practice?

I found my strong desire to breastfeed as the strongest power inside me. I had wanted to breastfeed since my own early childhood. I had a strong motivation. I was the sickest child and the only formula-fed baby in the family. My other two sisters were breastfed and healthy. I promised myself to breastfeed my children no matter what happens. When I became a midwife and breastfeeding counsellor I gained practical experience with regard to breastfeeding. I was privileged to listen and observe breastfeeding women, and I had a chance to talk to and share the stories among women. When it was my turn to breastfeed, I had very strong intention, knowledge and experience in breastfeeding. I felt confident and ready for challenges. I overcame many obstacles during breastfeeding. I convinced everybody in my social network to believe in breastfeeding and support my practice. I accepted much advice and many comments as long as they did not interfere with my
breastfeeding decision. I remember my mum, who spoon-fed my three-month-old daughter with expressed breast milk while I was at university. It was a challenge for her, but a great support for me. I believe my strong desire to breastfeed, high breastfeeding confidence and good support were the keys to my successful journey.

This study's literature review (Chapter Two) found that many studies have identified intention, self-efficacy and support as contributing factors in prolonged breastfeeding. Self-efficacy theory and the theories of Birth Territory and Midwifery Guardianship explain these conceptions in a philosophical way (Chapter Three). These theories give an understanding of the connections among those contributing factors in successful breastfeeding. However, there is no interventional study in breastfeeding with midwifery theoretical foundation. The Milky Way Program reported in this dissertation is based on evidence and a combination of midwifery and psychological theories. It both assists women to continue breastfeeding for the long term and enables them to feel good about themselves at the same time.

The Local Health District and Characteristics of the Population

The multicultural nature of the Australian populations is an important point to consider for the evaluation of this study. For this reason I will introduce the Australian Local Health District first. Then the characteristics of the population will be summarised.

In Australia, there are six states and two territories: New South Wales (NSW), Queensland (Qld), South Australia (SA), Tasmania (Tas), Victoria (Vic) and Western Australia (WA), Northern Territory (NT) and Australian Capital Territory (ACT) (Figure 1). Each state has its own state constitution and oversees a number of Local Hospital Networks. Local Hospital Networks directly manage single or small groups of public hospitals and related
community services and their budgets (Australian Institute of Health and Welfare, 2014; National Health Reform Agreement, 2012). Some states have their own local names for their administrative Local Hospital Networks. For example, in New South Wales they are called *Local Health Districts* (LHD) (Australian Institute of Health and Welfare, 2014). Prior to 2011, the Local Health Districts were divided differently, and they were called *Area Health Services*. For this reason, in this dissertation, I have referred to Area Health Services if the source of the data was published before 2011 (New South Wales Ministry of Health, 2014).

In NSW, there are eight LHDs in Sydney metropolitan regions (Figure 2) and seven rural and regional LHDs. South Western Sydney LHD covers seven metropolitan Local Government areas from Bankstown to Wingecarribee and has a population of

![Figure 1: Australia and its states and territories](Kingswood Distillery, 2014)
approximately 820,000 people. South Western Sydney LHD has one of the most rapidly growing populations in NSW. The District manages six acute public hospitals, including Liverpool Hospital, where this study was conducted (New South Wales Ministry of Health, 2014).

Figure 2: NSW Metropolitan Local Health Districts

(New South Wales Ministry of Health, 2014).

The population in South Western Sydney LHD is vibrant and culturally diverse. Almost a third of its population speaks a language other than English at home (South Western Sydney Local Health District, 2014). The main reason for the growth of exciting multicultural societies in Australia is the government's support for immigration. The
Australian Bureau of Statistics gives current estimates of one international migrant entering the country every 2 minutes and 9 seconds (Australian Bureau of Statistics, 2014). In the 2011 Census, the largest contributors to Australia's migrant population were the United Kingdom (1.1 million) and New Zealand (483,000 people). The other top contributors were China (319,000 people), India (295,000), Italy (185,000) and Vietnam (185,000) (Australian Bureau of Statistics, 2011). The trend of immigration is very similar to the data from 2001 Census. The largest overseas-born population in Australia is in Sydney. South Western Sydney region has more than 50 percent migrants (Australian Bureau of Statistics, 2011). The latest statistics from South Western Sydney LHD in NSW, where The Milky Way Program was conducted, indicate that between 2005 and 2009, more than 30 percent of women giving birth were born outside Australia, and 40 percent of women were from non-English-speaking countries (Centre for Epidemiology and Research, 2011). The South Western Sydney area has also been identified as one of the poorest communities in the state, characterised by high unemployment and a high proportion of families dependent on government welfare aids (Sydney South West Area Health Service, 2005). Chapter Four gives more details about the specific study site and the participants of this study.

**Research Question and Study Design**

Is The Milky Way Program effective in increasing rates of breastfeeding to six months among Australian primiparous women?

This study is a quasi-experimental design to compare the breastfeeding outcomes between standard hospital maternity care (standard-care group) and The Milky Way Program (intervention group).
Aim and Objectives

The aim of the study is to evaluate effectiveness of The Milky Way Program compared to the standard care in increasing rates of breastfeeding to six months postpartum. The independent variable is the type of care (The Milky Way Program compared to the standard care) and the dependent variable is the rate of breastfeeding.

The hypothesis is that participation in the Milky Way Program will be associated with higher breastfeeding rates at six months postpartum compared with the standard care group.

The primary outcome measure is breastfeeding rates at six months postpartum and the secondary outcome measures based on the study objectives include: a) breastfeeding rates at one and four months postpartum; (b) changes in women’s breastfeeding intention across time; (c) changes in women’s perceived breastfeeding social support across time; (d) changes in women’s breastfeeding confidence across time; (e) women’s breastfeeding self-efficacy score between the groups; (f) women’s type of breastfeeding at one, four and six months; and (g) women’s reasons for breastfeeding cessation.

The objectives of the study are to evaluate the effect of The Milky Way intervention on the following outcomes:

- breastfeeding rates at one and four months postpartum;
- women’s breastfeeding intention;
- women’s breastfeeding confidence (self-efficacy);
- women’s perceived breastfeeding support;
- types of breastfeeding; and
- reasons for breastfeeding cessation.
Table 1: Definition of key terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Breastfeeding</td>
<td>An infant-feeding method where the child receives some breast milk and can also receive any food or liquid including non-human milk (Webb et al., 2002, p. xi). Thus the term breastfeeding includes exclusive, predominant and complementary breastfeeding. For the purposes of this research a baby is defined as breastfeeding if she/he received any breast milk in the past 24 hours.</td>
</tr>
<tr>
<td>Exclusive breastfeeding</td>
<td>An infant-feeding method where an infant receives only breast milk from his/her mother, or a wet nurse, or expressed breast milk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines (Webb et al., 2002, p. xi).</td>
</tr>
<tr>
<td>Predominant breastfeeding</td>
<td>An infant-feeding method where the infant’s predominant source of nourishment is breast milk, but he or she may also receive water and water-based drinks (sweetened and flavoured water, teas, infusions and so on); fruit juice; oral rehydration solution; drop and syrup forms of vitamins, minerals and medicines; and ritual fluids (in limited quantities). All other food-based fluids are excluded – in particular, non-human milk (Webb et al., 2002, p. xii).</td>
</tr>
<tr>
<td>Complementary feeding</td>
<td>An infant-feeding method where the infant receives solid or semi-solid food in addition to breast milk, including expressed milk. This may include any food or liquid, including non-human milk and formula. (Australian Health Ministers’ Conference, 2009, p. 4).</td>
</tr>
<tr>
<td>Fully breastfeeding</td>
<td>An infant-feeding method where the infant receives breastmilk as the main source of nourishment. This includes infants who are either a) exclusively breastfed or b) predominantly breastfed. The fully breastfed rate is the combined rate of exclusively breastfed and predominantly breastfed (Webb et al., 2002, p. xii).</td>
</tr>
<tr>
<td>Weaned</td>
<td>The infant/child no longer receives any breast milk (Webb et al., 2002, p. xii).</td>
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<table>
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<tr>
<th>Term</th>
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<tr>
<td><strong>Primiparous</strong></td>
<td>A woman who has given birth only once at 20 or more weeks (Cunningham et al., 2010).</td>
</tr>
<tr>
<td><strong>Intention</strong></td>
<td>A plan that has been formulated to achieve a particular goal stated through certain instrumental actions (Gibbons, Gerrard, Outllette, &amp; Burzette, 2000, p. 139).</td>
</tr>
<tr>
<td></td>
<td>For the purpose of the current study, <em>breastfeeding intention</em> is defined as a women’s plan to breastfeed that is formed based on a woman’s inner desire to breastfeed or not.</td>
</tr>
<tr>
<td><strong>Social support</strong></td>
<td>A woman’s perception of supportive behaviours from others in her social network that she believes will ultimately be beneficial to her (McGrath, 2000, p. 496). Women experience support when they receive care, concern, respect, understanding, advice, encouragement and practical help (Williams, 2005).</td>
</tr>
<tr>
<td></td>
<td>For the purpose of this study, <em>breastfeeding support</em> is defined as a women’s perception of supportive behaviour from her social network. This definition is inclusive of professional, family and peer support.</td>
</tr>
<tr>
<td><strong>Self-efficacy</strong></td>
<td>People’s beliefs in their capabilities to organise and execute the course of actions required to produce given attainments (Bandura, 1997, p. 3). Self-efficacy also refers to a situation-specific form of self-confidence (Block, Taliaferro, Harris, &amp; Krause, 2010, p. 44).</td>
</tr>
<tr>
<td><strong>Breastfeeding self-efficacy</strong></td>
<td>A mother’s perceived ability to breastfeed her newborn (Dennis, 2006, p. 257). In this dissertation, I have used term <em>breastfeeding confidence</em> when I have referred to women’s self-confidence in their breastfeeding ability, and the term <em>breastfeeding self-efficacy</em> when I have stressed the guiding theory or using the breastfeeding self-efficacy scale (BSES) to measure women’s breastfeeding self-efficacy.</td>
</tr>
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Organisation of the Dissertation

The dissertation is organised into six chapters.

Chapter One is the introduction to the dissertation and presents the significance of the research, provides the background for the study and outlines the aim and research question.

Chapter Two reviews the literature with a particular focus on factors that influence breastfeeding duration and the contemporary interventions that have been used to support prolonged breastfeeding up to six months. The literature review has been published in Journal of ‘Women and Birth’.

Chapter Three provides a theoretical frame for The Milky Way Program. In this chapter the theories of Self-efficacy and Birth Territory and Midwifery Guardianship are explored in depth to strengthen the design of the intervention.

Chapter Four is the methods chapter and describes the design of the study; the enrolment and consent procedures; the outcome measures; and methods of data collection.

Chapter Five presents the results of the study including the baseline data, the primary outcome and the secondary outcomes. The findings of the study have been published in journal of ‘Midwifery’.

Chapter Six presents an overview of the research and returns to the study objectives, addressing each in turn. It also discusses the major findings and limitations of the research and implications for practice.
Summary

This chapter has demonstrated that there is a problem with low breastfeeding rates at six months postpartum that current standard care has not been effective in addressing. The broad context for the study was described both geographically and demographically. My personal passion and abilities to undertake this study were also given.

The next chapter explores influencing factors that could be modified during pregnancy, and potential interventions to prolong breastfeeding up to six months.
Chapter Two: Literature Review

Introduction

The previous chapter highlighted the importance of the promotion of and support for prolonged breastfeeding worldwide, including Australia, where the majority of women initiate breastfeeding but stop in the early postpartum period.

This chapter presents the literature that supports the design of The Milky Way Program, a midwifery-driven intervention aimed at prolonging breastfeeding up to six months. The literature review is in three parts. The first part introduces the search strategy. The second part outlines the factors that have been identified as influencing women to continue breastfeeding; specifically, socio-demographic, biophysical and psychosocial factors. The third part gives an overview of evidence for the effectiveness of interventions to promote long-term breastfeeding, with a specific report on the effectiveness of the intervention studies focusing on breastfeeding outcome at six months.

Search Strategy

The literature search was conducted in three stages. The first stage identified factors that can influence breastfeeding duration and are potentially modifiable by a midwife-driven intervention. The second stage determined any interventions that increase duration of breastfeeding based on the identified modifiable factors. The last stage identified any current and effective interventions that increase breastfeeding rates at six months.

An initial online search was conducted in the Medline, CINHAL, Maternity and Infant Care and Cochrane Databases of Systematic Reviews. The search strategy included the following key concepts based on the research question: breastfeeding, duration, factors
and interventions. Search terms and key words were identified using the search fields of abstract, MeSH subject headings and exploded subject heading. Truncation, wildcards and phrases were used based on each database; e.g., ‘Breastfeeding’, Breast Feeding, Breastfeeding, BF. Studies were limited to those in English, published since 1990 and focusing on human, medicine, nursing and social science. Boolean operators (AND, OR, NOT) and other connectors were used to combine the search terms. Additional studies were located from reference lists of some systematic reviews and on-line publications of the New South Wales Health Department, Australia. After completion of these steps, the search was run in the relevant database. At every step of the search, the retrieved records were investigated for relevance. The search was completed when there were no new retrieved records. Appendix 2 contains details of the search strategy. Over 7000 potentially relevant articles were found. I decided to limit the results according to the guiding question and the aim of the review. Thus, to examine for effectiveness of educational interventions, only papers that reported systematic reviews, randomised controlled trials and cohort studies were included. For the identification of the factors that influence success with breastfeeding we also included qualitative and descriptive studies.

A further online search was conducted in October 2013 to update the available literature. The same search strategy was used in the Medline, CINAHL, Maternity and Infant Care, Scopus and Cochrane Databases of Systematic Reviews to identify any current successful intervention in increasing breastfeeding rates at six months or beyond. At this stage, systematic reviews, randomised controlled trials (RCT) and high-quality non-randomised controlled trials from developed or nearly developed countries, if relevant to the aim of the study were included. After removing duplicate results, 31 papers were reviewed.
Factors Influencing Breastfeeding Duration

Breastfeeding is a complex practice that is performed within the social environment in which a woman lives (Sheehan, 1998; Sheehan, Schmied, & Barclay, 2010). Different factors influence the outcomes depending on an individual’s personal history and current circumstances (Forster, McLachlan, & Lumley 2006). The factors affecting breastfeeding are summarised in three categories: socio-demographic, biophysical and psychosocial.

Socio-demographic factors

There are some socio-demographic factors affecting breastfeeding practice, including age, marital status, smoking, education and income level (Baxter, Cooklin, & Smith, 2009; McLeod, Pullon, & Cookson, 2002). Consistent evidence from literature reviews indicates that older age (Chertok, Luo, Culp, & Mullett, 2011; New South Wales Department of Health, 2006; Scott, Landers, Hughes, & Binns, 2001), not smoking (Bertini, Perugi, Pezzati, Tronchin, & Rubaltelli, 2003; Chaves, Lamounier, & Cesar, 2007; Chertok, et al., 2011; Donath, Amir, & Team, 2004), being married (Lande et al., 2003; Taveras et al., 2003), being educated (Cernadas, Greciela, Barrera, Martinez, & Garsd, 2003; Scott et al., 2001) and higher income (McLeod et al., 2002; Scott et al., 2001) are each associated with longer breastfeeding duration. Although many of these factors are not amendable to change for individual women, there may be some related factors that are modifiable; this is discussed further below.

Biophysical factors

Biophysical factors, including negative intrapartum experiences (Dennis, 2002a; Scott et al., 2001), difficulties related to breastfeeding (Cernadas et al., 2003; DiGirolamo, Thompson, Martorell, Fein, & Grummer-Strawn, 2005; Scott et al., 2001) and insufficient milk supply (Bolling, Grant, Hamlyn, & Thornton, 2007; Cooke, Sheehan, & Schmied,
2003; Dennis, 2002a; Hector, King, Webb, & Heywood, 2005; Noel-Weiss, Rupp, Cragg, Bassett, & Woodend, 2006), have been cited in research literature as reasons for early weaning.

Evidence indicates that women’s birth experience may influence her breastfeeding behaviour. For instance, some researchers have found a negative association between caesarean delivery and breastfeeding initiation (Scott et al., 2001). However, many studies have shown that once breastfeeding has been established, birth experiences do not affect breastfeeding duration in the long term (Agboado, Michel, Jackson, & Verma, 2010; Cernadas et al., 2003; Dennis, 2002a; Scott et al., 2001). The experience of skin-to-skin contact after birth has been highlighted as a positive factor in short-term and long-term breastfeeding duration (Augustin, Donovan, Lozano, Massucci, & Wohlgemuth, 2014).

Similarly, breastfeeding difficulties, including nipple pain, have been shown to affect short-term breastfeeding duration but not long-term duration (DiGirolamo et al., 2005; Hector, King, Webb, et al., 2005). DiGirolamo, Thompson, Martorell, Fein, and Grummer-Strawn (2005) proposed that women who experience problems develop greater self-efficacy. Also, some authors indicate that women who are positive thinkers and problem-solvers perceive breastfeeding problems as “normal”, whereas women who are self-doubting, anxious and rigid in their breastfeeding practice are more likely to focus on negative aspects of breastfeeding (Dennis, 2002a).

Finally, insufficient milk supply is one of the most common reasons women give for breastfeeding cessation (Australian Health Ministers’ Conference, 2009; Australian Institute of Family Studies, 2008; J. Cunningham, Jackson, & Oickle, 2009; Garbarino et al., 2013; Kirkland & Fein, 2003). Only about 5 percent of women have physiological
insufficient milk supply (Hector, King, Webb, et al., 2005). Therefore insufficient milk supply is more perceived than physiological; there must be underpinning factors that undermine breastfeeding outcomes. For instance, maternal breastfeeding confidence has been reported to be associated with perceptions of insufficient milk supply (Blyth et al., 2002; Blyth et al., 2004; McCarter-Spaulding & Kearney, 2001). In a cross-sectional descriptive study of 60 women, McCarter, Spaulding and Kearney (2001) found a significant correlation ($r = .487, p < .01$) between perceived insufficient milk supply and low maternal breastfeeding confidence at 11 weeks postpartum. They explained that a mother’s lack of confidence in her physical ability to breastfeed and to deal with breastfeeding challenges may lead her to perceive that she has insufficient milk supply; which in turn may prompt supplementation of breast milk with formula (McCarter-Spaulding & Kearney, 2001).

**Psychosocial factors**

There are many psychosocial factors influencing breastfeeding practice; these are often modifiable and amenable to antenatal interventions. For instance, degree of intention to breastfeed, level of support from partner and family of origin and maternal breastfeeding confidence could possibly be strengthened by antenatal interventions (Blyth et al., 2004). For the purpose of this study, more attention has been given to breastfeeding intention, social support and breastfeeding confidence.

**Breastfeeding intention**

Breastfeeding intention is one of the significant predictors of breastfeeding initiation and duration, and has been the subject of many studies (Blyth et al., 2004; DiGirolamo et al., 2005; Forster et al., 2006; Kim, Hoetmer, & Vandenberg, 2013; Ryser, 2004; Swanson & Power, 2005). Ajzen and Fishbein (1980) believed that the most important determinant of
one’s behaviour is one’s behavioural intention (DiGirolamo et al., 2005). It has been reported that approximately 50 to 90 percent of pregnant mothers decide how they will feed their child either before becoming pregnant, or very early in their pregnancy (Bailey & Sherriff, 1992). In a longitudinal study of 300 Australian women, Blyth et al. (2004) found that mothers who intended to breastfeed for more than 12 months were 2.4 times as likely to continue breastfeeding until four months compared to those who intended to breastfeed for less than six months (87.5% vs. 35.7%, \( \chi^2 = 33.67 \quad p < .001 \)). Similarly, in a randomised controlled trial of 889 Australian women, Forster, McLachlan, and Lumley (2006) found a significant relationship between intended and actual duration of breastfeeding among all groups of women with different socio-demographic characteristics. In their study, having no intention to breastfeed for six months or more was negatively associated with feeding any breast milk at six months, (Adj \( OR_{47} \; 95\% CI [.30, .62] \)) (Forster et al., 2006). Although Foster et al. (2006) reported that breastfeeding intention changes over time; they did not identify any factors that could affect women’s intention to breastfeed.

Breastfeeding intention could be affected by women’s breastfeeding attitude and social influences (DiGirolamo et al., 2005; Scott et al., 2001; Scott, Shaker, & Reid, 2004; Swanson & Power, 2005). For instance, in a longitudinal study involving 1,665 women in the United States, DiGirolamo et al. (2005) found a significant correlation between breastfeeding intention (the length of time the woman intended to breastfeed) and breastfeeding attitude at home (\( r = .23, \quad p < .01 \)). In their study, women who intended to breastfeed antenatally sustained breastfeeding for more than 20 weeks if they had a positive attitude towards breastfeeding at home, whereas women who had a negative attitude terminated their breastfeeding practice earlier, when initial breastfeeding problems were experienced.
It is important to recognise that maternal breastfeeding attitude may be affected by social influences. In a longitudinal study of 108 expectant couples in the United Kingdom, Scott, Shaker and Reid (2004) reported that a woman’s infant-feeding attitude was significantly correlated with her partner’s attitude ($r = .67, p < .001$). Swanson and Power (2005) reported that women who chose to breastfeed their infant felt more social pressure to breastfeed than women who chose to bottle-feed. This finding suggests that interventions aiming to increase women’s intention to prolong breastfeeding should involve women with their own social networks.

**Social support**

The positive influence of support for breastfeeding initiation and duration has been reported in many systematic reviews and reports (Britton, McCormick, Renfrew, Wade, & King, 2007; Falceto, Giugliani, & Fernandes, 2004; Hector, King, & Webb, 2004; Hoddinott, Chalmers, & Pill, 2006; Sikorski, Renfrew, Pindoria, & Wade, 2003; Sikroski, Ronfrew, Pindoria, & Wed, 2002; Win, Binns, Zhao, Scotte, & Oddy, 2006).

A great deal of evidence supports the view that women’s infant-feeding attitudes and practices are influenced by specific persons in the woman’s social network, including the baby’s father, the maternal grandmother, close friends and health-care professionals (Chen, Johnson, & Rosenthal, 2012; Scott et al., 2001; Scott et al., 2004; Swanson & Power, 2005). Secondary data analysis of a cohort study with 2,586 American women demonstrated that social support and education from family and friends were positively associated with longer breastfeeding duration (Chen et al., 2012). In a longitudinal study of 203 mothers in the United Kingdom, women who continued breastfeeding until six weeks postpartum rated their partner, their own mother and midwives as having more pro-breastfeeding views than women who discontinued breastfeeding at six weeks (Swanson &
Power, 2005). Other studies also report the support of the infant’s father and the encouragement of society as playing an important role in the success of breastfeeding (De Montigny & Lacharite, 2004; Hector, King, et al., 2004; Wolfberg et al., 2004). The father’s involvement enhances the wellbeing of the mother and the child, considering that ‘professional help cannot replace the day to day support that mothers and fathers provide for each other’ (De Montigny & Lacharite, 2004, p. 337). De Montigny and Lacharite (2004) found in their qualitative study that the most positive experience for fathers was to know their infants and take care of them. However, for some fathers in this study, the mother’s breastfeeding was difficult when they did not know how to help when it was needed. According to de Montigny and Lacharite (2004), it was important for fathers to share needs and worries, be supported and take decisions as a couple or partner. This sharing and support could take the form of interventions aiming to involve fathers or family members in a woman’s education, and supporting and encouraging them to adopt an attitude of discovery towards modes of support along with understanding each other (De Montigny & Lacharite, 2004).

**Breastfeeding confidence**

Maternal breastfeeding confidence is a significant influencing factor on prolonged breastfeeding outcomes. It has been reported that low maternal breastfeeding confidence is associated with early cessation of breastfeeding (Blyth et al., 2002; Blyth et al., 2004; Dennis, 2003; Dunn, Davies, McCleary, Edwards, & Gaboury, 2006; Ertem, Votto, & Levnthal, 2001; Forster et al., 2006; Loke & Chan, 2013; McCarter-Spaulding & Kearney, 2001; O'Campo et al., 1992; Papinczak & Turner, 2000). In a descriptive study of 198 pregnant women, O'Campo, Faden, Gielen, and Wang (1992) found that women with low confidence in their ability to breastfeed had 3.1 times the risk of discontinuing breastfeeding before six months postpartum compared to women with high confidence.
(95% CI= 1.39-6.76) (O’Campo et al., 1992). In 1999, Dennis and Faux developed the breastfeeding self-efficacy scale (BSES) to measure maternal breastfeeding confidence (breastfeeding self-efficacy). In their study, maternal breastfeeding confidence was significantly related to breastfeeding at six weeks postpartum ($F = 9.89, p < .001$).

Similarly, Forster et al. (2006) found a statistically significant relationship between high breastfeeding self-efficacy scores and duration of breastfeeding at four months ($\chi^2 = 14.89, p < .001$). In a phenomenological study, deterioration in breastfeeding confidence during the postnatal period was a major factor in the decision to stop breastfeeding (Dykes & Williams, 1999).

Some evidence supports that women’s breastfeeding confidence is influenced by exposure to breastfeeding, support, past breastfeeding experiences and their own physical/mental status (Blyth et al., 2002; Dennis, 1999). Based on Hector, Kind, and Webb’s (2004) report, lack of practical skills and exposure to breastfeeding have been identified as a failure factor for successful breastfeeding among low-income women. The positive influence of support on breastfeeding confidence has been also reported in many studies (Blyth et al., 2004; Britton et al., 2007; Chatman et al., 2004; Hector, King, et al., 2004; Hoddinott, Lee, & Pill, 2006; Martens, 2002; Sharps, El-Mohandes, & El-Khorazaty, 2003; Sikorski, Boyd, Dezateux, Wade, & Rowe, 2001; Win et al., 2006; Wolfberg et al., 2004). Past breastfeeding experiences were the subject of a descriptive study of 300 women in Brisbane by Blyth et al. (2002). They found significant differences in breastfeeding self-efficacy scores at the first week and four months postpartum between women with no breastfeeding experiences and women with previous breastfeeding experiences, $t(298) = 2.59, p = .01$ and $t(227) = 2.51, p = .01$ respectively.
This evidence emphasises the importance of maternal breastfeeding confidence in continuation of breastfeeding. A conceptual framework provides the basis to promote and guide effective interventions. For the purpose of this study, Self-efficacy theory, extracted from Bandura’s social cognitive theory, has been considered as a conceptual framework; it is described in Chapter Three. I chose Self-efficacy theory because the theory supports maternal breastfeeding confidence and perceived problem-solving competence. Health-care professionals may modify a mother’s breastfeeding practice by designing interventions that respect women’s breastfeeding self-efficacy. It is important to note that in much of the breastfeeding literature the terms of self-efficacy and confidence have been used interchangeably to refer to a woman’s confidence in her ability to breastfeed. According to Block, Taliaferro, Harris, and Krause (2010), self-efficacy is a situation-specific form of self-confidence. Therefore, in this dissertation, I have used the term breastfeeding confidence when I have referred to women’s self-confidence in their breastfeeding ability, and I have used term self-efficacy when I have stressed the guiding theory of Self-efficacy, or when I have used a validated tool to measure women’s breastfeeding self-efficacy.

**Effectiveness of Interventions to Promote Prolonged Breastfeeding**

Literature regarding effective interventions associated with prolonged breastfeeding at six months or beyond is not widely examined in systematic reviews. However, the body of the evidence from available literature in terms of breastfeeding duration provides a basis for further interventions to increase breastfeeding rates up to six months. The interventions that aimed to increase breastfeeding duration are mainly in three categories: (a) system-level interventions such as Baby Friendly Health initiatives and training of health professionals; (b) professionally driven interventions such as breastfeeding education and support by midwives, lactation consultants, nurses, physicians or other health
professionals; and (c) lay support interventions such as peer support or counselling (Chung, Raman, Trikalinos, Lau, & Ip, 2008). Based on the reasons outlined in Chapter One, system-level interventions have not been discussed here. Therefore, I have initially examined professionally driven interventions that aimed to increase breastfeeding duration. Next, I have analysed the effectiveness of the professional interventions that specifically aimed to increase breastfeeding rates at six months. In the sections below, I have highlighted the interventions that aimed to amend the identified modifiable factors, including women’s breastfeeding intention, support and confidence. I have included the evidence for the effectiveness of lay, partner and family support in addition to professional support to expand the broad spectrum of social support for women.

**Effectiveness of interventions on breastfeeding duration**

The evidence of effectiveness of professional interventions on duration of breastfeeding is outlined below under headings of education, support and multifaceted interventions.

**Education**

Breastfeeding education has been recommended by many studies to support and promote breastfeeding practices (Ford & Miller, 2010; Hector, King, & Webb, 2005; Hector, King, Webb, et al., 2005; Lumbiganan et al., 2012; Mattar et al., 2007; Parliament of the Commonwealth Australia, 2007; Rupp et al., 2006; Ryser, 2004; Scott, et al., 2001; Sikorski, et al., 2003;; Wolfberg, et al., 2004). However, such breastfeeding educational interventions are not well defined in the literature, and it is sometimes hard to distinguish the type of support that women may receive during ongoing professional educational interventions. However, the literature suggests that the effectiveness of educational interventions on breastfeeding duration can be examined based on their timing, contents and strategies.
Timing

As discussed earlier in this chapter, women’s antenatal intention to breastfeed is a strong predictor for prolonged breastfeeding (DiGirolamo et al., 2005); therefore, breastfeeding education during pregnancy could be an important factor in increasing breastfeeding duration. Ford and Miller (2010) reported that seeking antenatal professional education was associated with a longer breastfeeding outcome. However, educational interventions aiming to increase breastfeeding intention and duration are not well published. Some authors believe that antenatal breastfeeding education improves women’s breastfeeding intention and attitude (Ryser, 2004). Others recommend postnatal motivational interviews to improve breastfeeding intention and duration (Racine, Frick, Carpenter, & Pugh, 2009; Wilhelm, Stepans, Hertzog, Rodehorst, & Gardner, 2006).

In general, there are a number of studies that focus on antenatal educational interventions, with mixed results. Lumbiganon et al. (2012) reviewed 16 randomised controlled trials in their Cochrane review to evaluate the effectiveness of antenatal-only breastfeeding education for increasing breastfeeding initiation and duration. They reported that antenatal education, including counselling or formal breastfeeding education, may increase duration of breastfeeding, but there was no evidence of any specific antenatal education program that was successful in increasing breastfeeding to six months (Lumbiganon et al., 2012). The individual randomised controlled trials with antenatal-only breastfeeding educational components (Forster et al., 2004; Kronborg, Mainburg, & Vaeth, 2012; Lavender et al., 2005) were not effective in increasing prolonged breastfeeding. Ineffectiveness of the antenatal education can be explained due to lack of women centred antenatal education (Fenwick et al., 2013); late pregnancy scheduled breastfeeding classes and interrupted support during postnatal period (Svensson, Barclay, and Cooke, 2007). This demonstrates
a need for continuous education and support that expands from early pregnancy to postnatal period.

Postnatal educational interventions aiming to increase women’s knowledge or focusing only on positioning and attachment were not effective at increasing breastfeeding duration (Henderson, Stamp, & Pincombe, 2001; Quinlivan, Box, & Evans, 2003). In a quasi-experimental study of 73 primiparous women in the United States, postnatal motivational interviews as a postnatal education program were not effective in increasing breastfeeding duration or intention up to six months postpartum. Women in the intervention group breastfed longer than the standard-care group ($M = 98.1$ days, $SD = 75.2$ vs. $M = 80.7$ days, $SD = 71.9$), $t(69) = .991$, $p = .325$, Cohen’s $d = 0.24$); however, there was no statistical difference in the results (Wilhelm et al., 2006).

Based on a systematic review including 37 experimental and quasi-experimental studies, a combination of group education sessions, home visits and individual sessions starting antenatally and continuing into the postpartum period was the most effective strategy in increasing breastfeeding duration (De Oliveria, Camache, & Tendston, 2001). However, the studies did not provide information on details of the interventions; for instance, types of strategies, educational materials, frequency and length of the interventions, qualification and experience of educators and types of settings were not clear. According to Hector, King, et al. (2004) who examined nine systematic reviews, educational interventions spanning both prenatal and postnatal periods are the most effective methods to extend breastfeeding duration. Combined antenatal and postnatal education provides women with an opportunity to learn and seek for extra support during pregnancy and then relate their antenatal learning outcomes when they experience real breastfeeding skills or face the reality.
The content of the educational sessions appears to influence breastfeeding duration. For instance, De Oliveira, Camache and Tendston (2001) in their systematic review conclude that effective interventions involve guidance for mothers on overcoming problems such as engorgement, colic and crying; combining breastfeeding and work; and expression and storage of breast milk (De Oliveria et al., 2001). In a cohort study by Win, Binns, Zhao, Scotte, and Oddy et al. (2006), expression of breast milk was found to be positively associated with any breastfeeding at six months, $RR = 0.71$, 95% CI [.52, .98]. The study suggests that breast-milk expression methods and storage of milk should be included in antenatal education programs. Many studies report that prenatal education on breastfeeding normative and behavioural changes in mother and baby and management of breastfeeding problems are likely to increase breastfeeding duration (McLeod et al., 2002; O'Campo et al., 1992; U.S. Preventive Services Task Force, 2003). Hector, King, et al. (2004) in their review on nine systematic reviews reported that educational content should include benefits of breastfeeding, myths, common problems and solutions and skills training (Hector, King, et al., 2004). However, there is no standard and consistent content list among the studies. A current systematic review demonstrated that any structured program, regardless of its content, appears to influence the duration of breastfeeding positively (Beake, Pellowe, Dykes, Schmied, & Bick, 2011). However, due to high heterogeneity in the methodology of the studies, the authors did not perform a meta-analysis to identify any specific educational content that could be more successful than the others.

Considering that women’s decision-making process is very complex, there must be extra attention on women’s immediate sociocultural context, individual experience and postnatal needs (Sheehan et al., 2010). Sheehan, Schmied, and Barclay (2010) highlighted the
importance of the complexity of the decision-making process for the women in whether they continued breastfeeding, instead of having a uniform content in professional and educational programs (Sheehan et al., 2010).

**Strategies**

Educational strategies used in the interventional studies vary from written material to role plays and simulated activities. There is clear evidence that interventions with passive approaches, such as written materials and lecturing, are not effective in changing behaviours (Guise et al., 2003; Hector, King et al., 2004). The results of a meta-analysis of the randomised controlled trials from Guise et al.’s systematic review (2003) showed that the combination of education and written material was less effective on breastfeeding duration than education alone, $RD = 0.39$, 95% CI [.27, .5]. In some studies breastfeeding duration was increased when posters, photographs and flip charts were used during educational programs and home visits (Hector, King, & Webb, 2005). In a randomised control trial, 401 Singaporean women who watched a breastfeeding DVD and received lactation counselling with educational material breastfed longer than those in the standard-care group (Mattar et al., 2007).

Some studies suggest implementing self-efficacy-enhancing strategies to increase breastfeeding duration (Hatamleh, 2006; Noel-Weiss, Rupp et al., 2006). Problem-solving and role-play activities in education sessions are useful strategies to increase self-efficacy (Boekaerts, Maes, & Karoly, 2005). However, there is no structured strategy to enhance breastfeeding self-efficacy. In a descriptive study of 63 Canadian women, observing breastfeeding role models through videotapes and pictures significantly increased the women’s breastfeeding self-efficacy, which could influence breastfeeding duration (Kingston, Dennis, & Sword, 2007). Hatamleh (2006), in an experimental study with a
convenience sample of 37 women, demonstrated increased breastfeeding duration based on self-efficacy-enhancing strategies. In this study, the mean duration of breastfeeding in the experimental group was 28.82 days, while in the control group the mean duration was 11.86 days, $t(30)=-3.02$, $p = .003$. Chapters Three and Four provide more details on self-efficacy-enhancing strategies.

Although education has been found to be effective in increasing initiation and short-term duration of breastfeeding, there is clear evidence that support can increase the longer-term duration of breastfeeding if it is combined with an educational component. De Oliveria et al. (2001) reported in their systematic review that for educational interventions involving pregnant women, support from mothers or someone from their social network prolongs breastfeeding duration (De Oliveria et al., 2001). Interventions in regards to support are discussed further below.

**Support**

Support as an important influential factor in duration of breastfeeding has been discussed earlier in this chapter; however, evidence for the effectiveness of support interventions as the only intervention is not clear. For instance, the components of education and support are not always clear and well defined (Hector, King, et al., 2004). Encouragement and reassurance in educational interventions could be considered as emotional support; however, those types of supports are not studied as a stand-alone strategy (De Oliveria et al., 2001). Williams (2005) in her qualitative study argues that the inconsistent results in pregnancy and parenting literature regarding the role of social support occurs for two reasons: inconsistencies in the definitions across the studies and a lack of understanding social support within a broader experience of social interaction. A Cochrane review by Britton, McCormick, Renfrew, Wade, and King (2007) indicates that women who receive any form of support are less likely
to stop exclusive breastfeeding before five months than to stop any other form of breastfeeding after five months. However, in this review the definition of support is not clear, and the role of the women’s own social network, including father, family members and friends, has not been addressed. The results of another Cochrane review revealed that both lay and professional support had a positive impact on breastfeeding outcomes (Renfrew, McCromick, Wade, Quinn, & Dowswell, 2012).

For the purpose of this study, social support includes women’s social interaction and their perception of breastfeeding support from professional resources, peers, family and friends. Intervenational studies in this section are discussed under *lay and professional support* and *partner and family support*.

**Lay and professional support**

The effectiveness of interventions involving lay and professional support for breastfeeding duration has been reported in Cochrane reviews, many systematic reviews and individual interventional studies (Britton et al., 2007; Chung et al., 2008; De Oliveria et al., 2001; Dennis, 2002a, 2002b; Guise et al., 2003; Haider, Kabir, Huttly, & Ashworth, 2002; Hector, King, et al., 2004; Hector, King, & Webb, 2005; Hector, King, Webb, et al., 2005; Hoddinott, Lee, & Pill, 2006; Kaunonen, Hannula, & Tarkka, 2012; Lavender, Richens, Milan, Smyth, & Dowswell, 2013; Sikorski et al., 2003). However, the results are mixed; and strategies, content and timing of support interventions vary between studies.

Lay support appears to be an effective intervention in Western countries, where women have less opportunity to observe other breastfeeding women (Britton et al., 2007; De Oliveria et al., 2001; Hector, King, et al., 2004; Hector, King, & Webb, 2005; Kaunonen, et al., 2012; Lavender et al., 2013; Sikorski et al., 2003). Dennis (2002a) reviewed 10
studies (four of which use experimental designs) to evaluate the effects of lay support on breastfeeding duration. She indicated that lay support from an experienced breastfeeding mother was a promising intervention. In a randomised controlled trial of 256 women in Canada, Dennis (2002b) found that breastfeeding rates at three months postpartum among women who received only proactive telephone support from experienced breastfeeding women were twice those of women who did not receive the phone support ($P = .01$). In contrast, Britton et al. (2007) in their Cochrane review reported a statistically significant benefit from face-to-face support over telephone support, $RR = 0.85$, 95% CI [.79, .92]. In this review, frequency, duration and content of the phone calls and face-to-face intervention may have differed between the studies, and women’s perception of the support provided and their needs may have influenced the results. Hector, King, et al. (2004) reported lay support as an effective intervention with socially disadvantaged women who intend to breastfeed. The Cochrane review by Britton et al. (2007) reported a significant reduction in the cessation of exclusive breastfeeding with only lay support interventions, $RR = 0.72$, 95% CI [.57, .90]. Sikorski, Renfrew, Pindoria, and Wade (2003) and De Oliveira et al. (2001) also found peer support to be an effective intervention in increasing the duration of exclusive breastfeeding, but not of any breastfeeding. It is noteworthy that the effectiveness of lay support could be enhanced with professional support.

Professional support based on the Cochrane review by Britton et al. (2007) indicated that professional support resulted in a positive effect on exclusive breastfeeding duration ($RR = 0.91$, 95% CI [.84, .98]). The overall effect of professional support on cessation of any breastfeeding did not reach statistical significance ($RR = 0.94$, 95% CI [.87, 1.01]). However, Sikorski et al. (2003) in their systematic review found that professional support was beneficial for the duration of any breastfeeding but not exclusive breastfeeding. Kaunonen, Hannula, and Tarkka (2012) reviewed 30 studies and reported that a
combination of professional support and peer support by trained and experienced peer supporters was effective in breastfeeding duration. They also recommended diverse types of interventions during different phases of motherhood. The review indicated the positive effect of support on duration of breastfeeding; however, only Chapman, Damio, Young, and Perez-Escamilla (2004) examined the effects of support on breastfeeding at six months, with no statistically significant results.

Although many reviews and reports concluded that a combination of lay and professional support extends duration of breastfeeding, none of them included support during lactation from the babies’ fathers, other family members or the mothers’ own social support networks.

**Partners and family support**

Interventional studies incorporating partners and family members (including grandmothers) into education and support are not widely published. Many authors have recommended interventions for both partners (De Montigny & Lacharite, 2004; Sheehan, 1998; Wolfberg et al., 2004; Wolfberg, Shields, Bienstock, O'Campo & Norwitz, 2002). However, there are a few interventional studies targeting pregnant women and their partners or family members.

Wolfberg et al. (2004) conducted a randomised controlled trial in which 59 expectant fathers from Johns Hopkins Hospital were assigned to attend a breastfeeding and infant-care class (intervention) or a class on infant care only (control). The class was only for expectant fathers, and it was guided by an experienced male facilitator. In this study men were encouraged to support each other in committing themselves to be an advocate for breastfeeding. They also participated in role play about how they could be a supportive
partner. The results of the study showed that women whose partner attended the
breastfeeding classes were significantly more likely to initiate breastfeeding compared to
women whose partners attended infant-care classes only (74% and 41% respectively, $p = .02$). This intervention was not effective in increasing breastfeeding duration. The
intervention in this study design implemented and evaluated male partners as individuals
rather than the couple as a unit. It asserts that to have better results, women and their
partners should be involved together to explore their own strategies and make plans to
support each other.

In a clinical trial of 208 couples in Brazil, Susin et al. (1999), found that exclusive
breastfeeding rates at the end of the first month and any breastfeeding rates at the end of
three months were 1.76 and 1.9 times higher (respectively) among women whose partner
was involved with them in the postnatal advice intervention, and gained higher
breastfeeding knowledge compared with the women whose partners were not involved in
the intervention. This study aimed to assess women’s and partners' knowledge and its
effect on breastfeeding rates. However, partners attending the classes may, in turn, increase
their support and cooperation, resulting in higher breastfeeding self-efficacy for the women
(Susin et al., 1999). In a descriptive study of 63 Canadian women, Kingston, Denis, and
Sword (2007) found that women who received praise from their partner and their own
mothers had significantly higher levels of breastfeeding self-efficacy ($p < .02$ and $p < .01$
respectively). Ekstrom, Widstrom, and Nissen (2003) emphasised the importance of
grandparent support in increasing breastfeeding duration. In their study of 488 Swedish
women, they found that multiparous women ($n = 294$) whose mothers told them about
their breastfeeding history breastfed longer than women whose mothers did not ($p < .006$).
They suggested that providing an opportunity for grandmothers to discuss their

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1 "Multiparous" refers to a woman who has completed two or more pregnancies to at least 20 weeks
(Cunningham, et al., 2010).
breastfeeding perceptions with each mother can be a helpful intervention to support breastfeeding (Ekstrom, Widstrom, & Nissen, 2003). However, interventional studies involving grandparents or women’s social networks are not widely published in the literature.

**Multifaceted interventions**

The literature review identified that combining strategies and procedures was effective in enhancing the duration of breastfeeding (Chung et al., 2008; De Oliveria et al., 2001; Gill, Reifsnider, & Lucke, 2007; Hector, King, et al., 2004; Hector, King, & Webb, 2005; Mattar et al., 2007; Miracle, Meier, & Bennett, 2004; Noel-Weiss, Parliament of the Commonwealth Australia, 2007; Rupp et al., 2006; Olson, Haider, Vangjel, Bolton, & Gold, 2010; Ryser, 2004; Scott et al., 2001; Sikorski et al., 2001; Simonetti, Palma, Giglio, Mohan, & Cicolini, 2012; U.S. Preventive Services Task Force, 2003; Wolfberg et al., 2004). For instance, in a systematic review by Guise et al. (2003), support alone as a single intervention increased short-term breastfeeding duration, with differences of 0.11 (95% CI [.03, .19]). However, a combination of interventions, including education and support, produced a larger increase in short-term breastfeeding duration, with differences of 0.37 (95% CI [.17, .58]).

An overview of nine systematic reviews by Hector, King, et al. (2004) about interventions to support and promote breastfeeding revealed that multifaceted interventions were more likely to be effective than single interventions in increasing breastfeeding initiation and duration. They reported that a combination of the following strategies was an effective method in improving breastfeeding practices: education of mothers, peer support, changes to hospital practices such as rooming-in and early skin-to-skin contact, staff training, policy, paid maternity leave and media campaigns/programs. Hector, King, et al. (2004)
also referred to a national multifaceted intervention in Scandinavia, where breastfeeding rates are high. In that program, four types of interventions have been integrated: providing problem-based information about breastfeeding, increased access to mother-to-mother support groups, increased paid maternity leave and changed maternity-ward practice towards mother-infant contact and autonomy. However, the effectiveness of each component has not been examined separately, so it is not clear which component is necessary in the package (Hector, King, et al., 2004). Chung, Raman, Trikalinos, Lau and Ip (2008) reviewed 36 randomised controlled trials to identify the effectiveness of primary care-initiated interventions to promote breastfeeding. They reported that combining prenatal and postnatal interventions had a larger effect on increasing duration of breastfeeding compared to either pre or post interventions alone.

**Effectiveness of interventions on breastfeeding rates at six months or beyond**

Effectiveness of the intervention studies aiming to increase breastfeeding rates at six months or beyond was identified based on the search results from major databases, limited to publications between 1990 and 2013 (Appendix 2). Only systematic reviews, randomised controlled trials and high-quality non-randomised controlled trials were reviewed and critically analysed. Based on the aim of this study, system-level interventions, including BFHI and staff training by WHO were not included in this review. The studies were analysed based on three components: (a) antenatal or postnatal focused interventions; (b) combination of both antenatal and postnatal interventions; and (c) any intervention that considered modifying women’s breastfeeding intention, support and confidence.

Intervention studies that stressed mainly antenatal education (Forster et al., 2004; Kronborg et al., 2012; Lavender et al., 2005; Mattar et al., 2007) or only postnatal
interventions (Henderson et al., 2001; Kronborg, Vaeth, Olsen, Iversen, & Harder, 2007; McDonald, Henderson, Faulkner, Evans, & Hagan, 2010; Pugh, Milligan, Frick, Spatz, & Quinlivan et al., 2003; Tahir & Al-Sadat, 2013; Wilhelm et al., 2006) were not effective in increasing breastfeeding rates at six months. For instance, Mattar et al. (2007), in their randomised controlled trial of 401 Singaporean women, examined two different forms of antenatal education at 36 weeks of pregnancy. They compared three groups of women: group A received a booklet, watched a DVD and had a 15-minute lactation consultation; group B received only a booklet and DVD; and group C received routine care. Women who received individual counselling and educational materials breastfed more than women who received routine care at six months ($OR = 2.5$, $95\% CI [1.0, 6.3]$). However, the results did not reach statistical significance ($p = .12$).

McDonald, Henderson, Faulkner, Evans, and Hagan (2010) conducted a randomised controlled trial with a postnatal focused intervention with 849 Australian women. They offered one-to-one postnatal education and weekly home visits until six weeks postpartum, but the intervention was not effective in increasing breastfeeding rates at six months. A randomised controlled trial ($N = 450$) in Singapore was conducted by Su et al. (2007) to identify the effectiveness of a single antenatal breastfeeding-education intervention separate from a postnatal supportive intervention. Neither antenatal education nor postnatal support was effective in increasing any breastfeeding rates at six months, although the interventions were effective in increasing exclusive breastfeeding rates at six months (Su et al., 2007). It is noteworthy to consider that more than 60 percent of women in this study were multiparous, and the antenatal education included only watching a 16-minute DVD and participating in a 15-minute lactation consultation with written materials. None of the important confounder factors, including age, education, intention or smoking, were considered in their data analysis, which indicates a detection bias.
The effectiveness of interventions including both antenatal and postnatal components aiming to increase breastfeeding rates at six months is slightly mixed. A quasi-experimental study among 990 American women (including multi- and primiparous) demonstrated effective results; the women in the intervention group were provided an program of intense antenatal educational home visits, postnatal home visits with weekly phone calls for the first week and monthly phone calls up to six months (Olson et al., 2010). Women in the intervention group were six times more likely to breastfeed at six months compared to the standard-care group ($OR = 6.2, 95\% CI [.01, .13]), p = .008$). The results were still significant after adjusting for some confounding factors such as age, education, income, smoking and having a previous pregnancy. Kaunonen et al. (2012), in a systematic review, reported that continuous breastfeeding support from the antenatal to postnatal periods by professionals and peers is effective in the continuation of breastfeeding, but not effective in increasing breastfeeding rates at six months (Kaunonen et al., 2012). It is important to note that this systematic review included only one study with a breastfeeding outcome at six months, which reported an ineffective result in increasing breastfeeding rates at six months (Chapman, Damio, Young, & Perez-Escamilla, 2004).

There are very few published studies of interventions that modify women’s breastfeeding intention, confidence and support involving partners, family and friends. The literature search found only one effective randomised controlled trial, from Thailand. In this study, the authors used theory-based antenatal educational sessions combined with postnatal phone calls to encourage women to use their own intrinsic power (Kupratakul, Taneepanichskul, Voramongkol, & Phupong, 2010), which may have modified women’s intention to breastfeed. There was no effective intervention by using only self-efficacy-enhancing strategies. For instance, Kronborg, Maimburg, and Vaeth (2012) conducted a
randomised controlled trial on 1,193 Danish women. Women were offered three antenatal parenting classes, which included a two-hour breastfeeding session with self-efficacy-enhancing strategies. The women were followed at six weeks and one year after birth. The results of the study demonstrated no difference in women’s breastfeeding self-efficacy score or breastfeeding rates at one year. Kronborg et al. (2012) recommended that antenatal educational programs need to be followed by postnatal breastfeeding support, as educational intervention is not sufficient by itself to increase long-term breastfeeding rates. Finally, no effective intervention focusing on involving women’s own social support was identified.

Based on the literature review, at the commencement of the study no randomised controlled trial or high-quality quasi-experimental studies in developed countries had reported a successful result specifically at six months for primiparous women where the breastfeeding initiation rate was high. Furthermore, none of the intervention studies simultaneously addressed women’s intention to breastfeed, women’s breastfeeding confidence and support.

**Conclusion**

Breastfeeding as a health behaviour could be protected and supported by the interventions that incorporate amendable influencing factors in women’s social networks. In the literature, the modifiable factors that are positively associated with breastfeeding duration are the woman’s breastfeeding intention, her breastfeeding self-efficacy and her social support. Women who have a strong desire to breastfeed for longer periods of time, are confident in their ability to breastfeed and are well supported by their own social network demonstrate positive and prolonged breastfeeding behaviours. However, not many
interventional studies consider these amendable factors in their procedures, and there is no intervention study that addresses them simultaneously.

Interventional studies used to extend breastfeeding were usually combined, and varied with the strategies and procedures used, the timing of the interventions and the context and formats in which they were developed. The most effective interventions reported to have a combination of face-to-face education, support and guidance spanning both the antenatal and postnatal period. However, because of the variety of the approaches in the literature, it is difficult to identify the best intervention with the optimal effectiveness in breastfeeding duration. In addition, the literature review revealed no effective intervention study that showed increased breastfeeding rates at six months in developed countries among women who were pregnant for the first time and had high rates of breastfeeding initiation.

There is, however, evidence to suggest that breastfeeding education and support spanning the antenatal and postnatal periods that involves women’s social networks, including women’s partners or mothers, has a positive influence on breastfeeding intention and self-efficacy. Educational interventions with hands-on activities and role playing have been identified as self-efficacy-enhancing experiences. Health-care professionals may be able to support a woman to breastfeed for a longer period of time by designing a woman-centred intervention that promotes the woman’s desire to prolong breastfeeding, helps her identify existing support and enhances her confidence to trust herself and make her own decisions about breastfeeding practice while she, at the same time, feels safe.

There is a need to design and conduct a woman-centred and unique multi-phased intervention to increase women’s breastfeeding intention and confidence, and to involve their social support, because many women still stop breastfeeding very early postpartum.
Chapter Three: Theoretical Framework of the Study

Introduction

The previous chapter outlined the evidence base concerning the factors, both modifiable and non-modifiable, that influence duration of breastfeeding. Three major modifiable factors were identified to influence women’s decision to continue breastfeeding for longer periods of time: woman’s breastfeeding intention, self-efficacy and social support. This chapter presents a theoretical framework for an intervention that provides guidance about how to modify those factors positively. The Milky Way Program was designed based on two theories: Self-efficacy (Bandura, 1997) and Birth Territory and Midwifery Guardianship (Fahy, Hastie, & Foureur, 2008). The chapter begins with the theory of Self-efficacy, describing the complexity of the self-efficacy concept; outlining sources of information that can influence individuals’ perceived self-efficacy; and providing some practical suggestions to enhance women’s breastfeeding self-efficacy. The second part of this chapter focuses on the theory of Birth Territory and Midwifery Guardianship, explaining how a woman’s inner power can influence her sense of breastfeeding self-efficacy and her decision to continue breastfeeding. Based on this theory, women can create their own breastfeeding space, which I call breastfeeding territory. Women’s breastfeeding territory can be supported by midwives, family and friends (guardianship of the territory). The theory of Birth Territory and Midwifery Guardianship highlights the main concepts of relevance to midwifery relationships with women, including the concepts of embodied self, intrinsic power, integrative and disintegrative power and midwifery guardianship. In this chapter, key concepts from both theories are defined, described and applied to the planned intervention. The definitions of the key concepts are also included in a glossary (Appendix 1).
This chapter demonstrates the synergistic nature of these two theoretical approaches. Self-efficacy, as a cognitive theory, is enhanced by adding a theoretical understanding of the embodied self of the woman and a more specific focus on the woman’s holistic environment. The thesis for this chapter is that a woman’s breastfeeding duration can be positively influenced when a midwifery guardian uses self-efficacy-enhancing strategies and fosters the use of integrative power between the woman and her support people.

**Self-efficacy Theory**

The theory of Self-efficacy is based on Bandura’s social cognitive theory (1986), where an individual’s psychological functioning is considered to be a product of a dynamic interaction among three sets of determinants: the behaviour that individual engages in; internal personal factors in the form of cognitive, affective and biological events; and the environmental events that affect the person (Bandura, 2012). The interactive relationship between these three determinants is called *triadic reciprocal causation*; in other words, there is a three-way interactive relationship between the person’s behaviour, internal factors and environmental events (Bandura, 1997). According to Bandura (1997), the reciprocity does not mean that the effects of each set of determinates is equal in strength. Their relative impact will vary for different activities and will be different based on each situation. Bandura (2012) postulates that an individual’s cognitive process in relation to other factors significantly influences his/her behaviour. Bandura (1997) refers to self-efficacy as a cognitive process of individuals to believe in their capability to plan and execute a series of actions in terms of being able to perform a specific task or behaviour. The theory of Self-efficacy can be used to change individuals’ behaviour (Bandura, 1977). Increased self-efficacy for any task is considered to contribute to increased frequency in performing the task. The concept of self-efficacy; the primary sources of self-efficacy; and
self-efficacy-enhancing strategies are explained in more detail below. In each section, women’s breastfeeding self-efficacy has been discussed.

**Concept of self-efficacy**

As noted above, “perceived *self-efficacy* refers to beliefs in one’s capabilities to organise and execute the course of actions required to produce given attainments” (Bandura, 1997, p. 3). There are three major aspects to this definition (Gist & Mitchell, 1992; Wood & Bandura, 1989). First, perceived self-efficacy is based on individuals’ comprehensive judgment in their ability to perform a task or behaviour; this judgment can be influenced by different factors (Bandura, 2004; Gist & Mitchell, 1992; Wood & Bandura, 1989). Second, self-efficacy is a dynamic construct that changes over time based on new experiences that the individuals encounter (Bandura, 1997; Gist & Mitchell, 1992; Wood & Bandura, 1989). Third, self-efficacy belief involves mobilisation components (Gist & Mitchell, 1992), which means that self-efficacy as a person's belief in their own capabilities can mobilise the motivation, cognitive resources and courses of action required to fulfil the situational demands (Wood & Bandura, 1989).

In summary, self-efficacy is a complex cognitive process that controls and regulates an individual’s motivation, thought process, emotional status and social environment to perform a specific task or behaviour (Bandura, 1986). Bandura (1997) refers to self-efficacy as the exercise of control. This means that the person exercises how to control his or her thoughts, emotions2 and external elements to achieve goals. Self-efficacy has been reported as an important motivational construct that affects individual choices, goals, emotional reactions, coping and persistence. Self-efficacy can be influenced by experience, learning and feedback (Gist & Mitchell, 1992).

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2 Emotion is a cognitive, physiological and behavioural component that involves a subjective conscious experience, bodily arousal and expression of characteristics (Weiten, 2014, p. 304)
Some authors consider self-efficacy as a situation-specific form of self-confidence that is not same as a person’s confidence by itself (Block et al., 2010). Bandura (1997) highlights the importance of differentiating self-efficacy from a person’s confidence. He explains that the construct of self-efficacy is different to the general term of confidence. According to Bandura (1997), confidence is a lay word to refer to the strength of somebody’s belief, whereas self-efficacy is more specific, referring to the person’s perceived ability to execute a specific action or behaviour, and the amount of effort that the person puts in to achieve a level of attainment. In other words, self-efficacy is affirmation of a capability in addition to the strength of that belief (Bandura, 1997). For instance, a woman can be a confident person, but her perceived self-efficacy about her breastfeeding ability may not be strong enough to keep her affirmed to sustain breastfeeding for a longer period of time.

According to Self-efficacy theory, there are two types of expectancies that should not be misinterpreted: outcome expectation and self-efficacy expectation (Bandura, 1986, 1997, 2012). Outcome expectation refers to the belief that a given behaviour will produce a specific outcome (Bandura, 1997). Self-efficacy expectation is an individual’s perceived ability to perform a certain task or behaviour (Bandura, 1997). Bandura (2012) highlights the importance of this distinction in Self-efficacy theory. He explains that people may believe that a specific behaviour will help them achieve a specific outcome. However, he also says that if they have little confidence in performing the behaviour, they will not be able to perform it successfully. For example, if a woman believes in the importance of exclusive breastfeeding for her baby but she is not confident in her ability to maintain her milk supply, it is difficult for her to avoid using formula (Dennis, 2003). Self-efficacy expectancies have diverse effects on an individual’s behaviours (Bandura, 2005). Based on people’s self-efficacy expectations they choose whether or not to engage in a specific behaviour; how much effort to expend; and how long to persist when facing a barrier.
Instilling a strong sense of efficacy in learning a new behaviour enhances the development of competencies (Bandura & Locke, 2003). Bandura (1997) advocates a behaviour-specific approach to the study of self-efficacy, as different behaviours require different expectations. For the purpose of this study, breastfeeding self-efficacy is introduced in this chapter.

**Breastfeeding self-efficacy**

Dennis (1999) extracted the concept of *breastfeeding self-efficacy* from Bandura’s Self-efficacy theory. She has defined breastfeeding self-efficacy as a woman’s perceived ability to breastfeed her child (Dennis, 2006; Dennis & Faux, 1999). She explained how women’s perceived breastfeeding self-efficacy can influence their thoughts and actions to initiate and continue breastfeeding. Dennis (2003) claimed that breastfeeding self-efficacy is a salient variable in duration of breastfeeding. According to Dennis, women’s perceived breastfeeding self-efficacy determines the following actions: (a) whether a woman prefers to breastfeed or not; (b) how much effort she will employ to insist in her attempts until she achieves mastery; (c) whether she will have self-enhancing or self-defeating thought patterns; and d) how she will respond emotionally to breastfeeding challenges (Dennis, 1999, 2003). For instance, women who have high perceived breastfeeding self-efficacy are more likely to believe that they can breastfeed successfully (efficacy expectation) (Dennis, 1999), and they will choose to breastfeed and enjoy the benefits of breastfeeding (outcome expectation). These women will probably employ maximum efforts to achieve mastery and sustain breastfeeding regardless of any difficulties or setbacks. Women with high breastfeeding self-efficacy are more likely to think positively and find solutions to overcome the obstacles. These women use self-enhancing thought patterns and envision themselves as a successful performer. These women will be able to control their anxiety.
and emotional disturbances to stay calm and respond appropriately when they need extra support (Dennis, 1999).

In contrast, women with low perceived breastfeeding self-efficacy are more likely to choose formula feeding and more likely to be scared of breastfeeding. Some of these women may attempt breastfeeding, as they are aware of its benefits, but when they encounter any challenges they give up and see themselves as a failure. Women with low self-efficacy are more likely to concentrate on self-defeating thought patterns and lose their faith in their own problem-solving ability. Thus, they are less likely to relax and enjoy breastfeeding (Dennis, 1999; Hatamleh, 2006).


**Sources of Self-efficacy**

Bandura (1977) has identified four primary sources of experienced information that shape and influence an individual’s self-efficacy: performance accomplishment, vicarious experience, verbal persuasion and emotional arousal (physiological and affective states). These experiences are complex, and each of them contributes to a variety of external and internal information that influences individuals’ perceived self-efficacy (Bandura, 2012; Gist & Mitchell, 1992).
**Performance accomplishment**

Performance accomplishment is synonymous with enactive mastery experience, the most powerful source of self-efficacy (Bandura, 1977). Enactive mastery is not about a simple performance improvement, but about making corrective reinforcement towards the perfection of skills through cognitive, behavioural and self-regulatory efforts (Bandura, 1977). Bandura (1997) explains that enactive mastery provides individuals with a success experience that reinforces their expectation of self-confidence. Through enactive mastery, individuals learn how to perform successfully in stressful and difficult situations (Bandura, 1977). By achieving performance accomplishment, individuals gain optimal coping skills, and learn how to be resilient, decrease their emotional arousal and minimise their perception of vulnerability to stress (Bandura, 1997; Hatamleh, 2006). According to Bandura (1997), a resilient sense of efficacy needs extra experience in overcoming obstacles through perseverant efforts. When individuals face difficulties and setbacks as they try to achieve their goals, this teaches them that success usually comes with a sustained effort (Bandura, 1997). Once people become convinced that they have what it takes to succeed, they persevere to achieve their goals and quickly recover from setbacks (Bandura, 1997). A good example of this effect is demonstrated among multiparous women who have previous successful breastfeeding experience. These women continue breastfeeding for longer periods compared to women who have had no breastfeeding experience in the past (Kim et al., 2013; Racine, et al., 2009). Blyth et al. (2002) found in their survey of 300 Australian women that women with previous breastfeeding experiences
had higher breastfeeding self-efficacy scores at one week and four months compared to women with no breastfeeding experiences. The difference between the scores were significant, \( t(298) = 2.59, p < .05 \) and \( t(227) = 2.51, p < .05 \) respectively.

Sense of efficacy through performance accomplishment also depends on pre-existing self-knowledge, the complexity of the task, the amount of effort expenditure, self-monitoring and the rate of improvement (Bandura, 1997). For instance, experiencing only easy and early successes is not enough for long-term success; but it can be an incentive to step up and prepare for new challenges and difficulties. Difficulties will generate opportunities to learn how to turn failure into success by exercising better control over events, which can enhance individuals’ self-efficacy (Bandura, 1997). DiGirolamo et al. (2005) believe that women who experience problems and work to overcome them develop a greater sense of self-efficacy. As discussed earlier, self-efficacious women develop self-enhancing thought patterns (Dennis, 2003). McNatt and Freston (1992) conducted a study on 45 primiparous women in England. They found that women who were generally positive thinkers and self-directed were more likely to be problem solvers and perceive breastfeeding problems as normal; whereas women who were self-doubting and anxious overall were more likely to perceive breastfeeding challenges as bothering and inconvenient. Women with self-doubting thought patterns gave up breastfeeding when they encountered the problems, although both groups of women experienced the same breastfeeding issues (McNatt & Freston, 1992). In general, first-time mothers need extra support to achieve enactive mastery in their breastfeeding experiences. This need leads into another source of self-efficacy, called vicarious experience.
Vicarious experience

Vicarious experience is another source of information which influences individuals’ perceived ability to perform a task. In the absence of enactive mastery experiences, vicarious experience can have a powerful impact on a person’s self-efficacy (Bandura, 1997). People enhance their self-efficacy perception by watching other people’s performance in live, recorded, printed (Bandura, 1986, 1997; Dennis, 1999) or imaginary forms (Bandura, 1997). Vicarious experience is also called modelling (Bandura, 1977). Both terms refer to observational learnings where individuals search for role models and observe the effective skills and strategies that the role models apply to manage environmental demands (Bandura, 1986, 1997). Individuals can observe the attitudes, styles of competencies and attainments of different people, including those from other cultures (Bandura, 1997). According to Dennis (1999), the effect of observational learning depends on the characteristics of the role models and the manner in which the demonstrator has performed the task or behaviour. For instance, repeatedly observing celebrities and political leaders when they breastfeed their children in public with joy and pride enhances women’s breastfeeding self-efficacy. The best example is when Miranda Kerr, an Australian model published a photo of her breastfeeding son on her personal blog. Miranda stated that she wanted to support breastfeeding women and encouraged other mums to breastfeed in public with confidence (The Australian News, 2011). Modelling has been classified into three types: effective actual modelling (observing people in everyday life), symbolic modelling (observing other people through television or other social media) and cognitive self-modelling (visualising oneself) (Bandura, 1997).

Effective actual modelling refers to the spontaneous learning that occurs naturally within a community (like observing people using smart phones) (Bandura, 1997). For instance, if a woman observes other women breastfeeding in their family or in public places including
shopping centres, cinemas, restaurants or public transports, she is more likely to build high self-efficacy by perceiving breastfeeding as pleasant and as a social norm. She also becomes familiar with breastfeeding challenges and the way other women overcome them in different situations. On the whole in Western society, there is less opportunity to observe women openly breastfeeding in the family or community, so this spontaneous learning is endangered (Boyer, 2012).

Symbolic modelling means using videos, pictures and posters to show various images of successful and pleasurable moments of performing a task or behaviour, with the aim of enhancing an individual’s sense of self-efficacy (Bandura, 1997). The empirical evidence to support this statement is a descriptive study of 63 Canadian women who observed breastfeeding role models through videotapes and pictures (Kingston et al., 2007). In this study, the authors reported that the women who observed breast-feeding role models through videotapes had significantly higher levels of breast-feeding self-efficacy compared to the women who did not have that opportunity.

The impact of symbolic modelling on self-efficacy can be further increased by cognitive self-modelling or cognitive rehearsal. Visualising oneself performing a behaviour successfully increases the individual’s self-belief that they can do it in real life. This stimulates individuals’ generative and innovative behaviour (Bandura, 1997). In cognitive self-modelling, people visualise themselves performing the task successfully even as they confront challenging tasks. They learn how to apply the rules and strategies to solve problems. Modelling using both visualisation and cognitive rehearsal builds stronger perceived efficacy than solely watching other people performing a task (Bandura, 1997). For instance, in a randomised controlled trial of 30 Iranian stroke patients, cognitive rehearsal on postural balance significantly improved the participants’ postural balance (p
Exemplification of success through sustained effort with cognitive self-modelling and symbolic modelling can be more effective than symbolic modelling only (Maibach & Flora, 1993).

Bandura (1997) highlights that amending efficacy beliefs through vicarious experiences is not simply a matter of exposing individuals to the models. He explains that modelling operates through complex cognitive processes where the observer pays attention to the model, retains the information, produces a course of action by breaking the complex task into simple tasks and creates incentives to alter his or her motivation (Bandura, 1997). Therefore, it is important to choose a modelling method that can attract the person’s attention; can be watched repeatedly; can be simplified to easy steps; and provides some incentives to regulate people’s motivation. A description of how this can apply to breastfeeding is described in the section on self-efficacy-enhancing strategies.

**Verbal persuasion**

**Verbal persuasion** can influence people’s sense of efficacy. When other people express trust and confidence in one’s capabilities to perform a behaviour, this increases one’s sense of efficacy (Bandura, 1997). In contrast, when other people express lack of confidence and doubt about one’s capabilities, one’s sense of self-efficacy diminishes (Bandura, 1977). Positive appraisal in a realistic manner leads people to try hard to succeed and creates higher efficacy beliefs, especially when the person is struggling with difficulties (Bandura, 1997). For instance, women continue breastfeeding for longer periods of time if they receive positive social persuasion (Racine et al., 2009; Swanson & Power, 2005). Verbal persuasion by a woman’s social network that includes family members, close friends and peers is an important factor in the duration of breastfeeding (Swanson & Power, 2005). However, if social evaluations focus on individuals’ deficiencies, that will diminish the
woman’s sense of efficacy (Bandura, 1997). People who have been persuaded that they lack capabilities tend to avoid challenging activities and give up when facing obstacles (Bandura, 1997). For example, when a woman is persuaded that she will not be able to breastfeed because her mother could not, she may quickly give up breastfeeding when any discomfort or challenge occurs. A qualitative study by Reid, Schmied and Beale (2009) described how grandmothers’ advice can influence women’s potential breastfeeding decisions in different ways.

People generally trust the evaluation of their capabilities by those who are skilled in the activity and have a great deal of knowledge and experience in the field (Bandura, 1997). Women have been shown to stop breastfeeding based on the advice that they have received from health professionals (Kirkland & Fein, 2003). For instance, in an American study by Kirkland and Fein (2003), some women reported that health professionals induced a perception that they had a low milk supply. Therefore, it is important for professionals to provide realistic feedback based on the woman’s capabilities. Raising unrealistic beliefs results in failures and discredits the persuaders, which undermines individuals’ beliefs in their capability (Bandura, 1997). According to Schunk (1984) giving feedback based on people’s ability in the early stages of skill development has an important effect on their sense of personal efficacy. Being expert in building other people’s sense of self-efficacy means giving realistic feedback, highlighting personal capabilities and referring to progress made without stressing the amount of hard work required (Bandura, 2004). Expert self-efficacy builders encourage people to measure their successes based on their self-improvement rather than winning over others (Bandura, 1997). According to Bandura (1997), once people are more confident in evaluating their own capabilities, they do not need to pay as much attention to what other people say (Bandura, 1997).
Physiological and affective states

Physiological and affective \(^3\) states (emotional reactions) of people in a specific situation can influence their sense of efficacy (Bandura, 1997, 2004). For instance, if a person feels emotionally stressed and become fearful about performing a task or behaviour, autonomic arousal will take place. In the process of autonomic arousal, defence hormones like adrenalin will surge and the sympathetic nervous system will be activated (Marieb & Hoehn, 2014). As a result of this reaction heartbeat usually increases, breathing accelerates, blood pressure rises, pupils dilate and skin hair erects (Marieb & Hoehn, 2014; Weiten, 2014). Some people interpret these physiological changes as indicating that they are vulnerable to stress or fear of failure; in contrast, some people perceive physiological arousal as a pleasant and joyful state that prepares them for succeeding in challenges (Bandura, 1997). According to Bandura (2004), the way people interpret and appraise the meaning of physiological and emotional reactions affects their self-efficacy beliefs. For instance, a negative interpretation of physiological arousal will diminish individuals’ sense of efficacy, whereas a positive interpretation will create more efficacious feelings (Bandura, 2004).

People's interpretation of physiological and affective states is influenced by several factors. First, level of activation – the way people mentally weigh and label the arousals – can affect people’s interpretation of physical or emotional reactions (Bandura, 1997). For example, when a woman feels highly emotional about experiencing fatigue, aches and pain after a long labour, she may not feel efficacious to breastfeed when her baby demonstrates unsettled behaviour; however, if the woman labels that feeling as a normal physiological change, her emotional arousal will be less likely to diminish her sense of efficacy. Cioffi (1991) explains that the intensity of the physical sensation is not the important influencing

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\(^3\) Affective status refers to a situation where a person experience feelings or emotions. Affect is defined as the experience of feeling or emotion (Weiten, 2014).
factor. People interpret the same physiological sensations differently depending on how much attention they have chosen to give the sensation and how sensitive they are about the situation. For instance, if a woman pays less attention to nipple pain during breastfeeding, she may merely interpret the nipple pain as a sign to correct the position of the baby on the breast; in contrast, if she pays more attention to the same pain, she may find it very unpleasant and interpret it as a sign of damaged nipples caused by breastfeeding. Although the intensity of the arousal is not as important as its level of activation, Bandura (1997) draws the attention to the complexity of activities. He believes that complex activities are more likely to activate high emotions, which may impair one's sense of efficacy. He further says that moderate levels of emotional reaction increase attentiveness and facilitate performing the skill or behaviour, which actually boosts the person’s self-efficacy. Simple activities and those that are overlearned do not cause emotional reaction and do not easily disturb people’s efficacy beliefs (Bandura, 1997).

Second, physiological reactions are interpreted differently depending on the person’s emotional status (Bandura, 1997). Even the emotional reactions of others in the same situation can affect individuals’ perceived judgment (Bandura, 1997; Weiten, 2014). People with low emotion are more likely to misjudge their physical reactions as a sign of coping deficiencies (Bandura, 1997). Bower (1983) believes emotional arousal affects thought processes. He explains that emotions become associated in memory with different events, so that people’s past successes and failures are stored in the memory with their affects. Therefore, people in low mood will interpret their physical arousal negatively as they recall the bad memories and reactivate a whole view of inadequacy and worthlessness. According to Bandura, low achievers may remember inefficacy feelings and will not push themselves enough to perform their desired task in a stressful situation. In contrast, high achievers with good mood motivate themselves to master difficult challenges and
outperform others (Weiten, 2014). They view their physical reactions as an energising facilitator. They push themselves to their limit to assess their optimal physical capabilities (Bandura, 1997).

Third, past efficacy experiences create biases in the interpretation and cognitive processing of physiological and emotional responses. A low sense of efficacy in the past is more likely to undermine an individual’s coping capabilities and increase their sensitivity to their bodily reactions (Bandura, 1997). According to Wright and Mischel (1982), selective recall of past successes will increase personal efficacy, whereas recalling failures will diminish the sense of efficacy. Therefore, it is important for breastfeeding women to receive accurate information and feedback about their physiological changes after birth and during breastfeeding. By normalising physiological changes and responses during breastfeeding, women are encouraged to feel that their bodily status is normal and therefore nothing to worry about. For example, having the knowledge that it is normal to feel tired after birth does not lower the woman’s perception of her breastfeeding self-efficacy. When the somatic events exceed a woman’s limits, support people can help by encouraging her to recall past successes with challenging tasks and to take a rest to restore coping capacity. According to Bandura (1997), the major ways of modifying self-efficacy through physiological and affective states are to enhance physical status, reduce stress levels and negative emotional tendencies and, correct misinterpretation of bodily status.

**Self-efficacy enhancing strategies**

Different self-efficacy-enhancing strategies have been used in clinical settings to modify breastfeeding outcomes (Dennis, 2003, 2006; Dennis & Hodnett Ellen, 2007; Hatamleh, 2006, 2012; McQueen et al., 2011; Nichols et al., 2009; Noel-Weiss, Rupp et al., 2006; Otsuka et al., 2014; Wu et al., 2014). These strategies have been developed based on four
sources of information that can affect individuals’ efficacy level for a specific task or behaviour. This section proposes some strategies that can be useful for first-time mothers during the antenatal period who have not built a sense of breastfeeding efficacy through role mastery.

**Strategies for performance accomplishment**

As mentioned earlier, not many strategies have been identified that can enhance breastfeeding self-efficacy through performance accomplishment for pregnant women without any previous breastfeeding experiences. However, an antenatal breastfeeding intervention would be useful if it provides some practical instruction, such as practice with different breastfeeding positions using dolls and pillows. Bandura (1997) stresses the importance of practising courses of action that will be needed in the future to manage constantly changing life circumstances and overcome obstacles. Therefore, it would be useful if women are prepared to manage life changes after birth and overcome the most common barriers in breastfeeding. For instance, women can use synthetic breasts to practise hand expressing and pump expressing during antenatal educational sessions as a method to increase their milky supply. Bandura (1997) believes that modelling strategies, cognitive stimulation and tutorial instructions cannot produce strong self-efficacy in the way that role mastery does. For this reason, first time mothers would benefit by receiving extra support during the early stages after birth while they try to achieve enactive mastery in breastfeeding.

**Strategies for vicarious experiences**

The next group of strategies that can be used to enhance women’s breastfeeding self-efficacy is modelling (vicarious experiences). Breastfeeding modelling can be executed by enactive, symbolic and cognitive modelling, as discussed earlier. Women can be
encouraged to find and communicate with a breastfeeding woman in their social network, including family or friends. Women who do not have any breastfeeding mothers in their social network can be encouraged to contact lay support services such as Australian Breastfeeding Association (ABA). Another source of vicarious learning is symbolic modelling. Symbolic modelling, including positive posters and breastfeeding videotapes and DVDs, has been used widely in breastfeeding research, with a positive effect on breastfeeding self-efficacy (Hatamleh, 2006, 2012; Kingston et al., 2007; Noel-Weiss, Rupp et al., 2006). A new intervention could involve a system of lending DVDs or providing simple posters to women to take home and watch them with family and friends as many times as they would like. This type of intervention provides opportunity for women to use symbolic modelling repeatedly and explore their concerns with their partner and family or friends. Women can also be encouraged to have cognitive rehearsal. Women can be asked to visualise themselves breastfeeding and enjoying bonding with their babies.

**Strategies for verbal persuasion**

The way health professionals or the people in women’s support networks provide verbal persuasion is very important for first-time mothers. The following elements can be considered during verbal persuasion:

a) attention to the successful or improved aspects of breastfeeding performances; (b) reinforcement of positive breastfeeding skills; (c) provision of consistent advice on how to improve future breastfeeding performances; (d) encouragement to recall the positive aspects of breastfeeding performances purposefully rather than to dwell solely on performance deficits; (e) provision of anticipatory guidance to acknowledge normalize maternal anxiety, stress, and fatigue; and (f) proactive attention to making the unobservable
breastfeeding skills apparent to the mother, such as envisioning successful performances, thinking analytically to solve problems, managing self-defeating thoughts, and persevering through difficulties. (Dennis, 2003, p. 743)

Interventions that are based on Self-efficacy theory have to incorporate these important elements when they provide feedback and support for women during antenatal and postpartum periods. Additionally, women’s progress needs to be reinforced without telling them that they had to work hard to overcome the obstacles; instead, women need to be encouraged to measure their success without comparing themselves with others.

**Strategies for physiological and affective states**

The interventions that prepare women to be efficacious in their breastfeeding ability must include strategies that address women’s physiological and affective states. These strategies may include some discussions that normalise breastfeeding challenges and physiological changes for both mothers and babies. For instance, women need to know that it is normal to feel tired and sore after birth due to physical effort during labour and birth. They need to know that it is normal for a newborn baby to be sleepy between 2 and 20 hours after birth and alert and active the next day (International Lactation Consultant Association, 2012). I believe it would be a useful strategy to encourage women to connect to their family and community support services, particularly if they are physically exhausted or emotionally distressed. For example, if a woman is exhausted and has sleep deprivation, she can ask for help to get some rest. If the woman communicates with another woman who has breastfeeding experience, she may moderate her emotions by knowing that there are other women who feel tired during the early breastfeeding period. Educating women on relaxation and meditation can be useful strategies as well.
Strategies from Self-Efficacy theory can be helpful, but they will not be sufficient to promote breastfeeding to six months; because using one’s own power integratively is crucial to women to be able to achieve prolonged breastfeeding. Theory of Birth Territory and Midwifery Guardianship will provide an explanation on how a woman’s inner power can impact on her breastfeeding self-efficacy and her decision to continue breastfeeding.

**Theory of Birth Territory and Midwifery Guardianship**

The theory of Birth Territory and Midwifery Guardianship is also known as *Birth Territory Theory*. This theory is based on the empirical experiences of midwives, researchers and childbearing women (Fahy et al., 2008; Fahy & Parratt, 2006; Fahy, Parratt, Foureur, & Hastie, 2011). The theory of Birth Territory is about supporting women in drawing from the deep, hidden capabilities within their embodied selves as they respond to childbearing challenges (Fahy et al., 2011). In this theory, birth refers to that period extending from peri-conception to early parenting. The theory is therefore applicable to the woman and the baby at all stages of childbearing, including the postpartum period and breastfeeding (Fahy, 2008).

The concept of *birth territory* is defined in this theory as the environment that is external to the woman and her baby; it encompasses the physical features of the environment (*the terrain*) and the use of power by people within that environment (*jurisdiction*) (Fahy, 2008; Fahy, et al., 2011). Birth territory can be conceptualised as the individual space during the childbearing period. The concept of birth territory also can be conceptualised as a broader space, such as maternity units and health-care services that operate as integrated social systems. At the highest level, birth territory includes historical, regulatory, legal, professional and political frameworks that direct, limit and control what is possible in the
individual space (Fahy et al., 2008; Fahy et al., 2011). Most midwives work with women in the birth territory within the woman’s individual space.

The theory of Birth Territory describes, explains and predicts how a woman’s wellbeing as an embodied whole is affected by the integrative power or disintegrative power used by themselves or by others (Fahy et al., 2011). As a result of using integrative power, a woman is likely to feel good about herself, which will create satisfaction with breastfeeding and greater adaptation after birth and during early mothering. The midwives’ role in this theory is to support women and others inside the territory to use integrative power instead of disintegrative power (Fahy et al., 2008). As birth territory is not limited to labour and birth, I have extracted the breastfeeding territory concept from the theory of Birth Territory, whereby women’s breastfeeding territory is the focus for midwives to respect and protect. The concept of breastfeeding territory is explained at the end of this chapter. The main concepts involved in the Birth Territory theory include terrain, jurisdiction, embodied self, integrative and disintegrative power, and midwifery guardianship. These concepts are defined and discussed below.

The terrain

In Birth Territory theory, terrain refers to the physical, geographical and dynamic features of individual childbirth space that affects women and babies (Fahy, 2008, p. 18). Women may find their terrain a place to optimise their ease, comfort and privacy. This type of terrain, called sanctum, makes the woman feel safe and confident (Fahy et al., 2011). According to Fahy (2008, p. 18), “an experience of ‘sanctum’ protects and potentially enhances the woman’s embodied sense of self; this is reflected in optimal physiological function and emotional wellbeing”.

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In contrast, the woman may find that her terrain is a *surveillance environment*, in which she feels unsafe and uncomfortable because other people are pushing her to do what they think is right for her. Fahy (2008) postulates that deviation from sanctum will reduce the woman’s sense of self, inhibit physiological function and reduce emotional wellbeing by causing emotional distress. For instance, when a woman feels pushed to breastfeed by her support people or health professionals, her normal physiological reaction can be inhibited by her emotional stress. This will result in malfunction of the woman’s *let-down reflex*, which can lead to low milk supply perception (Foureur, 2008).

**Jurisdiction**

*Jurisdiction* in birth territory refers to the power to do as one wants within the birth environment (Fahy, 2008, p. 18). *Power* is defined as an energy that makes a person enabled to do or obtain what the person wants (Northrup, 1998). The power can be internal or external. Jurisdiction varies between two types of power: *integrative power* and *disintegrative power* (Fahy et al., 2011). These two concepts, which are directly related to Midwifery Guardianship, are discussed below. However, the underlying concept that is essential to understanding all the concepts associated with jurisdiction will be discussed first.

**Embodied self**

The embodied sense of self is felt as a living body, embodied ego and spiritual being (Parratt, 2010). Parratt (2010, p. 28) defines the embodied self as the integration of body, mind and soul as a whole. According to Parratt (2010), the sense of embodied self-changes over time based on interactions between the woman’s intrinsic power and the external powers operating in her environment. The embodied self is able to create unique strategies to deal with challenges that arise during breastfeeding. To be able to optimise a woman’s
sense of self during lactation, midwives need to enhance her capacity to feel herself as an embodied whole and intrinsically powerful person. There are three major sub-concepts of the embodied self: (a) the living body; (b) the embodied ego; and (c) the spiritual being (intrinsic power). Each of these sub-concepts is explored below.

**The living body**

The living body is defined as a diverse biological organism that grounds the existence of the self as an embodied being (Parratt, 2010, p. 3). According to Parratt (2010), the living body is experienced uniquely by each person as new sensations and patterns of behaviour are internalised as bodily knowing. For instance, because a woman’s biological body is able to produce breast milk, if she initiates breastfeeding, after a while her body will internalise her breastfeeding sensations and patterns as bodily knowing behaviour, and that will help her continue breastfeeding with little or no conscious effort. Other examples of bodily knowing behaviours are eating, walking and driving a car. We eat, drink, walk and even drive a car without noticing them; originally we had to learn each difficult-to-master task. Bodily knowing behaviours are influenced by the embodied ego, and by intrinsic and extrinsic power (Parratt, 2010). For example, if a woman feels secure and intrinsically powerful, she is more likely to experience the let-down reflex and enjoy her breastfeeding moments.

**Embodied ego**

The embodied ego is made up of the rational, reflective, self-defining, values-based power of the embodied self (Parratt, 2010, p. 4). Embodied ego is developed in response to socialisation to keep the self safe and secure (Parratt, 2010). The ego is an embodied power that allows people to reflect on specific moments and make choices by contrasting, comparing and prioritising what our senses tell us about the safety of our embodied self.
According to Lacan (2002), the ego assesses and interacts reflectively with itself and the world around it to maximise sense of self and return to a state of secure wholeness (Parratt, 2010). For instance, if a woman observes breastfeeding practice as a social norm and a well-respected practice in society, her embodied ego rationalises breastfeeding as a safe action to perform. Scandinavia, where breastfeeding has been supported and accepted as a social norm and breastfeeding in public is not an embarrassing culture, provides an empirical example (Countries and their cultures, 2014). High breastfeeding initiation rates and continuation of breastfeeding among Scandinavian women is well known worldwide (Renfrew et al., 2005). However, in a society where breastfeeding is not well supported, women feel unsafe and uncomfortable breastfeeding in their social environment and the embodied ego creates boundaries and a disconnected sense of self (Brown, 2015). Ego tries to find a balance between rational and non-rational, conscious and unconscious desire (Fahy & Parratt, 2006; Parratt, 2008). Women in non-supportive environments need a strong inner power to overcome the ego’s boundaries. Inner power is explained in the discussion of intrinsic power below.

**Spiritual being (intrinsic power)**

The spiritual being is the part of the self which contains an indivisible part of the universal energy in a human being (Parratt, 2010); according to Kovel (1991), it is experienced as *soul*. The soul is free of what is rationalised by people, and it can achieve things that appear impossible to the ego. *Spirit* is defined as the power that drives the world and the cosmos (Parratt, 2010, p. 2). Spirit as the *inner self* is non-verbal, and communicates by emotion and symbols (Kovel, 1991). The power of spirit is beyond thinking. Spirit may be experienced as an energy or a strong feeling of interest, as an intuitive sense, or as the life giving force of breath that promotes the person to achieve the maximum level of health and wellbeing (Parratt, 2008).
The power of *inner self* in relation to embodied self is referred to as *inner power* or *intrinsic power* (Parratt, 2010). Parratt (2010, p. 28) defines intrinsic power as a non-rational spontaneous power experienced in the current moment that affects future knowing, action and power in both complex and not-so-complex ways. Intrinsic power interacts continuously with the ego and the world around the person. Intrinsic power can be experienced and expressed as love, joy and instinct (Parratt, 2010, p. 28). The power of inner self can be accessed by putting the mind and ego out of the way. This type of access to inner power has been observed when women enjoy skin-to-skin contact with their baby immediately after birth. Women can also access their intrinsic power when they feel deeply bonded to their children and when they feel strong emotional connection during breastfeeding (Racine et al., 2009). According to Racine, Frick, Carpenter, and Pugh (2009) women who are intrinsically motivated breastfeed for longer than women who are extrinsically motivated by the people around them. Women should be guided and encouraged to connect with and trust their body and their intrinsic power. Normalising challenging experiences, providing guidance and giving options are other ways to increase intrinsic power (Parratt, 2010).

**Integrative power and disintegrative power**

Integrative power is the integration of all forms of power within the environment to achieve a shared goal (Fahy & Hastie, 2008; Fahy & Parratt, 2006). Integrative power aims to support a woman in responding spontaneously and expressively to her bodily sensations and intuitions (Fahy & Hastie, 2008, p. 22). The use of integrative power integrates women’s body, mind and spirit as a whole and results in optimised psychophysiological wellbeing\(^4\) (Fahy & Hastie, 2008). Providing a physically and emotionally safe environment is very important to enhance the use of integrative power (Fahy et al., 2008).

\(^4\) Optimised psychophysiological wellbeing is the experience of mind, body and soul working together in a way that is most advantageous to the embodied self (Parratt, 2010, p. 28).
For instance, a woman who initiates breastfeeding in the birthing room needs a quiet and private place with minimum stimulation to enjoy the first moments with her child and her family. When a woman trusts her body and connects to her inner power, the "loving hormone" (oxytocin) will be released from the brain, which creates feelings of calm (Foureur, 2008; Uvnas-Moberg, & Petersson, 2005). Oxytocin also improves the mother’s learning abilities, enhances her social memory and facilitates love and attachments (Uvnas-Moberg, & Petersson, 2005). Enhanced integrative power enables women to feel good about their embodied self and adapt easily to early mothering.

In contrast, disintegrative power disintegrates all forms of the power within the environment (Fahy et al., 2008; Fahy & Parratt, 2006). It is an ego-centred power and anybody in the territory, including the woman, the midwife and the partner, can use disintegrative power (Fahy et al., 2008, p. 22). Disintegrative power in any form impairs the woman’s ability to respond spontaneously to her bodily sensations and intuition (Fahy et al., 2008). When a woman is forced by midwives or by her partner to breastfeed, her own inner power will be cut off. In such cases, she might initiate breastfeeding in the hospital as a result of her ego-centred need to feel emotionally safe from criticism. However, once she leaves the hospital she might stop breastfeeding and then feel a diminished sense of self. Disintegrative power destroys the unity of mind, body and spirit (Fahy et al., 2008). A woman who uses her egoic power to continue breastfeeding will limit her intrinsic power (inner power), which would make the woman feel less good about herself. Following forced breastfeeding, a woman’s feeling of self-appreciation will be limited sooner or later. She will stop breastfeeding, as she would not be satisfied with her feelings. As a midwife and IBCLC I have observed many women who, after breastfeeding cessation, have expressed their anger towards hospital policies, midwives and themselves. It is the responsibility of the midwifery guardian to prevent situations where these feelings
may arise, and to work consciously to create an improved sense of self in a way that the woman feels herself as an embodied whole and intrinsically powerful person; this encompasses an increased capacity to optimise psychophysiological wellbeing (Fahy & Hastie, 2008; Parratt, 2010).

Midwifery Guardianship

Midwifery guardianship, a sub-concept of integrative power, promotes the use of integrative power by women during childbearing (Fahy et al., 2008, p. 22). Anybody, regardless of their profession, who takes the role of being truly with woman can provide midwifery guardianship (Fahy et al., 2011). For instance, doctors who support women to feel strong and enhance women’s integrative power can act as guardians. However, midwives who are dominating can diminish women’s sense of self by using disintegrative power (Fahy et al., 2011). Midwifery guardianship, therefore, is open to midwives, doctors and support people. Midwifery guardians enable women to slow down their everyday thinking mind, trust their body and stay connected with their intrinsic power (Fahy & Hastie, 2008). The desired outcome of midwifery guardianship is to assist women to feel strong and empowered during breastfeeding even if their breastfeeding experience does not go the way they had planned.

Breastfeeding territory

The concept of breastfeeding territory has been extracted from the theory of Birth Territory and Midwifery Guardianship. Breastfeeding territory refers to the woman’s territory whenever and wherever she wants to breastfeed. Breastfeeding territory can be perceived as a sanctum or surveillance area. A breastfeeding sanctum is any place where

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5 Improved sense of self is an enhanced capacity to feel oneself as an embodied whole and intrinsically powerful person; this encompasses an increased capacity to optimise psychophysiological wellbeing (Parratt, 2010, p. 28)
the woman feels safe and comfortable to breastfeed her child with love and care. When the place is perceived as being under surveillance, it creates emotional distress with autosomal arousal; I believe this can inhibit the woman’s mind and body from breastfeeding successfully. When the woman perceives her breastfeeding territory as a sanctum, the release of oxytocin is facilitated; this, in turn, enhances bonding with her child, optimises her physiological wellbeing and – most importantly – lets her spirit soar.

Guardianship of the breastfeeding territory involves the midwife using his or her power integratively with the woman, aiming to support the woman to draw on her deep, inner, embodied power to optimise her sense of self during lactation. In my opinion, midwives can also encourage the woman’s social support people to be breastfeeding guardians by using their power integratively to enhance the woman’s sense of security in her breastfeeding territory. For instance, a woman’s family and friends can provide her with the emotional support and physical assistance to create and maintain an environment that is perceived to be a breastfeeding sanctum; in such a sanctum the woman can then feel secure enough to let her bodily sensations and intuition take over during breastfeeding. Therefore, it is important to involve women’s support people in breastfeeding educational programs and encourage them to learn how to provide emotional support, express trust, create a safe and pleasant environment, give positive feedback and offer physical assistance.

**Conclusion**

This chapter has described and applied the theories of Self-efficacy and Birth Territory to the theoretical framework for this study. Perceived self-efficacy is about exercising control and regulating thoughts, emotions and environmental factors. Individuals’ perceived self-efficacy is influenced by multidimensional information, including previous experience, vicarious experience, verbal persuasion and physiological responses. However, it is
important to recognise that there is a power apart from the cognitive side of women; this power can drive women to continue and enjoy breastfeeding without controlling their surroundings. In my practice as a midwife and lactation consultant I have come across many angry women who felt that they were pushed to breastfeed against their will. I have also consulted women who felt guilty when they stopped breastfeeding, because they lost the control and felt defeated. Women will often discontinue breastfeeding if they choose to breastfeed just because of other people’s wishes or if they do not believe in it.

Women’s breastfeeding decisions should come from their inner self, not as a result of social pressure. Intrinsic power comes from within the woman; it helps women embody breastfeeding for a long period of time. Therefore, creating a healthy balance between intrinsic and extrinsic power in women’s breastfeeding territory boosts women’s breastfeeding confidence and helps they process self-efficacy information in a way that enhances their sense of embodied self. This, in turn, results in optimised physiological wellbeing. Midwifery guardianship enables midwives to protect women’s breastfeeding territory and to help women improve their sense of self as embodied whole selves. When midwifery guardianship is successful, women will feel good about themselves regardless of their breastfeeding practices. Both Self-efficacy theory and Birth Territory theory strengthen my study in terms of breastfeeding intention, confidence and social support.
Chapter Four: Methodology

Introduction

Chapters Two and Three provided an evidence-based and theoretical framework for designing The Milky Way Program to increase breastfeeding rates at six months. This chapter describes the methodology used in the study to answer the research question. The chapter begins with a discussion about the study design, setting and population. It then describes the intervention and data collection methods, including the reliability and validity of the tool, and gives an overview of the data analysis (Chapter Five contains more details and specific descriptions with the results).

Study design

This study was a quasi-experimental design to compare the breastfeeding outcomes for two groups of women: one group received standard hospital maternity care (standard-care group) and the other group received both standard care and The Milky Way Program (intervention group). Quasi-experimental designs are experimental studies where a researcher implements an intervention without either control group or randomisation (Elliott and Thompson, 2007). The hospital standard care and The Milky Way Program are described in detail in this chapter. The initial plan was to conduct a randomised controlled trial; however, on the advice of the methodology supervisor, that plan was changed to a quasi-experimental design with different recruitment points for the standard-care and intervention groups. The concern was the possibility for exchange of information between the two groups of women, leading to contamination of data which might have affected the internal validity of the study. Internal validity refers to whether the intervention (independent variable) has a real measurable effect on the outcome (dependent variable). Internal validity of a study is compromised if confounding factors influence and jeopardise
the results (Elliott and Schneider, 2007, p.199). Another reason for using a quasi-experimental design was to avoid participants’ perceptions that their care was inequitable if some received breastfeeding education and others did not. For these reasons, the standard-care group was recruited first, and the recruitment of the intervention group commenced after the last antenatal visit of women in the standard-care group. However, to reduce the selection bias or any possibility of favouring an outcome, primary analysis was performed on an intention-to-treat basis: all women, regardless of whether they satisfied the entry criteria, the treatment received and subsequent withdrawal, were included in the data analysis to measure the primary outcome.

The intervention was a multi-phased program, and the effectiveness was measured by checking and comparing the antenatal baseline characteristics of the groups, assessing breastfeeding rates (yes/no) based on intention-to-treat and adjusting the breastfeeding outcome based on major confounding factors.

**Setting**

The study was conducted at Liverpool Hospital, a large, tertiary-referral public hospital in New South Wales, Australia. It is situated in metropolitan Sydney, located within the South Western Sydney Local Health District. According to the Centre for Epidemiology and Research (2011), a tertiary-referral hospital provides the highest level of care and specialisation and function as a university teaching hospital. The women and children division at Liverpool Hospital, which is classified as providing Level Six maternity services, undertakes approximately 3,200 confinements a year (Centre for Education and Workforce Development, 2011). Level Six maternity services provide a range of services from low-risk to the most complex cases. They have 24-hour onsite access to specialist obstetricians and anaesthetists through a Neonatal Intensive Care unit (Centre for
Epidemiology and Research, 2011, p. 13). Liverpool Hospital was selected for the study as it was a part of Sydney South West Area Health Service where the second lowest rates of breastfeeding at six months in NSW (28.6%) was reported in 2001 (Hector, Webb, et al., 2004).

**Ethics Approval**

The research project commenced after obtaining ethics approval from the Sydney South West Area Human Research Ethics Committee (approval number: 08/LPOOL/212) and the Human Research Ethics Committee of Newcastle University (approval number: H-2008-0152). Ethics Approval was granted from the Human Research Ethics Committee of Southern Cross University after transferring the study from University of Newcastle to the University of Southern Cross (approval number: ECN-11-213) in September 2011.

The key ethical concerns that were addressed in the ethical proposal were free and fully informed consent, and non-maleficence including maintaining anonymity and privacy. Women were recruited by the staff of the antenatal clinic to ensure that no-one felt coerced to participate. Women were free to drop out of the study without giving reasons and with no risk that their relationships with care providers would be damaged; this was described clearly in the information and consent forms. Women’s verbal consent was also sought at the beginning of each follow-up telephone call to make sure that women still consented to participation in the study.

Confidentiality of the participants’ information was respected during and after completion of the study. During the study, hard copies of consent forms and data were stored in a locked cabinet in the researcher's office, which was only accessible to the principal researcher. Data were coded, and participants’ names and contact information were filed
separately from the data files. Electronic data were kept in the researcher’s computer with password access. After completion of the study the results were sent to participants who had requested them. Electronic data were filed at the University of Southern Cross on a CD; data will be stored and destroyed based on the university policy. All other data kept by the researcher, including consent forms, names, telephone numbers and addresses of the participants, were destroyed. The full, approved ethics application is attached as Appendix 3.

**Power and Sample Size**

Based on a Department of Health report in 2004, only 28.6 percent of women from Sydney South Western Area Health Service were breastfeeding at six months (Hector, Webb, et al., 2004, p. 17). Considering that about 30 percent of the population breastfed at six months in 2004, the assumption was made to expect 40 percent breastfeeding rates for the standard care group during the study. Based on other similar intervention studies, I consider a small increase of 17 percent in breastfeeding rates in the intervention group to be practical.

The difference of 17 percentage points would require a sample size of 133 in each group to detect significant differences with 80 percent power and a Type I error rate of 5 percent. Considering a minimum 25 percent attrition rate, the total required sample size was calculated to be a minimum of 354 participants (that is, 177 in each group). In addition, it was intended to over-sample both groups due to risk of unexpected drop out; thus 200 women would be needed in each group to arrive at a total sample of 400.

**Study Population**

The study population was women from a large culturally and linguistically diverse (CALD) childbearing population who booked at Liverpool Hospital to receive maternity care. Based on the 2009 "Mothers and Babies" report from the NSW Department of
Health, the main maternal cultural backgrounds in the South Western Sydney Local Health District were Anglo-European, Middle Eastern, South-east Asian and South Asian (Centre for Epidemiology and Research, 2011). The majority of the population was between 25 and 34 years old. A small percentage of the population was Aboriginal or Torres Strait Islander (1.3%). The majority of women commenced antenatal care prior to 20 weeks' gestation (82.6%). Less than 10 percent of women reported smoking in the second half of pregnancy (Centre for Epidemiology and Research, 2011). It was important that The Milky Way Program recruit a sample of women who reflected the cultural and linguistic diversity of the population. However, due to minimal funding available for the research and challenges such as difficulties of arranging interpreters and the cost of translating documents, women from different ethnic backgrounds who were not English-literate were excluded from the study. Considering these valid reasons, this means that the recruited sample may not have been representative of the population to which the intervention was applied, and the results could be biased.

**Study sample**

The participants were nulliparous women who intended to breastfeed and who were booked into Liverpool Hospital for their first antenatal booking visit. The inclusion criteria are listed below, and the reasons for those criteria are explained later in this chapter.

**Inclusion criteria**

The inclusion criteria for recruitment were:

- being interested in breastfeeding;
- nulliparous;

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6 Nulliparous is referred to a woman who has never completed a pregnancy after 20 weeks (Cunningham, et al., 2010)
- age minimum 19 years (20 years by the birth of the baby);
- singleton pregnancy;
- absence of any medical contraindication to breastfeeding;
- ability to speak, read and write English.

Additional inclusion criteria for continuing in the study were:
- baby born alive at or after 37 weeks' gestation;
- baby had no congenital or medical conditions that preclude breastfeeding.

Exclusions
Eligibility to participate was rechecked by the researcher through the hospital computer system, and each time a woman was contacted by telephone. The main reason for the recheck was to prevent contacting women who might have had any miscarriage, termination, stillbirth or neonatal death. The women who were no longer eligible for inclusion in the study (based on the criteria) were excluded from the study. Eighteen participants were excluded from the intervention group and fifteen from the comparison group for the following reasons: women moved their care to another hospital or had multiple-pregnancy, miscarriage, termination of pregnancy, preterm birth or stillbirth, or there was neonatal death.

Rationales for inclusion criteria
The inclusion criteria were chosen to allow the elimination of some variables that are known to create extra challenges for women to continue breastfeeding. I have discussed these variables in three parts. First, having previous breastfeeding experience could have positive or negative effects on women’s breastfeeding practice (Bolling et al., 2007; De Oliveira et al., 2006; Forster et al., 2006; Racine et al., 2009). For instance, in an infant-
feeding survey in the United Kingdom, 73 percent of the multiparous women who had breastfed their first child for less than six weeks stopped breastfeeding in the six weeks after birth, and only around 10 percent of those women were breastfeeding at six months; in contrast, 83 percent of the multiparous women who breastfed their first child for six weeks or more were still breastfeeding at six weeks, and more than half of those women were still breastfeeding at six months (Bolling et al., 2007). Thus, including multiparous women in The Milky Way Program would have made it hard to compare them with the women who had no previous breastfeeding experience. For that reason only nulliparous women were included in the study. Nulliparous women who intended to artificially feed their babies were not included in the study, as they had already made their decision; and ethically, that decision needed to be respected.

Second, very young maternal age is an important variable in breastfeeding outcome. For instance, breastfeeding initiation rates and duration among adolescent mothers are lower than for mothers who are beyond their teen years (Monteiro, Stefanello, Nakano, & Gomes-Sponholz, 2014; Wambach & Cole, 2000). Data from an infant-feeding survey in the United Kingdom (2007) demonstrated that adolescent mothers were five times less likely to continue any breastfeeding at six months (5%) compared with adult mothers (28%) (Bolling et al., 2007). Low breastfeeding rates among teenagers have also been reported in Australian populations (Hure, Powers, Chojenta, Byles, & Loxton, 2013). For instance, in a longitudinal study of Australia’s children (LSAC) in 2009 (N= 9,773), only 38 percent of teenage mothers continued any breastfeeding at six months, whereas more than 60 percent of adult women continued any breastfeeding at six months and beyond (Hure et al., 2013).
Third, other variables including multiple births, prematurity and severe maternal or neonatal conditions can also make breastfeeding more challenging (International Lactation Consultant Association, 2012). For instance, in an Australian cohort study (N = 4679), multiple birth was associated with early introduction of formula (during the first month postpartum) (Baxter et al., 2009). In the Australian study (N = 9773), having a premature or low-birth-weight infant was associated with low breastfeeding rates at six months and beyond (Hure et al., 2013). Furthermore, there are some severe maternal or neonatal conditions that absolutely contraindicate breastfeeding (National Health and Medical Research Council, 2003). For instance, based on the Australian Dietary Guidelines for Children and Adolescents (2003), maternal infection with human immunodeficiency virus (HIV) is an absolute contraindication for breastfeeding (National Health and Medical Research Council, 2003). Infant metabolic disorders such as galactosaemia or maple syrup urine disease are also considered as contraindications for breastfeeding (National Health and Medical Research Council, 2003). For the relative or absolute negative effects of these conditions on breastfeeding outcome, women who did not meet the inclusion criteria were excluded from the study.

As discussed earlier, due to limited research funds, I was not able to translate the educational resources or the survey forms to different languages. Therefore, women who needed an interpreter at their booking visit were not included in this study.

**Recruitment**

The clerical staff in the antenatal clinic aimed to invite all nulliparous women who attended the clinic for their antenatal booking visit to join the breastfeeding study. Women who were interested in the study were given the information, consent and antenatal survey forms (Appendices 4, 5, 6, 7, and 8). It was hoped that women would take the opportunity
to read the forms while they were waiting for their appointment. During the visit the midwives explained the study to the women based on the information sheet, and allowed them to ask questions. If the woman wanted to participate, informed consent was obtained. Women were assured of their right to withdraw from the study at any point without prejudice to their care or their relationship with their care providers. Obtaining consent and providing information were undertaken in line with the National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council, 2007).

Women’s free choice to participate and not feel pressured was honoured by the following process. Women did not have to submit their consent forms to midwives who were providing their care; instead they were asked to approach the clerical staff after the booking visit to submit the signed consent forms if they wished to participate. The consent and survey forms were deposited in a labeled box outside the midwives’ room next to the clerical desk.

Women in the intervention group were invited to attend the breastfeeding classes that had been designed specifically for this study with their partners or their support people. The information about the date and time of the classes, venue and location was sent out by the hospital’s parenting-education section (Appendices 8 and 9).

**Stages of recruitment**

The recruitment of the study had three stages. In the first stage, women were recruited for the pilot study beginning in February 2009. The pilot study is described in this chapter. The second stage commenced after completion of the pilot study in June 2009. At the second stage, all the women were allocated to the standard-care group, as there was no intervention in that stage of the study. The last stage commenced after the final antenatal
visit of the last participant in the standard-care group in July 2010. All the women who were recruited in the third stage were allocated to the intervention group.

Several introduction sessions for the staff members were held in the antenatal clinic prior to the commencement of each recruitment stage. The target groups were the midwives, clerical staff, nurse unit manager and clinical midwifery educator in the antenatal clinic. In these sessions I explained about the study, including the recruitment and consent process. The staff also had opportunity to ask questions and discuss their concerns. During the study a few more introduction sessions on the recruitment and consent process were planned to keep the new and rotating staff well trained.

**Issues in recruitment and consent**

Recruitment and gaining consent from women for the standard-care groups occurred according to the plan. Many nulliparous women were interested in the study. Recruitment of the standard-care group took about four and half months, from June 2009 to October 2009. Recruitment of the intervention group took about nine months, from July 2010 to April 2011. During the recruitment of the intervention group there were a few difficulties resulting from staff shortages, staff workload and changes in the hospital layout. The clerical staff member, who was the main person giving out the study information and survey forms, was promoted; and not long after that, the second key member went on annual leave. There was only one clerk left in the clinic who was confident with inviting women to participate and giving out the forms. There were several casual clerks who worked in the clinic during this time. The midwives were thus required to complete the clerical duties while they also did their own job. Therefore they did not have enough time to invite women, which slowed the recruitment process. At this stage, several attempts were made to increase the recruitment numbers. I went to the antenatal clinic to monitor,
assess and assist the recruitment process without becoming directly involved in inviting women. Midwives were asked to recruit women during early antenatal visits. Reminder notes were placed in the midwives room and the clerical desk to hand out the forms and invite women to participate. Finally, a permanent clerk was appointed to the job and the other clerk came back to her duty. The new clerk was trained on the recruitment and study processes and recruitment numbers increased.

Three months after this challenging period, slow recruitment was noticed again. This time the layout of the hospital was changing and the hospital premises were expanding. The antenatal clinic had to completely move to another building. Staff members were busy packing and preparing to move out. I went back to the clinic and liaised with the manager to come and help with the new settlement to have an opportunity to assess and keep the recruitment process moving. Finally, everything came back to normal, but because of these problems, the recruitment process for the intervention was twice as long as for the standard-care group. Finally, a certificate of appreciation was given to the staff in the antenatal clinic to recognise and acknowledge their participation in the study process.

**The Pilot Study**

A pilot study was conducted between February 2009 and April 2009 with the aim of assessing: (a) the effectiveness of the recruitment process; (b) the appropriateness of the data-collection tool; (c) the reliability of the modified short form of the breastfeeding self-efficacy scale; and (d) retention of the participant at one month after recruitment.

In the pilot study 12 women were recruited at their 36-week checkup visit. Women in the pilot study received the hospital standard care, and they were followed for one month. This follow-up period was chosen due to the limited timeframe for the main study. During the pilot study women took the invitation positively and they were interested in participating in
the study. No specific issue was identified during the recruitment process. The data-
collection tool was tested and worked well; no concerns were identified. Women were able
to read the antenatal survey form easily and answer the questions with no problem; thus no
changes were required. The postnatal interviews went well and no changes were needed.
Reliability of the modified short form of the breastfeeding self-efficacy scale (BSES-SF)
was evaluated using Cronbach’s alpha coefficient. The result was a Cronbach’s alpha
coefficient of 0.83, which was higher than the minimum acceptable number of 0.70
(Tavakol & Dennick, 2011). No participant chose to leave the pilot study. Only one
woman was excluded from the study due to a severe neonatal medical condition.

**Standard Care**

The standard care was the maternity care routinely provided to pregnant women at
Liverpool Hospital during the study. Standard maternity care involved an initial booking
visit with a certified midwife followed by a regular antenatal visits until 40 weeks of
pregnancy (every four weeks until week 28, every two weeks until week 36 and thereafter
every week until week 40). The antenatal care was provided by one of the following
health-care professionals: hospital midwife, midwifery student under the supervision of a
registered midwife, hospital medical officer, private obstetrician or general practitioner.
There was no midwifery group practice among the models of care; however, some women
had continuity of care with midwifery students. Some women After 40 weeks, antenatal
care was provided by the hospital obstetric team or the woman’s private obstetrician.
Women may, or may not, have discussed their breastfeeding concerns with their midwives
or doctors during their antenatal care. Antenatal parenting education classes were offered
to all pregnant women and their partners. The classes included a two-hour session on
breastfeeding and setting techniques if the couples were interested in breastfeeding their
infants. According to the nurse unit manager in Women and Children’s Health Outpatients
department, only about 10 percent of women attend breastfeeding education sessions at Liverpool Hospital.

As the part of standard care and the hospital policy, women after vaginal birth should have been offered skin-to-skin contact with their newborn babies. Postnatally, midwives supported breastfeeding women and invited them to attend daily breastfeeding classes on the ward. There was also a full-time lactation-resource midwife in the hospital who was an IBCLC and provided extra support and follow-up for the women who had breastfeeding challenges. Average stay in the hospital was two to three days for normal births and four to five days for caesarean births. Women with long-term breastfeeding issues were referred to the Child and Family Health Centre in Hoxton Park for further follow-up in the community. These women were followed up by a designated lactation consultant. These centres were called Early Childhood Health Centres (ECHC) at the time of the study. Child and Family Health Centres, community resources available for women, provide health care and support to families with children 0-5 years.

The available standard care was checked several times during the study to identify any changes in terms of providing breastfeeding education or support in the hospital and the community centre. A substantial change occurred during the intervention part of the study. The lactation-support midwife reduced her hours from full-time to part-time (working only two days a week). Staff members' breastfeeding knowledge and skills of staff were mixed due to staff shortages. Registered nurses and midwifery students who had little or no training in breastfeeding support were working in the postnatal ward, as were midwives who had extensive experience in breastfeeding support. However, breastfeeding support in the Child and Family Health Centre remained the same during the whole study.
Sources of Antenatal Breastfeeding Information

Women’s source of antenatal breastfeeding information was questioned in the first postnatal data collection point, which was at one month postpartum. Without considering The Milky Way Program, more women in the standard-care group received antenatal breastfeeding information through different sources compared to The Milky Way Group (37.9% vs. 21.1%, \( p < .001 \)) (Table 2). About 70 percent of women (n = 106) in the intervention group attended the antenatal breastfeeding sessions that were specifically offered by The Milky Way Program.

<table>
<thead>
<tr>
<th>Sources of information</th>
<th>Milky Way n = 152</th>
<th>Standard care n = 190</th>
<th>( p ) value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received antenatal breastfeeding information regardless of the intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>32 (21.1)</td>
<td>72 (37.9)</td>
<td>&lt;.001(^a)</td>
</tr>
<tr>
<td>Source of information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Midwife</td>
<td>8 (5.3)</td>
<td>19 (10.1)</td>
<td>.111</td>
</tr>
<tr>
<td>• Parent educator</td>
<td>17 (11.2)</td>
<td>24 (12.6)</td>
<td>.739</td>
</tr>
<tr>
<td>• General practitioner</td>
<td>1 (0.7)</td>
<td>2 (1.1)</td>
<td>1.000</td>
</tr>
<tr>
<td>• Hospital doctor</td>
<td>0 (0)</td>
<td>6 (3.2)</td>
<td>.036(^b)</td>
</tr>
<tr>
<td>• Family/friends and other</td>
<td>6 (2.6)</td>
<td>27 (8.9)</td>
<td>.001(^c)</td>
</tr>
</tbody>
</table>

Note: A chi-square test was performed to examine differences between the allocated groups. Fisher’s exact test was used if the test violated minimum expected cell frequency.

\( a: \chi^2 (1,342) = 57.2, p < .001 \)

\( b: \chi^2 (1,342) = 4.8, p = .036 \)

\( c: \chi^2 (1,342) = 10.2, p = .001 \)
The Milky Way Program (Study Intervention)

The intervention of the study was a theory- and evidence-based multi-phased intervention called The Milky Way Program. The Milky Way Program included three antenatal educational group sessions and two postnatal follow-up phone calls.

The antenatal group sessions started in the second trimester\(^7\). Women and their partner/support person participated in groups of 10 to 20 people. Each session was conducted in a seminar room of the hospital on Saturdays during daylight. The duration of each session was 90 minutes and they were free of charge. The Milky Way Program was based on the theory of Self-efficacy and Birth Territory and Midwifery Guardianship, and addressed the three major modifiable factors that could influence prolonged breastfeeding: breastfeeding intention, breastfeeding self-efficacy and support (as discussed in Chapter Two). The key content of the classes was in aligned with World Health Organisation Ten Steps to successful breastfeeding (Baby Friendly Health Initiative Australia, 2009, p. 9). The classes included benefits of breastfeeding based on WHO recommendations, the role of skin-to-skin contact after birth and early initiation of the first breastfeed, positioning and attachment, rooming-in, how to know if the baby is getting enough milk, feeding cues, effects of bottle or dummies prior to breast feeding being fully established (Appendix 9). Additional contextual information, based on the theory of Self-efficacy and Birth Territory was included in more depth which have been addressed in the following pages.

The evidence from the literature review also demonstrated that single interventions with passive approaches to learning, including written materials and lectures, were less effective in changing behaviours (Grimshoew et al., 2001; Guise et al., 2003; Hector, King, 2001).

\(^7\) Trimester refers to a period of three months (14 weeks) during pregnancy. Pregnancy is divided into three equal time periods, each is almost three calendar months. The first trimester is from the first week to 14 weeks of pregnancy, the second is 15 to 28 weeks and the third is the 29th week to the end of 42 weeks (Cunningham, et al., 2010).
et al., 2004). Therefore, adult-learning principles, including motivation, active participation, multi-sensory learning, practice and reinforcement, using meaningful materials and relevancy-oriented topics, were used in the intervention. Women were asked to come to the antenatal sessions with their partner or other support people. The purpose of this invitation was to involve women’s social support in their breastfeeding journey. My skills and experiences as a woman with long-term breastfeeding experience (more than two years), as a midwife, as a lactation consultant and as a parent educator also influenced the design and implementation of the program (as summarised in Chapter One). The Milky Way Program was built and delivered based on its strong theoretical foundation. Self-efficacy-enhancing strategies were used in The Milky Way Program; and women and their support people were guided in how to use integrative power and how to protect the woman’s breastfeeding territory in terms of providing sanctum where the woman feels safe to breastfeed. More details are provided below.

Self-efficacy-enhancing strategies in The Milky Way Program were based on the four primary sources of self-efficacy:

(a) Performance accomplishments (role mastery): women and support people were asked to participate in a number of simulated scenarios. Problem-solving activities were exercised through a number of role plays to overcome most common barriers in breastfeeding. Women were also encouraged to practice different positions for breastfeeding and practice hand or pump expressing on a synthetic breast.

(b) Vicarious experience (learning from others): breastfeeding postcards, breastfeeding photos from birth up to one year of age, a breastfeeding DVD (Breast Is the Best) and a breastfeeding calendar containing women’s testimonials were given to women in the
class to watch and talk about it, and they were asked to take them home and share the
discussion with their friends and families. Women were also encouraged to find and
communicate with a breastfeeding mother in their social network who had at least four
months' breastfeeding experience. Women were given Australian Breastfeeding
Association numbers to call and discuss their concerns or interests if they did not have
a successful breastfeeding woman in their social network. Using cognitive rehearsal
was introduced in The Milky Way Program. Women were encouraged to rehearse
cognitive breastfeeding by imagining that they breastfeed their newborn in a safe and
loving environment.

(c) Verbal persuasion (encouragement): women and support people were asked to explore
some positive, encouraging and realistic feedback. They were also asked to explore
some negative statements that they should avoid. Having mothers or sisters with
previous breastfeeding experience among their support people was helpful in the
antenatal classes, as they were sharing their own experiences with the first-time
mothers. During the postnatal phone calls, women were given positive feedback and
consistence advice. They were encouraged to recall the positive aspects of their
breastfeeding and to think analytically to solve their problems.

(d) Physiological responses: women and their support people were asked to participate in
hands-on activities to explore and understand normal maternal and neonatal
physiological changes or needs after birth, including babies' growth spurts. The aim of
this activity was to reduce women’s anxiety by normalising the changes. Women were
also encouraged to ask for help if they were physically exhausted or emotionally
stressed. Connecting to the Child and Family Health Centres was highlighted during
antenatal sessions and postnatal phone calls. Women were asked to visit their local
Child and Family Health Centre during pregnancy and make themselves familiar with its location and group activities.

Based on the theory of Birth Territory and Midwifery Guardianship, women were encouraged to believe in themselves and connect to their inner power during breastfeeding. Partners and support people were encouraged to use integrative power and support women in a way that increased the women’s sense of self and security. Showing empathy, love and respect to the woman’s feelings and decisions are examples of creating integrative power and enhancing the woman’s sense of self. However, pushing the woman to breastfeed or formula feed without letting her follow her instinct can damage her feelings for the rest of her life. Women were asked to perform a mental exercise at home by closing their eyes and imagining the most loving breastfeeding moment with their babies. They were encouraged to practice feeling their love and bonding to the newborn baby after birth by having skin-to-skin contact and spending a quality time with the baby. A re-lactation option without any medical intervention was also discussed as an option for women who wish to resume breastfeeding to spend time and bond with their child even after weaning.

The same principles were applied during the postnatal phone calls. Postnatal phone calls were made prior to critical times for breastfeeding cessation (Baxter et al., 2009; Hamlyn, Brooker, Oleinikova, & Wands, 2002). The first phone call was made in ten days after birth when the woman changes her environment from the hospital to home. The second phone call was at three months, when the child goes through a growth spurt and new behavioural changes, as discussed in Chapter Two. Postnatal phone calls were made to provide women with individual consultation, empower women, provide a revision session

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8 Re-lactation refers to restimulation of lactation after breastfeeding cessation (International Lactation Consultant Association, 2012). In this study re-lactation was based on: (a) spending more time in bonding; (b) offering the breast to the baby; and (c) expressing and feeding the baby with the mother’s expressed breast milk.
based on individuals’ needs, remind women how babies’ behaviour and maternal needs change from birth onwards, support women with their problem-solving strategies and connecting them to available support networks including the Australian Breastfeeding Association and Child and Family Health centres. During postnatal phone calls I provided realistic feedback to the woman about their breastfeeding capabilities. Their progress was reinforced without telling them that they had to work hard to overcome the obstacles. Women were encouraged to measure their success without comparing themselves with others.

The following table demonstrates a summary of the intervention process. More details of the antenatal sessions, including aims, learning outcomes, objectives and strategies, are outlined in the session plans (Appendix 9).
<table>
<thead>
<tr>
<th>Intervention</th>
<th>Point of Time</th>
<th>Structure</th>
<th>Aim</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Antenatal Session</td>
<td>Early pregnancy (24-28 weeks)</td>
<td>• Face-to-face group interaction (90 min) with home activity</td>
<td>• To create long-term breastfeeding motivation and intention</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For the home-activity, the “Breast Is the Best” DVD was given to each woman to watch with her support people. Women were asked to explore their thoughts, expectations and available support in their family/friend network</td>
<td>• To clarify the myths and facts around breastfeeding</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• To provide opportunity for women to explore their own available support network</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To identify the effects of people on breastfeeding through integrative or disintegrative power</td>
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<td></td>
<td></td>
<td>• To enhance participant breastfeeding self-efficacy to deal with people’s comments on breastfeeding</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To empower women to connect to their inner power and enhance their sense of self</td>
</tr>
<tr>
<td>Second Antenatal Session</td>
<td>Mid-pregnancy (28-32 weeks)</td>
<td>• Face-to-face group interaction (90 min) with home activity</td>
<td>• To understand normal physical and emotional changes/needs of a woman and a baby from birth up to six months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• For the home activity, women were asked to chat to a woman from their network with a minimum of four months’ breastfeeding experience. The ABA phone number was given to provide more options for the women to chat to other breastfeeding women in the community</td>
<td>• To empower women to communicate with their babies and to identify their needs and growth spurts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To enhance women’s breastfeeding self-efficacy to identify and maintain adequate milk supply</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To enhance women’s breastfeeding self-efficacy to deal with people who doubt their milk supply or their breastfeeding ability</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To enhance women’s breastfeeding self-efficacy to handle breastfeeding challenges during the first six months</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To connect the women to their community breastfeeding support services</td>
</tr>
<tr>
<td>Intervention</td>
<td>Point of Time</td>
<td>Structure</td>
<td>Aim</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Third Antenatal</td>
<td>Late pregnancy (32-36 weeks)</td>
<td>• Face-to-face group interaction (90 min) with home activity</td>
<td>• To achieve role mastery in practical parts of breastfeeding (different positions in breastfeeding, expressing milk by hand or storage of expressed milk)</td>
</tr>
<tr>
<td>Session</td>
<td></td>
<td>• No home activity. However, women’s attention was drawn to the stories written in their breastfeeding calendar that had been given in the first session.</td>
<td>• To increase women’s breastfeeding self-efficacy in dealing with breastfeeding issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To support women to believe in themselves</td>
</tr>
<tr>
<td>First Postnatal</td>
<td>In 10 days after birth</td>
<td>One-to-one phone consultation</td>
<td>• To empower women</td>
</tr>
<tr>
<td>Call</td>
<td></td>
<td></td>
<td>• To provide a revision session based on individuals’ needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To remind women how babies’ behaviour and maternal needs change in the first month and what to expect next</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To support women with their problem-solving strategies</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To provide individual consultation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To connect women to the ABA and their Child and Family Health Centre</td>
</tr>
<tr>
<td>Second Postnatal</td>
<td>At three months postpartum</td>
<td>One-to-one phone consultation</td>
<td>• To empower women</td>
</tr>
<tr>
<td>Call</td>
<td></td>
<td></td>
<td>• To provide a revision session based on individuals’ needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To remind women how babies’ behaviour and maternal needs change around three months and what to expect next</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To support women with their problem-solving strategies</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To provide individual consultation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• To connect women to the ABA and their Child and Family Health Centre</td>
</tr>
</tbody>
</table>
Time Frame of the Study

The study was conducted from June 2009 through April 2012. Between June 2009 and October 2009, 261 primiparous women who intended to breastfeed and did not need an interpreter were given consent forms, an information statement and an antenatal survey form to consider their participation in the control group to receive the standard care. After the consent process, 215 eligible women returned their antenatal survey forms to the research box.

Recruitment of the intervention group commenced after the last antenatal visit of the women in the control group. Between July 2010 and April 2011, 258 primiparous women were invited to participate in the intervention part of the study, and 205 eligible women returned their antenatal survey forms to the research box. Recruitment of the intervention group was longer due to staff shortages and expansion of the hospital premises that resulted in the relocation of the antenatal clinic in the hospital. The lengthy period of recruitment was covered in greater detail earlier in this chapter. Postnatal data were collected from June 2009 to April 2012 at one, four and six months postpartum. The flow of the participants through the study is presented in Chapter Five.

Data-Collection Tools

A self-reporting structured questionnaire and telephone interviews were used to collect the data for the study. The content validity of the data-collection tools were based on the literature review and expert judgment of my supervisors, two lactation consultants, and a group of breastfeeding counselors from the Australian Breastfeeding Association.

There were four points of data collection: one at the recruitment point and three at one, four and six months postpartum. The structured questionnaire (the survey form) was given
by clerical staff to each woman during recruitment process. Women completed the survey forms and returned them with the consent forms in the box allocated for the study next to the clerical desk in the antenatal clinic. Baseline maternal characteristics, including socio-demographic and antenatal information on women’s breastfeeding intention, support and confidence, were collected antenatally at this point (Appendix 8). Eleven questions were allocated for the socio-demographic data, including age, place of birth, Aboriginality, level of education, marital status, family income, returning to work after birth and smoking status. One question was on the expected date of confinement. There were two questions on women’s breastfeeding intention, two questions on women’s breastfeeding support and two questions on women’s breastfeeding confidence. Questions on breastfeeding intention, support and confidence were used as baseline information, and they were repeated during postnatal data collection.

Postnatal data were collected at the end of one, four and six months postpartum by the researcher through telephone interviews. Before the initial phone calls, the hospital Core Clinical Information System was checked by the researcher for date of birth, type of birth and birth outcome to check the eligibility of the participants and to prevent phone calls for those women who had had a miscarriage, stillbirth or neonatal death. In the first phone call for data collection (one month postpartum) there were extra questions to identify women’s antenatal sources of information on breastfeeding and any breastfeeding interruptions or problems in first few weeks after birth. All postnatal interviews at the first, fourth and sixth months had four questions on feeding method, two questions on breastfeeding intention, two questions on breastfeeding support and three questions on women’s breastfeeding confidence. One of the questions on breastfeeding confidence specifically measured women’s breastfeeding self-efficacy. The modified BSES-SF was used to measure breastfeeding self-efficacy (Appendices 10 and 11). The modified BSES-SF was not used
in the antenatal survey form due to its leading effect on breastfeeding practice. For instance, one of the items on breastfeeding self-efficacy scale refers to whether the woman is managing her breastfeeding situation to her satisfaction, which may lead the woman to choose prolonged breastfeeding. The validity and reliability of the breastfeeding self-efficacy scale are addressed in the next section. In the case of breastfeeding cessation at the postnatal data collection points, time of weaning and reasons to stop breastfeeding were asked (Appendices 10 and 11).

**Breastfeeding self-efficacy scale**

The original Breastfeeding Self-efficacy Scale (BSES) was developed by Dennis and Faux (1999) to measure breastfeeding confidence level. This scale was a 33-item self-report instrument. The items were scored between 1 to 5, where 1 indicates *not at all confident* and 5 indicates *always confident*. The content validity of the scale was assessed by a panel of experts and by interviewing experienced breastfeeding women. The reliability of the scale was evaluated using Cronbach’s alpha coefficient, which was more than 0.96, with 73 percent of all corrected item-total correlations ranging between 0.30 and 0.70 (Dennis & Faux, 1999).

In 2002, Dennis developed a short form of the scale, with 14 items instead of 33. Scores in this short form could range from 14 to 70. A higher score indicates a higher level of breastfeeding self-efficacy. The short form of BSES (BSES-SF) is widely used across the world (Keemer, 2013; Loke and Chan, 2013; Noel-Weiss, Rupp et al., 2006). In a psychometric assessment of the BSES-SF, Cronbach’s alpha was 0.94. Inter-item correlation was above 0.08 and predictive validity was confirmed by the positive relationship between breastfeeding self-efficacy and infant feeding patterns at one, four and eight weeks (Dennis, 2003).
To make the BSES-SF suitable for phone interviews in this study, the word “always” was taken away from each item and the wording of three items was changed, as shown in Table 4. The modified BSES-SF in this study was further simplified by reducing the items from 14 to 13, because item seven, “I can always keep wanting to breastfeed”, was addressed in the survey form under the breastfeeding-intention questions “How long do you intend to breastfeed your baby?” and “How do you rate your intention for breastfeeding?”

Table 4: Changes in the modified form of BSES-SF

<table>
<thead>
<tr>
<th>Item</th>
<th>Original BSES-SF</th>
<th>Adjustments in the modified BSES-SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 2</td>
<td>“I can always successfully cope with breastfeeding like I have with other challenging tasks”</td>
<td>“I can successfully cope with breastfeeding as I cope with other challenging tasks”</td>
</tr>
<tr>
<td>Item 3</td>
<td>“I can always breastfeed my baby without using formula as a supplement”</td>
<td>“I can breastfeed my baby without supplementing with formula”</td>
</tr>
<tr>
<td>Item 10</td>
<td>“I can always deal with the fact that breastfeeding can be time-consuming”</td>
<td>“I can deal with the fact that breastfeeding takes time”</td>
</tr>
</tbody>
</table>

To make the scoring easier for the women on the phone, the original five-point Likert scale was reduced to a three-point Likert scale by collapsing the first two and last two scores. The middle score remained unchanged. The total score ranged from 13 to 39 (Appendices 6 and 7).

The reliability of the modified BSES-SF in this study was evaluated using Cronbach’s alpha coefficient during the pilot study; the coefficient was 0.83, higher than the recommended 0.70. The corrected item-total correlation for all items was more than 7.8.
Based on having small sample size in the pilot study, the pilot Cronbach’s alpha coefficient was not sufficiently robust. Therefore, after completion of the main study, Cronbach’s alpha coefficient for the BSES-SF was recalculated with full data set at one, four and six months postpartum, with a result of 0.89, 0.90 and 0.87 respectively.

Considering that modifying a psychometric instrument could have been a risk to the validity of the scale, the post-hoc alpha testing suggests that the measure has retained its integrity. This outcome supports the validity of the modified BSES-SF as a measure of breastfeeding self-efficacy.

**Intention-to-Treat**

Primary analyses were performed on an intention-to-treat to treat basis. An intention-to-treat (ITT) analysis is usually considered as the least biased method to estimate effects of an intervention specifically in randomised controlled trails (Newell, 1992). The principle of ITT analyses include: a) keeping participants in the intervention groups to which they were randomised with or without receiving the intervention; b) measuring outcomes on all participants; and c) counting all randomised participants in the analysis (Higgins, Deeks & Altman, 2008).

Generally, intention-to-treat is interpreted as including all the participants, regardless of whether they satisfied the entry criteria, the treatment received and subsequent withdrawal or deviation from the protocol (Hollis & Campbell, 1999). It is important to consider that sometimes participants are excluded from analyses due to different reasons such as lost to follow-up, no obtained outcome, lack of compliance, or ineligibility. The common way of dealing with missing data is to impute them with replacement values such as assuming all missing data were poor outcomes (Higgins, Deeks & Altman, 2008). If the analysis is not
performed based on intention-to-treat, clinical effectiveness may be overestimated (Hollis & Campbell, 1999; Sedgwick, 2013).

In this study, all the women who participated in the research were included in the data analysis. Data were analysed according to the group to which the women were allocated, irrespective of whether they received the intervention or not. Most importantly, the missing data were included in the analyses. For instance, at the one-month data collection point, 25 out of 215 women from standard care and 53 out of 205 women from the intervention group were excluded or not contactable, or had withdrawn from the study. During the four- and six-months data-collection periods, two additional women were unable to be contactable by telephone (Figure 3). Based on intention-to-treat, women who were excluded or not contactable at any stage were considered as having not breastfed at all, and they were included in the data analysis of primary outcomes as “not breastfeeders”.

**Data Analysis**

All data were analysed with Statistical Package for the Social Sciences (SPSS) version 19 (Field, 2009; Hinton, McMurray, & Brownlow, 2014). The researcher undertook the analysis with her supervisors and a university statistical support scholar, who are both experienced in statistical analysis. Assumptions for all statistical tests were examined.

Descriptive statistics were used to determine frequencies, percentage, mean and average of the variables. Inferential statistics were used to compare the groups and test the effectiveness of the intervention. All the statistical tests were two-sided, using a significance level of $p < .05$. For instance, a chi-square test was used to compare categorical variables between the standard-care group and the intervention group. Fisher’s exact test was used if the test violated the minimum expected cell frequency. The Mann-
Whitney U test was also used to examine any changes in breastfeeding intention, confidence and support within and between the groups across time when the ordinal variables were treated as continues variables. To measure the difference of two mean scores of breastfeeding self-efficacy between the groups, t-test analysis was used. Logistic regression was used to determine the degree to which assignment to the intervention prolongs breastfeeding. Odds-ratio adjustments with a 95% confidence interval were made to determine whether potential confounders, including age, education, smoking and breastfeeding intention, had any effect on the outcome measure. Potential confounders identified from the literature included age (older vs. younger), education (high vs. low education level) and smoking (non-smokers vs. smoker). A screen of $p < .05$ was used to justify retaining the variables in the model, except for the group, which was retained regardless. A more detailed explanation of the analysis is presented in Chapter Five.

**Outcome Measures**

The study sought to answer questions related to the effectiveness of the intervention to increase the rate of breastfeeding up to six months postpartum. Therefore, the primary outcome measure of the study was to measure the rate of breastfeeding at six months postpartum between the groups. The secondary outcome measures were: a) breastfeeding rates at one and four months postpartum; (b) changes in women’s breastfeeding intention across time; (c) changes in women’s perceived breastfeeding social support across time; (d) changes in women’s breastfeeding confidence across time; (e) women’s breastfeeding self-efficacy score between the groups; (f) women’s type of breastfeeding at one, four and six months; and (g) women’s reasons for breastfeeding cessation. Other clinical-outcome data related to antenatal breastfeeding education, type of birth, initiation of first breastfeeding and early breastfeeding problems were also collected.
Monitoring and Adverse Events

The recruitment and consenting processes were monitored regularly by the principal researcher. Data entry was completed in consultation with a senior statistician. The progress of the study was regularly reported to the supervisors. No adverse event occurred during the study. There are some memos from the participants in the Milky Way Program which have been summarised in Appendix 12.

Funding

The study received a small amount of funding from Australian Postgraduate Award lasting less than six months.

Conclusion

This chapter has described the methods that were used in the study, including the setting; sample size; recruitment and consent process; data collection tools and process; study intervention; and outcome measures. Designing and implementing the multi-phased intervention was based on the theories of Self-efficacy and Birth Territory and Midwifery Guardianship. The key factors, including breastfeeding intention, self-efficacy and support, were considered in designing the intervention. The following chapter presents the results of the study.
Chapter Five: Findings

Introduction

The previous chapter outlined the details of the methodology used to implement The Milky Way Program. This chapter presents the results of the study to answer the research question; and it specifically reports on the primary and secondary outcome measures.

The chapter begins with the flow of the participants through the study and continues with the baseline findings and postnatal characteristics of the participants. Then the primary outcome measure, rates of breastfeeding at six months, is reported. The secondary outcome measures are presented in the following order: (a) breastfeeding rates at one and four months postpartum; (b) change in women’s breastfeeding intention across time; (c) change in women’s perceived breastfeeding support across time; (d) change in women’s breastfeeding confidence across time; (e) women’s breastfeeding self-efficacy score; (f) women’s type of breastfeeding at one, four and six months; and (g) women’s reasons for breastfeeding cessation. The discussion of these findings, in the context of the extant literature, will be addressed in the final chapter.

Flow of the Participants through the Study

Of 519 women who were invited, 420 were eligible and agreed to participate in the study. Two hundred fifteen women were recruited into the standard-care group (in 2009), and 205 were in the intervention group (in 2010-2011). As the study progressed, 54 women were excluded: 21 from the standard-care group and 33 from the intervention group. Exclusions were due to miscarriages (5), termination of pregnancy (6), still birth/neonatal death (2), preterm birth (18), multiple-pregnancy (1), severe neonatal medical condition (7),
breastfeeding contraindication (3), moving to other hospital (1) and changing the feeding plan to formula prior birth (11). The study enrolled 366 women and 28 (6.6%) were lost to follow-up during the six months postpartum: five women from the standard-care group, 18 from the intervention group who were not contactable by telephone and five from the intervention group who withdrew from the study (Figure 3). About 70 percent of women in The Milky Way group attended a minimum of one antenatal breastfeeding education session, and more than 75 percent came to two or three sessions. All of the women who were enrolled in the study and were contactable by telephone received postnatal phone consultation.
Recruitment of the standard-care group
June 2009-October 2009

Invited to the study  
\( n = 261 \)

Admitted to the study  
\( n = 215 \)

Excluded (total=21)
- Preterm birth \( n = 11 \)
- Termination (3) or miscarriage (0) \( n = 3 \)
- Severe neonatal medical condition \( n = 3 \)
- Changing the feeding plan to formula prior birth \( n = 3 \)
- Stillbirth or neonatal death \( n = 1 \)
- Other \( n = 0 \)

Enrolled in the study  
\( n = 194 \)

Available data
- Antenatal questionnaire \( n = 194 \)
- 1 month postpartum interview \( n = 190 \)
- 4 months postpartum interview \( n = 189 \)
- 6 months postpartum interview \( n = 189 \)

Lost to follow-up
- Not contactable at 1 month \( n = 4 \)
- Not contactable at 4 months \( n = 1 \)
- Not contactable at 6 months \( n = 0 \)
- Withdrew \( n = 0 \)
- Total at six months \( n = 5 \)

Not eligible or not interested in the study  
\( n = 46 \)

Recruitment of The Milky Way group
July 2010- April 2011

Invited to the study  
\( n = 258 \)

Admitted to the study  
\( n = 205 \)

Excluded (total=33)
- Preterm birth \( n = 7 \)
- Termination (3) or miscarriage (5) \( n = 8 \)
- Severe neonatal medical condition \( n = 4 \)
- Changing the feeding plan to formula prior birth \( n = 8 \)
- Stillbirth or neonatal death \( n = 1 \)
- Other \( n = 5 \)

Enrolled in the study  
\( n = 172 \)

Available data
- Antenatal questionnaire \( n = 172 \)
- 1 month postpartum interview \( n = 152 \)
- 4 months postpartum interview \( n = 149 \)
- 6 months postpartum interview \( n = 149 \)

Lost to follow-up
- Not contactable at 1 month \( n = 15 \)
- Not contactable at 4 months \( n = 3 \)
- Not contactable at 6 months \( n = 0 \)
- Withdrew \( n = 5 \)
- Total at six months \( n = 23 \)

Not eligible or not interested in the study  
\( n = 53 \)

Data collection for the standard-care group
(June 2009 - November 2010)

Date collection for The Milky Way group
(July 2010 - April 2012)

Figure 3: Flow chart of the study
Baseline Findings

Antenatal baseline data were compared between the two enrolled groups for: (a) demographic characteristics; (b) intention to breastfeed; (c) perceived social support; and (d) perceived confidence to breastfeed. The two groups were equivalent in all antenatal baseline characteristics.

Antenatal demographic characteristics

Participants ranged in age from 19 to 42 years ($M=26.6$, $SD=4.9$). Almost half of the women had been born outside Australia and had a certificate or university qualification. The majority of women (85.5%) were in a committed relationship (married or de-facto) and planned to return to work after giving birth (73%), mainly after six months (72%). Only eight women identified themselves as being from Aboriginal and Torres Strait Islander background (one in The Milky Way and seven in the standard-care group). Fisher’s exact test was used to compare Aboriginality. A chi-square test was used to identify any other differences between the groups. There were no statistical differences in demographic characteristics between the groups (Table 5).
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Milky Way n = 172</th>
<th>Standard care n = 194</th>
<th>( p ) value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 or younger</td>
<td>52 (31.1)</td>
<td>83 (42.8)</td>
<td>.126</td>
</tr>
<tr>
<td>25-29</td>
<td>66 (39.5)</td>
<td>67 (34.5)</td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td>33 (19.8)</td>
<td>32 (16.5)</td>
<td></td>
</tr>
<tr>
<td>35 or older</td>
<td>16 (9.6)</td>
<td>12 (6.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Country of birth</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Born in Australia</td>
<td>72 (44.2)</td>
<td>92 (48.7)</td>
<td>.453</td>
</tr>
<tr>
<td>Born outside Australia</td>
<td>91 (55.8)</td>
<td>97 (51.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td>.604</td>
</tr>
<tr>
<td>Married</td>
<td>117 (70.0)</td>
<td>127 (66.1)</td>
<td></td>
</tr>
<tr>
<td>De-facto</td>
<td>29 (17.4)</td>
<td>34 (17.7)</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>13 (7.8)</td>
<td>23 (12.0)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>8 (4.8)</td>
<td>8 (4.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
<td>.060</td>
</tr>
<tr>
<td>Lower secondary or less</td>
<td>5 (3.0)</td>
<td>9 (4.7)</td>
<td></td>
</tr>
<tr>
<td>Upper secondary</td>
<td>35 (21.0)</td>
<td>58 (30.2)</td>
<td></td>
</tr>
<tr>
<td>Certificate</td>
<td>56 (33.5)</td>
<td>67 (34.9)</td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>71 (42.5)</td>
<td>58 (30.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Intention to return to work after birth</strong></td>
<td></td>
<td></td>
<td>.307</td>
</tr>
<tr>
<td>Yes</td>
<td>119 (71.7)</td>
<td>144 (74.6)</td>
<td></td>
</tr>
<tr>
<td>Expected time to return to work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In 1 or 2 months</td>
<td>6 (5.0)</td>
<td>6 (4.2)</td>
<td>.980</td>
</tr>
<tr>
<td>In 3 or 4 months</td>
<td>14 (11.8)</td>
<td>16 (13.3)</td>
<td></td>
</tr>
<tr>
<td>In 5 or 6 months</td>
<td>13 (10.9)</td>
<td>17 (11.8)</td>
<td></td>
</tr>
<tr>
<td>In more than 6 months</td>
<td>86 (72.3)</td>
<td>105 (72.9)</td>
<td></td>
</tr>
<tr>
<td><strong>Smoking in pregnancy</strong></td>
<td></td>
<td></td>
<td>.142</td>
</tr>
<tr>
<td>Yes</td>
<td>11 (6.6)</td>
<td>20 (10.3)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>156 (93.4)</td>
<td>174 (89.7)</td>
<td></td>
</tr>
</tbody>
</table>

Note. Demographic information of five women who withdrew from the study has not been included in this table. A chi-square test was performed to examine differences between the groups.
Antenatal breastfeeding intention

Baseline antenatal breastfeeding intention was compared between the groups to identify any difference. In total, most women intended to breastfeed for about six months or more (83.6%). There was no statistical difference between the groups (Table 6).

**Table 6: Antenatal breastfeeding intention**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Milky Way n = 172</th>
<th>Standard care n = 194</th>
<th>P value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breastfeeding intention</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of intended breastfeeding duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• &lt;6 months</td>
<td>20 (12.3)</td>
<td>38 (20.0)</td>
<td>.138</td>
</tr>
<tr>
<td>• 6 months</td>
<td>66 (40.7)</td>
<td>75 (39.5)</td>
<td></td>
</tr>
<tr>
<td>• &gt;6 months</td>
<td>79 (47.0)</td>
<td>77 (40.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Rate of breastfeeding intention</strong></td>
<td></td>
<td></td>
<td>.097</td>
</tr>
<tr>
<td>• Very strong</td>
<td>83 (49.7)</td>
<td>74 (38.1)</td>
<td></td>
</tr>
<tr>
<td>• Strong</td>
<td>53 (31.7)</td>
<td>72 (37.1)</td>
<td></td>
</tr>
<tr>
<td>• Not sure</td>
<td>29 (17.4)</td>
<td>44 (22.7)</td>
<td></td>
</tr>
<tr>
<td>• Weak</td>
<td>0 (0)</td>
<td>3 (1.5)</td>
<td></td>
</tr>
<tr>
<td>• Very weak</td>
<td>2 (1.2)</td>
<td>1 (0.5)</td>
<td></td>
</tr>
</tbody>
</table>

Note. Demographic information of five women who withdrew from the study has not been included in this table. A chi-square test was performed to examine differences between allocated groups.

Antenatal perceived breastfeeding support

Baseline antenatal perceived support for breastfeeding was compared between the groups to identify any difference. In total, most women perceived their partner (93.8%) and family (92.2%) as being supportive. There were no statistical differences between the groups (Table 7).
Table 7: Antenatal perceived breastfeeding support

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Milky Way n = 172</th>
<th>Standard care n = 194</th>
<th>P value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Breastfeeding support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband/partner support</td>
<td>n = 165</td>
<td>n = 191</td>
<td>.236</td>
</tr>
<tr>
<td>towards breastfeeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Supported</td>
<td>158 (95.8)</td>
<td>176 (92.1)</td>
<td></td>
</tr>
<tr>
<td>• Not sure</td>
<td>7 (4.2%)</td>
<td>13 (6.8)</td>
<td></td>
</tr>
<tr>
<td>• Not supported</td>
<td>0 (0)</td>
<td>2 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Family/friends support towards</td>
<td>n = 166</td>
<td>n = 193</td>
<td>.190</td>
</tr>
<tr>
<td>breastfeeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Supported</td>
<td>157 (94.6)</td>
<td>174 (90.2)</td>
<td></td>
</tr>
<tr>
<td>• Not sure</td>
<td>9 (5.4)</td>
<td>17 (8.8)</td>
<td></td>
</tr>
<tr>
<td>• Not supported</td>
<td>0 (0)</td>
<td>2 (1.0)</td>
<td></td>
</tr>
</tbody>
</table>

Note. Demographic information of five women who withdrew from the study has not been included in this table. A chi-square test was performed to examine differences between the groups.

Antenatal perceived breastfeeding confidence

Baseline antenatal perceived breastfeeding confidence was compared between the groups to identify any difference. In total, most women felt confident to breastfeed their children (87.8%). There were no statistical differences between the groups. Table 8 gives more details on women’s breastfeeding confidence.
Table 8: Baseline characteristics of the women in breastfeeding confidence

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Milky Way n = 172</th>
<th>Standard care n = 194</th>
<th>P value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding confidence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived breastfeeding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Strongly agree</td>
<td>86 (51.5)</td>
<td>90 (46.4)</td>
<td>.275</td>
</tr>
<tr>
<td>- Agree</td>
<td>60 (35.9)</td>
<td>81 (41.8)</td>
<td></td>
</tr>
<tr>
<td>- No opinion</td>
<td>14 (8.4)</td>
<td>20 (10.3)</td>
<td></td>
</tr>
<tr>
<td>- Disagree</td>
<td>7 (4.2)</td>
<td>3 (1.5)</td>
<td></td>
</tr>
<tr>
<td>- Strongly disagree</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
<tr>
<td>Perceived breastfeeding confidence in unexpected events</td>
<td>56 (33.7)</td>
<td>49 (25.5)</td>
<td>.209</td>
</tr>
<tr>
<td>- Strongly agree</td>
<td>84 (50.6)</td>
<td>107 (55.7)</td>
<td></td>
</tr>
<tr>
<td>- Agree</td>
<td>20 (12.0)</td>
<td>32 (16.7)</td>
<td></td>
</tr>
<tr>
<td>- No opinion</td>
<td>6 (3.6)</td>
<td>4 (2.1)</td>
<td></td>
</tr>
<tr>
<td>- Disagree</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td></td>
</tr>
</tbody>
</table>

Note. Demographic information of five women who withdrew from the study has not been included in this table. A chi-square test was performed to examine differences between the groups.

Postnatal characteristics

Postnatal characteristics based on the available data were compared between the groups to identify any differences in the mode of birth, time of breastfeeding initiation and type of breastfeeding problems that women felt in first few weeks after birth. The two groups were equivalent in postnatal characteristics. The majority of women in both groups had vaginal birth, initiated breastfeeding in one hour after birth and experienced some breastfeeding problems. However, more women in The Milky Way group reported nipple pain or grazed nipples (p < .001) compared to the standard-care group (Table 9).
Table 9: Postnatal characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Milky Way n = 152</th>
<th>Standard care n = 190</th>
<th>p value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mode of birth</strong></td>
<td></td>
<td></td>
<td>.794</td>
</tr>
<tr>
<td>Vaginal</td>
<td>117 (77.0)</td>
<td>149 (78.4)</td>
<td></td>
</tr>
<tr>
<td>Caesarean section</td>
<td>35 (23.0)</td>
<td>41 (21.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Breastfeeding in first hour after birth</strong></td>
<td></td>
<td></td>
<td>.079</td>
</tr>
<tr>
<td>Yes</td>
<td>121 (79.6)</td>
<td>135 (71.1)</td>
<td></td>
</tr>
<tr>
<td><strong>Had breastfeeding problems</strong></td>
<td></td>
<td></td>
<td>.238</td>
</tr>
<tr>
<td>Yes</td>
<td>111 (73.0)</td>
<td>127 (66.8)</td>
<td>.0001*</td>
</tr>
<tr>
<td>Nipple pain or grazed nipple</td>
<td>69 (45.4)</td>
<td>45 (23.7)</td>
<td>.077</td>
</tr>
<tr>
<td>Latching problem</td>
<td>69 (45.4)</td>
<td>68 (35.8)</td>
<td></td>
</tr>
<tr>
<td>Perceive low milk supply</td>
<td>8 (4.8)</td>
<td>21 (10.8)</td>
<td>.077</td>
</tr>
<tr>
<td>Mastitis</td>
<td>3 (2.0)</td>
<td>4 (2.1)</td>
<td>1.000</td>
</tr>
<tr>
<td>Other</td>
<td>5 (3.3)</td>
<td>11 (5.8)</td>
<td>0.314</td>
</tr>
</tbody>
</table>

Note. Postnatal characteristics are based on the available data. A chi-square test was performed to examine differences between the groups.

χ²(1,342) = 17.9, p < .001

Primary Outcome

The primary outcome measure was the proportion of women who continued any type of breastfeeding until the end of six months postpartum. Women in The Milky Way group had significantly higher rates of breastfeeding compared with the standard-care group, 54.7% (n = 94) vs. 31.4% (n = 61). Based on intention-to-treat, a chi-square test was performed to determine differences in breastfeeding rates at six months. To strengthen the results, all the missing data were considered as cases of not breastfeeding. The results demonstrated a statistically significant difference in breastfeeding rates at six months between the groups, χ²(1, 366) = 20.11, p < .001 (Figure 4).
The effect size of The Milky Way Program was measured by Cramer’s phi (without missing data). At six months Cramer’s phi was 0.31, which indicates that involvement in The Milky Way Program accounted for around 30 percent of the variance in breastfeeding rates at six months.

A logistical regression was applied using the entering method to account for potential confounders on the primary outcome of breastfeeding at six months. Potential confounders were identified from the literature and were included in the model. They were: age (older women breastfeed longer); education (higher education related to prolonged breastfeeding); smoking status (non-smoking is related to prolonged breastfeeding) and intention (women who intend to breastfeed more than six months breastfeed longer).

Assignment to The Milky Way Program predicted extended breastfeeding. An odds ratio with a 95% confidence interval was adjusted based on the potential confounders. Age, education and intention rates did not significantly contribute to the breastfeeding outcome at six months. The woman’s intention to breastfeed for six months or more increased the
likelihood of breastfeeding by about 3.5 times at six months (OR= 3.5, 95% CI [1.63–7.76]). Being a non-smoker increased the likelihood of breastfeeding by about 2.5 times at six months (OR= 2.6, 95% CI [1.08–6.13]). Engagement in the Milky Way program increased the likelihood of breastfeeding by three times at six months (OR = 3.01, 95% CI [1.86–4.86]) (Table 10) (Meedya, Fahy, Yoxall, & Parratt, 2014).

Table 10: Logistic regression model for the primary outcome of breastfeeding at six months and influencing factors

<table>
<thead>
<tr>
<th>Variables</th>
<th>Breastfeeding at six months</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unadjusted</td>
<td>Adjusted</td>
<td>Unadjusted</td>
<td>Adjusted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
</tr>
<tr>
<td>Study group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard care</td>
<td>1.0</td>
<td>[2.28-5.632]</td>
<td>1.0</td>
<td>[1.859-4.864]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>3.586</td>
<td>[1.63-7.76]</td>
<td>3.007</td>
<td>[1.08-6.13]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 or younger</td>
<td>1.0</td>
<td>[0.96-2.63]</td>
<td>1.325</td>
<td>[0.751-2.339]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td>2.135</td>
<td>[0.79-4.22]</td>
<td>1.305</td>
<td>[0.505-3.371]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 or older</td>
<td>1.826</td>
<td>[1.14-3.98]</td>
<td>1.305</td>
<td>[0.505-3.371]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper secondary or less</td>
<td>1.0</td>
<td>[1.186-3.142]</td>
<td>1.410</td>
<td>[0.814-2.442]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificate or more</td>
<td>1.93</td>
<td>[1.186-3.142]</td>
<td>1.410</td>
<td>[0.814-2.442]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.0</td>
<td>[1.80-9.44]</td>
<td>2.576</td>
<td>[1.083-6.131]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention length</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 6 months</td>
<td>1.0</td>
<td>[1.17-3.50]</td>
<td>1.365</td>
<td>[0.722-2.580]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very weak/weak/not sure</td>
<td>1.0</td>
<td>[1.17-3.50]</td>
<td>1.365</td>
<td>[0.722-2.580]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong or very strong</td>
<td>2.041</td>
<td>[1.17-3.50]</td>
<td>1.365</td>
<td>[0.722-2.580]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. OR=odds ratio; CI= confidence interval.

a: \( p < .001 \)
b: \( p = .032 \)
c: \( p = .001 \)
**Secondary Outcomes**

Secondary outcome measures included five categories: (a) breastfeeding rates at one and four months postpartum; (b) women’s breastfeeding intention; (c) women’s breastfeeding perceived support; (d) women’s breastfeeding self-efficacy; (e) type of breastfeeding and (f) reasons for breastfeeding cessation.

**Breastfeeding rates at one and four months postpartum**

Breastfeeding rates at one and four months were also measured based on intention-to-treat (N = 366). The secondary analysis was equally positive for The Milky Way group: 83.7% vs. 61.3%, \( p < .001 \) at one month and 64.5% vs. 37.1%, \( p < .001 \) at four months (Table 11). The Milky Way group had higher rates of breastfeeding compared with the standard-care group.

Cramer’s phi was 0.38 at one month and 0.36 at four months, a small to medium effect size that suggests that engagement in The Milky Way Program accounts for at least a third of the variance in the breastfeeding rates at one and four months across the two groups.

**Table 11: Breastfeeding rates at one and four months based on intention-to-treat**

<table>
<thead>
<tr>
<th>Breastfeeding rate</th>
<th>Milky Way n = 172 n (%)</th>
<th>Standard care n = 194 n (%)</th>
<th>( P ) value (Tow sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One month</td>
<td>144 (83.7)</td>
<td>119 (61.3)</td>
<td>&lt; .001(^a)</td>
</tr>
<tr>
<td>Four months</td>
<td>111 (64.5)</td>
<td>72 (37.1)</td>
<td>&lt; .001(^b)</td>
</tr>
</tbody>
</table>

Note. All the missing data were coded as “not breastfeeder”.

\( a: \chi^2(1,366)=22.58, p < .001 \)

\( b: \chi^2(1,366)=27.42, p < .001 \)
Changes in women’s breastfeeding intention across time

To measure any changes in women’s breastfeeding intention, only women who breastfed at one month were selected, and the difference in their antenatal and one month postpartum breastfeeding intention was measured. The reason for this selection was that data on breastfeeding intention was not collected on the women who stopped breastfeeding, and many women in the standard-care group stopped breastfeeding at four months. A chi-square test demonstrated that there was no statistical difference between the groups in their antenatal baseline breastfeeding intention. A Mann-Whitney U test was used to examine any changes in breastfeeding intention within and between the groups across time. The results demonstrated a significant increase in breastfeeding intention in The Milky Way group compared to the standard-care group, \( p = .001 \). To explore the amount and direction of the change, a chi-square test was conducted (Table 12). More women in The Milky Way group reported increased breastfeeding intention at one month compared to the standard-care group, and more women in the standard-care group reported a decreased breastfeeding intention compared to The Milky Way group.

Table 12: Changes in breastfeeding intention across time—from baseline to one month postpartum

<table>
<thead>
<tr>
<th>Breastfeeding intention change</th>
<th>Milky Way n = 142</th>
<th>Standard care n = 118</th>
<th>( p ) value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased</td>
<td>54 (37.5)</td>
<td>31 (26.1)</td>
<td>.002*</td>
</tr>
<tr>
<td>Not changed</td>
<td>70 (48.6)</td>
<td>50 (42.0)</td>
<td></td>
</tr>
<tr>
<td>Decreased</td>
<td>20 (13.9)</td>
<td>38 (31.9)</td>
<td></td>
</tr>
</tbody>
</table>

\( a: \chi^2 (2,263)=12.883, \ p = .002 \)
Changes in women’s perceived breastfeeding support across time

Any changes in women’s perceived breastfeeding support from husband or partner and family or friends were measured between the groups of women who were breastfeeding at one month (as above). A chi-square test demonstrated that there was no statistical difference between the groups in their antenatal baseline breastfeeding support. A chi-square test demonstrated that there was no statistical difference between the groups in their antenatal baseline breastfeeding support. A Mann-Whitney U test was used to examine the change between antenatal and one month postpartum perceived breastfeeding support. The results demonstrated no significant changes in breastfeeding support from husband/partner \( (p = .693) \) and family/friends \( (p = .289) \) between the groups across time.

Changes in women’s breastfeeding confidence across time

Women’s perceived breastfeeding confidence was assessed by asking two questions. One of the questions was about women’s general breastfeeding confidence. The other question was about women’s breastfeeding confidence during unexpected events. A chi-square test demonstrated that there was no statistical difference between the groups in their antenatal baseline breastfeeding confidence. A Mann Witney U test was used to examine any changes in perceived breastfeeding confidence from the antenatal baseline to one month postpartum. Over time, women’s general breastfeeding confidence increased in the intervention group and decreased in the standard-care group, with statistically significant difference \( (p = .001) \).

Women’s perceived breastfeeding confidence during unexpected events was measured as well. Women in The Milky Way group developed a significantly higher breastfeeding confidence than the standard-care group, \( p = .001 \). A chi-square test was conducted to explore the amount and direction of the change in the groups (Table 13). More women in
The Milky Way group reported increased breastfeeding confidence at one month compared to the standard-care group, and more women in the standard-care group reported decreased breastfeeding confidence compared to The Milky Way.

Table 13: Changes in breastfeeding confidence across time from baseline to one month postpartum

<table>
<thead>
<tr>
<th>Breastfeeding confidence change</th>
<th>Milky Way n = 144</th>
<th>Standard care n = 119</th>
<th>P value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived breastfeeding confidence</td>
<td>n = 144</td>
<td>n = 119</td>
<td>.001(^a)</td>
</tr>
<tr>
<td>Increased</td>
<td>51 (35.4)</td>
<td>27 (22.7)</td>
<td></td>
</tr>
<tr>
<td>Not changed</td>
<td>68 (47.2)</td>
<td>48 (40.3)</td>
<td></td>
</tr>
<tr>
<td>Decreased</td>
<td>25 (17.4)</td>
<td>44 (37.0)</td>
<td></td>
</tr>
<tr>
<td>Perceived breastfeeding Breastfeeding confidence in unexpected events</td>
<td>n = 143</td>
<td>n = 117</td>
<td>.009(^b)</td>
</tr>
<tr>
<td>Increase</td>
<td>71 (49.7)</td>
<td>38 (32.5)</td>
<td></td>
</tr>
<tr>
<td>Not changed</td>
<td>55 (38.5)</td>
<td>53 (45.3)</td>
<td></td>
</tr>
<tr>
<td>Decreased</td>
<td>17 (11.9)</td>
<td>26 (22.2)</td>
<td></td>
</tr>
</tbody>
</table>

a: \(\chi^2(2,263)=13.813, \ p = .001\)
b: \(\chi^2(2,260)=9.406, \ p = .009\)

Women’s breastfeeding self-efficacy score between the groups at one month

Women’s breastfeeding self-efficacy was measured using the modified Breast BSES during the postnatal period. A t-test analysis was used to measure the difference of two mean scores between the groups at one month. The results demonstrated that the total mean BSES score was higher in The Milky Way group at one month \((M = 36.13, SD = 4.75)\) compared to the standard-care group \((M = 34.03, SD = 4.72)\). The difference between the groups was statistically significant, \(t(261) = 3.55, p = .001\).
Women’s types of breastfeeding

More women in The Milky Way Program were exclusively breastfeeding at one, four and six months. The difference between the groups was only statistically significant at six months, \( \chi^2 (1,155) = 6.19, p = .045 \) (Table 14).

Table 14: Type of breastfeeding at one, four and six months

<table>
<thead>
<tr>
<th>Type of breastfeeding</th>
<th>Milky Way n (%)</th>
<th>Standard care n (%)</th>
<th>( p ) value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One month</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exclusive</td>
<td>n = 144</td>
<td>n = 119</td>
<td>.051</td>
</tr>
<tr>
<td>Predominant</td>
<td>2 (1.4)</td>
<td>1 (0.8)</td>
<td></td>
</tr>
<tr>
<td>Complementary</td>
<td>50 (34.7)</td>
<td>59 (49.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Four months</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exclusive</td>
<td>n = 111</td>
<td>n = 72</td>
<td>.493</td>
</tr>
<tr>
<td>Predominant</td>
<td>56 (50.5)</td>
<td>32 (44.4)</td>
<td></td>
</tr>
<tr>
<td>Complementary</td>
<td>54 (48.6)</td>
<td>38 (52.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Six months</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exclusive</td>
<td>n = 94</td>
<td>n = 61</td>
<td>.045a</td>
</tr>
<tr>
<td>Predominant</td>
<td>18 (19.1)</td>
<td>4 (6.6)</td>
<td></td>
</tr>
<tr>
<td>Complementary</td>
<td>76 (80.9)</td>
<td>56 (91.8)</td>
<td></td>
</tr>
</tbody>
</table>

\( a: \chi^2 (1,155) = 6.19, p = .045 \)

Women’s reasons for breastfeeding cessation

Women who stopped breastfeeding were asked to provide their reasons for breastfeeding cessation. Women could give more than one reason. A chi-square test was used to compare the groups. Fisher’s exact test was used if the test violated minimum expected cell frequency. Perceived low milk supply was the most common reason to stop breastfeeding among the standard-care group (\( n = 77, 60.2\% \)). However, only a small number of women in The Milky Way group (\( n = 4, 7.4\% \)) believed that they had low milk supply (\( p < .001 \)). The main reasons for breastfeeding cessation among The Milky Way group were latching problem and medical advice (Table 15).
Table 15: Women’s reasons for breastfeeding cessation

<table>
<thead>
<tr>
<th>Reasons for breastfeeding cessation</th>
<th>Milky Way n = 54 n (%)</th>
<th>Standard care n = 128 n (%)</th>
<th>P value (Two-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not enough milk (perceived low milk supply)</td>
<td>4 (7.4)</td>
<td>79 (61.7)</td>
<td>&lt; .0000&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Latching problem or nipple issues</td>
<td>15 (27.8)</td>
<td>24 (18.8)</td>
<td>.175</td>
</tr>
<tr>
<td>Unsettled baby or frequent feeding</td>
<td>10 (18.5)</td>
<td>20 (15.6)</td>
<td>.631</td>
</tr>
<tr>
<td>Lack of sleep</td>
<td>1 (1.9)</td>
<td>10 (7.8)</td>
<td>.123</td>
</tr>
<tr>
<td>Baby not interested in breastfeeding</td>
<td>10 (18.5)</td>
<td>9 (7.0)</td>
<td>.021&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Did not enjoy breastfeeding (uncomfortable, time-consuming, not much freedom)</td>
<td>6 (11.1)</td>
<td>10 (7.8)</td>
<td>.473</td>
</tr>
<tr>
<td>Medical advice</td>
<td>13 (24.1)</td>
<td>7 (5.5)</td>
<td>&lt; .001&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Back to work or study</td>
<td>2 (3.7)</td>
<td>9 (7.0)</td>
<td>.134</td>
</tr>
<tr>
<td>Not knowing my options</td>
<td>1 (1.9)</td>
<td>6 (4.7)</td>
<td>.364</td>
</tr>
<tr>
<td>Other</td>
<td>6 (11.1)</td>
<td>9 (7.0)</td>
<td>.361</td>
</tr>
</tbody>
</table>

Note: Chi-square analysis was used to compare the groups. Fisher’s exact test was used if the test violated minimum expected cell frequency.

**Conclusion**

There were no significant baseline differences between the two groups of women. Women assigned to The Milky Way group had higher rates of breastfeeding at one, four and six months. Engaging in The Milky Way Program increased the likelihood of breastfeeding by about 3.5 times at six months. Women in The Milky Way group also had higher rates of postnatal breastfeeding intention and confidence, with no differences in perceived social support for breastfeeding. Women in The Milky Way group had higher breastfeeding self-efficacy scores than those in the standard-care group. Perceived low milk supply was the main reason for women in the standard-care group to stop breastfeeding. However, the main reasons for women in The Milky Way were latching problems and medical advice.
Chapter Six: Discussion and Conclusion

Introduction

The previous chapter presented the findings of this study. This final chapter synthesises and summaries the findings that answer the research question: “Is The Milky Way Program effective in increasing the rates of breastfeeding to six months among Australian primiparous women?” The Milky Way Program was a professionally initiated intervention, conducted by a health professional; it involved numerous strategies to address the problem of low breastfeeding rates at six months. This chapter first describes how effectiveness was measured. Next, it gives an overview of the findings and discusses them in relation to the research and theoretical literature that informs this study. Then it reports the strengths and limitations of the study. It addresses the implications of the results by providing recommendations for education, policy and practice, and presents the conclusion of the study at the end.

Discussion of the Findings

The demographic characteristics of the study population were similar to those of the general population of the South Western Sydney LHD, in terms of age, marriage, income, place of birth and smoking during pregnancy (Centre for Epidemiology and Research, 2011; Sydney South West Area Health Service, 2005). The effectiveness of the study was measured in a number of ways, as discussed in the methodology chapter (Chapter Three). I checked the antenatal characteristics of all participants as the baseline data, and confirmed that there were no statistically significant differences in the demographic data collected for each group. I initially measured frequencies and percentages of breastfeeding in the two groups over time. This showed an increase in breastfeeding for The Milky Way group. I then examined the differences in breastfeeding rates between the two groups based on
intention-to-treat. Intention-to-treat is the strongest methodological approach for demonstrating efficacy (Hollis & Campbell, 1999; Sedgwick, 2013). In addition, I determined a statistically significant difference between groups at one, four and six months. Finally, after controlling for confounding variables, I used logistic regression to determine that participation in The Milky Way Program was associated with prolonged breastfeeding. On this basis effectiveness has been demonstrated for The Milky Way Program.

The main findings for this study are based on the primary and secondary outcome measures. The Milky Way Program was associated with a 33 percent increase in breastfeeding rates at six months when compared with standard care (the primary outcome measure). The women in The Milky Way group had three times more chance of breastfeeding at six months compared to the other group when controlling for the confounding variables (age, education, smoking and breastfeeding intention). These findings answer the research question by showing that The Milky Way Program is effective in increasing rates of breastfeeding up to six months postpartum.

Based on the secondary outcome measures, women in The Milky Way group had higher breastfeeding rates at one and four months. When the women were surveyed in the postnatal period, they had higher rates of breastfeeding intention and confidence, the factors that were specifically targeted by The Milky Way Program. Women’s perceived social support did not show any significant changes across the study period. Finally, the women in The Milky Way group did not report perceived low milk supply as their main reason to stop breastfeeding; in contrast, the majority of women in the standard-care group who ceased breastfeeding believed that they had low milk supply. Women in The Milky
Way group primarily stopped breastfeeding because of medical advice and/or latching problems.

In considering previous research, I focused mainly on the studies that concerned professionally driven interventions. I excluded BFHI studies because those involve major organisational change (as discussed in Chapter One). At the time of commencing data collection for the present study, no previous randomised controlled trials or high-quality non-randomised controlled trial had reported a successful result specifically at six months for primiparous women where they had high breastfeeding initiation rates, although there were mixed findings about increasing breastfeeding duration; there was less focus on prolonged breastfeeding outcome at six months or beyond.

As discussed in Chapter Two, previous studies left out one or more factors known to be associated with prolonging breastfeeding: intention, support and confidence. For example, just providing extra professional support during the postnatal period does not increase breastfeeding rates to six months (Britton et al., 2007; Kronborg et al., 2007; Lavender et al., 2005). Equally, just focusing on women’s breastfeeding self-efficacy without considering the other two factors does not increase breastfeeding rates to six months for first-time mothers (Kronborg et al., 2012). A problem with previous studies is that they lacked an adequate theoretical framework, which meant not having a well-defined, coherent approach to the program content and/or to the educational and support strategies that they used. Since the data collection has been completed, some studies have been published that are congruent with The Milky Way Program (Kupratakul et al., 2010; Olson et al., 2010). Like The Milky Way Program, Kupratakul, Taneepanichskul, Voramongkol, and Phupong (2010) focused on empowering women to make their own decisions.
Factors that Contributed to the Success of The Milky Way Program

I ascribe the success of The Milky Way Program to two core characteristics. First, the program is grounded in a theoretical foundation. Second, the structure and process of the program focused on the three major modifiable factors: women’s breastfeeding intention, support and confidence. As the facilitator of The Milky Way Program, I combined all these characteristics to create a breastfeeding territory, and provided the midwifery guardianship to allow women and their support people to acquire the necessary knowledge, attitudes to and skills to be able to continue breastfeeding to six months. My aim was that women would feel confident enough that with lay, family and professional support they would be able to create the necessary breastfeeding territory wherever, and whenever, they needed to breastfeed. The success of the program is based on the combination of elements and the birth of a new program with a women-centred approach.

Theoretical foundations of The Milky Way Program

The combination of the midwifery and psychology theories of Birth Territory and Midwifery Guardianship and Self-efficacy was a crucial part of the success of this program. The first theory concerns how women can be supported to develop their birth territory, and how midwives can promote women’s optimal reproductive physiology by working with them to facilitate each woman’s breastfeeding confidence in their physiology. Birth Territory and Midwifery Guardianship theory (Chapter Three) encompasses the importance of the midwife strengthening women’s intention to experience physiological childbearing, which necessarily includes breastfeeding. In my use of this theory, I have narrowed the broader concept of birth territory to the more contextually specific concept of breastfeeding territory. Midwifery Guardianship emphasises the important role of the midwife in providing professional support; it also emphasises the midwife’s role in strengthening the woman’s social support. The three factors
(breastfeeding intention, support and confidence) that are known to be important for success with breastfeeding (Meedya, Fahy, & Kable, 2010) nest well within this midwifery theory.

The theory of Self-efficacy, described in Chapter Three, explains how people choose whether to engage in a specific behaviour; in this case breastfeeding. Self-efficacy concerns understanding and explaining how much effort someone is willing to expend and how long to persist when facing a barrier (Bandura, 1997). Thus, having high breastfeeding self-efficacy predicts the continuation of breastfeeding regardless of obstacles (Dennis, 1999). Being guided by this understanding, I focused The Milky Way Program first on increasing women’s willingness to expend energy in learning how to breastfeed for the first time. This learning experience involves getting to know one’s own body and how the baby gives cues and responds. Self-efficacy theory also guided me to prepare women to feel confident; and to expect early challenges to breastfeeding and persist when they arose. For instance, women in The Milky Way group persevered with breastfeeding even if they experienced latching problems or sore, cracked or grazed nipples; in contrast, women in the standard-care group gave up breastfeeding once they faced breastfeeding obstacles in the first few weeks after birth. The main reason for women in the standard-care group to stop breastfeeding was perceived low milk supply. Perceived low milk supply is also cited in several studies as the major reason for early breastfeeding cessation (Chatman et al., 2004; Hamlyn et al., 2002; McLeod et al., 2002). Compared to standard care, women in The Milky Way group had higher postnatal breastfeeding self-efficacy and lower rates of perceived low milk supply, just as self-efficacy theory predicts. The Milky Way Program successfully used self-efficacy theory to prepare women to believe in their reproductive physiology and to persist in spite of early difficulties.
The structure and processes of The Milky Way Program

The key components in the program structure are as follows. First, The Milky Way Program started in mid-pregnancy, which allowed women enough time to think about breastfeeding, process their learning and be prepared for the new experience. Starting early enough meant that the women had enough time to seek and find their own social support to discuss their expectations and share their thoughts and feelings. Previous research studies showed the ineffectiveness of interventions when they were delivered only during the postnatal period or late pregnancy (Henderson et al., 2001; Khresheh, Suhaimat, Jalamdeh, & Barclay, 2011; Kronborg et al., 2007; McDonald et al., 2010; Quinlivan et al., 2003; Tahir & Al-Sadat, 2013; Witt, Smith, Mason, & Flocke, 2012). Second, The Milky Way Program closed the gaps in the transition from the hospital environment to the home and community. The Milky Way Program provided a continuity of education and support from pregnancy until six months postpartum. The Milky Way participants had the opportunity to trust, feel comfortable with and share their thoughts with a non-judgemental facilitator with whom they were familiar. Third, the postnatal phone calls were made prior to critical times for breastfeeding cessation (Gill et al., 2007; Hamlyn et al., 2002); times that I believe women are more likely to doubt their ability to breastfeed. The Milky Way Program prepared women to understand normal physiological changes from birth to six months. In each phone call, I reminded the woman about what to expect during the next two months; specifically, about the baby’s growth and normal changes in the behaviour. We talked about how to support the body to calibrate the milk supply based on the baby’s growth or demand. At three months, The Milky Way participants who had almost stopped breastfeeding were encouraged to consider re-lactation if they were interested. Remarkably, 14 women in The Milky Way Program re-lactated around three months.
The key modifiable factors in The Milky Way Program

The success of the study is a demonstration of the philosophical agreement between the broader theoretical approaches (above) and the three major factors that influence the woman’s duration of breastfeeding: her breastfeeding intention, confidence and supports. Each factor is explained below.

Women’s breastfeeding intention

One of the most important factors in the intervention was to be able to modify women’s breastfeeding intention, a significant predictor in breastfeeding duration (Blyth et al., 2004; DiGirolamo et al., 2005; Forster et al., 2006; Ryser, 2004; Swanson & Power, 2005). The Milky Way Program demonstrates a statistically significant increase in women’s breastfeeding intention compared with a decline in the standard-care group, although the baseline antenatal breastfeeding intention was similar in both groups. As discussed earlier, I believe that starting the program in early to mid-pregnancy allowed the women a sufficient time to reflect upon their learning experiences and their concerns and strengths, and thus have time to strengthen their intention to breastfeed. Drawing upon propositions from Birth Territory and Midwifery Guardianship Theory played an important role in strengthening women’s intention. For example, women were encouraged to connect to their own inner power and trust their bodies to be able to breastfeed successfully. Birth Territory and Midwifery Guardianship theory also guides midwives to support women to trust themselves enough to know that they will able to prevent and solve common early breastfeeding concerns and problems.

The outcome of the study is consistent with the many studies that highlight the importance of women’s breastfeeding intention on duration of breastfeeding (Blyth et al., 2004; DiGirolamo et al., 2005; Ryser, 2004; Swanson & Power, 2005). As discussed in Chapter
Two, prior to this study there had been no successful intervention to increase women’s breastfeeding intention and duration at six months. For instance, Wilhelm, Stepans, Hertzog, Rodehorst and Gardner (2006) used motivational interviews to increase breastfeeding intention and duration among 73 American primiparous women, but the results showed no significant improvement at six months. In 2004, Ryser’s randomised controlled trial on 54 American women showed a significant increase in breastfeeding intention, but this affected initiation only, not duration.

**Women’s breastfeeding support**

The second important factor in the intervention was to provide the women with professional and lay support and encourage them to build a supportive network of family and friends. In The Milky Way Program I encouraged women to call the Australian Breastfeeding Association (lay support) and to visit or contact their local Child and Family Health Centres during the antenatal period (to familiarise themselves with an important source of postnatal support). In addition, I invited women to bring people from their support network to the antenatal breastfeeding sessions, where they were actively involved in discussions. In the learning sessions I encouraged support people to use their power integratively – in other words, to provide encouraging and positive comments to help the woman feel confident in her breastfeeding. Take-home activities were designed to create discussions with each woman’s significant others so as to build a committed group of support people. I also tried to use integrative power while I was facilitating the antenatal sessions and providing professional support via the postnatal phone calls.

Women in both groups stated that their partner and/or mother were the most valuable source of support. The rate of perceived support did not change across time in either group. The results of this study are consistent with the result of a systematic review by Sikorski et
al. (2003) that found that lay support alone was not effective in increasing any breastfeeding at six months. Likewise, professional support alone does not affect breastfeeding rates at six months (Britton et al., 2007). The most recent Cochrane review on telephone support reports a positive effect of support on breastfeeding duration, although with no specific effective results at six months; perhaps because most studies do not continue until six months postpartum (Lavender et al., 2013).

**Women’s breastfeeding confidence**

The third factor that The Milky Way Program was designed to modify was women’s breastfeeding confidence. The Milky Way Program did demonstrate an increase in women’s breastfeeding confidence over time. The results of this study (Chapter Five) showed that the baseline antenatal breastfeeding confidence was similar in both groups, but that women in The Milky Way group developed a statistically significantly higher level of confidence postnatally compared to the standard-care group, who reported an actual reduction in breastfeeding confidence. Breastfeeding self-efficacy scores as measured by the modified BSES-SF (Chapter Four) were also higher in The Milky Way group compared with the standard-care group. The difference between the mean scores for postnatal self-efficacy for the two groups was statistically significant.

This discussion shows that The Milky Way Program was successful in enhancing women’s confidence to breastfeed. In The Milky Way Program I used all four main sources of self-efficacy: (a) preparing women for role mastery (performance accomplishment); (b) organising for them to have vicarious experiences of other women breastfeeding; (c) using multiple methods of verbal persuasion (oral and written); and (d) helping women to develop skills in being aware of and managing their physiological responses. For example, role mastery was enhanced by giving women synthetic breasts to practice positioning their
fingers on the breast in a way that gives more room for the baby to latch. Women also practiced how to express and store breast milk in a simulated situation (performance accomplishment). Many pictures and breastfeeding postcards were used, and women were given a breastfeeding calendar and a DVD to take home and watch with their support people (vicarious experience). Women in The Milky Way Program were encouraged to discuss their concerns with the facilitator and their support people to prepare themselves to feel self-efficacious about breastfeeding (verbal persuasion). Through role playing, women were well prepared to identify their physiological changes after birth and plan their own strategies to relax and continue breastfeeding in different situations such as physical exhaustion and perceived low milk supply (physiological status).

As described in Chapter Two, breastfeeding self-efficacy is one of the major factors that contribute to prolonged breastfeeding. Kingston et al. (2007) in a descriptive study of 63 Canadian women found that observing breastfeeding role models through videotapes and pictures increased women’s breastfeeding self-efficacy. Hatamleh (2012) demonstrated successful results with self-efficacy-enhancing strategies to increase breastfeeding duration up to six weeks. The Milky Way Program is the only intervention to have simultaneously demonstrated an increase in breastfeeding confidence levels with high breastfeeding self-efficacy scores and continued breastfeeding to six months.

**Strengths of the Research**

A strength of the study is the robust and innovative design of The Milky Way Program (discussed above). The research design was strong in that it involved intervention and control groups that were comparable at baseline. The study was sufficiently powered to detect differences in breastfeeding rates at one, four and six months. A few strategies were used to measure the effectiveness of the intervention, including intention-to-treat and
logistic regression analysis. The Milky Way Program employed clear session plans that can be used by other health professionals and other facilities (Appendix 9).

**Limitations of the Research**

The study used a quasi-experimental design, which creates a potential bias. There was a possibility that the standard care that women received during the study had changed. To check for this possibility, I regularly assessed the standard-care services for any change; there was no significant change, which supports our claim that there were no clinically significant differences between the two groups except exposure to The Milky Way Program. Although, there was no major change in the standard care, the possibility of minor changes like lack of continuity of care or education in the standard care was inevitable.

Women who met the inclusion criteria and were adult at the time of birth, intended to breastfeed and were literate in English were recruited in the study. To address the concern that the sample may not have been representative of the population from which it was drawn, I compared the antenatal demographic characteristics of the study population to the South Western Sydney Local Health District (SESLHD). The demographic characteristics of the study population were close to SESLHD in terms of age, marriage, income, place of birth and smoking during pregnancy (Centre for Epidemiology and Research, 2011; Sydney South West Area Health Service, 2005). The majority of women in this study were young and married, and had low family income. More than half of the women were born outside of Australia, and only 8 percent were smoking during pregnancy. Similar to the wider local population, participants in both study groups reported relatively high levels of education. However the sample was less diverse than the local population in those findings cannot be generalised to adolescent and women who do not intend to breastfeed or who are
not literate in English. More women in The Milky Way group withdrew from the study compared with the standard care group, however, based on the fact that the number was small, no comparison was made between the women who withdrew from the study and the women who remained in the study.

Another potential bias is that I as the researcher was not blind to the group allocation. Due to financial limitations, I delivered the intervention and collected the postnatal data. Considering my passion and extensive experience in lactation and facilitation, women might have perceived extra support than the designed intervention program. Furthermore women benefit from the consistency of the facilitator which was not possible for the standard care group. Women also might have perceived the data-collection phone calls as the extra supportive follow-up phone calls, although there was no breastfeeding advice provided during data collection. Also, there was a possibility of response bias, in which the women may have tended to give socially desirable responses when questioned about perceived support from partners or mothers. Based on quantitative design of the study, there was no intention to collect and analyse women’s experience.

Finally, the modified BSES-SF was used to measure breastfeeding self-efficacy during the postnatal period, but not in the antenatal survey. This could be considered a detection bias. The rationale for not using the scale was to prevent exposing the women to leading questions on breastfeeding challenges. For instance, some of the items in the modified BSES-SF may have led the woman to think that breastfeeding takes time or can be embarrassing and uncomfortable when performed in front of other people. To address this specific concern, women’s breastfeeding confidence was measured antenatally instead, using two 5-point Likert scale questions on breastfeeding confidence (Appendix 8).
Breastfeeding confidence was again measured postnatally, in addition to breastfeeding self-efficacy.

**Recommendations for Practice, Policy, Education and Research**

The Milky Way Program is a potentially effective way to increase breastfeeding rates up to six months. Women in the program had an enhanced sense of intrinsic power and breastfeeding confidence. These women were able to create the necessary breastfeeding territory wherever, and whenever, they needed to breastfeed. I believe the following recommendations for practice, policy, education and research can be inferred from the study.

**Practice**

The Milky Way Program is an effective and feasible intervention that can be available to all women who want to breastfeed for the first time. The Milky Way Program can be adopted into Baby Friendly Hospitals and structured continuity-of-care models to provide extra support for prolonged breastfeeding.

The program can be run by facilitators with no extra qualifications or certificates. Any health professional with training and experience in the field of breastfeeding can learn about the program and implement the intervention. Midwives, child and family health nurses, lactation consultants and other health professionals can adopt the program, create a breastfeeding territory and use integrative power to support breastfeeding women.

The literature review demonstrated that the antenatal preparation classes currently being routinely offered in health services are not effective in prolonging breastfeeding to six months postpartum. The lack of an effective form of antenatal preparation in hospitals is, I believe, related to the professional-centred nature of classes and their lack of continuity. In these classes, an array of different health professionals (midwives, dieticians,
physiotherapists and possibly others) teach how they believe women should prepare for birth and/or the postpartum period, including breastfeeding and baby care. In contrast, The Milky Way Program is woman-centred, has continuity of facilitator, extends support into the postnatal period and aims to promote women’s sense of their own confidence. The practical challenge to implement this program would be closing the gap from the hospital to the community. There will be a need for effective team work between the prenatal care providers and community care providers.

**Policy**

The Milky Way Program can be used in polices and best-practice recommendations that address perceived low milk supply and support breastfeeding practice at local, national and international levels.

**Education**

The Milky Way Program can be incorporated into educational programs to support breastfeeding women. The current study indicates that some health professionals who work with women during childbearing need benefit from extra education and training on supporting women to breastfeed.

**Research**

Implementation of The Milky Way Program with different populations, ideally as a cluster-randomised controlled trial, would be a valuable research focus. Conducting a qualitative study to explore women’s experiences in The Milky Way Program would be useful. Another potential study is implementation of the program with multiparous women who have not previously breastfed or who have ceased breastfeeding early. The program is
likely to be successful in supporting women who had previous unsuccessful breastfeeding experiences; a study directed at this group is recommended.

**Conclusion**

This study has demonstrated the effectiveness of The Milky Way Program to increase breastfeeding rates at six months. The Milky Way Program virtually doubled the rate of breastfeeding and moved the rates closer to the NHMRC target of 80 percent breastfeeding at six months of age (National Health and Medical Research Council, 2003). Assignment to The Milky Way Program was associated with increased breastfeeding likelihood even when accounting for well-known confounders: age, education, smoking and breastfeeding intention. Additionally, and not surprisingly, women who were assigned to The Milky Way group had higher rates of breastfeeding intention, confidence and self-efficacy in the postnatal period. I recommend that managers, parent educators, lactation consultants, midwives, nurses and other health professionals use The Milky Way Program to help and support women to breastfeed with little professional intervention after birth. This dissertation has added to the knowledge and evidence about breastfeeding by showing success in a program where women were actively involved in trusting themselves and creating their own breastfeeding territory with a supportive network. In addition, the program facilitator and women’s support people were encouraged to use integrative power and let the woman sense her embodied self. The positive results demonstrated in this study were directly related to the newly created woman-centred intervention called The Milky Way program.
References


### Appendix 1: Glossary

<table>
<thead>
<tr>
<th>Glossary</th>
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</thead>
<tbody>
<tr>
<td><strong>Affect</strong></td>
</tr>
<tr>
<td>The experience of feeling or emotion (Weiten, 2014).</td>
</tr>
<tr>
<td><strong>Antenatal</strong></td>
</tr>
<tr>
<td>The period before giving birth; i.e. pregnancy (Maternity and Child Health Unit, 2010, p. ii).</td>
</tr>
<tr>
<td><strong>Breast milk</strong></td>
</tr>
<tr>
<td>Human milk and colostrum (Webb et al., 2002, p. xi).</td>
</tr>
<tr>
<td><strong>Breastfeeding</strong></td>
</tr>
<tr>
<td>An infant-feeding method where the child receives some breast milk and can also receive any food or liquid including non-human milk (Webb et al., 2002, p. xi). Thus the term <em>breastfeeding</em> includes exclusive, predominant and complementary breastfeeding. For the purposes of this research a baby is defined as <em>breastfeeding</em> if s/he received any breast milk in the past 24 hours.</td>
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<tr>
<td><strong>Breastfeeding intention</strong></td>
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<tr>
<td>For the purpose of the current study breastfeeding intention is defined as a woman’s plan to breastfeeding that is formed based on the woman’s inner desire to breastfeed or not.</td>
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<tr>
<td><strong>Breastfeeding self-efficacy</strong></td>
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<td>A woman’s perceived ability to breastfeed her newborn (Dennis, 2006, p. 257).</td>
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<tr>
<td><strong>Breastfeeding support</strong></td>
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<tr>
<td>For the purpose of this study breastfeeding support is defined as a women’s perception of supportive behaviour from her social network. This definition is inclusive of professional, family and peer support.</td>
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<tr>
<td><strong>Breastfeeding territory</strong></td>
</tr>
<tr>
<td>In this study the concept of breastfeeding territory has been extracted from the theory of Birth Territory and Midwifery Guardianship, it is defined as a woman’s territory whenever and wherever she wants to breastfeed.</td>
</tr>
<tr>
<td><strong>Childbearing</strong></td>
</tr>
<tr>
<td>The period of time when women experience: becoming pregnant; being pregnant; giving birth; and the early months of parenting (Parratt, 2010, p.7).</td>
</tr>
<tr>
<td><strong>Complementary feeding</strong></td>
</tr>
<tr>
<td>An infant-feeding method where the infant receives solid or semi-solid food in addition to breast milk, including expressed milk. This may include any food or liquid, including non-human milk and formula. (Australian Health Ministers’ Conference, 2009, p. 4).</td>
</tr>
<tr>
<td><strong>Disintegrative power</strong></td>
</tr>
<tr>
<td>An ego-centred power that disintegrates other forms of power within the environment (Fahy &amp; Hastie, 2008, p. 22).</td>
</tr>
<tr>
<td>Glossary</td>
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<tr>
<td>Embodied self</td>
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<td>Emotion</td>
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<td>Exclusive breastfeeding</td>
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<td>Fully breastfeeding</td>
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<td>Gestational age</td>
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<tr>
<td>Improved sense of self</td>
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<td>Integrative power</td>
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<tr>
<td>Intention</td>
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<tr>
<td>Intrinsic power</td>
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<tr>
<td>Jurisdiction</td>
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### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td><strong>Level Six Maternity Service</strong></td>
<td>In NSW each maternity service has a designated Level (1–6). This thesis included Level Four and Level Six services. A Level Six maternity service provides a range of services from low risk to the most complex cases. They have 24-hour onsite access to specialist obstetricians and Anaesthetists Centre for Epidemiology and Research (2011, p. 13).</td>
</tr>
<tr>
<td><strong>Living body</strong></td>
<td>A uniquely experienced diverse biological organism that: grounds existence of the self as an embodied being (Parratt, 2010, p. 3).</td>
</tr>
<tr>
<td><strong>Local Health District</strong></td>
<td>A unit of health system administration in NSW. There are eight Local Health Districts in the Sydney metropolitan area and seven in rural NSW. The LHDs are each accountable to the NSW Health Department for the management of public hospitals and community health services in the government region (Australian Institute of Health and Welfare, 2014). Prior to 2011, the Local Health Districts were divided differently and they were named Area Health Services.</td>
</tr>
<tr>
<td><strong>Midwife</strong></td>
<td>Health professional who specialises in caring for women during pregnancy, labour, birthing and the postnatal period (Maternity and Child Health Unit, 2010, p. ii).</td>
</tr>
<tr>
<td><strong>Midwifery Guardianship</strong></td>
<td>A sub-concept of integrative power; promotes the use of integrative power by women during childbearing (Fahy &amp; Hastie, 2008, p. 22).</td>
</tr>
<tr>
<td><strong>Multiparous</strong></td>
<td>A woman who has completed two or more pregnancies to 20 weeks or more (Cunningham et al., 2010).</td>
</tr>
<tr>
<td><strong>Nulliparous</strong></td>
<td>A woman who has never completed a pregnancy beyond 20 weeks' gestation (Cunningham et al., 2010).</td>
</tr>
<tr>
<td><strong>Optimised psychophysiological wellbeing</strong></td>
<td>The experience of mind, body and soul working seamlessly together in a way that is most advantageous to the embodied self (Parratt, 2010, p. 28).</td>
</tr>
<tr>
<td><strong>Performance accomplishments</strong></td>
<td>Corrective reinforcement towards the perfection of skills through cognitive, behavioural and self-regulatory efforts (Bandura, 1997).</td>
</tr>
<tr>
<td><strong>Physiological responses</strong></td>
<td>Physiological and emotional reactions that impacts on people's self-efficacy beliefs (Bandura, 1997).</td>
</tr>
<tr>
<td><strong>Postnatal</strong></td>
<td>Period of time after pregnancy and birth (Maternity and Child Health Unit, 2010, p. ii).</td>
</tr>
<tr>
<td><strong>Power</strong></td>
<td>An energy which enables a person to do or obtain what the person wants (Fahy et al., 2008, p. 172).</td>
</tr>
<tr>
<td>Glossary</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Predominant breastfeeding</td>
<td>An infant feeding method when the infant’s predominant source of nourishment is breast milk but he or she may also receive water and water-based drinks (sweetened and flavoured water, teas, infusions, and so on); fruit juice; oral rehydration solution; drop and syrup forms of vitamins, minerals and medicines; and ritual fluids (in limited quantities). All other food-based fluids are excluded—in particular, non-human milk (Webb et al., 2002, p. xii).</td>
</tr>
<tr>
<td>Primiparous</td>
<td>A woman who has given birth only once at 20 or more weeks (Cunningham et al., 2010).</td>
</tr>
<tr>
<td>Re-lactation</td>
<td>Re-stimulation of lactation after breastfeeding cessation (International Lactation Consultant Association, 2012). In this study re-lactation was based on: (a) spending more time for bonding; (b) offering breast to the baby; and (c) expressing and feeding the baby with the mother’s expressed breast milk.</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>People’s beliefs in their capabilities to organise and execute the course of actions required to produce given attainments (Bandura, 1997, p. 3). Self-efficacy also refers to a situation-specific form of self-confidence (Block et al., 2010, p. 44).</td>
</tr>
<tr>
<td>Social support</td>
<td>A woman’s perception of supportive behaviours from others in her social network that she believes will ultimately be beneficial to her. Women experience support when they receive care, concern, respect, understanding, advice, encouragement and practical help (Williams, 2005).</td>
</tr>
<tr>
<td>Soul</td>
<td>The experienced spiritual part of self (Kovel, 1991).</td>
</tr>
<tr>
<td>Spirit</td>
<td>The power that drives the world and the cosmos (Parratt, 2010, p. 2).</td>
</tr>
<tr>
<td>Spiritual being</td>
<td>The spiritual part of self as an indivisible part of universal energy in a human being (Parratt, 2010).</td>
</tr>
<tr>
<td>Terrain</td>
<td>The physical, geographical and dynamic features of individual childbirth space that affects women and babies (Fahy, 2008, p. 18).</td>
</tr>
<tr>
<td>Tertiary-referral hospital</td>
<td>Hospital that provides the highest level of care, specialisation and functions as a university teaching hospital (Centre for Epidemiology and Research, 2011). The same as a Level Six Maternity Service.</td>
</tr>
<tr>
<td>Trimester</td>
<td>A period of three months (14 weeks) during pregnancy. Pregnancy is divided into three equal time periods; each is almost three calendar months. The first trimester is from first week to 14 weeks of pregnancy, the second is from 15 to 28 weeks, and the third from the 29th week to the end of 42 weeks (Cunningham et al., 2010).</td>
</tr>
<tr>
<td><strong>Glossary</strong></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td><strong>Verbal persuasion</strong></td>
<td>Other people’s expression of trust and confidence in one’s capabilities to perform a behaviour that increases one’s sense of efficacy (Bandura, 1997).</td>
</tr>
<tr>
<td><strong>Vicarious experience</strong></td>
<td>Observational learnings where individuals search for role models and observe the effective skills and strategies that the role models apply to manage environmental demands (Bandura, 1997).</td>
</tr>
<tr>
<td><strong>Weaned</strong></td>
<td>The infant/child no longer receives any breast milk (Webb et al., 2002, p. xii).</td>
</tr>
</tbody>
</table>
| **WHO Ten steps to successful breastfeeding (for BFHI hospitals)** | 1. Have a written breastfeeding policy that is routinely communicated to all health care staff.  
2. Train all health care staff in skills necessary to implement this policy.  
3. Inform all pregnant women about the benefits and management of breastfeeding.  
4. Help mothers initiate breastfeeding within half an hour of birth.  
5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants.  
6. Give newborn infants no food or drink other than breast milk, unless medically indicated.  
7. Practise rooming-in - that is, allow mothers and infants to remain together - 24 hours a day.  
8. Encourage breastfeeding on demand.  
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.  
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic (World Health Organization, 1998, p.5). |
Appendix 2: Search Strategy

An online literature search was conducted in Medline (from 1990), CINHAL (from 1990), Maternity and Infant Care and the Cochrane Database of systematic reviews. The search strategy included the following key words, using the search fields of abstract, MeSH subject headings and exploded subject heading: breastfeeding, duration, initiation, cessation, weaning, education, support, partner, social support and self-efficacy. Studies were limited to those in the English language, published since 1990. Additional studies were located from reference lists of some systematic reviews or previous articles. The concept of Birth Territory and Midwifery Guardianship was searched separately; and no results were found in terms of breastfeeding concepts. Details of the search strategies are as follows.

Step 1: Identifying search terms

Four concepts were identified for the research title: breastfeeding, factors (affecting breastfeeding practice), interventions (supporting breastfeeding) and self-efficacy. To select search terms, assistance was obtained from research supervisors and the University of Newcastle and Liverpool Health Services librarians. See the table on the next page.
| Designing and implementing a theory-based intervention to prolong breastfeeding |
|---|---|---|---|---|
| Concepts | Breastfeeding | Factor | Intervention | Self-efficacy theory |
| Synonyms | Lactation Human milk Breast milk Nurturing | Variable Determinant Time factors | Strategy | Confidence |
| Broader terms | Infant feeding Infant food Infant nutrition | Patient education Maternal education | Social cognitive theory Personality Self-esteem |
| Narrower terms | Prolonged breastfeeding Any breastfeeding | Duration Weaning Initiation Long term Prolonged | Breastfeeding education Breastfeeding support | Self-efficacy |
| Related terms | Duration Initiation Prevalence Exclusivity Weaning Hazards of formula Infant Women Mother Newborn Partner | Socio-demographic Age Education Income Marital status Single Separated Married Psychosocial Smoking Support Partner depression Knowledge Attitude Parity Education Public attitude Hospitalization In-laws Sister Physical | Antenatal education Family support Health professional support Paternal support Paternal education Infant setting education Postnatal Antenatal Prenatal Prenatal | Planned behaviour theory Social behaviour Bandura’s theory |
| Alternative spelling | Breast-feeding Breastfeeding BF | | | Behaviour |
| Parts of speech | Breastfed Breastfeed Breastfeeds Feeding | Factors | Interventions |
| Phrase/separate words | “Breast feed” Breast feed | | “Self efficacy” Self-efficacy |
**Step 2: Limiting the search**
The search was limited to publications in the English language, published since 1990 and focused on breastfeeding.

**Step 3: Truncation, wildcards, and phrases**

<table>
<thead>
<tr>
<th>Search terms</th>
<th>Possibilities</th>
<th>Truncation, wildcards, and phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding</td>
<td>Breast-feeding</td>
<td>“Breastfeeding”, Breast Feeding, Breastf$, BF</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding BF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breastfed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breastfeed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Breastfeeds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feeding</td>
<td></td>
</tr>
<tr>
<td>Lactation</td>
<td>Lactated, lactation, lactate</td>
<td>Lactat$</td>
</tr>
<tr>
<td>Breast milk</td>
<td></td>
<td>“breast milk”</td>
</tr>
<tr>
<td>Nurturing</td>
<td></td>
<td>Nurtur$</td>
</tr>
<tr>
<td>Infant feeding</td>
<td>“infant feeding”</td>
<td>“Infant food”</td>
</tr>
<tr>
<td>Infant food</td>
<td>“infant nutrition”</td>
<td></td>
</tr>
<tr>
<td>Infant nutrition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prolonged</td>
<td>Prolonged, prolonging, prolong</td>
<td>Prolong$, “prolonged breastfeeding”</td>
</tr>
<tr>
<td>Sustaining</td>
<td>sustain</td>
<td>Sustain$</td>
</tr>
<tr>
<td>Continue</td>
<td>continuation, continued</td>
<td>Continu$</td>
</tr>
<tr>
<td>Initiation</td>
<td>Initiated</td>
<td>Initiat$</td>
</tr>
<tr>
<td>Weaning</td>
<td>Wean, weaning, weans, weaned</td>
<td>Wean$</td>
</tr>
<tr>
<td>Stopped</td>
<td>Stop, Ceasing,</td>
<td>Stop$, Ceas$</td>
</tr>
<tr>
<td>Rate</td>
<td>Rates</td>
<td>Rate?</td>
</tr>
<tr>
<td>Exclusivity</td>
<td>Exclusive, exclusively</td>
<td>Exclusiv$</td>
</tr>
<tr>
<td>Women</td>
<td>Woman, women</td>
<td>Wom#n</td>
</tr>
<tr>
<td>Mother</td>
<td>Mothers</td>
<td>Mother#</td>
</tr>
<tr>
<td>Newborn Infant</td>
<td>Newborns, Infant</td>
<td>“newborn”, Infant</td>
</tr>
<tr>
<td>Partner</td>
<td>Partners, Fathers</td>
<td>Partner?, Father?</td>
</tr>
<tr>
<td>Socio-demographic</td>
<td>Social and demographic</td>
<td>“Social and demographic”</td>
</tr>
<tr>
<td>Age</td>
<td>Maternal age</td>
<td>Sage</td>
</tr>
<tr>
<td>Search terms</td>
<td>Possibilities</td>
<td>Truncation, wildcards, and phrases</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Income</td>
<td>Low income</td>
<td>“low income”</td>
</tr>
<tr>
<td>Smoking</td>
<td>Smoke</td>
<td>Smok$</td>
</tr>
<tr>
<td>Support</td>
<td>Supportive, supports, social support, emotional support, physical support</td>
<td>Support$,</td>
</tr>
<tr>
<td>Postnatal</td>
<td>Postnate, postnatally</td>
<td>Postnat$</td>
</tr>
<tr>
<td>depression</td>
<td>Depressed, postnatal depression, PD</td>
<td>Depress$, PD, “postnatal depression”</td>
</tr>
<tr>
<td>Sister</td>
<td>Sisters</td>
<td>Sister?</td>
</tr>
<tr>
<td>Siblings</td>
<td>Sibling</td>
<td>Sibiling?</td>
</tr>
<tr>
<td>In-laws</td>
<td>In-law</td>
<td>In law?</td>
</tr>
<tr>
<td>Mother in-law</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>Intervention or interventions</td>
<td>Intervention?</td>
</tr>
<tr>
<td>Strategy</td>
<td>Strategies</td>
<td>Strateg$</td>
</tr>
<tr>
<td>Education</td>
<td>Educated,</td>
<td>Educa$,</td>
</tr>
<tr>
<td>Antenatal</td>
<td>Antenatally</td>
<td>Antenat$</td>
</tr>
<tr>
<td>Confidence</td>
<td>Confident, confidently</td>
<td>Confident</td>
</tr>
<tr>
<td>Behavior</td>
<td>Behaviour</td>
<td>Behavio?r,</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td></td>
<td>“Self efficacy”</td>
</tr>
</tbody>
</table>

**Step 4: Combining terms (Boolean logics and other connectors)**

Boolean logics (AND OR NOT) and other connectors were used to combined search terms.

For instance:

1. (breastfeed$ or lactat$3)
2. (breastfeed$ or lactation) and (prenatal education or perinatal education or antenatal education).mp
3. (first time mothers or primipar$)
4. 1 and 2 and 3
5. remove duplicated from 4
6. (breastfeeding adj3 duration)
7. breastfeeding adj5 prolong$ child$3.ti
After completion of these steps, the search was run in the relevance database. At every stage of the search, the retrieved records were investigated for relevance. Additional relevant terms were included, and the search strategy was modified and improved during the search. Once a manageable number of relevant records was achieved, the search history was saved. The search was completed when there were no new retrieved records. However, the search was updated during the course of the project to add new records from databases.

A further search was conducted in 2013 to find updated information for the discussion chapter. The Medline, CINAHL, Maternity and Infant Care, Scopus and Cochrane Databases of Systematic Reviews were searched (as shown in the following table) to identify any successful intervention in increasing breastfeeding rates at six months.
Results from search for discussion chapter 1999-2013 (Current)

<table>
<thead>
<tr>
<th>Search Term</th>
<th>Database results</th>
<th>Medline</th>
<th>Cochrane</th>
<th>CINAHL</th>
<th>Maternity and Infant Care</th>
<th>Scopus</th>
</tr>
</thead>
<tbody>
<tr>
<td>breastfeeding OR ‘breast feeding’ OR breast$ OR BF OR lactat$ OR ‘breast milk’ or ‘infant feeding’</td>
<td></td>
<td>218366</td>
<td>24859</td>
<td>61,767</td>
<td>17818</td>
<td>45,533</td>
</tr>
<tr>
<td>Prolong OR “prolonged breastfeeding” OR duration OR sustain$ OR continu$</td>
<td></td>
<td>1259034</td>
<td>96839</td>
<td>163,828</td>
<td>24013</td>
<td>852,210</td>
</tr>
<tr>
<td>Intervention? Or strateg$ OR educa$ OR “effective intervention” OR program$</td>
<td></td>
<td>1957327</td>
<td>139359</td>
<td>487,645</td>
<td>37446</td>
<td>3,420,864</td>
</tr>
<tr>
<td>#1 AND #2</td>
<td></td>
<td>27132</td>
<td>3894</td>
<td>3888</td>
<td>5,105</td>
<td></td>
</tr>
<tr>
<td>#1 AND #3</td>
<td></td>
<td>46511</td>
<td>5184</td>
<td>3800</td>
<td>2,452</td>
<td></td>
</tr>
<tr>
<td>#1 AND #2 AND #3</td>
<td></td>
<td>7152</td>
<td>1304</td>
<td>2,062</td>
<td>1247</td>
<td>1,233</td>
</tr>
<tr>
<td>Limited to English, &gt;1999, journals, breastfeeding, human, medicine, Nursing and social science</td>
<td></td>
<td>4849</td>
<td>274</td>
<td>515</td>
<td>153</td>
<td>568</td>
</tr>
<tr>
<td>Reviewed only RCT, systematic review, cohort, developed countries and relevant to the aim of the study</td>
<td></td>
<td>4 Duplicated in Scopus Asku 2011</td>
<td>3 Britton et al 2007 Lavender et al 2013 Lumbiganon et al 2012</td>
<td>25 on duration but only 9 articles reported on 6 months BF outcome</td>
<td>4 Duplicated in Scopus</td>
<td>24 on duration but only 14 (4 was duplicated in CINHAL)had 6months outcome results Asku 2011</td>
</tr>
</tbody>
</table>

Used * in Cochrane Library database instead of $
Appendix 3: Ethics Approvals

Mrs Shahla Meedya
277 Dora Street
HURSTVILLE  2220

Dear Mr Meedya:

Re: A theory and evidence-based based intervention to prolong breastfeeding until six months postpartum in an Australian population
HREC reference: 08/LPOOL/212
SSA reference: 08/LPOOL/265
Local reference: 08/166

Thank you for submitting an application for authorisation of this project. I am pleased to inform you that authorisation has now been granted for this study to take place at the following site(s):

Women's & Child Health Outpatient Department, Liverpool Hospital.

You are reminded that:

1. Proposed amendments to the research protocol or conduct of the research which may affect the ongoing site acceptability of the project, are to be submitted to the research governance officer.

Yours faithfully,

Ms Jennie Grech
Research Governance Officer
Sydney South West Area Health Service
HUMAN RESEARCH ETHICS COMMITTEE

Notification of Expedited Approval

To Chief Investigator or Project Supervisor: Professor Kathleen Fahy
Cc Co-investigators / Research Students: Dr Ashley Kable
                                              Mrs Shahia Meedy
Re Protocol: A theory and evidence-based based intervention to
            prolong breastfeeding until six months postpartum in
            an Australian population
Date: 05-Feb-2009
Reference No: H-2008-0152

Thank you for your Variation submission to the Human Research Ethics Committee (HREC) seeking approval in
relation to a variation to the above protocol.

The researcher submitted confirmation of approval for this project from the Sydney South West Area
Health Service HREC.

In gaining approval from the SSWAHS HREC minor variations were required to the following study
documents:
- Information Statements for Part A, Part B and Pilot Study (now versions 4, dated 04/11/2008)
- Consent Forms for Part A, Part B and Pilot Study (now versions 3, dated 31/10/2008)

Your submission was considered under Expedited review by the Chair/Deputy Chair.

I am pleased to advise that the decision on your submission is Approved effective 05-Feb-2009.

The full Committee will be asked to ratify this decision at its next scheduled meeting. A formal Certificate of Approval
will be available upon request.

Simon
Acting Chair, Human Research Ethics Committee

For communications and enquiries:
Human Research Ethics Administration

Research Services
Research Office
The University of Newcastle
Callaghan NSW 2308
T +61 2 492 18999
F +61 2 492 17164
Human-Ethics@newcastle.edu.au

HUMAN RESEARCH ETHICS COMMITTEE (HREC)
HUMAN RESEARCH ETHICS SUB-COMMITTEE (HRESC)

NOTIFICATION OF APPROVAL

To: Professor Kathleen Fahy/Shahla Meedya
   School of Health and Human Sciences/Nursing
   Kathleen.fahy@scu.edu.au,smeedya@hotmail.com

From: Secretary, Human Research Ethics Committee
      Division of Research, R. Block

Date: 22 September 2011

Project: A theory and evidence-based intervention to prolong breastfeeding until six months postpartum in an Australian population

Approval Number ECN-11-213

The Southern Cross University Human Research Ethics Committee has established, in accordance with the National Statement on Ethical Conduct in Human Research – Section 5/Processes of Research Governance and Ethical Review, a procedure for expedited review by a delegated authority.

Thank you for your ‘Minimisation of Ethics approval’ application for approval. This has been considered by the Chair, HREC and has been approved. Your research may continue at SCU under the above approval number.

Please note the attached standard conditions of approval.

Sue Kelly
HREC Administration
Ph: (02) 6626 9139
E. ethics.lismore@scu.edu.au

Prof Bill Boyd
Chair, HREC
Ph: 02 6620 3650
E. william.boyd@scu.edu.au
Dear Participant,

You are invited to participate in this research project about how midwives can assist new mothers (and their partners) who wish to breastfeed. Shahla Meedya will conduct the research as part of her PHD study at the University of Newcastle. Shahla is a breastfeeding consultant and parent educator. She will conduct the research under the supervision of Professor Kathleen Fahy and Doctor Ashley Kable from the School of Nursing and Midwifery.

**Why is the research being done?**
The purpose of the research is to learn how midwives and nurses can more effectively promote breastfeeding for mothers and babies until six months of age. The study will compare the effectiveness of our normal breastfeeding support practices which you will receive, with a new educational intervention which we plan to test in the next phase of the study.

**Who can participate in this study?**
Women who say; YES’ to all five (5) questions below are invited to participate in this research:

- **Question 1:** Are you pregnant with your first baby?
  (Please note, you can still participate even if you have had a previous miscarriage)

- **Question 2:** Are you carrying only one baby?
  (As we are focussing first on women who have one baby at a time women with multiple pregnancies (twins or more) are not eligible to participate in this research project)

- **Question 3:** Do you wish to breastfeed?

- **Question 4:** Are you aged 19 years or older?

- **Question 5:** Do you speak, read and write English easily?

**Women who participate in this study may not continue their participation if the following occur:**

- multiple pregnancy (twins or more),
- baby is born more than two weeks early
- mother develops a severe medical condition that makes breastfeeding more difficult
- baby has a severe medical condition or congenital condition that makes breastfeeding more difficult

**What would you be asked to do?**
Participants will be asked to complete four (4) survey forms: one before birth and three after.

The first survey is attached to the consent form. The second, third and fourth survey forms will be completed through phone interviews. You will be invited to provide your telephone number so that.
Information Statement for Part A potential (Pre-intervention) participants (continued)
Women’s breastfeeding practice in first six months after birth

the researcher can call you. These calls will happen at approximately one, four and six months after the birth.

The questions will ask you consider your feelings about breastfeeding, your sense of confidence about breastfeeding and the support you expect and receive from family and friends. You will be asked about how long you breastfeed and whether any other foods or fluids are given to the baby in the first six months.

In order to establish when you have given birth, with your permission, the hospital computer system will be checked for the date of birth, type of birth and birth outcome.

How much time will it take?
Each survey should take about 10-15 minutes to complete.

What are the risks and benefits of participating of you and your baby?
There may be no direct benefits to you personally but your answers will contribute to improving our knowledge about factors that affect whether women begin and continue breastfeeding up to six months of age. There are no risks to you or your baby’s physical welfare but there is a possibility that you will experience emotional distress related to mothering and breastfeeding. In the case of any emotional distress you will be offered immediate emotional support by Shahla Meedya. Depending upon the situation, Shahla may also offer you referral for appropriate counselling either via the Child and Family Health Centres in Sydney South West Area health services or through a relevant community organisation.

How will your privacy be protected?
Any identifying information, including your name and phone number, will be stored securely and only accessed by the researcher. The research data will be coded and only the researcher will be able to link the coded data to the participants. At the completion of the research all identifying names and contact information will be destroyed and coded data will be copied from the computer and stored as electronic data on CD’s. These CDs will be securely stored at the School of Nursing and Midwifery for 5 years. The University of Newcastle has the ownership of the information.

Your privacy will be protected during and after completion of the project. However, the researcher may be obligated to report specific types of unlawful conduct of the participants if you decide to disclose that. For example the researcher has to report any case of child abuse or neglect to the Department of the Community Services (DOCs) under the Child Protection Act. This may include domestic violence whilst you are pregnant or after the birth of the baby.

How will the information collected be used?
The final results of this study will be published as a scholarly dissertation to be submitted for Ms Shahla Meedya’s PhD degree. Journal articles on various topics will be published in national and international journals. No identifying data will be presented in anything that is published. A summary of results may be available to you on request at the completion of the study, by phoning the researcher.

What choice do you have?
Participation in this research is entirely your choice. Whether or not you decide to participate, your decision will not disadvantage you. If you do decide to participate, you may withdraw from the project by contacting the researcher at any time without giving a reason. If you do withdraw you may also withdraw any data and your contact details.
What do you need to do to participate?
If you would like to participate, please complete and return the attached consent form and survey form to the breastfeeding research box near the receptionist in the antenatal clinic at Liverpool hospital. If there is anything you do not understand, or if you have questions, please ask the midwife who gave you this information sheet or contact the researcher (her details are below).

Further information
If you would like further information please contact Shahla Meedya (PHD student, University of Newcastle) on this Number 95919464 or Professor Kathleen Fahy (Research Chief supervisor) on (02) 49215966.

Thank you for considering this invitation.

Student: Shahla Meedya
Supervisor: Professor Kathleen. Fahy
Professor of Midwifery
Program Convenor,
Ph 02 49215966
FAX 02 49216301

Supervisor: Dr Ashley Kable
Senior Lecturer Postgraduate
Ph 02 49216334
Fax 02 49216301

Complaints about this research
This project has been approved by the University’s Human Research Ethics Committee (Approval No. H- 2008-0152) and Sydney South West Area Health Service Human ethics Committee (Approval No: 08/LPOOL/212).
Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au and the Ethics Secretariat (Western Zone), Sydney South West Area Health Service, Locked Bag 7017, LIVERPOOL BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, email jennie.grech@sswhs.nsw.gov.au).
Appendix 5: Participant’s Consent Form (Standard-Care Group)

Consent Form for the research project (Part A)
Women’s breastfeeding practice in first six months after birth
Researcher: Shahla Meedya, student of University of Newcastle
Supervisors: Professor Kathleen Fahy and Dr Ashley Kable
Document Version 4; dated

I agree to participate in the study described in the information statement attached to this form and give my consent freely.

I acknowledge that I have read the Information Statement, which explains why I have been selected, the aims of the study and the nature and the possible risks of the investigation, and the statement has been explained to me to my satisfaction.

Before signing this Consent Form, I have been given the opportunity to ask any questions relating to any possible physical and mental harm I might suffer as a result of my participation. I have received satisfactory answers to any questions that I have asked.

My decision whether or not to participate will not prejudice my present or future treatment or my relationship with Sydney South West Area Health Service or any other institution cooperating in this study or any person treating me. If I decide to participate, I am free to withdraw my consent and to discontinue my participation at any time without prejudice or giving any reasons.

I consent to:

- completing survey forms
- being contacted by phone during the first six months after the birth of my baby
- the researcher accessing the hospital computer system, Core Clinical Information System, to check the date of birth of my child, type of birth and birth outcome

I agree that research data gathered from the results of the study may be published, provided that I cannot be identified.

I understand that if I have any questions relating to my participation in this research, I may contact the study researcher, Shahla Meedya, on telephone 95919464, who will be happy to answer them.

I acknowledge receipt of a copy of this Consent Form and the Information Statement.

Complaints may be directed to the Ethics Secretariat (Western Zone), Sydney South West Area Health Service, Locked Bag 7017, LIVERPOOL BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, email jennie.grech@sswhs.nsw.gov.au).

Signature of participant ______________________ Please PRINT your name ______
Date ______________________

Contact Details

Phone number: (home): ______________________ (work): ______________________ (Mobile): ______________________

Signature of investigator/Midwife ______________________ Print name ______________________
Date ______________________

Please return this form with your questionnaire to the breastfeeding research box near the clerical desk in the Antenatal clinic
Appendix 6: Participants Information Sheet (Intervention Group)

Women’s breastfeeding practice in first six months after birth
Document Version 5; dated 14/07/2009

Dear Participant,

You are invited to participate in this research project about how midwives can assist most new mothers (and their partners) who wish to breastfeed. Shahla Meedya will conduct the research as part of her PHD study at the University of Newcastle. Shahla is a breastfeeding consultant and parent educator. She will conduct the research under the supervision of Professor Kathleen Fahy and Doctor Ashley Kable from the School of Nursing and Midwifery.

Why is the research being done?
The purpose of the research is to learn how midwives and nurses can more effectively promote breastfeeding for mothers and babies until six months of age. The study will compare the effectiveness of our normal breastfeeding support practices with a new educational intervention which you will receive in this part of the study.

Who can commence participation in this breastfeeding study?
Women who say; YES’ to all five (5) questions below are invited to participate in this research:

Question 1:  Are you pregnant with your first baby?  
(Please note, you can still participate even if you have had a previous miscarriage)

Question 2: Are you carrying only one baby?  
(As we are focussing first on women who have one baby at a time women with multiple pregnancies (twins or more) are not eligible to participate in this research project)

Question 3: Do you wish to breastfeed?

Question 4: Are you aged 19 years or older?

Question 5: Do you speak, read and write English easily?

Women who participate in this study may not continue their participation if the following occur:

- multiple pregnancy (twins or more),
- baby is born more than two weeks early
- mother develops a severe medical condition that makes breastfeeding more difficult
- baby has a severe medical condition or congenital condition that makes breastfeeding more difficult

What would you be asked to do?
As described below you will be invited to attend classes and have some follow up support after the birth. You will also be asked to complete some surveys.

Classes
You and your partner or support person will be invited to attend three breastfeeding education classes that aim to promote breastfeeding. The educational sessions will be run when you are about six, seven and eight months pregnant. The antenatal clinic receptionist at Liverpool hospital will arrange appointment times. She will provide you with the address, a map and instructions. Attending all three classes is necessary for your participation. These classes are free from any charges.
Follow Up Phone Calls
You will receive two follow-up phone calls from the researcher about ten days and three months after birth. The aim of the call is to support you in continuing to breastfeed.

Surveys
Participants will be asked to complete four (4) survey forms: one before birth and three after.

The first survey is attached to the consent form. The second, third and fourth survey forms will be completed through phone interviews. You will be invited to provide your telephone number so that the researcher can call you. These calls will happen at approximately one, four and six months after the birth.

The questions will ask you consider your feelings about breastfeeding, your sense of confidence about breastfeeding and the support you expect and receive from family and friends. You will be asked about how long you breastfeed and whether any other foods or fluids are given to the baby in the first six months.

In order to establish when you have given birth, with your permission, the hospital computer system will be checked for the date of birth, type of birth and birth outcome.

How much time will it take?
Each survey should take about 10-15 minutes to complete. Education session will take 1½ hours and each follow-up phone call will take about 10 minutes.

What are the risks and benefits of participating?
There may be no direct benefits to you personally but your answers will contribute to improving our knowledge about factors that affect whether women begin and continue breastfeeding up to six months of age. However, increasing breastfeeding duration is beneficial for you and your child. There are no risks to your or your baby’s physical welfare but there is possibility that you will experience emotional distress related to mothering and breastfeeding. In the case of any emotional distress you will be offered immediate emotional support by Shahla Meedya. Depending upon the situation, Shahla may also offer you referral for appropriate counselling either via the Child and Family Health Centres in Sydney South West Area health services or through a relevant community organisation.

How will your privacy be protected?
Any identifying information, including your name and phone number, will be stored securely and only accessed by Shahla Meedya. The non-identifying research data will be coded and only the researcher will be able to link the coded data to the participants. At the completion of the research all identifying names, telephone numbers, mail address and email addresses will be destroyed and coded data will be copied from the computer and stored as electronic data on CD’s. These CDs will be securely stored at the School of Nursing and Midwifery for 5 years. The University of Newcastle has the ownership of the information.

Your privacy will be protected during and after completion of the project. During educational sessions, it is possible that the groups will explore personal or sensitive details, all participants will be requested to maintain the confidentiality of the group discussion and not release the specific content to outside parties. However, the researcher may be obligated to report specific types of unlawful conduct of the participants if you decide to disclose that. For example the researcher has to report any case of child abuse or neglect to the Department of the Community Services (DOCs) under the Child Protection Act. This may include domestic violence whilst you are pregnant or after the birth of the baby.
**How will the information collected be used?**

The final results of this study will be published as a scholarly dissertation to be submitted for Ms Shahla Meedya’s PHD degree. Journal articles on various topics will be published in national and international journals. No identifying data will be presented in anything that is published. A summary of results may be available to you on request at the completion of the study by phoning the researcher.

**What choice do you have?**

Participation in this research is entirely your choice. Whether or not you decide to participate, your decision will not disadvantage you. If you do decide to participate, you may withdraw from the project by contacting the researcher at any time without giving a reason. If you do withdraw you may also withdraw any data and your contact details.

**What do you need to do to participate?**

If you would like to participate, please complete and return the attached consent form and survey form to the breastfeeding research box near the receptionist in the antenatal clinic at Liverpool hospital, then go to the receptionist to arrange appointment times for the classes and receive information pack about breastfeeding classes. If there is anything you do not understand, or if you have questions, please ask the midwife who gave you this information sheet or ring the researcher (her details are below).

**Further information**

If you would like further information please contact Shahla Meedya (PHD student, University of Newcastle) on this Number 95919464 or Professor Kathleen Fahy (Research Chief supervisor) on (02) 49215966.

**Thank you for considering this invitation.**

Student: Shahla Meedya

Supervisor: Professor Kathleen. Fahy
Professor of Midwifery
Program Convenor,  Ph 02 49215966
FAX 02 49216301

Supervisor: Dr Ashley Kable
Senior Lecturer Postgraduate

[Signature]

**Complaints about this research**

This project has been approved by the University’s Human Research Ethics Committee (Approval No. H- 2008-0152) and Sydney South West Area Health Service Human ethics Committee (Approval No: 08/LPOOL/212).

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au and the Ethics Secretariat (Western Zone), Sydney South West Area Health Service, Locked Bag 7017, LIVERPOOL BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, email jennie.grech@sswahs.nsw.gov.au).
Appendix 7: Participant’s Consent Form (Intervention Group)

Consent Form for the Research Project (part B)
Women's breastfeeding practice in first six months after birth
Researcher: Shahla Meedya, student of University of Newcastle
Supervisors: Professor Kathleen Fahy and Dr Ashley Kable
Document Version 4; dated

I agree to participate in the study described in the information statement attached to this form and give my consent freely.

I acknowledge that I have read the Information Statement, which explains why I have been selected, the aims of the study and the nature and the possible risks of the investigation, and the statement has been explained to me to my satisfaction.

Before signing this Consent Form, I have been given the opportunity to ask any questions relating to any possible physical and mental harm I might suffer as a result of my participation. I have received satisfactory answers to any questions that I have asked.

My decision whether or not to participate will not prejudice my present or future treatment or my relationship with Sydney South West Area Health Service or any other institution cooperating in this study or any person treating me. If I decide to participate, I am free to withdraw my consent and to discontinue my participation at any time without prejudice or giving any reasons.

I consent to:
- completing survey forms
- being contacted by phone during first six months after the birth of my baby
- the researcher to access the hospital Clinical Computer Information System to check the date of birth of my child, type of birth and birth outcome.
- attending three education sessions during pregnancy accompanied by my partner or support person

I agree that research data gathered from the results of the study may be published, provided that I cannot be identified.

I understand that if I have any questions relating to my participation in this research, I may contact the study researcher Shahla Meedya on telephone 95919464, who will be happy to answer them.

I acknowledge receipt of a copy of this Consent Form and the Information Statement.

Complaints may be directed to the Ethics Secretariat (Western Zone), Sydney South West Area Health Service, Locked Bag 7017, LIVERPOOL BC, NSW, 1871 (phone 9612 0614, fax 9612 0611, email jennie.grech@sswhs.nsw.gov.au).

Signature of participant ______________________ Please PRINT your name______
Date

Contact Details
Phone number: (home):  (work):  (Mobile):
Signature of investigator/Midwife and Print name
Date

Please return this form with your questionnaire to the breastfeeding research box near the clerical desk in the Antenatal clinic
Appendix 8: Antenatal Survey form

Date…….. Study number……..

1. General information
1.1. What is your age?  
1.2. Where were you born?

1.3. Are you an Australian Aborigine or Torres Strait Islander?  
[ ] Yes  
[ ] No

1.4. What is the highest level of education you have completed?  
[ ] Primary  
[ ] Lower secondary  
[ ] Upper secondary  
[ ] Certificate (e.g. TAFE)  
[ ] University degree

1.5. What is your marital status?  
[ ] Married  
[ ] De-facto  
[ ] Single  
[ ] Other

1.6. What is your estimated family income (AUD) a year?  
[ ] Less than $20,000  
[ ] $20-30,000  
[ ] $30-40,000  
[ ] $40-50,000  
[ ] More than $50,000

1.7. Do you intend to return to work after giving birth?  
[ ] Yes  
[ ] No

1.8. If yes, how many months after birth do you intend to return to work?  
[ ] 1 or 2 months  
[ ] 3 or 4 months  
[ ] 5 or 6 months  
[ ] after 6 months

1.9. Do you smoke?  
[ ] Yes  
[ ] No

1.10. If yes, how many cigarettes per day do you smoke?  
[ ] 1-9  
[ ] 10-19  
[ ] 20-29  
[ ] 30 or more

1.11. Have you stopped smoking while you are pregnant?  
[ ] Yes  
[ ] No

2. Birth information  
2.1. What is your expected due date for the birth of your child?

3. Breastfeeding intention  
3.1. How long do you intend to breastfeed your baby?  
[ ] Less than 6 months  
[ ] 6 months  
[ ] More than 6 months (please specify)

3.2. How do you rate your desire to breastfeed?  
[ ] Very strong  
[ ] Strong  
[ ] Not sure  
[ ] Weak  
[ ] Very weak

4. Breastfeeding support  
4.1. How do you feel about the support of your husband/partner regarding your decision to breastfeed?  
[ ] Supported  
[ ] Not sure  
[ ] Not supported

4.2. How do you feel about the support of your friends and other family members regarding your decision to breastfeed?  
[ ] Supported  
[ ] Not sure  
[ ] Not supported

5. Breastfeeding confidence  
Indicate your agreement or disagreement with each statement by circling the best answer

5.1. I feel confident to breastfeed my baby.  
[ ] Strongly agree  
[ ] Agree  
[ ] No opinion  
[ ] Disagree  
[ ] Strongly disagree

5.2. I feel confident that I could cope with unexpected events during breastfeeding.  
[ ] Strongly agree  
[ ] Agree  
[ ] No opinion  
[ ] Disagree  
[ ] Strongly disagree

Thank you for your participation. Please return your completed questionnaire with the consent form to the breastfeeding research box near the clerical staff in the Antenatal clinic
## Appendix 9: Session Plans for the Antenatal sessions

### First Antenatal Session

<table>
<thead>
<tr>
<th>Time</th>
<th>Content and strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction (10 min)</strong></td>
<td><strong>Greeting and introduction</strong></td>
</tr>
<tr>
<td></td>
<td>Informing participants of the format of the session:</td>
</tr>
<tr>
<td></td>
<td>• Benefits of breastfeeding and risks associated with artificial feeding</td>
</tr>
<tr>
<td></td>
<td>• WHO recommendation on breastfeeding with the reasons</td>
</tr>
<tr>
<td></td>
<td>• Myths and facts around breastfeeding</td>
</tr>
<tr>
<td></td>
<td>• Connections to the inner power</td>
</tr>
<tr>
<td></td>
<td>• Roles of your support people</td>
</tr>
<tr>
<td></td>
<td>• Impacts of people on breastfeeding; focusing on using integrative power</td>
</tr>
<tr>
<td></td>
<td>• Session activity</td>
</tr>
<tr>
<td></td>
<td>• Home activity</td>
</tr>
<tr>
<td><strong>Body (25 min)</strong></td>
<td><strong>Benefits of breastfeeding</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Brainstorm</strong> with the couples about their reasons for breastfeeding. Use photos and pictures. <strong>Remember that you are the facilitator; and the participants should run the discussion.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Activity</strong>: by using the breastfeeding and formula-feeding photos reinforce long-term breastfeeding motivation among the participants. Include the support people (partners, grandparents or friends).</td>
</tr>
<tr>
<td></td>
<td><strong>WHO recommendations</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Explore</strong> with the group their preferred duration of breastfeeding and WHO recommendation with the reasons behind (use photos and pictures).</td>
</tr>
<tr>
<td><strong>Body (25 min)</strong></td>
<td><strong>Myths and facts</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Activity</strong>: Use the myths box to explore with the group about the myths. The myths box contains eight cards that encourage women to trust themselves and connect to their inner power. Each card states one popular myth around breastfeeding. The written myths are: small breasts do not make enough milk, colostrum is not good for the baby, in first few days women cannot make enough milk, women cannot breastfeed if their mother or sister was not able to breastfeed their children, long-term breastfeeding makes the baby stick to the mum, long-term breastfeeding makes breasts saggy, a breastfeeding woman should have a special diet, if a woman takes medication she should not breastfeed and any myths that participants want to say. Encourage women to trust themselves when they make decisions. <strong>Remember that you are the facilitator; and the participants should run the discussion.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Connection to the inner power</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Play</strong> a short breastfeeding DVD that demonstrates the loving, relaxing and bonding parts of breastfeeding and stresses the women’s inner power and the importance of the loving and bonding moments. Ask the women to visualise the best bonding time with their child.</td>
</tr>
<tr>
<td><strong>Break (15 min)</strong></td>
<td></td>
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</tbody>
</table>
### Role of support people and impact of other people (20 min)

**Brainstorm** with the group about roles of support person. Ask participants to discuss it with their partner/support person and to talk about their expectations of each other in relation to breastfeeding (use photos and pictures).

**Activity** Explain about the role of support person and importance of positive relationship (it should include emotional support, physical assistance, having positive attitude and behaviour) **Play** a DVD on relationship.

**Brainstorm** with the group how other people could affect their breastfeeding practice. Give a simple example by saying:
- Imagine you tell your friend that you want to breastfeed your child. Then your friend says back: “Wow, what a lovely decision” 😊
  
  How would you feel? Does this comment make you feel relax and happy?
  
  Then you draw a circle on the board to make a happy face after response of the group to the question.

- But what happens if your friend tells you, “Breastfeeding, ouch!” 😞
  
  What does your body automatically feel? More tension?
  
  Then you draw the sad face. Then explain how people could affect their decisions.

### Session activity

Divide the class into three groups.

Give each group a piece of cardboard to write possible situations where other people could affect their breastfeeding practice or pressure them to adopt artificial feeding. Discuss the issues and explore the responses with the class. **Role play** a few scenarios.

### Summary and Home activity

Give them The Milky Way Program postcards, and ask them to write on the backs of the cards about: their own reasons for breastfeeding, three facts on breastfeeding, main expectations from their own support person and a few strategies to face people who pressure them to adopt artificial feeding.

**Home activity**: Give each couple a DVD on breastfeeding (breastfeeding practice) to take home and watch with key family members and friends to discuss the issues and concerns. Ask women to watch the DVD as many times as they wish. They need to return the DVD in the next session. Issues will be discussed in upcoming sessions. Also, participants will be asked to seek and identify a woman from their network who has long breastfeeding experience. If they do not have anybody to talk with, a breastfeeding woman from the Australian Breastfeeding Association will be introduced to that participant in the second antenatal session.
## Second Antenatal Session

<table>
<thead>
<tr>
<th>Time</th>
<th>Content and strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction and revision (15 min)</strong></td>
<td><strong>Greetings and feedback from the last session and their home activity</strong></td>
</tr>
<tr>
<td></td>
<td>Questions will include:</td>
</tr>
<tr>
<td></td>
<td>- How did you find watching the DVD?</td>
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<tr>
<td></td>
<td>- Who did you watch with?</td>
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<tr>
<td></td>
<td>- What issues did you discuss?</td>
</tr>
<tr>
<td></td>
<td>- What concerns do you have to discuss?</td>
</tr>
<tr>
<td></td>
<td>Informing the participants about the format of the current session:</td>
</tr>
<tr>
<td></td>
<td>- Understanding your body and your baby</td>
</tr>
<tr>
<td></td>
<td>- Most common questions</td>
</tr>
<tr>
<td></td>
<td>- Milk supply</td>
</tr>
<tr>
<td></td>
<td>- Breastfeeding issues and their management</td>
</tr>
<tr>
<td></td>
<td>- Breastfeeding support</td>
</tr>
<tr>
<td></td>
<td>- Session activity</td>
</tr>
<tr>
<td></td>
<td>- Home activity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Body (25 min)</th>
<th><strong>Understanding your body and your baby</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Brainstorm</strong> with the group about their feelings and the baby’s behaviour after birth.</td>
</tr>
<tr>
<td></td>
<td><strong>Activity</strong>: Divide the participants into three groups and give each group one pair of The Milky Way photo frames. Each photo frame contains information about what to expect from birth to six months. Discuss the information with the groups. Highlight the importance of communication with the baby. When you talk about baby’s feeding requirements on day one, give the participants a marble. Let them to touch the marble and explain about the baby’s stomach capacity and breast-milk production. Discuss about growth spurts and other normal changes in the baby’s growth and behaviour.</td>
</tr>
<tr>
<td></td>
<td><strong>Activity</strong>: Ask each couple to come forward and match some photos with the information from the photo frames. Write the important issues on the board. Discuss some important tips for successful breastfeeding and add your tips on the board.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th><strong>Most common questions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Activity</strong>: Give a box of the questions to the participants and ask them to take one question each and read it out. Go through The Milky Way postcards and the related photos. The questions include:</td>
</tr>
<tr>
<td></td>
<td>1. How do I know if my baby is hungry?</td>
</tr>
<tr>
<td></td>
<td>2. How do I know if my baby gets enough milk?</td>
</tr>
<tr>
<td></td>
<td>3. How often and how long should I breastfeed?</td>
</tr>
<tr>
<td></td>
<td>4. What happens if I feed the baby and he/she cries soon after the feed?</td>
</tr>
<tr>
<td></td>
<td>5. How long should I burp my baby?</td>
</tr>
<tr>
<td></td>
<td>6. My friend told me that if babies get only nipple while breastfeeding, they will not get enough milk and that causes grazed and sore nipples. How can I avoid this?</td>
</tr>
<tr>
<td></td>
<td><strong>Activity</strong>: push pop activity. Give the participants a push pop and ask them to suck only on the tip of the lolly and then ask them to push the lolly a bit further in their mouth and try to suck it. Then explore with the group about the differences. And give the explanation on correct attachment. Play a short breastfeeding video which demonstrates correct attachment.</td>
</tr>
</tbody>
</table>

<p>|               | <strong>Break (15 min)</strong> |</p>
<table>
<thead>
<tr>
<th>Body (25 min)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Milk supply</strong></td>
<td></td>
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</tbody>
</table>
| **Brainstorm** with the group about how they could produce enough milk from birth to six months (use photos and pictures)  
Give some examples from real life. For example whenever our refrigerator is empty we buy food, vegetables or fruit. If nobody takes fruit or vegies from the refrigerator there is no point in buying things. Same thing with breast milk. If the baby does not remove milk from the breast, the woman’s body will not produce more milk. |  |
| **Breastfeeding issues and their management** |  |
| **Activity**:  
Visualise the issue using the milk production poster.  
Draw a positive cycle of milk intake and weight gain to demonstrate milk supply and demand feeding (use photos and picture). **Remember that you are the facilitator; and the participants should run the discussion.**  
**Brainstorm** with the group about when people might doubt their milk supply.  
Explore the issues around colostrum, unsettled baby, soft breasts, weight loss, not observing milk letdown, baby’s frequent feeding, growth spurts, breast refusal, when the baby is playful and not concentrating on feed and….  
Draw a negative cycle of milk intake and milk supply  
**Activity**  
Give each participant a chatterbox to find out how they could increase their milk supply if they are in doubt. Address the most common problems with breastfeeding and their management plans, such as grazed nipples, engorgement and mastitis.  
**Brainstorm** with the group about the roles of the support person.  
Introduce community breastfeeding resources:  
Australian Breastfeeding Association  
Tresillian centre  
Karitane service  
Child and Family Health breastfeeding counsellors  
Ask participants to discuss it with their partner/support person and to talk about their expectation when they doubt their milk supply and what would they do if somebody pressured them to give formula.  
Role playing. |  |
| **Summary and home activity (10 min)** |  |
| Give them the postcards, and ask them to write behind about what to do to have enough milk supply, how to know if they have enough milk and their problem-solving strategies if they believe they have insufficient milk supply.  
As a home activity, ask participants to chat to a woman who breastfed her child for at least four months. Give the guidelines for a breastfeeding chat. If the participants do not know anybody with prolonged breastfeeding experience, give a contact number of a breastfeeding woman from ABA. Issues will be discussed in the next sessions.  
Ask the participants to bring an infant size baby-doll to the next session if they have any. |  |
# Third Antenatal Session

<table>
<thead>
<tr>
<th>Time</th>
<th>Content and strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction (15 min)</td>
<td>Greetings and getting feedback from the last session and their home activity. Questions will include:</td>
</tr>
<tr>
<td></td>
<td>• How did you find the home activity?</td>
</tr>
<tr>
<td></td>
<td>• What were some common comments?</td>
</tr>
<tr>
<td></td>
<td>• What was the most interesting part of your conversation?</td>
</tr>
<tr>
<td></td>
<td>• What concerns do you have to discuss?</td>
</tr>
<tr>
<td></td>
<td>Informing participants about the format of the session</td>
</tr>
<tr>
<td></td>
<td>• Positioning and attachment</td>
</tr>
<tr>
<td></td>
<td>• Hand expressing</td>
</tr>
<tr>
<td></td>
<td>• Pump expressing and storage of expressed breast milk</td>
</tr>
<tr>
<td></td>
<td>• Settling a baby</td>
</tr>
<tr>
<td></td>
<td>• Class activity</td>
</tr>
<tr>
<td>Body (30 min)</td>
<td><strong>Positioning and attachment</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Activity:</strong> Give the participants water in a foam cup and ask them to drink.</td>
</tr>
<tr>
<td></td>
<td>- Highlight the position of their head while they are drinking.</td>
</tr>
<tr>
<td></td>
<td>- Explain that babies need to do the same when they breastfeed.</td>
</tr>
<tr>
<td></td>
<td>- Play a DVD on attachment</td>
</tr>
<tr>
<td></td>
<td><strong>Activity:</strong> Ask the participants to practice different breastfeeding positioning (cradle, cross-cradle, football and lying down) with their dolls. Explore any concerns or difficulties.</td>
</tr>
<tr>
<td></td>
<td><strong>Hand expressing</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Activity:</strong> Demonstrate hand expressing on a breast proteas and ask the participants to use stress balls to practice. Explain about hand hygiene, positioning hands on the breast and let-down reflex. Discuss about different ways of dealing with separation, going to party or having a sickness.</td>
</tr>
<tr>
<td>Break (15 min)</td>
<td></td>
</tr>
<tr>
<td>Body (20 min)</td>
<td><strong>Pump expressing and storage of expressed breast milk</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Activity:</strong> Ask participants to set up a breast pump and place it correctly on the synthetic breast. Use a breast model for demonstration. Discuss about storage of expressed milk.</td>
</tr>
<tr>
<td></td>
<td><strong>Settling a baby</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Activity:</strong> Ask participants how they would settle a crying baby, using a doll as a model. Explore different solutions or ideas. Encourage women to trust themselves and be creative about their own ways of raising children. <strong>Remember that you are the facilitator; and the participants should run the discussion.</strong></td>
</tr>
<tr>
<td>Summary and evaluation (10 min)</td>
<td>Give them The Milky Way postcards, and ask them to write on the back about their view on positioning a baby for breastfeeding and their problem-solving strategies when they face a difficulty. Give them a The Milky Way Breastfeeding Calendar and remind them about postnatal phone calls. Encourage women to visualise themselves in a positive and calming environment while they bond with their infant.</td>
</tr>
</tbody>
</table>
Appendix 10: Postnatal Data Collection Interview Form at One Month

Postnatal telephone interview

Date ------------ One month postpartum Study number--------

1. Birth and general questions
   A. CCIS Data
   1.1. Date of birth ............
   1.2. Was the baby born before 37 weeks? [ ] Yes [ ] No
   1.3. Type of Birth: [ ] vaginal birth [ ] caesarean section
   1.4. Birth outcome: [ ] alive [ ] Still birth [ ] Neonatal death
   The woman will not be contacted, if there is a case of still birth or neonatal death

Phone interviews will be commenced by the following conversation
"Hello, my name is Shahla Meedya, you may remember me I was going to call you in relation to the breastfeeding research I am doing. Is it OK to talk to you about that?" If the participant agrees to talk I will remind the woman that she does not have to answer any question she does not feel comfortable with. Then I would begin by asking general questions such as, how are you today? How are things going with you and your family?

1.5. Was the baby admitted to special care for more than 24 hours? [ ] Yes [ ] No
1.6. Was breastfeeding interrupted while you were in the hospital? [ ] Yes [ ] No
1.7. If yes, what was the reason? (please specify)

-----------------------------------------------------------------------------------------------------------
1.8. Have you been feeling depressed or anxious after giving birth? [ ] Yes [ ] No
1.9. Did you receive any breastfeeding information during pregnancy? [ ] Yes [ ] No
If yes, who provided the information during pregnancy?
[ ] Your midwife
[ ] Your GP
[ ] Your hospital doctor
[ ] Your educator from Parenting education classes
[ ] Other

-----------------------------------------------------------------------------------------------------------
1.10. Did you receive any instruction on breastfeeding positions during pregnancy? [ ] Yes [ ] No
1.11. Did you breastfeed your baby within the first hour of birth? [ ] Yes [ ] No
1.12. Did you have any breastfeeding problems in the first few weeks? [ ] Yes [ ] No
1.13. If yes, please specify:
[ ] Nipple problem [ ] Latching problem [ ] Mastitis [ ] Other-

1.14. Do you give a dummy to your child? [ ] Yes [ ] No
1.15. Does your baby sleep in your room? [ ] Yes [ ] No

2. Feeding method
2.1. Does your baby still receive mother’s milk (any breastfeeding)? [ ] Yes [ ] No
2.2. If yes, please specify if:
[ ] Baby receives breast milk only with no other liquids or solid (Exclusive breastfeeding)
[ ] Baby receives breast milk and water/ water based drinks (Predominant breastfeeding)
[ ] Baby receives breast milk and breast milk substitute (formula or non human milk) or semi-solid food (Complementary feeding)
2.3. Has your baby received any expressed breast milk? [ ] Yes [ ] No
2.4. If yes, what was the reason? -------------------------------
3. Breastfeeding intention

3.1. How long do you intend to breastfeed your baby?
[ ] Less than 6 months  [ ] 6 months  [ ] More than 6 months (please specify)  

3.2. How do you rate your intention for breastfeeding?
[ ] Very strong  [ ] Strong  [ ] Not sure  [ ] Weak  [ ] Very weak

4. Breastfeeding support

4.1. How do you feel about the support of your husband/partner regarding breastfeeding?
[ ] Supported  [ ] Not sure  [ ] Not supported

4.2. How do you feel about the support of your friends and other family members regarding breastfeeding?
[ ] Supported  [ ] Not sure  [ ] Not supported

4.3. Since having your baby have you asked for any support or help?  [ ] Yes  [ ] No

4.4. If yes, what type of support or help have you asked for? Pick as many as appropriate.
[ ] Baby sitting including, playing with the baby, settling the baby, putting the baby to sleep
[ ] House work
[ ] Getting some time for sleep, rest or just to be your self
[ ] Preparing meal and its delivery
[ ] Social participating such as going out
[ ] Listening to you
[ ] Seeking for advice
[ ] Emotional support
[ ] Other, please specify

4.5. Who do you feel was the most valuable source of support or help since having the baby?
[ ] Husband/Partner  [ ] Mother  [ ] Sister  [ ] Close friend
[ ] Midwives in the hospital  [ ] Local GP  [ ] Early childhood nurses
[ ] Australian Breastfeeding Association  [ ] Other, please specify

5. Breastfeeding confidence

Indicate your agreement or disagreement with each statement by circling the best answer

5.1. I feel confident to breastfeed my baby.
[ ] Strongly agree  [ ] Agree  [ ] No opinion  [ ] Disagree  [ ] Strongly disagree

5.2. I feel confident that I could cope with unexpected events during breastfeeding.
[ ] Strongly agree  [ ] Agree  [ ] No opinion  [ ] Disagree  [ ] Strongly disagree
6. Modified short form of Breastfeeding self-efficacy tool for a phone interview

How do you score your confidence level from 1 to 3 for the following statements?

1 = Not confident at all or hardly ever
2 = Sometimes confident
3 = Always or most of the time confident

<table>
<thead>
<tr>
<th>Statements</th>
<th>N</th>
<th>S</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1. I can determine that my baby is getting enough milk.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.2. I can successfully cope with breastfeeding as I cope with other challenging tasks.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.3. I can breastfeed my baby without supplementing with formula.</td>
<td>1</td>
<td>2</td>
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</tr>
<tr>
<td>6.4. I can ensure that my baby is properly latched on for the whole feed.</td>
<td>1</td>
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</tr>
<tr>
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<td>1</td>
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</tr>
<tr>
<td>6.6. I can manage to start a breastfeed even if my baby is crying.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.7. I can comfortably breastfeed with my family members present.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.8. I can be satisfied with my breastfeeding experience.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.9. I can deal with the fact that breastfeeding takes time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.10. I can finish feeding my baby on one breast before switching to the other breast</td>
<td>1</td>
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</tr>
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<td>6.11. I can continue to breastfeed my baby for every feed.</td>
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<td>6.12. I can manage to keep up with my baby’s breastfeeding demands.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.13. I can tell when my baby is finished breastfeeding.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

7. In the case of breastfeeding cessation
7.1. When did you wean the baby? Please specify………………………………………………….

7.2. In your opinion what were the reasons you stopped breastfeeding before six months?

[ ] Breast issues: sore nipples, mastitis, abscess                    [ ] Frequent feeding
[ ] Breastfeeding was too time consuming                              [ ] Unsettled baby
[ ] Lack of sleep                                                     [ ] Baby’s small weight gain
[ ] Limited freedom                                                   [ ] Refusal of breast feeding
[ ] Relationship issues with the partner                              [ ] Diluted look of my milk
[ ] Embarrassment in front of people                                  [ ] Soft breasts
[ ] Being able to get somebody to feed the baby                       
[ ] Lack of support from the partner                                  
[ ] Lack of support from social network                               
[ ] Not knowing what to do                                            
[ ] Not knowing my options                                            
[ ] Pressure from family to stop breastfeeding                        
[ ] Conflicting advice                                                
[ ] Medical advice-----------------------------------------------------
[ ] Other, please specify------------------------------------------------

Thank you for your participation
Appendix 11: Postnatal Data Collection Interview Form at Four and Six Months

Postnatal telephone interview

Date -----------                     Four and six months postpartum       Study number--------

Phone interviews will be commenced by the following conversation

'Hello, my name is Shahla Meedya, you may remember me I was going to call you in relation to the breastfeeding research I am doing. Is it OK to talk to you about that?' If the participant agrees to talk I will remind the woman that she does not have to answer any question she does not feel comfortable with. Then I would begin by asking general questions such as, how are you today? How are things going with you and your family?

1. General questions
1.1. Have you been feeling depressed or anxious recently? [ ] Yes [ ] No
1.2. Do you give a dummy to your child? [ ] Yes [ ] No
1.3. Does your baby sleep in your room? [ ] Yes [ ] No

2. Feeding method
2.1. Does your baby still receive mother’s milk (any breastfeeding)? [ ] Yes [ ] No
2.2. If yes, please specify if:
[ ] Baby receives breast milk only with no other liquids or solid (Exclusive breastfeeding)
[ ] Baby receives breast milk and water/ water based drinks (Predominant breastfeeding)
[ ] Baby receives breast milk and breast milk substitute (formula or non human milk) or semi-solid food (Complementary feeding)
2.3. Has your baby received any expressed breast milk? [ ] Yes [ ] No
2.4. If yes, what was the reason? -----------------------------------------------

3. Breastfeeding intention
3.1. How long do you intend to breastfeed your baby?
[ ] Less than 6 months [ ] 6 months [ ] More than 6 months (please specify) -----------
3.2. How do you rate your intention for breastfeeding?
[ ] Very strong [ ] Strong [ ] Not sure [ ] Weak [ ] Very weak

4. Breastfeeding support
4.1. How do you feel about the support of your husband/partner regarding breastfeeding?
[ ] Supported [ ] Not sure [ ] Not supported
4.2. How do you feel about the support of your friend and other family members regarding breastfeeding?
[ ] Supported [ ] Not sure [ ] Not supported
4.3. Since having your baby have you asked for any support or help? [ ] Yes [ ] No
4.4. If yes, what type of support or help have you asked for? Pick as many as appropriate.
[ ] Baby sitting including, playing with the baby, settling the baby, putting the baby to sleep
[ ] House work
[ ] Getting some time for sleep, rest or just to be your self
4.5. Who do you feel was the most valuable source of support or help since having the baby?

- Husband/Partner
- Midwives in the hospital
- Australian Breastfeeding Association
- Other, please specify

5. Breastfeeding confidence

Indicate your agreement or disagreement with each statement by circling the best answer

5.1. I feel confident to breastfeed my baby.
- Strongly agree
- Agree
- No opinion
- Disagree
- Strongly disagree

5.2. I feel confident that I could cope with unexpected events during breastfeeding.
- Strongly agree
- Agree
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6. Modified short form of Breastfeeding self-efficacy tool for a phone interview

How do you score your confidence level from 1 to 3 for the following statements.

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[ ] Lack of support from the partner
[ ] Lack of support from social network
[ ] Not knowing what to do
[ ] Not knowing my options
[ ] Pressure from family to stop breastfeeding
[ ] Conflicting advice
[ ] Medical advice---------------------------------------------------------------
[ ] Other, please specify---------------------------------------------------

Thank you for your participation
Appendix 12: Memos from the participants’ comments about The Milky Way Program

<table>
<thead>
<tr>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Felt that the classes prepared her well for the challenges especially when she had swine flu.</td>
</tr>
<tr>
<td>Thought the phone calls were as important as the classes.</td>
</tr>
<tr>
<td>Felt good about herself and felt empowered. The program made her feel important.</td>
</tr>
<tr>
<td>Felt supported by the phone calls.</td>
</tr>
<tr>
<td>Felt that she could not continue breastfeeding without phone calls.</td>
</tr>
<tr>
<td>Appreciated the combination of early classes and ongoing support.</td>
</tr>
<tr>
<td>Made the following comment: “I did not know that I could Breastfeed after stopping. At the moment I breastfeed once a day and during night time; and this makes me very happy”.</td>
</tr>
<tr>
<td>Felt that she wanted to breastfeed and nobody could stop her.</td>
</tr>
<tr>
<td>Found the phone calls so supportive and made her to believe in herself.</td>
</tr>
<tr>
<td>Felt pressured from mother in-law towards formula and bottle, but felt that the program prepared her to make her own decision and continue breastfeeding. She said she felt very happy about herself and her decision.</td>
</tr>
<tr>
<td>Found combination of phone calls and classes helpful, she felt that was connected to Early Childhood Centre on time</td>
</tr>
<tr>
<td>Found the program useful as it made her resistant to so many challenges; she did not give up even if people around her persist in formula feeding.</td>
</tr>
<tr>
<td>Found that the program connected her to community health services.</td>
</tr>
<tr>
<td>Felt good about herself when she breastfed for six months.</td>
</tr>
<tr>
<td>Felt that the preparation and support from the program was useful.</td>
</tr>
<tr>
<td>Felt that the support was very important as she could not continue breastfeeding by herself.</td>
</tr>
</tbody>
</table>