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‘BREASTFEEDING SELF-EFFICACY AND ALTERNATIVE TECHNIQUES TO OVERCOME MATERNAL OR INFANT BREASTFEEDING CHALLENGES: A RETROSPECTIVE DESCRIPTIVE STUDY’

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Keywords

Breastfeeding, self-efficacy, confidence, challenges, baby friendly health hospital initiative, term infant, alternative technique, bottle, teat, syringe feeding, finger feeding, cup feeding, nipple shield, supplementation, lactogenesis, breastfeeding problems, night nursery, breastfeeding knowledge, breastfeeding support.

Referencing Style

The referencing style used throughout this thesis is APA 5th.

Abstract

Background: Breastfeeding is the internationally accepted ideal in infant feeding. Ensuring mothers and babies receive optimal benefits, in both the short and long term, is dependent upon the successful establishment of breastfeeding in the first week. Many maternal and infant challenges can occur during the establishment of breastfeeding (Lactogenesis II). There are also many methods and devices (alternative techniques) which can be used to help, but the majority do not have an evidence-base. The mother's self-confidence (self-efficacy) can be challenged by these unexpected circumstances, but understanding of the relationship is unclear.

Method: This descriptive study used mail survey (including the Breastfeeding Self-Efficacy Scale – Short Form) to obtain the mother's reports of their self-efficacy and their breastfeeding experience during the first week following birth, as well as actual use of alternative techniques. This study included all mothers of full term healthy singleton infants from one private hospital in Brisbane who began any breastfeeding. The data collection took place from November 2008 to February 2009. Ethical approval was granted from the research site and QUT Human Research Ethics Committee.

Results: A total of 128 questionnaires were returned, a response rate of 56.9%. The sample was dissimilar to the Queensland population with regard to age, income, and education level, all of which were higher in this study. The sample was similar to the Queensland population in terms of parity and marital status. The rate of use of alternative techniques was 48.3%. The mean breastfeeding self-efficacy score of those who used any alternative technique was 43.43 (SD=12.19), and for those who did not, it was 58.32 (SD=7.40). Kruskal-Wallis analysis identified that the median self efficacy score for those who used alternative techniques was significantly lower than median self efficacy scores for those who did not use alternative techniques. The reasons women used alternative techniques varied widely, and their knowledge of alternative techniques was good.

Conclusion: This study is the first to document breastfeeding self-efficacy of women who used alternative techniques to support their breastfeeding goals in the first week postpartum. An individualised clinical intervention to develop women's self-efficacy with breastfeeding is important to assist mother/infant dyads encountering challenges to breastfeeding in the first week postpartum.

Statement of original authorship

"The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made."

Signature _____

Date _____

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Sonia and her two sons: When you were about to quit breastfeeding, I gave you a nipple shield and ‘broke all the rules’. You went on to breastfeed for nine months. Even though I have no memory of that first meeting, I am flattered to know that I could have such an effect on your life, and that you would remember me some years later.

“Charlotte” (pseudonym) the writer of ‘Preaching to the Inverted’, and all 128 women who participated enthusiastically in this research.

PREFACE

"Preaching to the Inverted"

– A Mother's Story in Her Own Words

"I am one of the not so rare women who have inverted or flat nipples. At my 12 week anti natal visit to my obstetrician I was told that due to my severely inverted nipples I would have a lot of trouble breastfeeding and at around 5 months I needed to pull at my nipples to encourage them to come out. With each visit to my OB I was told that my chances of breastfeeding were almost non-existent and when I was told that there was medication I could be given to dry up my milk after my baby was born I decided I needed to do some investigation about what my options really were.

I was surprised to find that there wasn't all that much information out there to assist women in my situation with the exception of the Australian Breastfeeding Association website and the mid wives at the hospital. My son was born in December 2006, and I was extremely nervous about breastfeeding but determined to give it my best attempt. With the use of nipple shields, supply lines, a lot of expressing in the initial stages, patience and assistance from mid wives I managed to feed my rather large son (4.39kg). Each week at first was a bonus, and each month a blessing.

My son Joshua is now 11 months old and I am still breastfeeding him with the assistance of a nipple shield. Using the shield did not reduce of my milk supply (I was told I could only use the shield for a few weeks perhaps a couple of months, because they could reduce the amount of milk available to the baby) and my son is a healthy happy 11.5kg bundle of joy. I wanted to share my story to encourage others with inverted nipples to stick with it, because it can be done!"

Charlotte.

CHAPTER ONE
BACKGROUND

1.1 INTRODUCTION

This woman's story captures the essence of why this research was undertaken. She encountered advice that was not always based on evidence, and that may have threatened her plans to breastfeed. This story highlights the lack of understanding and information about alternative breastfeeding techniques. It is not known how many women use such techniques to establish and to continue breastfeeding. Yet it is known that 17% of women following birth and who initiate breastfeeding will experience maternal and/or infant breastfeeding challenges, particularly in the first week postpartum (Australian Bureau of Statistics, ABS, 2001). It is also known that of those who are breastfeeding at time of discharge from hospital, only 23.3% of these women will still be breastfeeding six months later (Amir & Donath, 2008). Whilst there are many studies examining the ways to enhance breastfeeding rates and duration, very little focus is placed on how to assist women to overcome breastfeeding challenges to ultimately increase the longer term rate of breastfeeding.

1.2 STATEMENT OF PROBLEM

There is a need for evidence to support the clinical use of certain alternative techniques for term infants, as the reasons for and rate of use of such techniques remains undocumented. Moreover, while breastfeeding self-efficacy is critical to the initiation and continuance of breastfeeding, little is known about the relationship between breastfeeding self-efficacy and use of alternative techniques when women experience breastfeeding challenges.

1.3 SCIENTIFIC HYPOTHESIS

- H1 Breastfeeding self-efficacy score of women who used an alternative technique is significantly lower than women who did not.
- H0 Breastfeeding self-efficacy score of women who used an alternative technique is not significantly lower than women who did not.

This chapter will provide background and contextual information that supports and informs the research project undertaken for exploring the use of alternative breastfeeding techniques when faced with breastfeeding challenges. It will outline commonly used terminology, present research questions and hypotheses, and provide an overview of the thesis in general.

1.4 BREASTFEEDING BENEFITS

The benefits of breastfeeding for both mothers and infants are internationally recognised, and consistently reproduced. These benefits are economic, physiological, and emotional (Fewtrell, Morgan, Duggan, & Gunnlaugsson, 2007). First, the economic benefits of breastfeeding include reduced or non-existent costs within the family. It is also associated with as well as reductions in healthcare costs due to infant ill health, with studies reporting that breastfeeding is associated with reduced rates of hospitalisation for infants with conditions such as gastroenteritis (Fewtrell, 2004). Benefits to the infant are reported in some studies to be reduced rates of obesity, and reduced rates of cardio-vascular disease in adulthood (Butte, 2009). Other emotional benefits of breastfeeding are enhanced infant and maternal bonding (Bramson, 2009; Else-Quest, Hyde, & Clark, 2003). Additionally, some studies have reported health benefits to the mother including reduced rates of breast cancer, and accelerated uterine involution (Negishi, 1999; WHOb, 2002).

The rates of breastfeeding initiation in Australia are among the highest in the developed world (Callen & Pinelli, 2004). In Queensland in 2007, between July and December, 78.4% of infants were breastfed during their stay in hospital

(QueenslandHealth, 2007). However, it is also known that the rate at which infants received formula as well during this time was 22.1%. The reasons for this are not recorded. The alternative technique by which the non-breast milk was given to the infant is also not recorded.

1.5 THE BABY FRIENDLY HOSPITAL INITIATIVE (BFHI)

To increase breastfeeding initiation around the world and to sustain breastfeeding, the World Health Organisation (WHO) in collaboration with United Nations Children's Fund (UNICEF) developed a strategy called the Baby Friendly Health Initiative (BFHI). This section will provide background information and provide context of the BFHI in Australia. Understanding the context of BFHI is pivotal to this thesis, because some BFHI recommendations narrow the choice of clinical management of breastfeeding challenges during the establishment of breastfeeding, particularly in the first week postpartum.

The BFHI recommendations, commonly known as the 'Ten Steps to Successful Breastfeeding' (Figure 1, below) are designed to create a global norm of breastfeeding of infants, and guide feeding management in hospitals based on evidence that promotes the health of infants and mothers (Australian College of Midwives, ACM, 2009).

FIGURE 1

World Health Organisation "The Ten Steps to Successful Breastfeeding"

The Ten Steps to Successful Breastfeeding

Every facility providing maternity services and care for newborn infants should:

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 a half-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 breastmilk, unless *medically* indicated.

7. Practice rooming-in -- 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.

(WHO, 1998)

In order to attain BFHI accreditation, maternity facilities must demonstrate that 75% of mothers exclusively breastfeed from birth to discharge. The only acceptable reasons for not reaching 75% are medically indicated supplementation, or fully informed choice of non-breast milk feeding (WHO, 2009). It has been difficult for most maternity facilities to attain this, because, only 67 of approximately 500 maternity units in Australia have been accredited 'baby friendly' (Sweet, 2008). Nevertheless, the goals of the BFHI have been widely promoted (and challenged) in

the literature. The principles of BFHI are well known among maternity facilities, whether accredited or not (Bartington, Griffiths, Tate, & Dezateux, 2006; Camurdan, 2007; Fallon, Crepinsek, Hegney, & O'Brien, 2005; Hofvander, 2005).

Steps six, seven, and nine pose particular challenges for maternity facilities in Australia. The sixth step is that the breastfeeding infant should not receive any fluids other than breast milk, except where medically necessary. When there is a breastfeeding challenge experienced by the mother, the infant, or both, the guidelines of UNICEF are to give breast milk wherever possible, and when not available, artificial non-breast milk may be used to supplement when breast milk alone cannot address the issue (UNICEF, 2006). When it is medically necessary to feed either breast milk or non-breast milk to an infant, the BFHI suggests that this should occur by means other than artificial teats, as per their ninth step. The ninth step is that infants should not receive any artificial teats or pacifiers. The seventh step is that infants and mothers should remain together twenty-four hours a day (‘rooming in’), to promote breastfeeding.

However, personal observations during the researcher’s clinical practice have confirmed that mothers experiencing breastfeeding challenges often discreetly used artificial teats, such as bottle teats and nipple shields, along with non-breast milk and night nursery care for their infant. This is in direct conflict with the BFHI steps, even though it was their goal and desire to breastfeed exclusively. Such observations assisted in development of the research questions to determine the breastfeeding practices of women in the first seven days postpartum.

1.6 TERMINOLOGY

This section will introduce and clarify frequently used terminology and concepts used in this thesis (refer to Table 1). Throughout the thesis, the time frame referred to is the first week postpartum only.

TABLE 1

Terminology

Infant	Infants referred to throughout are: Healthy (not admitted to Special Care Nursery (SCN) Singleton – no multiple births Term – 37 – 42 weeks gestation Weight – appropriate for gestational age (2500 – 5000g)
Mothers	Women who were current inpatients following delivery of their infants, and who did not have major postpartum complications such as haemorrhage requiring transfer to another facility or ward.
Multipara	A woman who has completed two or more pregnancies to viability (Cunningham et al., 2008)
Primipara	A woman who has been delivered only once of a fetus or fetuses who reached viability (Cunningham et al., 2008)
Breastfeeding	Feeding the infant directly at the breast
Breast milk feeding	Colostrum or breast milk fed to an infant with an alternative technique
Breastfeeding 'challenges'	A demanding task or situation (Oxford, 2009b)
Maternal 'challenges'	Physical or emotional states that require problem solving
Supplementary feeding	Artificial formula added to complete a breastfeed (Oxford, 2009a)
Infant 'challenges'	Anatomical or behavioural states that prevent or contribute to inability or difficulty feeding directly at the breast.
Alternative technique	Alternative – any form of feeding other than direct breastfeeding Technique - describes the action of using a device to deliver milk to the infant ('Method' is used in literature to describe either breast or formula feeding; it is not suitable for this project.)

1.6.1 Alternative techniques

The term infant 'feeding method' is frequently used in the literature to describe infants who are either fully breastfeeding or formula feeding. In this context, it describes the type of milk fed to an infant, not the way in which it is given. The term 'breastfeeding intervention' is used in the literature to describe an experimental implementation of an educational program, or provision of support (Hector & King, 2005). Therefore, to avoid confusion, these terms have not been used. Rather, the term 'technique' has been adopted, as it describes an action.

1.6.2 Types of feeding

In addition to feeding techniques, it is important to clarify terminology regarding the contents of the feeds. Non-breast milk feeds that are given to breastfed infants in addition to breastfeeds are 'supplementary' feeds. Non-breast milk feeds are given with an alternative technique, including bottles with teats, cups, syringes, spoons, finger feeding, and supply lines. 'Breastfeeding' denotes direct mother/infant feeding, whilst 'breast milk feeding' refers to the hand/pump expressing of breast milk or colostrum, which is then fed indirectly to the infant with any of the alternative techniques.

1.6.3 Maternal and infant challenges to breastfeeding

There are many reasons why breastfeeding women might need an alternative technique. These reasons can be maternally based, as in the case of nipple shape, pain or maternal request. Infant based reasons for needing an alternative technique can be weak or disorganized suck, or hypoglycaemia, amongst others. Given that there is a clear delineation between maternal and infant reasons for using alternative techniques, breastfeeding challenges will be described throughout as either maternal or infant, although it is recognised that a mother/infant dyad may experience one or more of these factors concurrently. The term 'overcome' will be used as it describes the process of the challenge to attain the goal of breastfeeding, despite obstacles, and reflects current usage in breastfeeding literature (Borucki, 2005; Hegney, Fallon, & O'Brien, 2008).

For the purposes of this research the collective group of alternative techniques will be referred to as 'Alternative Techniques to Overcome Maternal or Infant Challenges to Breastfeeding' (succinctly reduced to 'alternative techniques' throughout).

The remainder of this chapter will present background information that provides context to the research project undertaken. Topics including maternal

challenges, infant challenges will be presented, along with a description of alternative techniques.

1.7 MATERNAL CHALLENGES

Maternal challenges cited as reasons for ceasing breastfeeding include nipple pain and damage, as well as engorgement, mastitis, and perceived insufficient milk supply (Brodribb, 2004; Lauwers & Swisher, 2005; Powers & Tapia, 2004). Additionally, flat or inverted nipples can present latching difficulty for infants who otherwise appear to be capable of breastfeeding (Brigham, 1996; Watson, 2008). Women who have breastfed for extended durations have reported experiencing early problems with attachment, nipple pain and infant behaviour (Gribble, 2008).

Lactogenesis II is the process of establishing a breast milk supply following the delivery of an infant. During this time from day 1-8, the breast undergoes significant changes. At about day 3-4, engorgement of the breast can happen due to vascularity or over abundant milk supply, and results in changes to the shape of the breast near the nipple. This can result in damage to the nipple as the infant latches to a different shaped nipple (Bainbridge, 2005).

1.8 INFANT CHALLENGES

Under optimal conditions, with no breastfeeding challenges, healthy term infants are able to breastfeed due to a combination of reflexive and physiological factors. Infants exhibit a sequence of behaviours that facilitate successful latching, including adaptive oral reflexes, hand to mouth movements, tongue movements, mouth opening, focusing on the nipple, crawling to the nipple, massaging the breast to evert the nipple, and licking (Colson, Meek, & Hawdon, 2008; Geddes, Kent, Mitoulas, & Hartmann, 2008). The healthy term infant is able to co-ordinate sucking, swallowing and breathing, whilst maintaining oxygen saturation with protective reflexes of gag and cough (Spangler 2008). The infants cheeks have fat pads which assist the infant to maintain suction when breastfeeding. To achieve optimal sucking technique, infants need to have a wide open mouth, be able to extend the tongue under the areola and use rhythmic, deep sucks (Righard, 1998). The application of

strength of the rear of the tongue to the nipple is very strong at birth and weakens during the first month (Iwayama & Eishima, 1997).

The infant's ability to breastfeed can be challenged in many ways, including type of delivery. Disorganised suck, tongue position, shape of palate, strength of suck, and tongue tie (ankyloglossia) may all play a part in the interruption of breastfeeding establishment (Dollberg, Botzer, Grunis, & Mimouni, 2006; Lauwers & Swisher, 2005). The use of forceps, and vacuum extraction can alter the infants ability to achieve the above normal physiological processes (Smith, 2007b). During delivery of healthy term infants, interventions such as maternal pain relief can challenge the initiation of breastfeeding (Marzan-Chang, 2003; Smith, 2007b). Respiratory depression of the infant is one well-known side-effect of the use of intramuscular narcotic for pain relief of the mother during delivery. Caesarean delivery, whether in labour or elective also has the capacity to affect normal infant breastfeeding behaviours, although the mechanism for this is not well understood (Baskett, Allen, O'Connell, & Allen, 2006; Liston, Allen, O'Connell, & Jangaard, 2008; Marzan-Chang, 2003).

1.9 ALTERNATIVE TECHNIQUES

Two levels of clinical strategies can be used to encourage and assess the infant's breastfeeding capability. Facilitative first-line strategies are those which encourage normal development, such as skin-to-skin contact and oral motor exercises. Compensatory strategies are second-line strategies that promote effective infant feeding, but do not change underlying problems (Watson, 2008). The use of some alternative techniques can promote effective infant feeding, and are therefore second-line strategies.

Whilst mothers have the goal to breastfeed, when faced with challenges some mothers are known to turn to alternative techniques. Choice of alternative technique, whilst still supporting the breastfeeding goal of the mother, has traditionally been guided by professional experience and opinion. A search of literature for evidence

for using alternative techniques in healthy term infants revealed a distinct lack of research for all alternative techniques except bottle feeding. Given that artificial teat use is not preferable under BFHI recommendations, and whilst not ideal, reliance on professional experience and opinion to choose other alternative techniques continues and is unavoidable (Martens, 2002). Research literature pertaining to pre-term infants and alternative techniques exists, but the research cannot be generalized to the healthy term infant population, as outcomes could be different (Aloysius & Hickson, 2007; Meier et al., 2006). The following section describes individual alternative techniques further.

1.9.1 Cup

Cup feeding of newborn infants is not a new technique, with reported usage throughout history and in many cultures (Aloysius & Hickson, 2007). To cup feed, the infant is held in a semi-recumbent position, and the infant is encouraged to lap milk from the edge of a small tilted cup, such as a medicine cup. It is thought that this technique encourages the infant to learn to position the tongue forward, as in breastfeeding. Cup feeding is recommended as an appropriate temporary method to feed term infants (Thorley, 2005). It has been shown that physiologic stability of the newborn during cup feeding is better than during bottle feeding (Howard, de Blieck, ten Hoopen, & Howard, 1999). An advantage of this technique is that it can be used whether breast milk or formula is required (Trotter, 2006).

1.9.2 Syringe

Syringe feeding involves sitting the infant upright, and slowly depressing the plunger to deliver milk into the infant's mouth. It is essentially the same method that would be used in the community with an eyedropper (Yount & Yount, 2003). Syringes can be used to feed either colostrum or non-breast milk to infants. They are particularly useful for small volumes, as would be the case when an infant cannot latch in the first one or two days. Syringes serve the dual purpose of being a collection device for hand expressed colostrum, and are then used to feed the milk to the infant.

1.9.3 Finger feeding

Finger feeding is a variation of syringe feeding and involves placing the adult finger into the infant's mouth, pad side up, and allowing the infant to suck whilst milk is inserted directly into the side of the mouth with a syringe. It has been suggested that this intervention is in compliance with the BFHI for preterm infants (Oddy & Glenn, 2003). A further variation of this technique involves taping a fine gauge 5 feeding tube to the adult finger, and administering the milk either by gravity or by depressing the plunger.

1.9.4 Nipple Shields

Nipple shields are made of thin silicone, and are placed over the mother's nipple. The infant latches to the breast over the shield. They can be used for infants who have difficulty maintaining a latch due to nipple shape, size, texture, or lack of infant strength (Chertok, Schneider, & Blackburn, 2006). Nipple shields have also been reported as useful for maternal reasons, such as nipple pain and damage (Powers & Tapia, 2004).

1.9.5 Supply lines

A supply line is a fine tube taped to the mother's breast, with the opening end at the nipple. The infant latches over this, and uses their own negative pressure to obtain milk both from the breast, and through the tube. The other end of the tube is in a reservoir (bottle) containing breast milk or non-breast milk. Supply lines are also known as nursing supplementers, supplemental nursing systems, supplemental devices, and breast oro-gastric tubes (de Aquino & Osorio, 2009).

1.9.6 Bottles and teats

As volumes of milk needed by infants change considerably in the first week, other alternative techniques such as syringe feeding and cup feeding may be abandoned in favour of bottles and teats. Breast milk feeding is achieved by manual

or pump expression of breast milk which is then fed to the infant with a bottle and teat. While many brands of teats exist in the marketplace, the two most commonly used ones are standard (narrow) neck teats, and wide neck teats which fit several commercially available brands of bottles (Avent, 2009).

1.10 THEORETICAL FRAMEWORK

This section will discuss self-efficacy, and breastfeeding self-efficacy, the chosen theoretical constructs of this research study. The framework of self-efficacy is particularly suitable, as the core features of it are directly applicable to breastfeeding as a learning experience, where self-care is encouraged and recognised to be beneficial.

1.10.1 Self-efficacy

Self-efficacy is a theory of cognitive psychology that has been widely used in health-care research (Lenz & Shortridge-Baggett, 2002). The concept of self–efficacy is based upon the social cognitive theory that the person, the self, believes that they are capable of making things happen. Bandura (1997) defines self-efficacy as "people's beliefs about their capabilities to produce effects" (p. 71). Bandura expanded this concept by exploring how thoughts, feelings, and actions affect behaviour and are vital factors in achieving goals (Bandura, 1997). In addition to motivation, incentive, and perseverance, further foundations of self-efficacy such as perception, consciousness, cognition, learning, memory, and emotion all play significant parts in self-efficacy (Seema, Patwari, & Satyanarayana, 1997).

There are four main sources of self-efficacy: enactive mastery experiences; vicarious experience; social and verbal persuasion; and perception of emotional and physical (somatic) reactions (Bandura, 1997). These sources of self-efficacy have also been identified as important in breastfeeding research (Dennis & Faux, 1999). The remainder of this section will discuss these four sources of self-efficacy, in particular how they are applied to the breastfeeding scenario.

1.10.1.1 *Enactive mastery experiences*

Enactive mastery experiences are those learned through personal experience. An interplay of several factors affects enactive mastery experiences. For example, pre-existing knowledge and task difficulty are two of these factors, with effort expenditure and context also playing an important role (Bandura, 1997). Other factors affecting enactive mastery experiences involve the individual assessing their own performance before, during, and after the task. To do this, self-monitoring takes place, and reconstruction of enactive mastery experience by thoughtful reflection, allows the individual to assess the attainment of their goal. Attainment trajectories are the individual's interpretation of their success over time (Bandura, 1997). Enactive mastery experience in the context of this research is the woman actually undertaking the task of breastfeeding her infant. When the breastfeeding task is undertaken, the amount of effort expended on the task depends upon her pre-determined level of commitment, and she relies on her pre-existing knowledge of breastfeeding. She also assesses the difficulty of the task. She then cognitively monitors and judges her performance, both during and at the completion of the breastfeeding task. She assesses whether the outcome is as expected (healthy, settled infant). Attainment trajectory is her monitoring of the repeated breastfeeding task performance over time, and her interpretation of success.

1.10.1.2 *Vicarious experience*

Vicarious experience, the second source of self-efficacy, is gained through observation of others undertaking a task. This is known as modelling. Modelling involves the individual visualising others who have similar attributes to themselves. In observing models succeed, especially those perceived as peers, self-efficacy in the form of vicarious experience is acquired. In the case of breastfeeding, women who see other mothers with similar attributes to themselves succeed at breastfeeding, can vicariously experience positive outcomes from this behaviour, and thus be more likely to engage in breastfeeding themselves. The knowledgeableness and credibility of the model is a vital factor in the degree of influence of vicarious experience. Modelling is further supported by verbal persuasion (Bandura, 1997).

1.10.1.3 *Verbal and social persuasion*

Verbal and social persuasion is the third source of self-efficacy. This can be obtained in several ways. The supportive or unsupportive verbal persuasion of the partner, parents, friends and peers can influence self-efficacy, and in the case of the breastfeeding task, so too can the verbal input of health professionals. Notably, if verbal and social persuasive efforts are unrealistic, this can lead to an over inflated perception of self-efficacy, and result in disappointment which effectively undermines the person's self-efficacy (Bandura, 1997; Johnsen, 2002). In the context of breastfeeding education, the provision of visual media showing breastfeeding is a source of both social persuasion and vicarious experience.

1.10.1.4 *Somatic experiences*

The fourth source of self-efficacy is physiological and affective (somatic) states. Situations which are interpreted by the individual as stressful or demanding can debilitate performance and actually produce the results feared. This is because the perception of stress activates fear, anger, sorrow, or a mixture of these feelings. The level of activation and the perception of that level impacts on physiological and affective states. A raised heart rate or blood pressure is a physiological state experienced by the individual. It is possible that individuals can misinterpret or exaggerate these feelings, depending on previous experiences, predominantly negative ones (Bandura, 1997). Concurrent clinical issues of pain as a result of the birth may also contribute to the general cognitive interpretation of the breastfeeding task. In the breastfeeding situation, an individual with a history of breastfeeding challenges such as nipple pain may react with fear to breastfeeding a subsequent infant. Alternately, if they are not prone to misjudging and being generally inefficacious, they may be significantly less stressed by the same degree of nipple pain, and willing to continue pursuing their goal of breastfeeding.

1.10.2 Breastfeeding self-efficacy

The broader theoretical construct of self-efficacy has been applied to many health care contexts, and Bandura supports this (Bandura, 2006; Lenz & Shortridge-Baggett, 2002). Self-efficacy has been applied specifically to the breastfeeding

context in the literature and has been described as “a woman’s confidence in her ability to breastfeed” (Noel-Weiss, Bassett, & Cragg, 2006). The work of Dennis and Faux (1999) and others has subsequently established breastfeeding self-efficacy as a prime part of the research literature available to inform the practice of clinicians caring for breastfeeding women (Blyth et al., 2002; Creedy et al., 2003; Dai & Dennis, 2003; Dennis, 2006; Dennis & Faux, 1999; Hatamleh, 2006; Hauck, Hall, & Jones, 2007; O'Brien & Fallon, 2005). Although some studies find that women who ceased breastfeeding early had lower breastfeeding self-efficacy, the bulk of the existing research does not specifically address or measure the rate of breastfeeding challenges, nor how those breastfeeding challenges are resolved in the first seven days postpartum.

1.11 RESEARCH QUESTIONS

The primary and secondary research questions have been formulated based on the self-efficacy framework used in this thesis, and following the literature review as presented in Chapter Two.

Primary research question:
What is the breastfeeding self-efficacy of women who did, and women who did not use an alternative technique?

Secondary research questions:
What is their knowledge and preference for alternative techniques?
What level did they rate sources of breastfeeding knowledge and support?
What are their reasons for using an alternative technique?
How often are alternative techniques used?

1.12 SUMMARY

The BFHI recommendations have created a challenge for maternity facilities in Australia. However, it is clear that women and infants can experience a myriad of challenges to breastfeeding, particularly in the first week postpartum. There are many

alternative techniques which can be used to assist the mother/infant dyad achieve the breastfeeding goal. The theoretical construct of self-efficacy has been applied to the health care realm with success, and over the last ten years has been applied breastfeeding. Further understanding of the relationship between the use of alternative techniques and breastfeeding self-efficacy would be useful.

1.13 OUTLINE OF THESIS

Chapter one has provided background information and context to the proposed research. In chapter two, the literature review will further expand upon the vital components of this research and identify gaps in the literature. Methodology of the research will be presented in chapter three. The fourth chapter presents the results of the research, and chapter five presents a discussion of findings, and recommendations for further research.

CHAPTER TWO
LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents a review of the literature on breastfeeding challenges and alternative techniques. To understand why mothers use alternative techniques during breastfeeding, it was necessary to search the literature for variables of interest related to the research questions. A number of database searches were conducted using CINAHL and Medline. Using key words such as “breastfeeding”, “breastfeeding duration”, “breastfeeding cessation”, and “Baby Friendly Hospital Initiative” it was possible to glean a broad understanding of the key issues that scholars and researchers were presenting in the literature about breastfeeding. Identifying the significance of the self-belief that one can be successful when implementing breastfeeding led to the additional search using other key words like “breastfeeding self-efficacy”, “Bandura self-efficacy” and “breastfeeding self-confidence”. Some scholars and researchers appeared to be using the terms “self-confidence” and “self-efficacy” in an inter-changeable manner and so a comparison of the two terms was also undertaken. In addition, as this study focused on breastfeeding challenges, the final major search conducted aimed to identify what was known about how mothers manage when breastfeeding is difficult. This search included exploring what was known about alternative techniques that mothers may use when faced with breastfeeding challenges. The key words used for this last major search included terms like “breastfeeding challenges”, “breastfeeding problem” “breastfeeding difficulty”, “alternative techniques”, “artificial feeding”, “bottle feeding”, “teats”, “nipple shields”, “finger feeding”, “syringe feeding”, “supply lines”, “nasogastric tube”, “supplements”, “cup feeding”, “flat and inverted nipples”, “pain and fatigue”, “breast refusal”, and “nipple confusion”. Finally, these terms were applied to both the Australian Digital Thesis database, and the (international) Proquest Dissertation and Thesis Database.

The first section of this chapter, “maternal challenges” will begin with examining the normal anatomical and physiological significant changes that occur, which require mothers to learn new skills to work with these changes. This section then moves to other influences that will impact on the mother’s comfort and ability to learn a new skill like breastfeeding. Infant challenges that are known to inhibit

successful breastfeeding will then be examined. When challenges occur mothers may turn to alternative breastfeeding techniques to overcome these challenges. Therefore, it was necessary to identify what research had been undertaken about the use of such alternative techniques. Finally, breastfeeding self-efficacy literature will be critiqued.

2.2 MATERNAL CHALLENGES

This section will discuss challenges to breastfeeding in the first week post-partum which are solely maternal related. Maternal challenges are comprised of anatomical and physiological changes and variations. These include nipple shape variation, postpartum pain, and fatigue.

Maternal challenges in the first week postpartum, can affect women's perception of success of breastfeeding (Adewale, 2005; Ayre-Jaschke, 2004; Bottorff, 1990). The nature and severity of these challenges varies greatly, as does maternal ability to cope with these challenges. The ability of women to persevere in the face of breastfeeding challenges is a phenomena identified clearly in qualitative literature. Australian authors Hegney, Fallon and O'Brien (2008) have defined many major themes in women who persevered with breastfeeding when they encountered challenges. These themes include: expectations, support issues, feelings about breastfeeding, psychological distress, coping strategies, pride, and additionally for non-continuing women: early breastfeeding problems, reluctance to seek help, and guilt. Of particular note, the study by Hegney et al. shows that women who weaned their infants to non-breast milk experienced breastfeeding challenges in the early post-partum period which were not resolved before hospital discharge.

Other qualitative breastfeeding research provides additional themes specific to breastfeeding challenges. Bottorff's (1990) phenomenological approach to examining breastfeeding challenges reveals two more distinct themes: some women view a problem as a difficulty (negative), and others view the same problem as a challenge (positive) to be overcome. These women persist in their efforts to initiate and maintain breastfeeding, in spite of problems.

Women can experience a wide range of feelings when they encounter challenges to breastfeeding (Hauck, Langton, & Coyle, 2002; Hegney et al., 2008). Some women are able to persevere with breastfeeding when these challenges occur, their motivation and problem solving abilities being able to withstand the challenge, in order to achieve their goal (Ayre-Jaschke, 2004). On the other hand, guilt and grief can be experienced by women who wean, or are considering weaning their infants, and this is particularly true where the mother had not planned to wean (Hailes & Wellard, 2000).

2.2.1 Breast physiological challenges

Lactogenesis II is significant as breast secretions change from colostrum to breast milk in the first week postpartum, and is a potential maternal challenge. According to Smith (2007a) changes of Lactogenesis II between 30-40 hours postpartum are 'not related to sucking stimulus and will occur regardless of the baby's status' (p. 270). This is supported by other evidence that Lactogenesis II is primarily controlled by complex hormonal balances (Neville & Morton, 2001). Other literature presents the opposing view that removal of colostrum from the breast, and nipple stimulation is vital to further establishment of lactation (Asakuma et al., 2007). Therefore, although Lactogenesis II is initially hormonally controlled, the sustainment of the breast milk supply is dependent on the 'supply and demand' principle. In itself, a compromise or failure of Lactogenesis II is a maternal challenge due to insufficient milk supply. As this research focuses on alternative techniques that may be utilised during the first week postpartum, it is important to understand the physiological and anatomical challenges experienced during this time.

2.2.2 Breast anatomical challenges

Current literature shows that breast anatomy is far more variable than once thought. The use of ultrasound imaging shows that the lactating breast contains differing numbers of milk ducts in different women (Ramsay, Hartmann, Hartmann, & Kent, 2005). Once thought to be uniform in nature, distribution of glandular and adipose tissue also varies between women, but not between breasts of the same woman. These authors also point out that in spite of these variations; breast milk production was not affected. Therefore, perhaps the challenge of breast anatomy in

relation to the need for alternative techniques lies with still widely held, but outdated, understanding of breast anatomy.

2.2.3 Breast Engorgement

Another maternal challenge during the first week is engorgement of the breast, either from a change of volume of colostrum to breast milk, from venous engorgement, or both. Binns and Scott (Binns & Scott, 2002) report a rate of 26.6% for breast engorgement during hospitalisation. Initially, venous engorgement, rather than milk engorgement can be problematic (Brodribb, 2004). However, the challenge to breastfeeding arises when the breast tissue behind the nipple fills out and creates a rounded nipple shape that is difficult for the infant to latch to. Therefore, even in the absence of flat or inverted nipples under prelactation conditions, the nipple may be temporarily flat or inverted during engorgement.

2.2.4 Nipple Shape Variation

Variation in nipple protractility and texture are common and degrees of both contribute to nipple shape variation becoming a maternal challenge (Kelleher, 2006). It is believed that the placement of the nipple at the junction of the infants hard and soft palate is vital to breastfeeding efficiency, although further research may be required on this topic (Dickinson, Faulkner, Doherty, Hart, & Jacobs, 2007). The challenge arises if the infant is unable to adjust to the existing nipple shape and texture. Clinicians have developed a classification structure that includes protraction – a normal nipple which responds with a forward movement; retraction – a nipple that moves inwards back to the mothers body, and inversion – a nipple that is anchored to the muscle wall with adhesions. Within these three categories, further variation is classed as stage I, II, III, IV, and V, depending on severity (Brodribb, 2004). These nipple variations are commonly referred to in the literature as flat or inverted nipples, and these nipple shapes have been associated with delayed onset of lactation, presumably because of the failure of the infant to latch and remove colostrum and breast milk from the breast (Powers & Tapia, 2004). In Australia, a rate of 3% inverted nipples has been reported (Binns & Scott, 2002), however precise documentation in research studies of nipple shape and texture is rare.

2.2.4.1 *Nipple pain*

The somatic experience of pain is known to be a source that informs self-efficacy (see 1.10.1.4). The literature shows that nipple pain has been stated as a main source of pain for breastfeeding women in Australia, and is sometimes caused by infants with a strong suck (Binns & Scott, 2002). More than half (55.8%) of women in the study by Binns and Scott (n=556) reported sore or cracked nipples during the hospital stay following birth. Another Australian study, a randomised controlled trial with 160 participants investigating positioning and attachment education in primiparas, found that the experimental group who received education on positioning and attachment reported less nipple pain on day two and three than the control group (Henderson, Stamp, & Pincombe, 2001). Interestingly, visual observations of nipple trauma by the researcher did not reveal any difference between the groups. A possible explanation for this is that nipple pain may be present, as interpreted by the mother, without visible nipple damage to the researcher. Another possible cause of nipple pain is the individual strength of vacuum exerted by the infant during breastfeeding, and this nipple pain can persist, leading to earlier than planned weaning (Bond, 2007; McClellan et al., 2008; Schwartz et al., 2002).

2.2.5 Postpartum pain

The main sources of birth related postpartum pain are perineal, uterine (afterbirth) or caesarean related (MacVane-Phipps, 2003; Yeh, 2005). The individual experience of pain is known to involve psychological factors such as tendency to catastrophize (Flink, Mroczek, Sullivan, & Steven, 2009; Olden, Jordan, Sakima, & Grass, 1995). Perineal pain is known to affect as many as 48% women postpartum (Declercq, Cunningham, Johnson, & Sakala, 2008), however the impact of the pain experience on breastfeeding is not reported. Similarly, the impact of uterine pain, as a result of uterine involution, on breastfeeding is not known. The management of post caesarean pain continues to be the subject of research (Davis, 2006; Nafisi, 2007; Strulov et al., 2007). The effect of either elective or emergency caesarean on level of pain has been found to be negligible, although the sample contained 77.4% multiparous women (Karlstrom, Engstrom-Olofsson, Norbergh, Sjoling, &

Hildingsson, 2007). Similar to perineal and uterine pain, the impact of caesarean pain on breastfeeding is not clear in the literature.

2.2.6 Fatigue

The subjective experience of fatigue and its impact on successful breastfeeding over time is present in the literature. Hunter, Rychnovsky, & Yount (2009) identify that it is the subjective experience of fatigue which is important, not actual hours of sleep loss. The critical interaction of sleep deprivation and the ability to effectively parent has been recognised in the literature, but research specifically related to the first few postpartum days examining if fatigue increases breastfeeding difficulties is scarce (Dennis & Ross, 2005; Evans, Dick, Shields, Shook, & Smith, 1998; Hunter et al., 2009; Schnyer, Zeithamova, & Williams, 2009; Wambach, 1998). Other studies have shown some women perceive rooming in to disrupt their sleep, while others do not (Svensson, Matthiesen, & Widstrom, 2005; Young, 2005). However, correlations made between fatigue and using alternative techniques have not been demonstrated, and as such fatigue is a variable of interest to this study.

2.3 INFANT CHALLENGES

Numerous infant related challenges to breastfeeding in the first week postpartum are found in the literature. Additionally, several other variables of interest associated with infant challenges have been identified. These can occur independently or concurrently, resulting in a complex matrix of variables which have the capacity to affect breastfeeding. These will be discussed in the following section.

2.3.1 Infant anatomical and physiological challenges

The literature shows that infants may have one, or a number of anatomical and physiological challenges, which can impact on effective breastfeeding (Dewey, Nommsen-Rivers, Heinig, & Cohen, 2003; Weber, Woolridge, & Baum, 1986). There are many infant anatomical challenges noted in the literature including shape of palate tongue tie (ankyloglossia) (Dollberg et al., 2006). Physiological challenges include disorganised suck, tongue position, and strength of suck (Aizawa, Mizuno, &

Tamura, 2010; Geddes et al., 2008). The literature contains mostly studies concerning the physiological aspects, as discussed below.

2.3.1.1 *Infant suck-swallow-breathe co-ordination*

Compromised breastfeeding efforts of the infant have the potential to impact the breastfeeding self-efficacy of the primipara in particular. With each feed, the mother cognitively processes the success of the feed, building up enactive mastery experience. Ineffective infant sucking has been highlighted in the literature for term infants, and is relevant to this study. The breathing-swallowing coordination of newborn infants changes from the first 48 hours to the end of the first week. The pattern of dominance within the first two days is a swallow occurring mid-expiration, whilst by the end of the first week this is occurs significantly less (Kelly, Huckabee, Jones, & Frampton, 2007). Other research confirms that these reflexes are unique to the immediate postpartum period (Lau, 2001; Weber et al., 1986). The effect, if any, of the use of many alternative techniques on the suck-swallow-breathe reflex is yet to be researched.

The sucking action of pre-term infants (under 37 weeks gestation) and post-neonatal (post 28 days) infants is different to the term newborn (Bu'Lock, Woolridge, & Baum, 1990). Many studies that have investigated the sucking mechanisms of term infants explored different postnatal ages at the time of study, ranging from one week and beyond. Ramsay et al. (2002) have detailed that ineffective sucking at one week of age did not predict infant growth, or maternal postpartum depression, but did predict later inefficient feeding. It has been argued that the neuromuscular coordination of sucking results from gestational maturity, and not from postnatal sucking experience (Bu'Lock et al., 1990).

2.3.2 Nipple confusion

The literature has sporadically addressed the phenomenon known as nipple confusion. Nipple confusion has been defined by Neifert (1995) as “an infant’s difficulty in achieving the correct oral configuration, latching technique, and suckling pattern necessary for successful breastfeeding after bottle feeding or other

exposure to an artificial nipple" (S125). Nipple confusion appears to be related to the BFHI 'step nine', which suggests not using any artificial teats to breastfeed infants. Interestingly, the use of artificial teats has been associated with decreased duration of breastfeeding, but the mechanism by which this occurs is inferred to be nipple confusion (WHO, 1998).

Nipple confusion that occurs in the early neonatal period has been described as different to that which can occur with older infants. Neifert (1995) acknowledged that, at that time, scientific data did not exist to describe prevalence or mechanisms of nipple confusion. Additionally, this author recommended that individual babies and mothers should be assessed for vulnerability such as the existence of poor suck or difficulty latching to the breast. Further, Neifert suggests that, if necessary, supplements should be given by a technique other than bottles with teats.

Nipple confusion has attracted further debate in the literature over the years and has recently re-surfaced (Hargreaves & Harris, 2009; Neifert, Lawrence, & Seacat, 1995). An earlier literature review by Huang & Huang (1996) agreed that the phenomenon of nipple confusion has not been well researched. They examined both bottle and pacifier use and proposed a hypothetical framework for further research in this area. Hargreaves and Harris (2009) conducted an extensive literature review into the subject of nipple confusion. They make the very valid point that the available research literature does not show causality between bottle-feeding and nipple confusion.

2.3.3 Gestation and birth weight

Infant weight and gestational age were included in this literature review as the nutritional needs and feeding capabilities of infants are underpinned by these; and interpreting the rigour of the literature is dependent upon a consistent approach of what is considered normal for 'term' infants, who are a focus of this study.

The gestation and birthweight of the infant are also factors in the subsequent nutritional needs of the infant. Infants are considered 'small for gestational age' if they are 37+ weeks of gestation and under 2500g. Similarly, the upper limits of

‘large for gestational age’ is a birthweight over 4000g and up to 42 weeks gestation (Henriksen, 2008). All of these infants would be considered ‘healthy term newborns’ cared for on the general postnatal ward, and yet there is a large difference in weight and gestation. Whilst it is acknowledged in professional literature that ‘every baby’s needs are different’ (Lauwers & Swisher, 2005, p. 309), when parents and health care professionals should intervene with feeding is unclear.

2.3.3.1 Brown Adipose Tissue

Although classed as healthy term infants, smaller infants have less brown adipose tissue available as a source of energy for breastfeeding (in addition to thermoregulation and homeostasis) than larger infants do. The difference in energy gained from fat in a 3500g and 2200g infant at term is substantial at 5040 kilocalories and 1108 kilocalories respectively (Uauy, Mena, & Warshaw, 2006). Given the clear disparity in available energy, the feeding of smaller infants in the first few days’ postpartum warrants intervention with alternative techniques. This scenario is of particular concern because these infants may not cry to be fed, but rather, display sleepy behaviour which can be interpreted by parents as settled. The vigilence of clinical staff is vital, as extended periods of not feeding well in the first few days can result in dehydration, hypoglycaemia, and seizures (Glass & Wu, 2009; Udani 2009). The staff and parents must intervene if the infant does not wake for regular feeds, and must use an alternative technique to provide sustenance (either breast milk or non-breast milk).

Fetal distress/ hypoxia, resuscitation at birth, hypothermia, hyperthermia, and altered blood glucose levels, can all lead to healthy term infants compensating for this physiological stress by depleting brown adipose tissue faster than usual (Basu, Som, Choudhuri, & Das, 2009; Glass & Wu, 2009; Lyon, 2006; Udani, Ursekar, & Gupta, 2009). This is reflected in the BFHI guidelines that infants who have suffered birth asphyxia and hypoglycaemia may be given supplements of non-breast milk as a medically indicated necessity. In the absence of the above scenarios, infants who have a birthweight that is deemed appropriate for gestational age at term, theoretically have sufficient brown adipose tissue for thermoregulation and homeostasis.

2.3.4 Infant birthweight and weight loss

Some degree of weight loss is normal in newborn infants in the first few days of life. A loss of 5-7% of birthweight during the first week is considered normal (WHO, 2009). In professional literature, it has been stated that intervention becomes necessary at 10% weight loss, if the mothers breast milk supply is not obviously increasing (Cox, 2004). In a study of 280 mothers by Dewey, Nommsen-Rivers, Heinig and Cohen (2003), 40% of infants lost between 5-10% of birthweight, and 11.3% of infants lost 10-15% of birthweight. Various factors were found to be associated with this including primiparity, and caesarean section in multiparas, but delayed onset of lactation (>72hours) resulted in a risk 7.1 times greater of excess infant weight loss.

The importance of addressing the issue of weight loss is due to possible severe and long term neurological damage in dehydrated infants (Dewey et al., 2003; Livingstone, Willis, Abdel-Wareth, Thiessen, & Lockitch, 2000). Whether the intervention is to breastfeed more frequently or to supplement the infant with non-breast milk depends on the precise individual circumstances of the mother/infant dyad. If additional non-breast milk is required it will include the use of an alternative technique.

Routine weighing of the infant 2-3 days after birth is a practice that assesses loss of weight following birth. However, one researcher questioned the routine weighing of infants as being counter-productive to breastfeeding self-efficacy, as the mother and clinicians relied on weight data rather than assessing the flow of milk and infant output (Thomson, Hall, Balneaves, & Wong, 2009). This pilot study (n=49) used block assignment of participants to a control group and an experimental group. If it was decided that the infant's condition warranted intervention and the infant was in the experimental delayed weighing group, they were excluded from the study. The researchers hypothesized that delaying the second weighing (first weighing was at birth) of infants from day two-three to day five would promote breastfeeding self-efficacy. No statistically significant difference in breastfeeding self-efficacy was found between the groups. It was found that there was a significant ($p=<0.05$)

increase in non-breast milk supplementation in the group who had routine weighing at day two-three. This suggests that decisions regarding supplementation are based upon the weight, however, those weights might have been lowered enough to qualify as 'medically indicated' supplementation. Unfortunately, reasons for supplementation were not recorded.

2.3.5 Skin to skin contact

Increasingly, skin-to-skin contact of mother and infant at birth is appearing in the literature as a positive factor in improving rates of exclusive breastfeeding (Bramson, 2009; Smith, 2007b). Skin-to-skin contact is the practice of placing the infant on the mother's bare chest immediately after delivery, and delaying other tasks such as weighing, bathing, and injections (Caruana, 2008; Moore & Cranston-Anderson, 2007). It is recognized that skin-to-skin practice improves blood glucose stability and thermoregulation of the newborn. During skin to skin practice, the infant is able to utilize the body heat of the mother, thereby expending less of their own energy on thermoregulation by non-shivering thermogenesis (Lyon, 2006; Walters, Boggs, Ludington-Hoe, Price, & Morrison, 2007). Benefits to the mother include an improved bonding experience and higher circulating level of oxytocin which is crucial to breastfeeding (Bramson, 2009). Although skin-to-skin contact has positive benefits for both mother and infant, it is not clear whether it contributes to the prevention of nipple pain (Cantrill, 2006). Given that skin-to skin contact is considered a positive practice, the absence of this practice may constitute a breastfeeding challenge for the infant. Therefore, the occurrence of skin-to-skin contact will be measured in this study.

2.3.6 Infant breastfeeding behaviour

Poor or compromised infant breastfeeding behaviour can be a challenge to the establishment of breastfeeding. Suboptimal infant breastfeeding behaviour (SIBB) was measured by Dewey, Nommsen-Rivers, Heinig and Cohen (2003) in a sample of 280 participants that had 44% un-medicated deliveries. Of these, most were multiparous women. Infants of primiparas, who had caesarean sections, used non-breast milk and pacifiers, and infant birthweight less than 3600g, were significantly

more likely to display SIBB on the day of delivery. Clearly, infant's breastfeeding behaviour can be affected by a myriad of factors, however, causality has been implied, and it is not explored whether any of those infants received non-breast milk for medically indicated reasons.

Frequent feeding/demanding by infants at night is a breastfeeding challenge in the first few days. It is considered normal for infants to demand to feed hourly, especially at night during this time (Lauwers & Swisher, 2005). However, Gagnon et al. (2005) found that nurses rationales (n=40) about infant behaviour such as being fussy, unsettled, crying, and hungry (n=24) resulted in supplementation with non-breast milk. Associated with this was the belief by mothers and nurses that colostrum was insufficient to satisfy the infant (n=20). It is apparent that there is a disparity between what is considered normal infant behaviour, and the perceptions of mothers and nurses. An alternative explanation for decisions to supplement with non-breast milk is that the mother's level of fatigue is impacting on the breastfeeding self-efficacy – in particular the somatic experience of fatigue. Similarly, input from nurses, whether due to education levels or staffing levels, can affect the mother's breastfeeding self-efficacy via the third source, verbal/social persuasion. More will be presented on the influence of breastfeeding self efficacy later in this chapter.

2.3.7 Influences of Labour and Delivery Interventions

In the literature, many researchers have identified an association between maternal analgesia, delivery mode, and infant respiratory depression, resulting in compromised infant sucking ability and delayed onset of lactation (Albani et al., 1999; Baskett et al., 2006; Dewey et al., 2003; Liston et al., 2008; Marzan-Chang, 2003) . In particular, Riordan, Gross, Angeron, Krumwiede & Melin (2000) have identified a significant association using the specialized "Infant Breastfeeding Assessment Tool" (IBFAT). General anaesthesia is also thought to have an effect on breastfeeding outcomes. Research by Lie & Juul, (1988), showed that caesarean births with general anaesthesia or caesarean births with epidural anaesthesia, or vaginal delivery involving maternal analgesia are associated with less breastfeeding initiation and duration, with the most likely inhibitor to successful breastfeeding being caesarean births with general anaesthesia. More recently, in a large Canadian

(n=1260604) population-based, cohort analysis over 14 years, it was found that caesareans in labour predicted a higher rate of respiratory depression than caesareans without labour (elective) (Baskett et al., 2006; Liston et al., 2008). Notably though, the caesarean rate in this population was 9.2% in labour, and 4.8% elective, resulting in a total of 17724 caesarean deliveries in this study.

2.3.8 Breast refusal

In the literature, breast refusal in the first week is described as the distressed behaviour of an infant when attempting to breastfeed but failing, which can result in a negative psychological impact on the mother (Egan, 1989). According to Lauwers and Swisher (2005) and Watson (2008), whilst infants and mothers learn to breastfeed, latching attempts should be limited if the infant is displaying distressed behaviour. When breast refusal occurs, alternative techniques such as cup feeding (Thorley, 1997), can be used to feed the infant. There is limited scientific research examining the precise nature of breast refusal and how to resolve this challenge in the immediate postpartum period.

2.4 ALTERNATIVE TECHNIQUES TO OVERCOME MATERNAL AND INFANT CHALLENGES TO BREASTFEEDING

Substantial professional literature, rather than scientific literature, forms the bulk of the evidence base for alternative techniques to feed healthy term infants (Brodribb, 2004; Lauwers & Swisher, 2005; Lawrence & Lawrence, 2005; Martens, 2002; Riordan, 2005; Watson, 2008). Of the research literature found for alternative techniques, the focus is on pre-term infants, and the research cannot be generalized to the healthy term infant population (Martens, 2002). Lawrence & Lawrence (2005), acknowledge the need to use alternative techniques to feed term infants with medical conditions, and state, "there is little evidence about the safety or efficacy of most alternative feeding methods and their effect on breastfeeding" (p. 1067).

As described in Chapter One, there is a range of alternative techniques used to feed healthy term breastfed infants if the need arises. The seven kinds of alternative techniques pertinent to this study will now be discussed. Finger feeding and finger feeding with tube will be classed simply as 'finger feeding'.

2.4.1 Cup feeding

Although literature about the use of this technique for pre-term infants does exist, it should not be generalized to term infants (Abouelfettoh, Dowling, Dabash, Elguindy, & Seoud, 2008; Flint, New, & Davies, 2008; Martens, 2002). Due to physiological differences in the feeding abilities between preterm and term infants, comparisons are not appropriate (Freer, 1999). Nevertheless, the cup feeding technique has been used within the midwifery and lactation professions for term infants for many years (Lang, Lawrence, & Orme, 1994; Nyqvist & Strandell, 1999; Samuel, 1998; Shallow, 1994; Thorley, 2005).

Cup feeding is used to feed either breast milk or non-breast milk to infants. The adoption and promotion of this alternative technique in developed countries has happened due to the BFHI step nine recommendation that no artificial teats be used for breastfeeding infants (WHO, 1998). One semi-randomised controlled trial with 700 participants showed that cup feeding used for term infants born by caesarean section resulted in significantly increased breastfeeding duration from 90 days to 161 days (P=0.04) (Howard, 2003). The rate of caesarean section amongst the four groups ranged from 14% to 18%. The reasons for supplementation were noted, and 33% received supplementation for medically indicated reasons such as hypoglycaemia, and >10% weight loss. Maternal request for supplementation was 51%; however, more specific documentation of those maternal requests was not presented. Howard concludes that, in general, cup feeding was not especially advantageous to the general population of healthy, term (vaginally born) infants.

The experiences and expectations of the main users of the cup feeding technique, mothers and midwives, are important to inform clinical practice. Cloherty et al. (Cloherty, Alexander, Holloway, Galvin, & Inch, 2005) interviewed mothers (n=30), midwives (n=17), doctors (n=6) as well as assistant nurses and neonatal nurses (n=7), and established themes including ‘difficulties returning to breast’, ‘ease of use’ and ‘necessary skills and knowledge’ as main concerns. Whilst ‘difficulty returning to breast’ is a concern that is infant based, the other two topics that arose relate to the motivation of mothers, and their ability to learn a new skill. Therefore, a

connection to one of the main sources of self-efficacy – enactive mastery experiences - is clear.

2.4.2 Bottle feeding

Although BFHI recommendations advise against giving artificial teats to breastfed infants, bottle and teat use as an alternative technique remains one of the most common techniques implemented (Flores-Quijano et al., 2008). Cultural acceptance of bottles and teats being synonymous with infant care is widespread (Breastflow, 2009; Bryder, 2009; Limpvanuspong, Patrachai, Suthutvoravut, & Prasertsawat, 2007; Sloan, Sneddon, Stewart, & Iwaniec, 2006). By contrast, in some countries breastfeeding remains the cultural norm (Fletcher, Ndebele, & Kelley, 2008). Historically, infant bottle necks were narrow (Bryder, 2009). Recently though, bottles with wide necks and teats have been developed to mimic breastfeeding actions. Infant sucking action on some wide neck teat brands is physiologically similar to breastfeeding (Goldfield, Richardson, Lee, & Margetts, 2006). Similarly, Ramsay (2002) found non-significant results in a small randomised trial where transbuccal ultrasound was used to measure infants breastfeeding and bottle feeding. Although this was a small trial, and the methodology differs, the results support those found by Goldfield et al.

Other research shows differences in sucking between infant breast feeding and bottle (teat) feeding (Aizawa et al., 2010), and there is strong evidence in the literature that the use of bottles for breastfed infants has resulted in shortened duration of breastfeeding (Aysu Duyan et al., 2008). However, studies have not always considered confounders that have influenced the result. For example, some studies do not differentiate whether type of bottle teat or frequency of use was responsible for the result (Howard et al., 1999; Schubiger, Schwarz, & Tonz, 1997). Whether use of bottles and teats, or their contents, is responsible for shortened breastfeeding duration is also unclear, as is the mechanism. Whether the use of bottles and teats reflect pre-existing breastfeeding challenges has also not been addressed in the literature (Merewood, 2007; Schubiger et al., 1997).

A historical concern about bottle feeding of infants has been oxygen saturation of the infant during and after feeding. The oxygen saturation of infants during and after bottle feeding is only slightly lower than that in breastfed infants, who also display a slight decrease in oxygen saturation (Hammerman & Kaplan, 1995). The rate of flow of milk during bottle feeding is regulated by both gravity (positioning of the infant and angle of the bottle), the size of the teat holes, and the infants own level of negative pressure during sucking (Kassing, 2002).

Another factor associated with bottles and teats that appears in the literature is that women are polarized in their opinion of how bottle feeding affects their breastfeeding experience. Some women feel a great relief in being given 'permission' to give a supplemental feed by bottle, whilst others feel their efforts to exclusively breastfeed are undermined by this and interpret it as pressure (Hailes & Wellard, 2000; Hauck et al., 2002).

2.4.3 Syringe feeding

Evidence to support the use of syringe feeding of healthy term infants could not be identified. The paucity of literature could be due to this technique being relatively new in practice. The physiological action the infant uses to swallow the milk is thought to be possibly the least disruptive amongst all alternative feeding techniques, and infant tongue movements might resemble cup feeding (Qureshi, Vice, Taciak, Bosma, & Gewolb, 2002).

2.4.4 Finger feeding

Finger feeding as an alternative technique has entered clinical practice as a way to adhere to BFHI guidelines that breastfed infants receive no artificial teats. Finger feeding, as described in section 1.9.3 has been researched in premature infants only (Oddy & Glenn, 2003). No scientific literature could be found for the finger feeding of term infants.

The adult finger which is given to the infant to suck is firm. It is quite different to that of the mother's nipple. The argument that the adult finger at least

provides a human touch, which makes it an alternative technique of choice, is completely unfounded in the literature (Dowling & Thanattherakul, 2001). This practice has only appeared in clinical practice since WHO and BFHI recommendations sent clinicians in search of an alternative to the bottle and teat, due to step nine.

2.4.5 Supply lines

The use of supply lines in the first week postpartum is a clinical practice that also remains unsupported in quantitative literature. Nevertheless, qualitative evidence does exist and informs clinicians that women react differently to this technique (Borucki, 2005). The study by Borucki included infants who were different ages: three infants commenced at birth, seven during the first week, and five during the second week of life, as well as older infants ranging from one to three months (total n=22). Reasons for using supply lines are also reported, but are not specified to those infants/mothers who used the supply line from birth or in the first week. Borucki describes how use of the device constitutes 'managing the challenges' and that problem solving skills are necessary for a successful outcome. Although some mothers described this technique as "cumbersome", "time-consuming", "artificial", "complicated" and "messy", others gave positive comments such as feeling in control of the situation by doing something to actively to help themselves. They also emphasised the need for patience and commitment. These themes, and the way in which women vary in their perceptions, cast light on the connection to breastfeeding self-efficacy and successful breastfeeding outcomes. Mothers' descriptions provide insight to the role of the enactive mastery experiences in self-efficacy (further discussed at 2.5.2).

Other literature regarding supply lines centres on the subject of relactation, or re-establishing lactation after a break (Auerbach, 1981; Auerbach & Avery, 1980; de Aquino & Osorio, 2009; Seema et al., 1997). One interesting finding that could be pertinent to the use of supply lines in the first seven days is by Seema and colleagues in India, which reported that the use of supply line requires 'adequate motivation' of the mother. In Seema and colleagues' study, facilitating motivation appeared to occur through the use of peer support from other women who had been through the

breastfeeding/relactation experience. The topic of peer support and vicarious modeling are further discussed at 2.5.3.

2.4.6 Nipple shields

One of the arguments in the early literature was that nipple shield use resulted in reduced milk transfer. Two often quoted pieces of research are those of Woolridge, Baum and Drewett (Woolridge, Baum, & Drewett, 1980), and Auerbach (Auerbach, 1990). The study by Woolridge, Baum and Drewett was designed to explore the differences between two types of nipple shields. The second type, thin silicone, is similar to that in use today. The subjects in the study were term infants whose mother had an established breast milk supply with no confounding factors noted such as flat or inverted nipples. Over the last 30 years, these authors have been frequently quoted in the literature as finding that milk transfer for the silicone nipple shields fell by 22%. While this is technically correct, it is not generally discussed that this figure was calculated from mean milk intake figures of 38.4g and 29.9g, and that with statistical analysis, the difference was not significant. They also found that normal breastfeeding sucking patterns of infants were closely replicated with the thin silicone nipple shield. Auerbach's research compared the difference in milk transfer between a nipple shield and a breast pump, and showed less milk transfer with nipple shields. Whilst this research is often quoted as evidence in the literature and professional texts, it must be remembered that the comparison was between breast pump only, and breast pump with nipple shield. There was no comparison of breast only, and nipple shield only.

Another indicator of milk transfer during nipple shield use is infant weight. Although several research studies appear in the literature, none had sufficient numbers to allow statistical analysis, or it was not within the scope of the research design. Nonetheless, two studies report that infants did not have any problems with weight gain during or after nipple shield use (Brigham, 1996; Powers & Tapia, 2004). It has also been established in the literature that milk transfer with nipple shield use for pre-term infants is not compromised (Meier et al., 2006). Many mothers cite perceived insufficient milk supply as a reason for weaning (Gatti, 2008). Therefore, for it to be said that nipple shields affect milk supply, it would be

necessary for the percentage of mothers using nipple shields to report a higher incidence of perceived insufficient milk supply than the general population. To date, no research or literature that definitively shows modern thin silicone nipple shields are responsible for reduced milk transfer has been found.

By comparison to other alternative techniques, nipple shields have been well-researched. Unfortunately, much of that research is dated, has been misinterpreted, or is lacking strength in methodology. Professional (negative) opinion has been formulated by reference to that research (Auerbach, 1990; Woolridge et al., 1980). By contrast, several researchers have provided anecdotal evidence to illustrate maternal satisfaction with nipple shields (Bodley & Powers, 1996; Brigham, 1996; Clum & Primomo, 1996; Powers & Tapia, 2004). This is supported by a large retrospective survey (N=202) that clearly demonstrates maternal satisfaction (Powers & Tapia, 2004). The majority of women who used nipple shields in that study (88%) reported that they thought the nipple shield helped them succeed at breastfeeding. Further, 98% of these women stated they would use a nipple shield again for another baby. Additionally, a recent pilot study by Chertok, Schneider and Blackburn (2006) questioned the argument of decreased milk transfer with nipple shields. The study by Chertok and colleagues provided evidence of maternal satisfaction with nipple shields, in keeping with the earlier studies.

2.4.7 Nasogastric tube

Nasogastric tubes have been recommended as a preferable alternative technique with which to feed breastfeeding term infants if necessary (WHO, 2009). This alternative technique is not without risk, as it is an invasive procedure. The risks include misplacement into the lungs, and perforation of oesophagus or stomach. Parental distress over the use of this technique has also been documented (Taylor, et al., 2009). No further evidence could be found for the use of this device as an alternative technique to support breastfeeding in the healthy term infant population, and anecdotal evidence suggests at the site of the research suggests that this alternative technique is not used in clinical practice.

2.5 BREASTFEEDING SELF-EFFICACY

Since Dennis and Faux's (1999) study, the topic of breastfeeding self-efficacy has provided a significant perspective in understanding the complexity of successful breastfeeding. Breastfeeding confidence is also a construct that has appeared commonly in both qualitative and quantitative literature. The terms 'breastfeeding confidence' and 'breastfeeding self-efficacy' appear to have been interchangeable in the literature at one point, however, it would now appear that the construct 'breastfeeding confidence' is the antecedent to 'breastfeeding self-efficacy', which has a sound theoretical base.

This section will present literature associated with breastfeeding self-efficacy using the framework of self-efficacy, and the four major sources of self-efficacy; enactive mastery experiences; vicarious experiences; social/verbal persuasion; and somatic experiences. Precise measurement of breastfeeding self-efficacy using the BSES and BSES-SF tools will then be presented later in 2.6.

2.5.1 Breastfeeding confidence literature

Women's expectations of breastfeeding are based on their previous exposure to breastfeeding attitudes, information, and social norms. This guides the development of confidence when breastfeeding begins, but only when the breastfeeding experience progresses as expected (Grassley, 2004). Grassley's qualitative study establishes that the development of confidence is disrupted when challenges to the establishment of breastfeeding are experienced. Grassley identifies factors such as infant behaviour and complex breastfeeding technology as contributing to the disruption of the development of breastfeeding confidence. Additionally, the women who participated in Grassley's study experienced many opinions of others, and felt overwhelmed. It is known that breastfeeding challenges which are interpreted as negative can result in women needing in-patient care during early parenting for psychological support (Fisher, Feekery, & Rowe-Murray, 2002). Therefore, it can be concluded that realistic expectations produce improved breastfeeding confidence.

Papinczak and Turner (2000) measured breastfeeding confidence in an Australian longitudinal study, with 159 participants. The measurement of confidence was obtained with a single three point 'low', 'medium', 'high' self-report item. The first measurement was before women left hospital, and women self-rated their breastfeeding confidence to breastfeed for up to nine months. Results showed that women who intended to access Nursing Mothers Association (now Australian Breastfeeding Association), were significantly more likely to be breastfeeding at six months, showing that pre-existing intention and confidence is vital to achieve extended duration of breastfeeding. The value of that research is limited by the exclusion of participants who were 'distressed' postpartum, but also because it included mothers of premature infants, a potentially confounding factor. Nevertheless, this literature is important for its contribution to understanding pre-existing intention and confidence in breastfeeding. The intention to breastfeed and confidence are linked to motivation, outcome expectations, and positive personality traits – all vital components of self-efficacy, which will be discussed next.

2.5.2 Enactive mastery experiences

As discussed at 1.10.1.1, enactive mastery experience requires active cognitive processing each time the task is undertaken and facets such as perception, memory, coping, motivation and learning contribute to that cognitive processing. Many non-modifiable demographic factors which shape the life experience of the mother inform the facets of cognitive processing including: maternal age; formal education level; parity; and household income level (Blyth et al., 2002). The outcome expectation of the individual is also central to cognitive processing (Shortridge-Baggett, 2001). The outcome expectation that breastfeeding secures a healthy, well-fed, settled infant is challenged by the phenomenon of perceived insufficient milk supply, which will now be discussed.

Perceived insufficient milk supply (PIMS) is a common phenomenon in the literature (Binns & Scott, 2002; Otsuka, Dennis, Tatsuoka, & Jimba, 2008). It is a prime example of a possible failure of the enactive mastery experience in action, a negative cycle of thoughts and assessment surrounding the woman's breastfeeding experience. Interestingly, there was a vast difference between the rate of perceived insufficient milk supply in Australia at 23%, and 73% in Japan (Binns & Scott, 2002;

Otsuka et al., 2008). An Australian study by Binns and Scott (2002) found 23% of women reported PIMS. Actual insufficient breast milk supply is thought to be much less than 23%, with the discrepancy explained by maternal and sometimes professional perception, but actual breast milk supply is often not objectively measured (Gatti, 2008). This leaves vast numbers of women judging their breast milk supply to be insufficient, when in fact there is sufficient supply. The cognitive mechanism by which they judge it to be insufficient includes the outcome expectation that the infant should be settled and gaining weight. In the literature, the association of PIMS and breastfeeding self-efficacy has been established in a cross-sectional study of 262 Japanese breastfeeding women by Otsuka et al. (2008). Breastfeeding self-efficacy in the first week postpartum explained 21% of variance in PIMS at four weeks postpartum. This study also found that 73% of women stated insufficient milk supply as the reason for supplementing or weaning entirely to non-breast milk during the first four weeks. However, the comparison of these two main studies does highlight that some women perceive they have an insufficient milk supply, which may lead to women turning to supplements or to wean the infant from the breast milk and convert to artificial feeding.

2.5.3 Vicarious modelling

The second key source of self-efficacy is vicarious experience. Vicarious experience is gained through modelling by peers. The structure of peer breastfeeding support to obtain better breastfeeding outcomes has been a topic of note in the literature (Battersby, 2008). Some research suggests that group based peer support, in certain countries, leads to better uptake of that support than one-to-one support. It was noted in Great Britain in particular that women preferred group based-support (Hoddinott, Chalmers, & Pill, 2006). Other literature confirms that a combination of usual professional support and peer support is more effective than usual care alone (Chung, Raman, Trikalinos, Lau, & Ip, 2008; Clark, 2007).

Factors such as age and parity have been found to be important in predicting breastfeeding outcomes. One study of peer counselling support shows that breastfeeding duration was significantly associated with increased maternal age and personal breastfeeding experience (Bolton, Chow, Benton, & Olson, 2009). Whilst

these factors would be considered enactive mastery experience, it is clear that for women who are younger and have no personal breastfeeding experience, peer support as vicarious experience through modelling is a valuable source of self-efficacy. The differences in usefulness of peer support, and what women would prefer is confirmed in a another qualitative study of professional and peer support (Barona-Vilar, Escriba-Aguir, & Ferrero-Gandia, 2009). This Spanish study of nineteen women confirms that younger primiparous women preferred different combinations of professional and peer support, depending on their plans to work outside the home.

2.5.4 Social and verbal persuasion

The third source of breastfeeding self-efficacy is social and verbal persuasion. Breastfeeding education, support of partner, parents, friends and peers are all potentially modifiable sources of social and verbal persuasion which inform breastfeeding self-efficacy (Blyth et al., 2004).

It has been established in the literature that women's perception of breastfeeding advice/education can be positive or negative. Research by Graffy and Taylor (2005) identified that the type of assistance women receive when experiencing difficulties with breastfeeding is crucial. This large randomised controlled trial had a qualitative component and 654 participants, including only mothers who reported breastfeeding successfully for the first time. Therefore, both primiparas and those multiparas who had not successfully breastfed before were included. Emerging themes of helpful practices included consistent good quality practical help with positioning and latching to the breast, and advice of how to deal with sore nipples and engorgement. However, the participants found several things to be unhelpful during their breastfeeding experience, including feeling pressure to breastfeed, and being made to feel guilty for bottle-feeding. Graffy and Taylor's results show that persuasion by clinicians to continue breastfeeding in the face of challenges could be viewed by some women as encouragement (positive), or by others as coercion (negative), correlating with the findings mentioned above by Grassley (2004). The findings of Graffy and Taylor show one of the main sources of

self-efficacy in action – verbal and social persuasion, and the possible negative consequences of unrealistic coercion to breastfeed.

The literature provides ample evidence of the contribution of professional support to breastfeeding women, and women's perception of this has been raised as an issue. Professional support is a form of social and verbal persuasion because it contributes to the individual's perception that breastfeeding is the cultural norm. In a meta-analysis of 20 experimental or quasi-experimental studies from 10 countries with a total of 23 712 participants, the outcome of breastfeeding duration was found to increase with the provision of breastfeeding support services (Sikorski, Renfrew, Pindoria, & Wade, 2003). Breastfeeding education is a modifiable factor of breastfeeding self-efficacy, because it has been shown in studies that levels can be raised with interventions (Blyth et al., 2002; Hatamleh, 2006; Hauck et al., 2007; Noel-Weiss et al., 2006).

The usefulness of breastfeeding education and support during the first week of breastfeeding must be considered a priority of research (Adewale, 2005). Several researchers have questioned whether professional support is the most effective way to assist breastfeeding women (Danuta, 2004; Dykes, 2005; Hailes & Wellard, 2000; Hall-Moran, Dykes, Edwards, Burt, & Whitmore, 2005; Hannula, Kaunonen, & Tarkka, 2008), however, at times the constraints of firmly established hospital routines can affect women's perception of the quality of this education (Mushtaq, Skaggs, & Thompson, 2008; Peregrin, 2002).

Also contained in the literature is evidence of breastfeeding support provided by partners, parents, siblings and other family members, which can be clearly identified as sources of social and verbal persuasion for self-efficacy (Ekstrom, Widstrom, & Nissen, 2006; Lewallen et al., 2006). Ekstrom and colleagues researched level of support received by breastfeeding mothers, and found that a frequent source of support was from friends and family in the first 8 weeks after birth, excluding the initial post partum hospital stay. While the support of grandparents and family are important, the literature shows that it is the father of the child that has the most influence on mothers feeding decisions (Falceto, Guigliani, &

Fernandes, 2004; Gamble & Morse, 1993; Grassley & Eschiti, 2008; Lovera, Sanderson, Bogle, & VelaAcosta, 2007; Okon, 2004; Rego et al., 2009). Therefore, it can be concluded that the support offered by the father of the child is a prime example of social persuasion in action.

2.5.5 Somatic experiences

Somatic experiences such as fatigue, stress, and pain, constitute the fourth major source of self-efficacy information. Hauck, Langton and Coyle (2002) conducted a phenomenological study comprised predominantly of tertiary educated women, and identified a common theme of emotional and physical exhaustion. The ten women who participated were attending a breastfeeding clinic specifically for assistance with breastfeeding challenges. These women viewed exhaustion, brought about by their breastfeeding difficulties, as a burden.

The somatic experience of stress is demonstrated by the response rates noted in a Canadian breastfeeding study where, of 190 women who declined to participate, 61 stated that stress was the reason (Dennis & Ross, 2005). In another study that focused on teaching the mother correct positioning and latching, Henderson, Stamp, & Pincombe (2001) found there was no significant difference in the outcome of breastfeeding duration, however, the participants reported less nipple pain on day two and three. Interestingly, the participants reported less satisfaction with breastfeeding at three months than did the control group, who did not receive the education or correct latching and positioning. The researchers conclude this was possibly due to an inadvertent rising anxiety in the participants in the intervention group, by the level of focus placed on correct positioning and attachment.

The subjective experience of pain is a maternal challenge that may lead to a decision to use alternative feeding techniques. It is widely accepted in the literature that pain in the postpartum period significantly affects new mothers and can persist for weeks (Andrews, Thakar, Sultan, & Jones, 2008; Declercq et al., 2008; Drewett, Kahn, Parkhurst, & Whiteley, 1987; Heads & Higgins, 1995). As presented in Sections 2.2.4.1, and 2.2.5, nipple pain, along with perineal pain, caesarean wound pain and uterine contraction (afterbirth) pain, frequently occur in the postpartum

period. Whether the pain impacts breastfeeding self-efficacy or use of alternative techniques is not known.

2.6 BREASTFEEDING SELF-EFFICACY SCALE

Research using the original 33 item version of the Breastfeeding Self-Efficacy Scale (BSES) was first published in 1999 using a Canadian sample (Dennis & Faux, 1999). The BSES is the predecessor of the BSES-SF which was used in this study. The BSES contains five point likert scale items, with positive statements beginning with 'I can always', and consists of two sub scales 'intrapersonal thoughts' and 'breastfeeding actions'. The scores are summed to produce interval data, the highest possible score is 165 and the lowest possible score is 33. In this original study, the Cronbach's alpha of the BSES was 0.95. The scale has shown predictive validity, and had positive correlations to infant feeding patterns at 6 weeks postpartum. Infant feeding pattern (breastfeeding status) in this 1999 study was classified with maternal self-report as 'exclusive bottle feeding', 'combination feeding', or exclusive breastfeeding'.

Breastfeeding self-efficacy research was carried out by Blyth et al. (2002) in Australia, and different facets of the study were published in three separate papers, with two being by Blyth et al. (2002; 2004) and another by Creedy et al. (2003). Creedy's paper presents the psychometric characteristics of the sample, whilst Blyth measures breastfeeding self-efficacy and modifiable factors. This research had 300 participants, and breastfeeding self-efficacy was measured antenatally, at one week, and four months postpartum using the 33 item BSES. The psychometric properties of the scale were verified with Cronbach's alpha of 0.96 at one week postpartum. Creedy et al. found that results at one week and four months postpartum confirmed the predictive validity of the scale as found by Dennis (1999).

Blyth et al. (2004) investigated the association of modifiable antenatal factors such as breastfeeding information, breastfeeding support, and breastfeeding intention upon breastfeeding self-efficacy. Breastfeeding status was measured using the

Breastfeeding Status Questionnaire (Labbok & Krasovec, 1990) over the preceding 24 hours, with maternal self-report of one of the following:

a) Exclusive breastfeeding (breast milk only)
b) Almost exclusive breastfeeding (breast milk and other fluids not formula)
c) High breastfeeding (less than 1 bottle of non-breast milk per day)
d) Partial (at least one bottle of non-breast milk per day)
e) Token breastfeeding (comfort only, not nutrition)
f) Bottle feeding, no breast milk at all

Blyth et al. (2004) presented results that showed at one week postpartum, 91.7% of mothers were breastfeeding, with 72% exclusively breastfeeding. At four months postpartum, it was found that 57% were breastfeeding exclusively or almost exclusively. It was also reported that, at four months, 60% stated insufficient milk supply (with several concurrent reasons also, maternal reasons, started solids) as the reason for non-exclusive breastfeeding. The relationship between breastfeeding information and perceived level of support to breastfeeding duration was not found to be significant. However, the relationship of antenatal breastfeeding intentions and breastfeeding self-efficacy to breastfeeding duration was significant with $P<.001$. Interestingly, Creedy et al. report a significant increase in breastfeeding self-efficacy over time; however a rise in self-efficacy also occurred for those who were bottle-feeding or partially breastfeeding. This result shows one of the prime sources of self-efficacy – enactive mastery experience – evolving over time, regardless of the exclusivity of breastfeeding.

The timing of the measurement of breastfeeding self-efficacy has been shown to be important, because differences have been noted between antenatal and 1 week measurement, and subsequent postnatal measurement. The measurement at 1 week provides a stronger predictor of breastfeeding outcomes (Dennis, 2006).

Further research in Canada by Dennis (2006) using the BSES sought to identify predictors of breastfeeding self-efficacy in the immediate postpartum period. In that research, the BSES was administered at one week postpartum. Initially,

multiple variables from eight domains including socio-demographic; pregnancy-related; maternal adjustment; and infant feeding were included. Five domains were retained in the model, with specific factors that explained 54% of variance of BSES scores. These factors were all significant with <p.001:- education; support from women with other children; satisfaction with pain relief during labour; satisfaction with postpartum care; breastfeeding progress; feeding infant as planned; and anxiety, with the exception of type of delivery, which was significant with <p.05. In particular, the factor of breastfeeding progress shows that enactive mastery experience is evolving over the first week postpartum.

Many studies have been undertaken using the BSES in a range of countries including Australia (Blyth et al., 2002; Dai & Dennis, 2003; Molina Torres, Davila Torres, Parrilla Rodriguez, & Dennis, 2003). The translated versions of the BSES have demonstrated internal consistency, with Cronbach's alpha values exceeding 0.85.

2.7 BREASTFEEDING SELF-EFFICACY SCALE- SHORT FORM (BSES-SF)

The BSES was modified to a 14 item short form by removing redundant items. Redundant items were defined by Dennis (2003) as "(a) item mean of 4.2 or more (to increase variability), (b) corrected item-total correlation less than 0.60 (to increase overall item fit), (c) item with 10 or more inter-item correlations below 0.40 (to increase homogeneity), and (d) inter-item correlation above 0.80 (to decrease redundancy) (p. 738). In addition to one item that posed cultural difficulties during translation, 18 items fitting the specific criteria were removed (Dennis, 2003). Predictive validity of the BSES-SF at 4 and 8 weeks postpartum was retained and demonstrated with p<.001. The Cronbach's alpha for the BSES-SF was 0.94, and the mean breastfeeding self-efficacy was 55.88 (SD = 10.85). Therefore, Dennis concluded that the breastfeeding self efficacy scale in the short form was a valid tool for clinical research. According to Dennis, its usefulness extends beyond identifying mothers at high risk of early cessation of breastfeeding, but would also be useful in assessing breastfeeding behaviours and perceptions. Several other studies have confirmed the reliability and validity of the BSES-SF in various populations as shown in Table 2 (below) (Dai & Dennis, 2003; Gregory, Penrose, Morrison, Dennis,

& MacArthur, 2008; McCarter-Spaulding & Gore, 2009; Molina Torres et al., 2003; Nichols, Schutte, Brown, Dennis, & Price, 2009; Wutke & Dennis, 2007).

The predictive validity of the BSES-SF is based upon measurements taken initially in the first week postpartum, and then again at later points in time, such as four, eight, and sixteen weeks, depending on the study. Although many studies report having first administered the BSES or BSES-SF whilst the participants were 'in hospital' in the immediate postpartum period, the precise time of first measurement is often unclear and the usual length of stay was often not stated. This means that the scales could have been administered anywhere between day one and five postpartum, depending on local postpartum length of stay practices. As discussed earlier in Section 2.2 and 2.3, many maternal and infant challenges can arise during this time, so the precise timing of the first administration has the capacity to be reflected in the results.

The following Table (Table 2) provides a summary of the main studies undertaken using BSES and the short form (BSES-SF), which utilised in hospital or first week postpartum measurement of breastfeeding self-efficacy.

Author	BSES/ BSES-SF	Cronbach's alpha	Sampling	N=	Time	Mean BSES or BSES- SF Score (standard	Parity- primipara %	Vaginal birth %	Mean Age (standard deviation)	Married or de facto %	Health	Country
Dennis & Faux 1999	BSES	.95	convenience	130	*In hospital* 6 weeks	primiparas 159.0 (25.31) multiparas 179.2 (20.53) Total 168.5 (25.3)	50	81.5	28.7 (6.31)	90	public	Canada
Molina Torres et al 2002	BSES	.96	convenience	100	*In hospital*	131.8 (22.07)	50	63	27 (5.35)	73	private	Puerto Rico
Blyth et al 2002	BSES	.97 .96 .96	Prospective survey	300	Antenatal **1 week** 4 months	126.16 (23.85) **139.86 (23.87)** 128.10 (22.74)bf 109.57 (27.18)af 140.88 (24.63)	- *	-	28.5 (5.03)	88	public	Australia
White 2002	BSES	.95	consecutive	57	*In hospital* 4 weeks	134.47 (19.86) 137.63 (22.01)	36. 8	66.7	28.32 (4.71)	82.5	Public	Canada rural
Dai & Dennis 2003	BSES	.93	-	186	*In hospital* 4 weeks 8 weeks	118.78 (16.53) 127.57 (15.85)bf 110.68 (18.78)af 128.24 (16.05)bf 114.40 (16.60) af	**100 Primipara**	70	27.76 (2.97)	-	public	China
Dennis	BSES		-	594	**1 week** 4 weeks 8 weeks	**133.58 (23.40)**	44	76	28.8 (5.01)	91.2	-	Canada
Dennis 2003	BSES-SF	.94	-	104 585 459 389	Antenatal **1 week** 4 weeks 8 weeks	55.88 (10.85) **56.39 (10.48)bf** **42.58 (13.35)af** 57.66 (9.89)bf 46.13 (11.38)af 58.88 (8.89)bf 45.94 (11.46)af	45	76	29 (5.0)	90	-	Canada

Author	BSES/ BSES-SF	Cronbach's alpha	Sampling	N=	Time	Mean BSES or BSES- SF Score (standard	primipara %	Vaginal birth %	Mean Age (standard deviation)	Married or de facto %	Health	Country
Wutke & Dennis 2006	BSES-SF	.89	convenience	105	*In hospital* 8 weeks 16 weeks	55.5 (8.4) 56.7 (8.1)bf 50.7 (7.9)af 57.9 (7.3)bf 50.6 (8.5)af	70	44.8	28 (4.5)	95.2	-	Poland
O'Brien 2007	BSES-SF	.95	-	342	*Varied 0-14 days*	47.88 (12.24)	38.7	-	30 (5.47)	91.9 %	Public/private	Australia rural
Gregory et al 2008	BSES-SF	.90	cohort	165	*In hospital* 4 weeks	46.46 (12.75) -	49.1	63	21-29 40.6% 30-39 52.1%	-	-	UK 36.3% South East Asian
Otsuka et al 2008	BSES-SF	.95	Cross section	262 180	*In hospital* 4 weeks	44.7 (11.9) -	48.5	-	31.5 (4.5)	96.2	-	Japan
Semenic et al 2008	BSES-SF		Convenience	189 156 130	*24-72hours* 6 weeks 4 months	48.0 (9.4) 51.9 (11.7) 56.9 (10)	**100 Primipara**	70	30.1	-	public	Canada
Tokat et al 2008	BSES-SF	>.85	Convenience	144 a/n 150 p/n	Antenatal 12wk *In hospital* 12wk	58.52 (8.80)a/n 57.23 (6.8)12wkbf 54.7 (6.7)12wkaf 60.09 (8.2)p/n 58.64 (7.05)bf* 53.46 (7.22)af*	50	69.3	25.9 (4.4) 24.4 (4.4)		Public/private	Turkey
McCarter-Spaulding & Gore 2009	BSES-SF	.94	convenience	125	**1 week** 4 weeks	**51.86 (12.05)**	42	66	30.4 (6.5)	68.3	Public	USAAfrican Descent
Nichols et al *Intervention 2009	BSES		-	90	Antenatal 4 weeks Control gp intervention	50.27 (10.44) 51.98 (9.58) 53.36 (12.68) 57.37 (10.95)			29.22 (5.61)			Australia

a/n = antenatal, p/n = postnatal, wk = week, af = artificially feeding,

bf = breastfeeding, - = not stated, (sd) = standard deviation

2.8 SUMMARY

Breastfeeding literature has now reached a point where concepts, theories, and predictors of breastfeeding self-efficacy are well understood, however, studies that focus on the practical aspects of supporting breastfeeding women with alternative techniques in the first week could not be found. Examination of literature concerning infant oral anatomy and physiology reveals that it is a complex process, and it has not been taken into account with some commonly used alternative techniques. The literature does contain a small amount of discussion that focuses on comparing certain techniques to justify one technique over another. The frequency of use of alternative techniques by breastfeeding women in the first week is unknown.

The breastfeeding self efficacy scale is widely accepted as a valid and reliable tool for clinical research. It consistently predicts breastfeeding outcomes. Interventions based upon breastfeeding self-efficacy have been shown to alter breastfeeding self-efficacy in the short-term. Recently, maternal satisfaction with infant feeding method has been shown to be a significant factor in explaining differences in breastfeeding self-efficacy scores. However, the breastfeeding self-efficacy of women who experience challenges in the first week and use alternative techniques is unknown.

This chapter has reviewed relevant literature related to breastfeeding, breastfeeding self-efficacy and breast feeding challenges of mothers and infants. What this chapter highlights is the deficit in knowledge about what alternative techniques women use to support their breastfeeding goals. The next chapter will present the research design and methodology used to conduct this study.

CHAPTER 3
METHODOLOGY

3.1 INTRODUCTION

This chapter will introduce the research design and protocol. The research protocol will focus on the steps taken to maximise the research design strength, including identification of the target population, sample size and sampling strategy, exclusion criteria, and content validity. Additionally, measurement of the dependent and independent variables and instruments will be discussed. Research procedures and ethical issues will be presented along with data analysis procedures.

3.2 STUDY DESIGN

This research used quantitative methodology. It was a non-experimental, descriptive, retrospective, self-report survey. This design was useful to obtain data directly from the participants. The self-report survey design was an appropriate strategy to address the research questions for this study which sought to obtain information from individuals about their behaviours and experiences.

3.3 RESEARCH PROTOCOL

3.3.1 Target population

The target population is women who gave birth to a healthy term singleton infant, and initiated any breastfeeding at all in the first seven days postpartum.

3.3.2 Sampling frame and strategy

The sample frame is the population of mothers who delivered a healthy term singleton infant at one local private hospital, in Brisbane, Australia. The convenience sample of study participants were recruited from inpatient hospital records of women who gave birth, adhered to the inclusion criteria, and initiated any breastfeeding from 1st November 2008 to 27th February 2009.

3.3.3 Exclusion criteria

Exclusion criteria included mothers and infants who:

- formula fed from birth,
- delivered a stillborn infant,
- delivered a preterm (<37 weeks) or post term (> 42 weeks) infant,
- delivered an infant who was transferred to Intensive or Special Care Nursery,
- had an infant with a birth anomaly affecting feeding,
- had an infant with a birth weight less than 2500g or greater than 5000g.
- mother did not speak english

3.3.4 Sample size

In order to conduct hypothesis testing, forty cases per variable are necessary (Tabachnick & Fidell, 2007). As this study was designed to obtain descriptive data as well as test a hypothesis, it included eight alternative techniques. However, for the purposes of hypothesis testing, the eight alternative techniques were grouped to form one variable. This variable was "women who used an alternative technique" (n=62) and included all responses that indicated any alternative technique was used. The group who "did not use alternative techniques" (n=66) formed the second variable. When it became clear that responses for both variables were in excess of the minimum forty required, data collection was ceased.

3.4 INSTRUMENTS

A 34 item questionnaire was designed to obtain the data (Appendix 3). This questionnaire contained questions that yielded specific data in three main areas, and included the Breastfeeding Self-Efficacy Scale – Short Form (14 items). The three main areas are:

Feeding variables Q1, 2, 3 (except 3.2), 4, 5, 12, 13,14,15,16.
Obstetric variables Q3.2, 6,7,9,10,11
Demographics Q31 - 34.
Breastfeeding Self-Efficacy - Short Form – Retrospective – Q17 – 30 (discussed below at 3.3.1).

The questionnaire was designed so respondents who answered 'No' to Q1 proceeded to Q4, as the questions in between were not applicable. Most questions were fixed response items providing categorical or ordinal level data. Likert scales were used to assess the frequency of the following experiences and behaviours: nipple pain, birth related pain, fatigue, breastfeeding knowledge sources and breastfeeding support.

3.4.1 Measurement of dependent variable

The dependent variable, breastfeeding self-efficacy, was assessed using the Breastfeeding Self Efficacy Short Form Tool (Dennis, 2003). The tool was provided by the author to the researcher upon request with permission for use in this study. Dennis (2003) reports that testing of the short form of the scale suggests that it is a reliable and valid tool, having demonstrated construct validity through factor analysis, and concurrent validity through correlations of the tool with other measures including the Edinburgh Postnatal Depression Scale, the Rosenberg Self-Esteem Scale, and the Perceived Stress Scale. Response options require participants to provide a rating on a likert scale of one – five to reflect participant's level of confidence with various aspects of breastfeeding. A response of 1 denotes a 'not at all confident' response and 5 denotes a 'very confident' response. When the 14 items are added together, the highest possible score is 70, and the lowest possible score is 14 (Dennis, 2003). The BSES-SF collects ordinal data, which is then summed to provide interval data. Although this type of data conversion is common, it is not without controversy (Knapp, 1990). Concern about homgeneity of variance is sufficient to warrant the use of a non-parametric test, which according to Knapp, the power "maybe even higher" than it's parametric counterpart (p.123).

In all previous studies the BSES-SF was used to measure breastfeeding self-efficacy over the 24 hours previous to administration of the scale. In this study, the 14 items were adjusted to past tense, by changing the term "I can always..." to "I could always...", requesting participants to reflect upon the previous first seven days following delivery. This change was required to enable a retrospective assessment of breastfeeding over time, rather than a short period which may have been subjected to

other external confounding factors such as social commitments or short term disruptions unrelated to use of alternative techniques.

With the exception of Blyth et al (2002), other studies measuring breastfeeding self-efficacy in the antenatal period and then later show slight rises in breastfeeding self-efficacy over time that were not statistically significant (Nichols et al., 2009; Tokat, Okumus, & Dennis, 2010). Furthermore, studies which measured breastfeeding self-efficacy at one week postpartum and then later, also did not have significant increases over time (Blyth et al., 2002; Dennis, 2003; McCarter-Spaulding & Gore, 2009). In effect, the measurement of self-efficacy at one week postpartum is a reliable predictor of what future breastfeeding self-efficacy will generally be. Therefore, it was decided to measure breastfeeding self-efficacy at one week postpartum. In this study, Cronbach's alpha for the BSES-SF (retrospective) scale was 0.93.

3.4.2 Measurement of independent variables

The independent variable in this study is use of alternative breastfeeding techniques. The alternative techniques include a group of eight techniques. Use of these techniques was assessed using a series of items asking mothers to self-report if any alternative techniques were used (yes/no), which ones (yes/no for each item), and how frequently (not at all – more than five times). The alternative techniques were identified from a review of the literature, when it was clear that actual rates of use for these alternative techniques has not previously been described. These alternative techniques included:

- Cup
- Syringe only
- Syringe and finger feeding
- Syringe and Finger feeding with tube
- Bottle with regular teat
- Bottle with wide teat
- Nipple shield
- Supply line

3.4.3 Measurement of socio-demographic variables

Socio-demographic variables that were measured included age, marital status, education, and combined annual household income.

3.4.4 Content validity

The questionnaire was presented to a panel of two midwives and two mothers at the site of the research to provide feedback on the relevance of the items to the study question (these mothers did not participate in the survey). Suggestions received from this panel included a reduction of items and clarification of wording, which were then incorporated into the final questionnaire. Layout changes were made to improve organisation and readability, including borders and the order of some items. The demographic data was moved to the end of the questionnaire per the suggestions of the panel. Those changes were to the newly devised material only, not the BSES-SF.

3.5 PROCEDURE

3.5.1 Screening

Two visits to the site were made each week for the period of November 1, 2008 to January 30, 2009 to screen the current inpatients of the maternity ward. This ensured that all possible eligible participants would be screened during the normal course of their postnatal stay. The researcher asked the midwife in charge of the shift to identify any obvious client that would need to be excluded, for example those who formula fed from birth, or experienced a stillbirth or preterm birth. The researcher then further screened the remaining cases.

The institution routinely uses a form titled ‘Consent to dissemination of personal information’. The client can elect on this form not to allow access to the medical record for research or staff training purposes, and thirteen of these cases were identified. The next screening stage involved identifying any cases fitting the exclusion criteria as identified at section 3.3.3. For any clients born outside of Australia, the researcher verified with the midwife providing care that the client

spoke adequate English. Only one client needed the services of an interpreter, and was excluded from the study.

Once the mother was screened for inclusion, the infant's chart was reviewed for infant exclusion criteria such as weight, gestation, admission into intensive or special care nursery and absence of any birth anomaly affecting feeding. No infants were excluded on the basis of birth anomaly affecting feeding. One infant was excluded due to birth weight under 2500g, but no infants over 5000g were identified. The additional exclusion criteria of gestation under 37 weeks meant that one mother was unable to participate as her infant was preterm. No infants were post-term (over 42 weeks gestation).

3.5.2 Questionnaire preparation and mailing

When inclusion/exclusion criteria were satisfied, the client's name, the client's home address, the expected date of discharge, the date of infant birth, and parity was recorded into an electronic file for the purpose of sending out the appropriate documents related to this study. As close as possible to the fifth day after birth, the researcher prepared envelopes for mailing. These A5 size envelopes were addressed to each recipient by hand to indicate to the recipient that time and care was taken in asking them to participate (Taylor, Kermode, and Roberts, 2006). Similarly, the cover letter began with 'Dear' and used the client's first name only in the introduction (Appendix 5). In addition to the cover letter, the envelopes contained a study information sheet (Appendix 4), a four page double sided questionnaire with 34 questions, and a reply paid envelope, again, addressed by hand to the attention of the researcher. A total of 225 questionnaires were mailed to potential study participants, scheduled to arrive at their homes as close as possible to postpartum day seven. Consent was implied when the participants returned the questionnaire (Taylor, Kermode, and Roberts, 2006). This study design did not include capacity to follow up non-responders either by phone or mail. Personal consent during the postnatal hospitalisation was not obtained, due to time and resource constraints. Therefore, the researcher did not have permission to follow-up with non-responders. Additionally, it was recognised that the sensitive postnatal period often entails fatigue, and respected the decision of non-responders not to participate.

3.6 ETHICS

Ethics approval was sought from both UnitingCare Health and QUT and was granted in September 2008 and October 2008 respectively (Appendix 6 and 7).

3.6.1 Ethical implications

Breastfeeding can be a very emotive issue and receiving a questionnaire may cause a degree of emotional distress for mother. In the event that difficulties with breastfeeding have been encountered, the recall of these events could be distressing. Therefore, services of a qualified counsellor were made available free of charge to those who requested it. The contact details of the counsellor were provided in the study information sheet.

Interestingly, some mothers wrote extra comments on their questionnaires, and it was evident they felt they experienced poor breastfeeding support from some midwives and lactation consultants. As the questionnaires were anonymous, it was not possible to follow up with them. However, the comments have been included in a report to the institution along with other results.

3.6.2 Data security

Data security was achieved by receipt and storage of all anonymous responses into a padlocked filing cabinet, within a secure room at the university. This room was accessible by electronic proximity card only. All related paperwork was similarly securely stored, and electronic documents were stored on password protected computers of the researcher and two supervisors with direct involvement.

3.6.3 Data management and analyses

When questionnaires were returned, they were given an individual case number. There was no other identifying information on the questionnaires as no names were noted on these questionnaires, which meant that anonymity was retained. For those who did not use alternative techniques, questions two and three were coded as ‘8’ for ‘not applicable’. Where other questions were blank, they were coded as ‘9’

for ‘missing data’. Data entry was with version 16.0. of SPSS. Some comments made by the participants outside the questions were noted, but these are not reported in this thesis as they did not relate to the primary objectives for this study.

Descriptive statistics including percentages and means were used to: describe the demographic profile of the respondents; present the rates of use of alternative techniques and the reasons for their use; describe the knowledge and preferences for alternative techniques; and to present levels of breastfeeding knowledge and support. Means, medians and standard deviations were used to analyse the BSES-SF data. Upon examination of the data, large variances were noted in the data of the BSES-SF.

Inferential statistics were used to test the hypothesis. Due to the large variances, (see Appendix 2) the non-parametric Kruskal-Wallis Analysis of Variance was used to compare the median BSES-SF score for the two groups, as this test is not dependent upon the equal distribution of data (Wilcox, 2009). Parametric tests could not be used due to large variances, and the use of the Kruskal Wallis non parametric alternative provides an equally reliable, if not more reliable result (Knapp, 1990). The probability level chosen for hypothesis testing was $P > 0.05$.

3.7 SUMMARY

This chapter has presented the research design and methodology. Discussion of the target population, sample and sampling methods were included and details of the instruments used and the content validity of these has been discussed. Data security, data management and ethical considerations have been discussed. Finally, the data analysis plan has been described, including plans for hypothesis testing.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

The results of the research are presented in this chapter. The research aimed to describe breastfeeding self-efficacy, and actual use of alternative techniques. The data were analysed using descriptive statistical techniques, and hypotheses were tested using relevant inferential statistical tests.

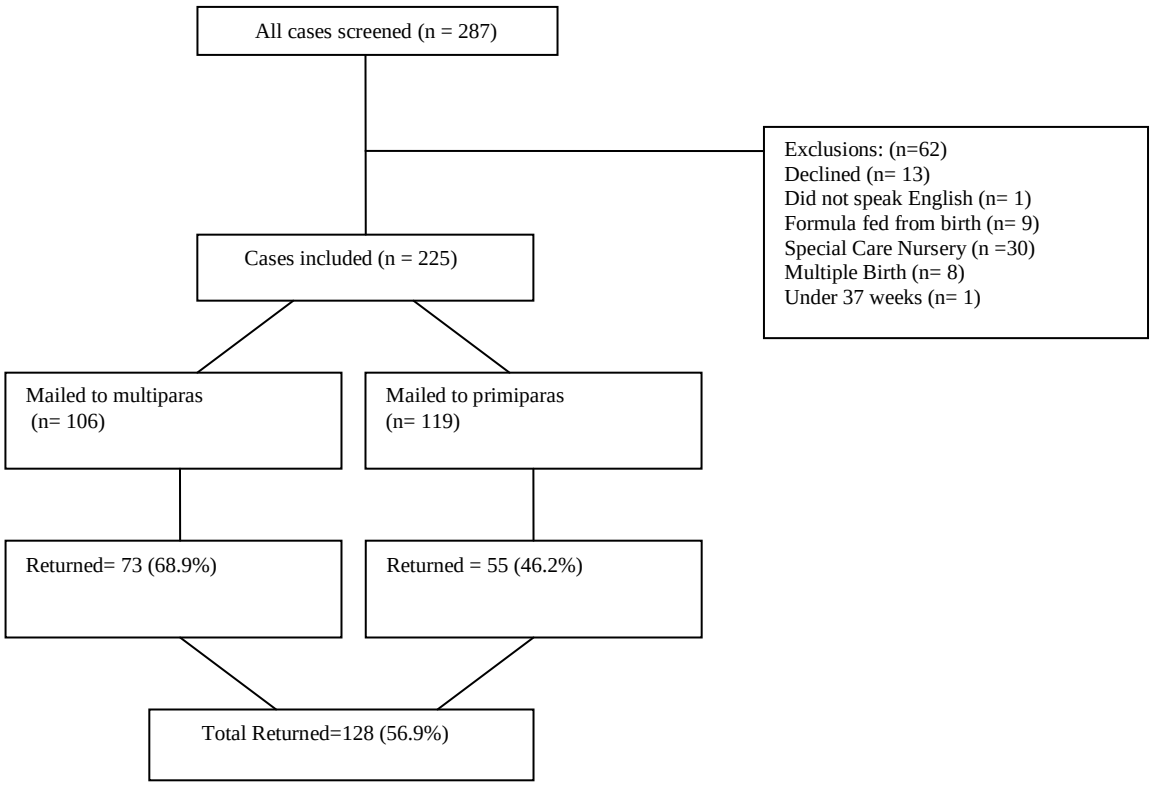
4.2 SAMPLE

The convenience sample for this research was obtained between November 1, 2008, and February 28, 2009 from one private hospital in Brisbane. All 287 postnatal patients during this period were considered for inclusion, with 62 cases being excluded. The reasons for exclusion are presented in Figure 2. The majority of cases were excluded due to the infant being premature or ill in the Special Care Nursery (SCN). Figure one (below) provides a flow chart that represents the flow of participant recruitment and reports the final sample size. Of the 225 eligible participants, a total of 128 (56.9%) returned the questionnaire. It is thought that a response rate of 59% with 3 points of contact is a good result (Dillman, 2007). Therefore, the response rate in this study of 56.9%, with one point of contact is satisfactory.

The number of cases screened during this recruitment phase (n=287) was compared to the known birth rate in Queensland. In 2006, 56,708 women gave birth in Queensland. Of these, 17,635 gave birth in private hospitals, representing approximately 30% of all births in Queensland (Queensland Health Perinatal Data, 2006). The approximate annual birth rate at the research site is 2000. The 287 cases screened represent 14.4% of the annual birth rate. Given that the timeframe for data collection was four months, it might be expected that potential cases would number approximately 500, or 25% of the annual birth rate. The actual number of potential research participants during the timeframe for data collection was thus less than expected, but could be attributed to fluctuation throughout the year.

FIGURE 2

Case screening, exclusion and response rate



4.2.1 Sample demographics

Age, marital status, combined annual income and education of the respondents is presented in Table 3. The mean age of the group was 33.4 years (SD = 4.0), with a range of 24 to 44. No respondents were divorced, widowed, or single. The combined annual income for the majority of the respondents was over $AU100 000. The majority of respondents had university and postgraduate level of education.

TABLE 3

Demographic profile of the sample

Age	n	%
20-24	2	1.6
25-29	22	17.2
30-34	53	41.4
35-39	42	32.8
40-44	8	6.3
Missing	1	0.8
Total	128	100.0
Marital status		
living with partner	14	10.9
Married	114	89.1
Total	128	100.0
Combined annual income AU$		
below 50 000	2	1.6
50 000 – 75 000	17	13.3
75 000 – 100 000	27	21.1
over 100 000	77	60.2
Missing	4	3.9
Total	128	100.0
Education		
year 10	4	3.1
year 12	14	10.9
TAFE*	16	12.5
University	58	45.3
postgraduate or higher	36	28.1
Total	128	100.0

*Technical and Further Education

4.3 MATERNAL AND INFANT VARIABLES

4.3.1 Infant weight and sex

The average weight of the infants in this sample is comparable to that of the general population in Queensland. In Queensland in 2006, 80.3% of infants weighed between 2500 – 3999g and 12.3% weighed 4000g or more (Queensland Health Perinatal Data, 2006). Table 4 shows the birth weight and sex of infants of the respondents in this study.

TABLE 4

Infant sex and birth weight of study sample

Infant birth weight (n=125) *	Sex of infant	
	Male	Female
2500-2999g	4	3
3000-3499	18	23
3500-3999	36	24
4000-4499	10	5
4500-4999	0	2
Total	68	57

* missing data for 3 cases

4.3.2 Parity

Study respondents consisted of 43% primiparas with the remainder being multiparas with two, three, or four live children (see Table 5 below). This is comparable to Queensland Health Perinatal Data (2006) which indicated that 40.3% of women were primiparas in 2006. For the purposes of data analysis in the remainder of the chapter, multiparas will be combined into one category.

TABLE 5

Parity

Parity (n=128)	n	%
Primipara – 1	55	43.0
Multipara – 2	48	37.5
Multipara – 3	21	16.4
Multipara – 4	4	3.1
Total	128	100.0

4.3.3 Delivery type

Women who had planned caesarean section deliveries were the largest group in this sample, comprising 45.7% of all deliveries. An additional 3.9% were unplanned caesarean deliveries, giving a total of 49.6% operative deliveries. The remaining women had vaginal deliveries (39.4%), and medically assisted vaginal deliveries with either vacuum extraction or forceps (11%).

4.3.4 Delivery analgesia

Participants in this study used a variety of analgesics during delivery. The respondents had high use of epidural/spinal analgesia (see Table 6 below). This is not unexpected given the high operative delivery rate; however, approximately half of all women who had vaginal deliveries also had epidural/spinal analgesia.

TABLE 6

Pain relief during delivery

Type of pain relief (n=128)	n	%*
None	9	7.1
Nitrous oxide	34	26.6
Pethidine	12	9.4
Epidural/Spinal	100	78.8
General anaesthetic	3	2.3
Don't know	1	0.8
Missing data	1	0.8

*respondents could choose more than one

4.3.5 Skin to skin practice

Due to the reported positive influence on increasing rates of breastfeeding, skin-to-skin contact (placing the infant skin-to-skin on the mother's chest as soon as possible after delivery) was assessed (Cantrill, 2006). Questionnaire responses indicate that skin-to-skin contact was commonly used, with 92.9% of the respondents reporting that this practice was facilitated at their delivery.

4.3.6 Breastfeeding and expressing history

A total of 124 women continued to breastfeed the infant delivered beyond the seventh day postpartum. It was beyond the scope of this study to assess whether women breastfeed exclusively, or to assess the duration of breastfeeding. However, of the total sample (n=128), only four women ceased breastfeeding before the seventh day.

Almost all the multiparous women had experience with expressing breast milk for a previous child. For those women who had breastfed previously, the majority did so for over six months (see Table 7).

TABLE 7

Breastfeeding history/duration of multiparas

Breastfeeding Duration	Birth order 2		Birth order 3		Birth order 4	
History	n	%	n	%	n	%
Up to 1 week	1	1.4	0	0	0	0
Over 1 up to 6 weeks	7	9.7	2	8.3	1	25.0
Over 6 weeks to 3 months	4	5.6	1	4.2	0	0
Over 3 months to 6 months	15	20.8	2	8.3	2	50.0
Over 6 months	45	62.5	19	79.2	1	25.0
Total	72	100.0	24	100.0	4	100.0

4.4 BREASTFEEDING KNOWLEDGE AND SUPPORT

As identified in Chapter Two, breastfeeding knowledge and breastfeeding support are key variables of interest to this study. The usefulness of various sources of breastfeeding knowledge is reported below in Table 8. After ‘own prior experience’, ‘midwives’ and ‘lactation consultants’ were identified as the most useful sources of knowledge. ‘Doctors’ and ‘classes’ were the least commonly identified useful sources of knowledge.

For those who used the specific source of knowledge, almost two thirds reported their ‘own prior experience’ as being ‘very useful’, and almost one half of respondents reported ‘midwives’ (41.7%) and lactation consultants (48.5%) as ‘very useful’. For those who used them, less than 16% identified ‘classes prior to birth’, ‘reading, books and internet’, ‘hospital literature’ and ‘doctor’ as being ‘very useful’.

TABLE 8

Sources of breastfeeding knowledge and ratings of usefulness

Sources of breastfeeding knowledge (n=128)	Not applicable*	Missing	Usefulness Ratings for Respondents who Used this Source									
			N	Not at all useful	%	Not very useful	%	Sometimes useful	%	Useful	%	Very useful	%
Own prior experience	48	3	77	7	9.1	3	3.9	5	6.5	13	16.9	49	63.6
Reading books, internet	29	4	95	73	76.8	11	11.6	41	43.2	23	24.2	13	13.7
Hospital literature	32	2	94	4	4.3	10	10.6	41	43.6	28	29.8	11	11.7
Midwives	12	1	115	1	0.9	9	7.8	29	25.2	28	24.3	48	41.7
Doctor	61	1	66	22	33.3	17	25.8	14	21.2	5	7.6	8	12.1
Lactation consultant	59	1	68	4	5.9	3	4.4	5	7.4	23	33.8	33	48.5
Classes prior to birth	60	2	66	9	13.6	7	10.6	23	34.8	17	25.8	10	15.2

*Refers to cases where the source of knowledge was not used

4.4.1 Breastfeeding support

As shown in Table 9 below, partners and midwives were identified as the most common source of support. For those who identified as using the source of support, over three quarters (77.4%) of respondents reported their partner as a source of breastfeeding support to be ‘useful’ and ‘very useful’. Just over two-thirds (70.8%) reported ‘Midwives’ as a source of breastfeeding support was also ‘useful’ or ‘very useful’. While identified as being used by fewer participants, a similar proportion (71.5%) of those who received support from a Lactation Consultant reported this to be a ‘useful or very useful’ source of support. Just over half reported

'parents' (54.5%), and 'friends' (52.5%), as 'useful' and 'very useful' sources of breastfeeding support, while less than half (44.6%) reported 'other family' as 'useful' and 'very useful', and less than one-third reported 'obstetrician' and reported 'general practitioner' at the same levels of usefulness.

TABLE 9

Sources of Breastfeeding support and ratings of usefulness

Sources of breastfeeding support (n=128)	Not applicable*	Missing	Usefulness ratings for respondents who used this source											
			N	Not at all useful	%	Not very useful	%	Sometimes useful	%	Useful	%	Very useful	%
Partner	12	1	115	5	4.3	4	3.5	17	14.8	31	27.0	58	50.4
Parents	37	1	90	10	11.1	11	12.2	20	22.2	17	18.9	32	35.6
Family	43	2	83	15	18.1	40	48.2	21	25.3	15	18.1	22	26.5
Friends	26	1	101	10	9.9	8	7.9	30	29.7	28	27.7	25	24.8
Midwife	14	1	113	3	2.7	9	8.0	21	18.6	28	24.8	52	46.0
Lactation consultant	56	1	71	6	8.5	2	2.8	8	11.3	21	27.3	34	44.2
Obstetrician	61	1	66	16	24.3	11	16.7	18	27.3	11	16.7	10	15.2
General practitioner	85	1	42	17	40.5	3	7.1	8	19.0	8	19.0	6	14.3

*Refers to cases where the source of knowledge was not used.

4.5 KNOWLEDGE AND PREFERENCE FOR ALTERNATIVE TECHNIQUES

As part of this descriptive research, women were asked to indicate their knowledge of and preference for alternative techniques (whether or not they actually used them). Almost all the respondents knew about 'bottles with regular teats' and slightly less knew about 'bottles with wide teats' as shown in Table 10 below. More than two-thirds knew about 'Nipple shields', while just over half the respondents knew about the 'syringe only' technique. "Supply lines', 'Syringe +finger feeding', and 'Syringe + tube +finger feeding' were less well represented with less than a quarter of respondents indicating they had knowledge of those alternative techniques.

Once participants indicated their knowledge of alternative techniques, they were asked to indicate a preference to have known about techniques they were not previously aware of. The participants answered a yes/no question, and then those who answered yes were asked to elaborate. One hundred and one participants indicated that they did not have any other preference, by their 'no' answer. Of the remaining 20 respondents who indicated a preference, over two thirds indicated that they would have preferred to have known about/tried a 'nipple shield'. As shown in Table 10 below, there was very little preference for other alternative techniques.

TABLE 10

Knowledge and Preference - Alternative Techniques

Knowledge Of Alternative Techniques (n=123)	Yes	
	n	%
Bottle regular teat	113	91.9
Bottle wide teat	97	78.9
Syringe only	72	58.5
Syringe + finger feeding	26	21.1
Syringe + feed tube + finger feed	22	17.9
Cup	44	35.8
Supply line	19	15.4
Nipple shield	87	70.7
Preferences for Alternative Techniques (by those who did not know about these techniques) (n=20)		
Bottle regular teat	3	15.0
Bottle wide teat	1	5.0
Syringe only	1	5.0
Syringe + finger feeding	3	20.0
Syringe + feed tube + finger feed	1	5.0
Cup	1	5.0
Supply line	2	10.0
Nipple shield	14	70.0

4.6 USE OF ATERNATIVE TECHNIQUES

One of the secondary research questions was “How often are alternative techniqes used?” The findings related to the use of alternative techniques by breastfeeding women in the first week postpartum are presented in the following sections.

4.6.1 Use of alternative techniques and parity

Nearly half of the sample (48.3%) used an alternative technique in the first week following the birth of their baby. As shown below in Table 11, the use of alternative techniques was more common in primiparas.

TABLE 11

Use of alternative techniques and parity in the first week following birth

Used alternative techniques	Primipara	%	Multipara	%
Yes	36	65.5	26	35.6
No	19	34.5	47	64.4
Total (n=128)	55	100.0	73	100.0

Table 12 (below) presents participants reports of the actual use of each type of alternative technique by parity for those who used at least one alternative technique (n=62). Respondents may have used one, or a number of alternative techniques. 'Bottle with regular teat' was the most common alternative technique used by breastfeeding women in the first week. This technique, along with 'bottle with wide teat', was more frequently used by primiparas. The alternative technique 'syringe only' was utilised by similar proportions of primiparas and multiparas, however primiparas were four times more likely to use this alternative technique 'more than five times'. The two variations of syringe feeding attracted less than half the responses of 'syringe only', and most of those were primiparas. The 'cup' technique was also more frequently used by primiparas, but there were only 12 instances of use in total. The nipple shield technique was utilized by similar proportions of primiparas and multiparas. By contrast, the supply line technique was only utilized by one primipara, who used this technique 'more than 5 times'.

TABLE 12

Frequency of use of alternative techniques by parity in the first week following birth

Frequency of use of Alternative Techniques* (n=62)		Primipara		Multipara		Total	Total
		n	%	n	%	n	%
Bottle Regular Teat	once only	5	21.7	4	26.7	9	23.7
	up to 5 times	8	34.8	7	46.7	15	39.5
	more than 5 times	10	43.5	4	26.7	14	36.8
	Total	23	100.0	15	100.0	48	100.0
Bottle with wide teat	once only	1	7.7	4	44.4	5	22.7
	up to 5 times	4	30.8	2	22.2	6	27.3
	more than 5 times	8	61.5	3	33.3	11	50.0
	Total	13	100.0	9	100.0	21	100.0
Syringe only	once only	6	40.0	5	41.7	11	40.7
	up to 5 times	5	33.3	6	50.0	11	40.7
	more than 5 times	4	26.7	1	8.3	5	18.5
	Total	15	100.0	12	100.0	27	100.0
Syringe + finger feeding	once only	2	20.0	0	0.0	2	15.4
	up to 5 times	3	30.0	3	100.0	6	46.2
	more than 5 times	5	50.0	0	0.0	5	38.5
	Total	10	100.0	3	100.0	13	100.0
Syringe + tube + finger feeding	once only	0	0.0	0	0.0	0	0.0
	up to 5 times	2	50.0	0	0.0	2	50.0
	more than 5 times	2	50.0	0	0.0	2	50.0
	Total	4	100.0	0	0.0	4	100.0
Cup	once only	4	44.4	2	66.7	6	50.0
	up to 5 times	5	55.6	1	33.3	6	50.0
	more than 5 times	0	0.0	0	0.0	0	0.0
	Total	9	100.0	3	100.0	12	100.0
Supply line	once only	0	0.0	0	0.0	0	0.0
	up to 5 times	0	0.0	0	0.0	0	0.0
	more than 5 times	1	100.0	0	0.0	1	100.0
	Total	1	100.0	0	0.0	1	100.0
Nipple Shield	once only	1	11.1	1	12.5	2	11.8
	up to 5 times	4	44.4	3	37.5	7	41.2
	more than 5 times	4	44.4	4	50.0	8	47.0
	Total	9	99.9**	8	100.0	17	100.0

*respondents may have used more than one alternative technique

**not 100.0% due to rounding

4.7 REASONS FOR USE OF ALTERNATIVE TECHNIQUES

The reason given by respondents for having used an alternative technique varied widely. The participants who used alternative techniques were able to nominate more than one reason. The seven key reasons reported are shown below in Table 13.

More than one third of respondents reported the reasons ‘nipple pain’, ‘baby would not settle’, ‘not enough breast milk or colostrum’, and ‘fatigue’ as being reasons for using an alternative technique.

TABLE 13

Key reasons and parity of those who used alternative techniques

Key reasons for using alternative techniques* n=62	Primipara	%	Multipara	%	Total	%
Nipple pain	14	56.0	11	44.0	25	40.3
Baby would not settle	13	52.0	12	48.0	25	40.3
Not enough breast milk or colostrum	16	69.6	7	30.4	23	37.1
Fatigue	14	60.9	9	39.1	23	37.1
Night nursery permission	9	56.3	7	43.8	16	25.8
Baby lost 10% or more birthweight	9	60.0	6	40.0	15	24.3
Pain associated with birth	9	69.2	4	30.8	13	21.0
Baby could not latch – various reasons	*see table 14				23	37.1

*respondents could choose more than one reason

For the 23 women who identified ‘baby could not latch – other reasons’ additional responses elaborating on the reasons for this concern were provided. These responses were grouped into eight sub-categories (see table 14), which yielded 23 responses. The most common reason for not latching/other was ‘uncoordinated suck’ and ‘breast refusal’.

TABLE 14

Various reasons infant could not latch for breastfeeding

Various reasons infant could not latch for breastfeeding (n=23)	Total	%
Unco-ordinated suck	9	39.1
Breast refusal	8	34.8
Pre-existing flat nipple	5	21.7
Inverted nipple	3	13.0
Engorgement – other	1	4.3
Engorgement flat/inverted nipple	2	8.7
Jaundice	3	13.0
Unknown	3	13.0

In addition further analysis of type of pain identified that women had a combination of pain sources. As shown in Table 15 below, women were most likely to report ‘cracks’ and ‘bleeding’ as the source of their nipple pain. The same proportion of primiparas reported ‘caesarean’ and ‘perineum’ as the reason for their use of an alternative technique.

TABLE 15

Reasons for nipple and birth related pain of those who used alternative techniques

Type of pain	Primiparas	%	Multiparas	%
Nipple pain (n=25)	14	56.0	11	44.0
-blisters	6	24.0	4	16.0
-cracks	11	44.0	10	40.0
-bleeding	10	40.0	11	44.0
-grazes	5	20.0	5	20.0
-no obvious cause	2	8.0	2	8.0
Birth associated pain (n=13)	9	69.2	4	30.8
- caesarean	4	30.8	3	23.1
- perineum	4	30.8	1	7.7
- afterbirth	1	33.3	0	0.0

In addition to nipple pain level and birth related pain level, fatigue level was measured. As shown in Table 16 below, primiparas most frequently reported a strong level of fatigue, whilst multiparas most frequently reported a moderate level as a reason they used an alternative technique. Similarly, a higher proportion of primiparas reported a strong level of nipple pain. Both primiparas and multiparas, who reported birth related pain as a reason for using an alternative technique, were more likely to report moderate and strong levels of pain. Overall, nipple pain and fatigue were more frequently reported than birth related pain to be the reason for using an alternative technique. Five women who indicated that they had nipple pain did not indicate the level of that pain.

TABLE 16

Levels of fatigue, nipple pain, and birth related pain of those who used alternative techniques

Levels of fatigue, nipple pain, & birth related pain		Primiparas	Multiparas	Total n	%
Fatigue (n=23)	mild	3	1	4	17.4
	moderate	2	4	6	26.9
	Strong	5	2	7	30.4
	extreme	4	2	6	26.9
	Total	14	9	23	100.0
Nipple pain (n=25)	missing	4	1	5	20.0
	mild	1	0	1	4.0
	moderate	3	1	4	16.0
	Strong	6	4	10	40.0
	extreme	3	2	5	20.0
	Total	17	8	25	100.0
Birth related pain (n=13)	mild	0	0	0	0.0
	moderate	3	2	5	41.7
	Strong	3	2	5	41.7
	extreme	1	1	2	16.6
	Total*	7	5	12	100.0

* missing data for one case

4.8 BREASTFEEDING SELF-EFFICACY

4.8.1 Instrument Reliability

The instrument 'Breastfeeding Self-Efficacy Scale - Short Form' (BSES –SF) was altered from current tense to past tense, eliciting retrospective responses about breastfeeding in the first seven days following birth. To assess the internal

consistency of the altered scale, a correlation matrix (Appendix 1) and Cronbach's alpha were produced. The correlation co-efficient values ranged from .60 to .80, suggesting high levels of inter-item correlation. The Cronbach's alpha was .93, which suggests the scale has high internal consistency. This result is similar to the original data reported by Dennis (2003).

4.9 HYPOTHESIS TESTING

The primary research question in this study was to establish whether the breastfeeding self-efficacy of women who use alternative techniques is different from those who did not use them. This section will discuss the testing of the hypothesis:-

- H1 Breastfeeding self-efficacy score of women who used an alternative technique is significantly lower than women who did not.
- H0 Breastfeeding self-efficacy score of women who used an alternative technique is not significantly lower than women who did not.

The BSES-SF provided interval data with the lowest possible score being 14, and the highest being 70. The mean BSES-SF score of those who used an alternative technique was 43.43 (SD=12.19), and of those who did not use an alternative technique it was 58.32 (SD=7.40) (Appendix 2). The median BSES-SF score was 53.00. In the group who used alternative techniques, 16 cases exceeded the median of 53.00, and 42 cases were less than 53.00. In the group who did not use alternative techniques, 44 cases were above the median, and 19 cases were below it. To establish whether there was a statistically significant difference and test the above hypothesis, the non-parametric test Kruskal-Wallis Analysis of Variance (ANOVA) was used. This analysis tests the null hypothesis that there is no difference between the two groups. This analysis provided the H statistic of 21.569 with a significance level of less than 0.001, providing evidence of a significant difference between the groups. Therefore the null hypothesis is rejected, and the alternate hypothesis that there is a significant difference between the breastfeeding self-efficacy scores for those who did use alternative techniques and those who did not is accepted. Specifically, a comparison of median scale scores for the two groups shows that the BSES-SF

scores are significantly lower for women who used alternative techniques compared to those who did not use alternative techniques.

4.10 SUMMARY

This chapter has presented the results of this study. The demographic profile of the sample has been described, and the frequency of use of various alternative techniques to breastfeeding has been presented. Levels of breastfeeding self-efficacy have been reported for the study sample, suggesting overall that women had moderate to high levels of breastfeeding self-efficacy. The null hypothesis was rejected and the alternate hypothesis that there was a significant difference between breastfeeding self-efficacy for those who used alternative techniques and those who did not was accepted.

CHAPTER FIVE
DISCUSSION

5.1 INTRODUCTION

This chapter will discuss the results of this study. The chapter will begin by reviewing the problem being investigated, the procedures used, and the research questions and hypotheses addressed. The findings of the analyses will be summarised, and various explanations for these findings will be presented. This chapter will discuss the limitations of the study, as well as recommendations for clinical practice and further research.

5.2 Summary of study

Types of alternative techniques and frequency of use in the first seven days has not been a focus of inquiry prior to this research project. Additionally, little was known about the level of breastfeeding self-efficacy within the first seven days postpartum, for those who utilised these techniques to support their breastfeeding. Therefore, as identified in chapter one, the overall purpose of this study was to describe the use of alternative techniques in the first week, and to determine if breastfeeding self-efficacy is significantly lower in women who use them, as compared to those who do not.

This study was conducted at one private maternity healthcare facility in Brisbane, Australia. The data collection phase took place from November 2008 to February 2009. A quantitative, retrospective, self-report design questionnaire was mailed to a convenience sample of all women who met the selection criteria at one week postpartum. The questionnaire included a range of items to assess actual use and reasons for use of alternative techniques in the first week following birth. Dennis's Breastfeeding Self-Efficacy Scale – Short Form was used to measure breastfeeding self-efficacy as it has been reported to be a reliable and valid measure of this construct (Dennis, 2003; Gregory et al., 2008; McCarter-Spaulding & Gore, 2009). From 225 questionnaires sent to potential participants who met the selection criteria, 128 postal questionnaires were returned.

5.3 MAIN FINDINGS

5.3.1 Sample characteristics

5.3.1.1 *Demographic characteristics*

The results shown in chapter four reveal that the demographic profile of the sample was dissimilar to the general population of childbearing women in Queensland (QueenslandHealth, 2007), in terms of education, income and age. While marital status in this sample was similar to both the local Queensland population, and other breastfeeding self-efficacy research (Dennis, 2003; Wutke & Dennis, 2007), when considering the findings of this study it is important to consider that this sample had higher levels of education and income, and women tended to be older than the average age of birthing women in Queensland.

Such demographic differences are important, as levels of education are typically known to predict higher breastfeeding self-efficacy (Dennis, 2006). While one study did not report education to predict breastfeeding self-efficacy (Blyth et al., 2002), the majority of literature reports otherwise (ABS, 2003; Aysu Duyan et al., 2008; Callen & Pinelli, 2004). Interestingly, the present study was conducted in the same city as Blyth et al., however, the samples were different in that Blyth et al.'s study was conducted in a public hospital, and the present study was conducted in a private hospital. The study reported in this thesis found higher levels of education than Blyth et al., and therefore the findings of this study are consistent with most other studies.

5.3.1.2 *Delivery characteristics*

The rate of vacuum extraction and forceps assisted vaginal deliveries in this study was consistent with Australian statistics, whereas the rate of caesarean deliveries was higher than the national average of 29% (ABS, 2008). The result in this study that 49.5% of deliveries were vaginal (including 11% vacuum extraction or forceps) differs from many other studies of breastfeeding self-efficacy. Three other studies had over 70% vaginal deliveries (Dai & Dennis, 2003; Dennis & Faux, 1999; Semenic, Loiselle, & Gottlieb, 2008) and numerous others were near 70%, (Gregory et al., 2008; McCarter-Spaulding & Gore, 2009; Molina Torres et al., 2003; Tokat et al., 2010; White, 2002). The only other study which was close in range to the study

reported in this thesis was a Polish study by Wutke and Dennis at 44.8% vaginal delivery (Wutke & Dennis, 2007). Unfortunately, two other studies which were conducted in the same city as this study did not report mode of delivery (Blyth et al., 2002; Nichols et al., 2009).

The participants in this study had a high rate of epidural use, even after accounting for the caesarean birth rate. The literature contains abundant research on the topic of epidural and subsequent potential for a negative effect on breastfeeding (Albani et al., 1999; Carvalho, 2007; Marzan-Chang, 2003; Widstrom et al., 2001). However, as discussed below, skin-to-skin practice was also high, highlighting that a range of other practices within the unit may have worked to facilitate breastfeeding amongst the sample.

The very high rate of the practice of skin-to-skin contact was an important finding, given the high caesarean birth rate. The positive aspects of this practice are evident in the literature (Cantrill, 2006), however, the practical aspects of providing one-to-one care for infant and mother during this time may be challenged by financial and organizational restraints in some hospitals. Skin-to-skin contact and time of first breastfeeding is further discussed at section 5.6.

5.3.1.3 *Breastfeeding initiation and history*

Of the cases screened in this study (n=285), nine cases were excluded due to bottle feeding from birth. This represents 3.1%, leaving 96.9% of women initiating breastfeeding. In this study, a further four women reported discontinuing breastfeeding before seven days. In other breastfeeding self-efficacy studies, the rate of women still breastfeeding at one week postpartum was similar to that found in this study. Blyth et al. (2004) reports that of 92% who initiated breastfeeding, 91.7% were continuing at 1 week. Consistent with national statistics, most multiparas in this study who initiated breastfeeding had prior breastfeeding experience (ABS, 2008). It is acknowledged, however, that measurement of breastfeeding initiation has been problematic, with inconsistent definitions (Labbok & Krasovec, 1990). For example, in Australia, statistics show that in 2004, 88% of children under three were ‘ever breastfed’, but it is not known whether this was short term or long term (ABS, 2008).

5.3.2 *Use of alternative techniques*

The literature review in Chapter two identified that there was a distinct lack of documentation of the use of alternative techniques for breastfed term infants in the first week postpartum. The results of this study show that 48.3 % of women in the sample used an alternative technique. In particular, participants in this study reported widespread use of bottles with teats, both regular size teats as supplied by the hospital, and wide neck teats that the mothers provided. It was also noted that the use of bottles and teats tended to be repeated as the participants more frequently cited using them 'more than five times'. Interestingly, the hospital only supplied the regular sized teats so it can be concluded that the women either came to the hospital with the items ready before the birth, they were supplied by family or friends whilst in hospital, or they were used immediately after discharge on day five, six, and seven. It is known that the influence of partner, family and friends on breastfeeding can be strong, and perhaps explains this result (Ayre-Jaschke, 2004; Franca, 2008; Okon, 2004).

Whilst Fallon et al. (2005) contend that the longer women remained in hospital, the greater the risk of exposure to negative hospital practices such as the use of alternative techniques like bottles and teats, it is worth considering an alternative perspective as has been presented by Ekstrom, Widstrom, and Nissen (2003). In that study, the use of supplementation when medically indicated was shown not to affect breastfeeding duration. They reasoned that this was because of the mothers' perception that it was medically necessary, and not a failing as interpreted by the mother.

The use of syringe feeding was the second most common alternative technique noted in this study. As presented in chapter two, no literature could be found to support the use of this technique in clinical practice. The limited number of women using other alternative techniques may reflect the complexity of these techniques, and the ability of the women to learn these (Borucki, 2005). Alternatively, the low use of techniques such as finger feeding, supply lines, and nipple shields may be a reflection of the staff's lack of confidence in the

effectiveness of the technique, judgment of complexity, or policy restrictions (Furber & Thomson, 2006).

5.3.3 Reasons for alternative technique use

One of the secondary research questions sought to identify the reasons that women used alternative techniques. Results demonstrated that reasons for use of these techniques are many and varied, with women often reporting multiple reasons for using them. The reasons were either based on maternal or infants needs, but frequently both played a part in the mother's decision to use an alternative technique.

One of seven key reasons cited by women in this study, 'not enough breast milk or colostrum' is referred to in the literature as 'perceived insufficient milk supply'. More than one-third of participants who were using alternative techniques cited this reason, which is higher than rates reported in other Australian research. Reported rates vary from 22% to 23% in Australian studies (Blyth, 2002; Binns and Scott, 2002 respectively), to 25% in a Canadian study (White, 2002) and 41% in a Japanese study (Otsuka et al., 2008).

Consistent with reasons for cessation of breastfeeding cited in other studies, the reasons cited in this study for using alternative techniques included infant behaviour (Binns & Scott, 2002; Gagnon et al., 2005; Sloan et al., 2006). The reason 'infant would not settle' is closely related to the reason 'did not have enough breast milk or colostrum', as it describes the interpretation by the mother of the infant's behaviour and her conclusion of the cause of this behaviour. This is a prime example of the maternal cognitive processing that occurs with enactive mastery experiences. It is feasible that when the maternal expectation of a settled baby did not occur the mother questioned whether there was sufficient milk supply and in turn, challenges the self-efficacy belief that she is capable of breastfeeding.

The results of this study in describing reasons for use of alternative techniques are unique because they provide a snapshot of the time between breastfeeding initiation and encountering challenges, prior to later cessation. However, the ability to compare the results of this study to existing literature has been challenged by a lack of consistent definitions of reasons women cite for

supplementing with non-breast milk and breastfeeding cessation. Furthermore, the literature does not clearly differentiate between those two outcomes, and the outcome examined in this study, the use of alternative techniques whilst maintaining the intention to exclusively breastfeed. It has been noted in the literature that authors such as Blyth et al. (2002) and White (2002) use categories for reasons of non-exclusive breastfeeding including 'maternal', 'infant', 'hospital management', and 'other'. Blyth et al. (2002) reports women stated maternal reasons (8.3%) to be sore and cracked nipples, fatigue, mastitis, whilst infant factors (6.5%) were, poor latch, slow weight gain, feeding frequency as well as 'other' category (5.1%) including hospital practices and inconvenience. Similarly, White (2002) noted that, at 24 weeks postpartum, the following reasons were cited: perceived insufficient milk supply (25%), maternal factors (21.4%), infant factors (21.4%), and breastfeeding management problems (10.7%). It would be useful if researchers were more consistent by using primary categories such as 'maternal' and 'infant', with all reasons classified under those categories.

5.3.4 Pain and fatigue

As discussed in chapter one, pain and fatigue are somatic experiences that inform the self-efficacy through cognitive processing. Somatic experiences likely to occur in the first week postpartum are nipple pain, birth related pain, and fatigue.

In this study, over one third of women who used an alternative technique reported nipple pain, similar to rates reported in other studies (Blyth et al., 2002; Cantrill, 2006; Coffield, 2008; Henderson et al., 2001). Cantrill (2006) reported that over forty percent of women experienced nipple pain in that study (n=88) of skin-to-skin contact at birth. In Cantrill's mixed methods study, women in both the experimental and control groups experienced nipple pain. The level of nipple pain in that study was measured with a 10 point visual analogue pain scale, at the time of consent to participate within 24-48 hours of birth. Additionally, level of nipple pain continued with two thirds of women reporting nipple pain at two weeks postpartum (Cantrill, 2006). There is little doubt as to the magnitude of the challenge of nipple pain early in the establishment of breastfeeding. This study directly establishes that one of the key reasons women turn to alternative techniques whilst endeavoring to establish breastfeeding is nipple pain. Moreover, similar to the findings by Cantrill

(2006) this study also found primiparas were more likely to state this pain was ‘strong’ and ‘extreme’.

Fatigue, as a reason for using an alternative technique, also featured as one of the seven key reasons in this study. Again, more primiparas than multiparas were likely to state fatigue, and that the level of this fatigue was ‘strong’ and ‘extreme’. Fatigue and another key reason, ‘night nursery’ were closely related. Many other studies cite the use of night nurseries (not rooming in 24 hours a day) as a threat to the establishment of breastfeeding (Abolyan, 2006; Meirelles, 2008; Young, 2005). The BFHI recommendation that mothers and infants should remain together 24 hours a day, in theory, protects breastfeeding by mothers being prompted to practice ‘demand’ breastfeeding, and responding to the infants cues faster. This study, however, shows that many women, particularly primiparas, have experienced a level of fatigue so great that it was a reason for using an alternative technique. Similarly, mothers opted to use the ‘night nursery’, and give permission for the infant to be fed via an alternative technique. This is distinct from the use of the ‘night nursery’, where infants can also be cared for whilst maintaining an exclusive breastfeeding status, and returned to the mother for breastfeeds.

5.3.5 Knowledge and preference for alternative techniques

All participants in this study were asked to report their knowledge of eight alternative techniques. As reported in Chapter Four at section 4.5, the participants had a high level of knowledge of most of the alternative techniques. By stark contrast, the same respondents rarely nominated a preference to have known about another alternative technique, with the exception of nipple shields. As compared to other techniques, many more women reported a desire to have known about the technique. These results reflect that the nipple shield technique may have been less available to women during their hospital stay (most of the first week postpartum, as discussed above at 5.3.2). As discussed in Chapter Two (2.4.6), varying interpretation of literature surrounding this technique has in the past resulted in negative views of this alternative technique in clinical practice. However, two studies in particular found that vast numbers of women reported a positive experience with nipple shields (Chertok, 2009; Powers & Tapia, 2004). Chertok’s (2009) study shows that there was no statistically significant difference (n=54) in infant weight at two

weeks, one month or two months, between infants who did or did not breastfeed with the aid of a nipple shield. The results in this study confirm that women have high levels of knowledge of all alternative techniques, but have a preference to know more about nipple shields.

5.3.6 Breastfeeding knowledge and support

The contribution of knowledge to the level of self-efficacy is known and Bandura (1997) notes that there is a difference between skill acquisitions and practice, with a combination of both being required to achieve enactive mastery experience. The sixth question addressed in this study thus sought to understand breastfeeding knowledge and support amongst the sample. In this study the results indicate that midwives and lactation consultants at the research site were amongst the most useful sources of breastfeeding knowledge and support as reported by the participants. This is consistent with many other studies (Chambers, McInnes, Hoddinott, & Alder, 2007; Chezem, Friesen, & Boettcher, 2003; McInnes & Chambers, 2008; Mitra, Khoury, Hinton, & Carothers, 2004).

A substantial critique of literature by McInnes and Chambers (2008) reveals that a prominent theme associated with breastfeeding support is health professional relationships, noting that these are not always positive relationships. Issues such as time pressures, unhelpful practices, and conflicting advice were identified as contributing to the deterioration of the health professional – mother relationship. Whilst the issue of lack of time in clinical settings can create a negative effect on women's experience, midwives and lactation consultants are still well situated to provide effective care (Schmied, Cooke, Gutwein, Steinlein, & Homer, 2009). This is evidenced by women's high ratings of the breastfeeding knowledge and support they received from midwives and lactation consultants in this study.

5.3.7 Level of breastfeeding self-efficacy

There are a variety of differences in BSES-SF scores in this study as compared to other studies. The median breastfeeding self-efficacy in this sample was 53.00. The overall mean was 51.18, which is lower than that found by Dennis (2003), Wutke & Dennis (2007), McCarter-Spaulding and Gore, (2008), and Nichols et al. (2009) (see Table 2 in Chapter Two). Alternatively, the score was higher than

reported by Gregory et al. (2008), O'Brien (2007), Otsuka et al (2008) and (Semenic et al., 2008)

Importantly, the level of breastfeeding self-efficacy of the women in this study was found to be significantly lower if they had utilised an alternative technique in the first week postpartum, suggesting they had a reduced belief in their ability to successfully breastfeed. In this study, the mean BSES-SF score of those who used an alternative technique was 43.43 (SD=12.19), and this is consistent with that found by Dennis (2003) of women who were entirely artificially feeding at one week postpartum (42.58, SD=13.35). For women in this study who did not use an alternative technique the mean BSES-SF score was 58.32 (SD=7.40). This is amongst the highest mean scores in published studies, such as Dennis (2003), Wutke and Dennis (2006), and Tokat et al. (2010), and is also among the lowest standard deviations.

Bandura (1986) emphasises that knowledge and skill should be distinguished. There is a process between acquiring knowledge, and proficient performance of the skill. Paramount in this process is the bidirectional influence of action and performance feedback, which allows modification and refinement. Therefore, one possible explanation for a low breastfeeding self-efficacy score in this study was that one week is insufficient time for mothers to achieve the refinement necessary that provides a strong belief in being successful and therefore, alternative techniques were implemented to problem-solve breastfeeding. However, the use of an alternative technique itself may have been included when these mothers evaluated their breastfeeding self-efficacy. If this was so, the immediacy of the need to feed the infant may not allow time for acquiring the knowledge required for, and then the proficient performance of, the skill of using a complex alternative technique. Therefore, the use of bottles and teats which was common in this study may have been perceived as easier to address the urgent need of a hungry infant compared to attaining the mothers' desire to exclusively breastfeed.

An alternative explanation could be that when women who have used alternative techniques fill out the BSES-SF, their interpretation of the items varies

from those who did not use alternative techniques. The item 'I could always ensure my baby is latched on for a whole feed' may have been scored lower by those who used alternative techniques, because seven of the eight alternative techniques do not include a direct attachment to the breast. The item 'I could always be satisfied with my breastfeeding experience', may have also been scored low as there had been a departure from feeding the baby at the breast, which had not been the antenatal plan. In the BSES-SF, the item "I can always determine that my baby is getting enough milk" corresponds to the finding that the reason 'not enough breast milk or colostrum' being frequently cited. This identifies the connection between breastfeeding self-efficacy, and the use of alternative techniques.

Of further interest is that the results of this study yielded a mean BSES-SF score of 58.32 for the group who did not use alternative techniques, with a standard deviation of 7.40. This is one of the lowest known standard deviations amongst published studies that measured breastfeeding self-efficacy at one week postpartum. Only two other studies, which translated the BSES-SF to Turkish and Polish, yielded similar low standard deviations, between 7 and 10 (Tokat et al., 2010; Wutke & Dennis, 2007). The interpretation of standard deviation is dependent upon the context of the range of studies involved. There is no specific 'high', 'medium' or 'low' figure, rather, the standard deviations need to be considered in light of the available information, such as previous studies (Wilcox, 2009). A standard deviation between 10 and 13 is common in BSES-SF studies (see table 2). In older BSES studies which used the 33 item scale, there were also common standard deviations between 20 and 25. The low standard deviation in the present study suggests that women who did not use alternative techniques were more consistent with their (higher) breastfeeding self-efficacy, whereas women who used alternative techniques, on an individual basis, varied more widely in their (lower) breastfeeding self-efficacy. This could be explained by the use of different techniques, however, due to the small numbers of women using some of the specific techniques this could not be further explored and is therefore a limitation of the study.

5.4 IMPLICATIONS FOR PRACTICE

Two authors suggest that the BSES-SF is a useful tool to identify women at risk for early weaning. According to McCarter-Spaulding and Gore (2009), it may be useful if further research could identify whether there is a level of breastfeeding self-efficacy below which weaning would occur, and above which breastfeeding would continue. Similarly, Dennis (2003) suggests that women at risk of early cessation could be identified early in the postpartum period. Therefore, this study is consistent by showing that a key benefit to measuring breastfeeding self-efficacy is to identify those who may require further breastfeeding support. As shown in this research, women can face a number of challenges during this time, yet, individual psychological factors such as resilience may minimize the impact of breastfeeding challenges (Johnsen, 2002).

Although this study did not measure whether infants received breast milk or non-breast milk via the alternative techniques, anecdotal evidence from staff at the research site strongly suggests that mothers request occasional non-breast milk feeding when it is not medically indicated, and that they sometimes prefer to use techniques such as bottles and teats, while still intending to fully breastfeed. It is acknowledged by Australia's BFHI administering body, the Australian College of Midwives (ACM), that mothers informed choice of feeding is to be respected and supported. However, in practice, choices may sometimes be withheld in order to promote BFHI practices. This may result in overriding the mother's right to an informed decision, raising ethical issues.

Gribble (2008) found that a number of women (n=107) were breastfeeding beyond two years duration, despite having encountered initial breastfeeding challenges. How the women overcame these challenges was not explored, however, psychological factors of resilience and optimism may explain the findings. As found by Maginness (2007) resilience incorporates many personal attributes including non-victim stance, determination, no blaming, optimism, gratitude, humour, openness and flexibility, empathy, intuition and knowing, and chunking (breaking down a large challenge into manageable chunks). Some of these facets of resilience, such as optimism and persistence, were also found by O'Brien, (2007), in a study that

measured and compared breastfeeding self-efficacy, dispositional optimism and other factors which predict breastfeeding duration. O'Brien's conclusions are that women could be better prepared for the very real possibility that they could experience breastfeeding challenges like nipple problems, and supply and attachment issues, and learn to think positively about overcoming these challenges, rather than resort to weaning (O'Brien, 2007). Therefore, individual tendencies of optimism and other facets of resilience could minimize the impact of breastfeeding challenges.

While Dennis (2003) concluded that 'in hospital' measurement of breastfeeding self-efficacy was useful to predict future level of breastfeeding support required, it remains that those measurements are taken at a time when Lactogenesis II is incomplete due to the limited length of hospital stay postpartum in many countries. The use of the retrospective version of the BSES-SF at one week postpartum in this study adds to the growing body of literature informing clinicians. The results can inform clinicians elsewhere working within a healthcare system with shorter length of stays, to refer women experiencing breastfeeding challenges to support networks and services like the use of lactation consultants.

5.5 RECOMMENDATIONS

The lived experiences of women with breastfeeding challenges have been identified as unique (Hauck et al., 2002; Schilling Larsen, Hall, & Aagaard, 2008). Bandura (1997) identified that individualised advice is cognitively processed on a deeper level than that which is standardized. As expectations do not meet reality when breastfeeding challenges are experienced, the process of providing supportive individual care becomes even more important. Midwives and Lactation Consultants are ideally placed to provide support that facilitates individualized care that might boost breastfeeding self-efficacy and improve the quality of their experience.

Incorporating the sources of self-efficacy information into clinical recommendations and practices of health care professionals would be a way to achieve improved quality. Including enactive mastery experiences in the health professional/mother dialogue could incorporate those recommendations mentioned below in Table 17. In particular, it would be necessary for the health care

professional to recognise the difference between enactive mastery experiences of primiparas and multiparas. Multiparas would be reflecting on all past breastfeeding experiences, whereas primiparas would be reflecting on each breastfeeding of the current experience.

Health care professionals need to be aware of other fundamental components of self-efficacy, the sources of experience, which are social/verbal persuasion, and somatic experiences. Similarly to enactive mastery experiences, the approach of the health care professional needs to respect the parity of the mother, whilst considering individual experiences and needs of the mother. Recommendations including these aspects are presented below in Table 17.

Table 17 Clinical recommendations and sources of self-efficacy information

Source of self-efficacy information	Clinical recommendation
Enactive mastery experience (Ayre-Jaschke, 2004; Bandura, 1997; White, 2002)	- assist mother to identify breastfeeding challenges in a positive way - encourage positive thinking even when faced with multiple challenges. - provide realistic goals for each feed and review each day. - teach the mother to identify signs of a well-fed infant considering Lactogenesis II. - encourage feeling confident -respect and acknowledge past breastfeeding experiences
Vicarious experience (Bandura, 2006)	-provide realistic models (peers) that experienced challenges and overcame them. -refer women to community networks
Social/verbal persuasion (Bandura, 1995)	-the use of positive wording with women who need or want to use alternative techniques -guide choice of alternative technique based on breastfeeding self-efficacy and support the mother's preferred alternative technique. -provide realistic encouragement. -provide balanced view of alternative techniques that is evidence based and respectful. -assist mothers to understand that challenges happen frequently and can be overcome.
Somatic experience (Bandura, 1997)	- avoid decision-making at times of fatigue. Encourage future planning and problem solving eg limit visitors, avoid stress and fatigue. - provide pain relief (pharmaceutical and non-pharmaceutical)

5.6 IMPLICATIONS FOR FURTHER RESEARCH

Improvements have been identified that could have made the design of this study stronger. Additionally, these improvements could be included in further research on this topic.

Two of the secondary research questions were "How often are alternative techniques used?" and "What are the reasons for use of alternative techniques". While participants were asked to self-report the reasons for the use in this research, researcher measurement of infant breastfeeding behaviour would be useful, for example, the breastfeeding behaviour of infants who are subsequently syringe fed. Researcher documentation of this would provide consistent data to further explore how that behaviour is associated with alternative technique use or vice versa. Given the dearth of literature about the syringe and finger feeding alternative techniques, further qualitative and quantitative research on this topic would add significantly to the body of knowledge supporting clinical practice.

It has been identified in the literature that researchers have an inconsistent approach to defining 'exclusive breastfeeding', by sometimes allowing the inclusion in this category of up to one bottle of formula a day. Upon reflection, it would have been useful to include the variable 'breastfeeding status' in this study, which is comprised of six categories ranging from 'exclusive breastfeeding' to 'exclusive formula feeding'. This would allow comparison to other breastfeeding and breastfeeding self-efficacy studies as recommended in the literature (Labbok & Krasovec, 1990). However, due to the alteration of the wording of the BSES-SF to retrospective questions covering a seven day period, it was expected that it would have been difficult for mothers to self-report due to the frequently changing feeding pattern of infants in the first week postpartum.

The intensity of nipple and birth related pain in the group of women who used alternative techniques was measured in this research. This was not measured in the group who did not use alternative techniques. The measurement of these variables in future research of both women who did, and did not, use alternative techniques would allow comparison of those variables between the two groups.

This study showed that skin-to-skin contact of mother and infant was frequently facilitated at birth, regardless of mode of delivery. Time from birth to first breastfeed could not be measured as it was beyond the scope of this study. It would serve a useful purpose in future research regarding the use of alternative techniques to obtain this data, due to the complex interaction between skin-to-skin contact and breastfeeding establishment.

Additionally, this study was initiated from the local need of a particular private maternity unit to identify the number of women using alternative techniques. Therefore, a convenience sampling approach was used to identify potential research participants. Further improvement could be made with multiple data collection sites with both public and private hospital populations with purposeful sampling.

5.7 LIMITATIONS

Several limitations of this study have been identified, including the profile of non-responders being unknown. Time and financial constraints did not allow for each potential participant to be personally approached during hospitalization for consent, and follow up with phone calls, which might have increased the response rate. Given the nature of the topic, and the delivery of the questionnaires to potential participant's homes almost immediately upon discharge, those experiencing extraordinary challenges may have felt overwhelmed and not responded. Hence, a most significant portion of the sample, are possibly not represented in this research.

Furthermore, the size of the sample means that it was not possible to obtain sufficient power to test each of the reasons for using alternative techniques, nor the individual alternative techniques, and the corresponding breastfeeding self-efficacy levels of the users.

5.8 SUMMARY

The results of this study present a unique insight into the use of alternative techniques that are used to support breastfeeding in the first postpartum week. It has been shown that breastfeeding self-efficacy is significantly statistically lower in

women who have used alternative techniques. Nevertheless, the complexity of the psychological factors associated with breastfeeding self-efficacy, means that there are also other possible individual outcomes.

This research has produced a description of the maternal and infant challenges experienced by women during the first week of lactation. Simultaneously, the level of breastfeeding self-efficacy was measured, and showed that women who used alternative techniques for various maternal and infant reasons had significantly lower breastfeeding self-efficacy. The reasons that women used alternative techniques were many and varied. Alternative explanations for these results have been explored, as well as limitations, implications for clinical practice, and further research directions.

Appendix 1

Item	item 1:	item 2:	item 3:	item 4:	item 5:	item 6:	item 7:	item 8:	item 9:	item 10:	item 11:	item 12:	item 13:	item 14:
1:	1.000	.654	.622	.393	.654	.483	.439	.292	.589	.382	.531	.491	.637	.578
2:	.654	1.000	.628	.502	.771	.549	.426	.334	.682	.549	.636	.598	.618	.490
3:	.622	.628	1.000	.374	.623	.549	.467	.253	.512	.511	.585	.595	.823	.581
4:	.393	.502	.374	1.000	.700	.541	.199	.216	.566	.303	.585	.495	.457	.485
5:	.654	.771	.623	.700	1.000	.617	.454	.406	.739	.498	.654	.627	.649	.556
6:	.483	.549	.549	.541	.617	1.000	.455	.286	.560	.518	.563	.690	.674	.564
7:	.439	.426	.467	.199	.454	.455	1.000	.509	.452	.560	.371	.464	.529	.321
8:	.292	.334	.253	.216	.406	.286	.509	1.000	.551	.358	.316	.348	.280	.132
9:	.589	.682	.512	.566	.739	.560	.452	.551	1.000	.539	.618	.638	.635	.451
10:	.382	.549	.511	.303	.498	.518	.560	.358	.539	1.000	.569	.640	.611	.482
11:	.531	.636	.585	.585	.654	.563	.371	.316	.618	.569	1.000	.702	.664	.589
12:	.491	.598	.595	.495	.627	.690	.464	.348	.638	.640	.702	1.000	.781	.567
13:	.637	.618	.823	.457	.649	.674	.529	.280	.635	.611	.664	.781	1.000	.684
14:	.578	.490	.581	.485	.556	.564	.321	.132	.451	.482	.589	.567	.684	1.000

Inter item correlation matrix, Breastfeeding Self-Efficacy Scale – Short Form Retrospective

Appendix 2

Mean Breastfeeding Self-Efficacy and Variables

		Primipara BSES-SF Score				Multipara BSES-SF Score				Total BSES-SF score			
		F	M	sd	Var	F	M	sd	Var	F	M	sd	Var
Used Alternative Techniques	No	19	55.06	6.65	44.20	47	59.43	7.37	54.38	66	58.32	7.40	54.70
	Yes	36	41.00	12.30	151.41	26	47.13	11.29	127.57	62	43.43	12.19	148.71
Bottle with regular teat	once only	5	44.20	12.32	151.70	4	42.00	16.37	268.00	9	43.38	12.83	164.55
	up to 5 times	8	37.50	11.41	130.29	7	50.00	11.51	132.40	15	42.86	12.74	162.29
	more than 5	10	33.80	9.54	91.07	4	46.67	13.58	184.33	14	36.77	11.44	130.86
	Subtotal	23	37.35	11.08	122.69	15	47.17	12.42	154.15	38	40.71	12.31	151.62
Bottle with wide teat	once only	1	42.00	.	.	4	39.75	15.11	228.25	5	40.20	13.12	172.20
	up to 5 times	4	33.25	12.37	152.92	2	54.00	.00	.00	6	40.17	14.37	206.57
	more than 5	8	33.25	10.53	110.79	3	34.33	11.06	122.33	11	33.55	10.11	102.27
	Subtotal	13	33.92	10.43	108.74	9	41.11	13.26	175.86	22	36.86	11.93	142.22
Syringe only	once only	6	53.20	12.32	151.70	5	48.40	15.53	241.30	11	50.80	13.46	181.07
	up to 5 times	5	42.40	10.11	102.30	6	49.20	11.99	143.70	11	45.80	11.05	122.18
	more than 5	4	36.50	8.35	69.67	1	.	.	.	5	36.50	8.35	69.67
	Subtotal	15	44.57	12.03	144.73	12	48.80	13.09	171.29	27	46.33	12.38	153.36
Syringe + finger feeding	once only	2	35.50	17.68	312.50	0	.	.	.	2	35.50	17.68	312.50
	up to 5 times	3	34.50	10.61	112.50	3	43.00	17.06	291.00	6	39.60	13.97	195.30
	more than 5	5	39.20	12.60	158.70	0	.	.	.	5	39.20	12.60	158.70
	Subtotal	10	37.33	11.73	137.50	3	43.00	17.06	291.00	13	38.75	12.63	159.48
Syringe + tube + finger feeding	once only	0	.	.	.	0	.	.	.	0	.	.	.
	up to 5 times	2	40.00	18.38	338.00	0	.	.	.	2	40.00	18.38	338.00
	more than 5	2	38.50	6.36	40.50	0	.	.	.	2	38.50	6.36	40.50
	Subtotal	4	39.25	11.27	126.92	0	.	.	.	4	39.25	11.27	126.92
Cup	once only	4	43.25	7.27	52.92	2	42.00	19.80	392.00	6	42.83	10.52	110.57
	up to 5 times	5	47.25	6.18	38.25	1	.	.	.	6	47.25	6.18	38.25
	more than 5	0	.	.	.	0	.	.	.	0	.	.	.
	Subtotal	9	45.25	6.61	43.64	3	42.00	19.80	392.00	12	44.60	8.91	79.38
Supply line	once only	0	.	.	.	0	.	.	.	0	.	.	.
	up to 5 times	0	.	.	.	0	.	.	.	0	.	.	.
	more than 5	1	27.00	.	.	0	.	.	.	1	27.00	.	.
	Subtotal	1	27.00	.	.	0	.	.	.	1	27.00	.	.
Nipple Shield	once only	1	.	.	.	1	30.00	.	.	2	30.00	.	.
	up to 5 times	4	37.50	8.81	77.67	3	53.67	7.51	56.33	7	44.43	11.50	132.29
	more than 5	4	44.00	12.54	157.33	4	56.00	1.00	1.00	8	49.14	10.96	120.14
	Subtotal	9	40.75	10.62	112.79	8	51.29	10.42	108.57	17	45.67	11.51	132.52

Appendix 2 continued

	Primipara BSES-SF Score				Multipara BSES-SF Score				Total BSES-SF score			
Reasons:	M	sd	Var	M	sd	Var	M	sd	Var	M	sd	Var	M
nipple pain	Yes	14	41.00	13.01	169.38	11	47.33	11.37	129.25	25	43.48	12.53	157.08
pain - birth	Yes	9	36.78	10.08	101.69	4	50.00	5.66	32.00	13	39.18	10.64	113.16
Fatigue	Yes	14	40.50	12.19	148.58	9	42.50	13.53	183.10	23	41.10	12.28	150.73
night nursery permission	Yes	9	43.11	12.99	168.61	7	44.00	14.48	209.60	16	43.47	13.09	171.41
baby would not settle	Yes	13	39.23	11.94	142.53	12	42.20	11.48	131.73	25	40.52	11.57	133.90
not enough breast milk or colostrum	Yes	16	37.44	11.45	131.06	7	44.29	12.84	164.90	23	39.52	12.03	144.72
baby lost 10% or more birthweight	Yes	9	40.00	8.82	77.75	6	45.20	13.44	180.70	15	41.86	10.49	110.13

Appendix 2 continued

Knowledge of alternative techniques		Primipara BSES-SF Score			Multipara BSES-SF Score			Total BSES-SF score					
		F	M	sd	F	M	sd	F	M	sd	F	M	sd
syringe only	No	27	42.65	13.23	175.04	24	55.35	9.28	86.15	51	48.61	13.10	171.62
	Yes	24	48.59	10.74	115.40	48	55.35	11.29	127.57	72	53.16	11.49	131.99
syringe + finger feeding	No	40	45.97	12.32	151.70	57	55.84	9.94	98.77	97	51.81	11.95	142.74
	Yes	11	43.10	13.08	171.21	15	53.43	13.12	172.11	26	49.13	13.83	191.33
syringe + feed tube + finger feed	No	43	43.95	12.73	162.00	58	53.73	11.08	122.76	101	49.55	12.71	161.62
	Yes	8	53.71	5.31	28.24	14	61.71	4.76	22.68	22	59.05	6.18	38.15
Cup	No	37	44.15	13.90	193.10	42	54.26	10.61	112.54	79	49.74	13.12	172.12
	Yes	14	48.36	7.19	51.63	30	57.04	10.55	111.34	44	54.07	10.32	106.52
Bottle regular teat	No	7	38.00	14.32	205.00	3	52.00	8.89	79.00	10	42.20	14.14	199.96
	Yes	44	46.63	11.77	138.59	69	55.50	10.70	114.50	113	52.10	11.89	141.26
Bottle wide teat	No	12	44.08	13.49	181.90	14	53.08	8.04	64.58	26	48.76	11.69	136.69
	Yes	39	45.81	12.18	148.33	58	55.88	11.10	123.24	97	51.93	12.49	155.95
supply line	No	45	44.95	12.93	167.19	59	54.86	10.62	112.89	104	50.56	12.62	159.35
	Yes	6	49.00	5.57	31.00	13	57.46	10.63	112.94	19	55.11	10.11	102.22
nipple shield	No	19	40.53	12.61	158.93	17	52.35	10.67	113.87	36	46.11	13.02	169.64
	Yes	32	48.55	11.37	129.26	55	56.33	10.49	110.03	87	53.54	11.38	129.45
Preference													
syringe only	No	12	40.25	12.43	154.39	7	55.67	5.16	26.67	19	45.39	12.79	163.66
	Yes	0	.	.	.	1	28.00	.	.	1	28.00	.	.
syringe + finger feeding	No	10	38.10	12.56	157.88	6	51.17	12.46	155.37	16	43.00	13.75	189.20
	Yes	2	51.00	.00	.00	2	55.00	.	.	4	52.33	2.31	5.33
syringe + feed tube + finger feed	No	11	39.27	12.54	157.22	8	51.71	11.47	131.57	19	44.11	13.34	177.87
	Yes	1	51.00	.	.	0	.	.	.	1	51.00	.	.
Cup	No	11	39.27	12.54	157.22	8	51.71	11.47	131.57	19	44.11	13.34	177.87
	Yes	1	51.00	.	.	0	.	.	.	1	51.00	.	.
Bottle regular teat	No	12	40.25	12.43	154.39	5	55.75	6.65	44.25	17	44.13	13.04	170.12
	Yes	0	.	.	.	3	46.33	15.89	252.33	3	46.33	15.89	252.33
Bottle wide teat	No	11	40.09	13.02	169.49	8	51.71	11.47	131.57	19	44.61	13.42	180.13
	Yes	1	42.00	.	.	0	.	.	.	1	42.00	.	.
supply line	No	10	42.80	12.05	145.29	8	51.71	11.47	131.57	18	46.47	12.31	151.51
	Yes	2	27.50	.71	.50	0	.	.	.	2	27.50	.71	.50
nipple shield	No	3	35.33	13.58	184.33	3	42.00	19.80	392.00	6	38.00	14.27	203.50
	Yes	9	41.89	12.41	154.11	5	55.60	5.77	33.30	14	46.79	12.31	151.57

Appendix 2 continued

		Primipara BSES-SF Score			Multipara BSES-SF Score			Total BSES-SF score					
		M	sd	Var	M	sd	Var	M	sd	Var	M	sd	Var
Type of birth	Vaginal Spontaneous	16	48.07	11.57	133.92	34	55.42	10.85	117.63	50	53.13	11.48	131.86
	vaginal – vacuum or forceps	12	38.27	14.85	220.42	2	44.50	23.33	544.50	14	39.23	15.31	234.53
	c/s planned	21	46.89	11.98	143.54	37	55.97	9.53	90.73	58	52.78	11.23	126.10
	Unplanned	5	44.40	9.53	90.80	0	.	.	.	5	44.40	9.53	90.80
Pain relief													
None	Yes	2	52.00	.	.	7	58.29	4.75	22.57	9	57.50	4.93	24.29
Gas	Yes	19	42.53	14.05	197.37	15	58.00	8.88	78.77	34	49.09	14.26	203.34
Pethidine	Yes	8	45.00	13.63	185.71	4	58.00	6.38	40.67	12	49.33	13.05	170.24
Epidural	Yes	46	44.60	12.87	165.58	54	54.60	11.60	134.60	100	50.07	13.12	172.01
general anaesthetic	Yes	2	35.00	9.90	98.00	1	57.00	.	.	3	42.33	14.50	210.33
Sex of infant	Boy	26	41.58	13.53	183.12	44	55.07	10.62	112.83	70	50.24	13.34	178.06
	Girl	28	48.35	10.87	118.08	29	55.89	10.55	111.26	57	52.19	11.26	126.89
Skin to skin practice	Yes	48	46.02	11.42	130.44	70	55.64	10.63	113.02	118	51.83	11.88	141.14
Infant birthweight	2500-2999g	5	38.33	15.82	250.33	4	50.00	5.89	34.67	9	45.00	11.82	139.67
	3000-3499	18	45.06	13.67	186.86	23	57.43	9.52	90.66	41	52.08	12.92	166.80
	3500-3999	24	46.25	13.02	169.41	36	56.91	9.50	90.32	60	52.58	12.17	148.04
	4000-4499	6	43.83	8.42	70.97	9	49.56	13.97	195.28	15	47.27	12.06	145.35
	4500-4999	1	46.00	.	.	1	33.00	.	.	2	39.50	9.19	84.50
Breastfed previously	No	55	45.41	12.64	159.65	1	54.00	.	.	56	45.58	12.57	157.94
	Yes	0	.	.	.	72	55.41	10.60	112.36	72	55.41	10.60	112.36
Level of education	Grade 10	1	58.00	.	.	3	47.67	4.93	24.33	4	50.25	6.55	42.92
	Grade 12	6	42.50	5.96	35.50	8	58.88	7.72	59.55	14	51.86	10.79	116.44
	TAFE	7	47.29	10.50	110.24	9	54.13	9.14	83.55	16	50.93	10.07	101.50
	University	24	45.86	13.71	188.03	34	56.73	10.13	102.70	58	52.38	12.76	162.83
	postgraduate	17	44.20	14.48	209.60	19	53.22	13.00	169.01	36	49.12	14.22	202.30
Marital status	living with partner	10	46.00	12.00	144.00	4	44.33	12.50	156.33	14	45.58	11.56	133.72
	Married	45	45.29	12.90	166.50	69	55.88	10.26	105.26	114	51.80	12.42	154.37
Combined annual income	below 50 000	0	.	.	.	2	67.00	.	.	2	67.00	.	.
	50 000 – 75 000	7	46.29	11.28	127.24	10	57.56	7.65	58.53	17	52.63	10.74	115.45
	75 000 – 100 000	10	42.78	11.79	138.94	17	52.00	13.76	189.33	27	48.68	13.60	185.06
	over 100 000	36	46.03	13.71	187.97	41	56.66	9.44	89.08	77	51.92	12.63	159.50

Appendix 3

Questionnaire

BREASTFEEDING AND ALTERNATIVE FEEDING METHODS RESEARCH QUESTIONNAIRE

PART A

Q1	**In the first SEVEN DAYS after birth, was your baby fed by a method other than direct breastfeeding? (Please see definition below.)**					
	☐ YES ☐ NO **(If no, please proceed to Q4)**					
	Tick yes if your baby received even one feed using any of the methods below		Tick no if you breastfed your baby entirely for every single feed			
	Indirect breastfeeding =		**Direct Breastfeeding =**			
	Expressed breast milk or baby formula + other methods such as: cup feed, syringe feed, finger feeding, supply line, bottle, nipple shield		Mother and infant only with no other methods used			
Q2	**Please indicate how often in the first SEVEN DAYS you used the following feeding methods to feed your baby colostrum / breast milk or baby formula?**					
	Tick all that apply					
		Bottle regular narrow teat (supplied by hospital)	**Not at all**	**Only once**	**Up to 5 times**	**More than 5 times**
			☐	☐	☐	☐
		Bottle wide neck teat (own, eg. Avent or other brand)	**Not at all**	**Only once**	**Up to 5 times**	**More than 5 times**
			☐	☐	☐	☐
		Syringe only (baby fed with syringe only)	**Not at all**	**Only once**	**Up to 5 times**	**More than 5 times**
			☐	☐	☐	☐
		Syringe and finger feeding (baby sucks on adult finger whilst being fed milk with syringe)	**Not at all**	**Only once**	**Up to 5 times**	**More than 5 times**
			☐	☐	☐	☐
		Finger feeding and feed tube (baby sucks on adult finger whilst being fed milk with	**Not at all**	**Only once**	**Up to 5 times**	**More than 5 times**
			☐	☐	☐	☐

		syringe and feed tube into mouth)				
		Cup (eg disposable medicine cup)	**Not at all**	**Only once**	**Up to 5 times**	**More than 5 times**
			☐	☐	☐	☐
		Supply line (fine feed tube supplies extra milk, taped to mothers breast)	**Not at all**	**Only once**	**Up to 5 times**	**More than 5 times**
			☐	☐	☐	☐
		Nipple Shield (thin silicone shield placed over mothers nipple during feed)	**Not at all**	**Only once**	**Up to 5 times**	**More than 5 times**
			☐	☐	☐	☐
	Questions continue on reverse of page					
Q3	**What was the reason/s that you fed your baby by another method in the first SEVEN DAYS? (Tick all that apply)**					
	☐	I had nipple pain – What kind was it? (tick all that apply)				
		☐ Blisters				
		☐ Cracks				
		☐ Bleeding				
		☐ Grazes				
		☐ Nipple Pain without obvious cause				
		On a scale of 1 – 5, please circle the response that best shows your level of pain at the time you used the alternative feeding method:				
		No pain	Mild pain	Moderate pain	Strong pain	Extreme pain
		1	**2**	**3**	**4**	**5**
	☐	I had other pain related to the birth – What kind was it?				
		☐ Caesarean pain				
		☐ Perineal stitches pain				
		☐ Afterbirth pain (abdominal cramping)				
	On a scale of 1 – 5, please circle the response that best shows your level of pain at the time you used the alternative feeding method:					
	No pain	Mild pain	Moderate pain	Strong pain	Extreme pain	
	1	**2**	**3**	**4**	**5**	
	☐	I was tired at the time---if you answered this question were you, at the time:				
	On a scale of 1 – 5, please circle the response that best shows how tired					

	you were at the time you used an alternative feeding method:				
	Not tired	Mildly tired	Moderately tired	Very tired	Extremely tired
	1	**2**	**3**	**4**	**5**
	☐	I gave permission for my baby to be fed in the Night Nursery			
	☐	I had engorgement			
	☐	I had engorgement and my baby could not latch on. What was the reason the baby could not latch on: (tick all that apply)			
		☐	Flat Nipple		
		☐	Inverted Nipple		
		☐	Nipple shape changed due to engorgement		
	☐	My baby could not latch on to take a whole feed (no engorgement). If you answered this question, was it because: (tick all that apply)			
		☐	Baby had tongue tie		
		☐	Baby's suck was uncoordinated		
		☐	Baby did not wake due to jaundice		
		☐	Baby did not wake – unknown reason		
		☐	Baby refused to latch on for feed – breast refusal		
		☐	flat nipple ☐ inverted nipple ☐ Don't know / other		
Q3. cont	☐	My baby would not settle, even after frequent breastfeeds			
	☐	I felt I did not have enough breast milk or colostrum to satisfy the baby			
	☐	My baby lost more than 10% of his/her birth weight			
	☐	I did not want to feed my baby at the breast, but I did want to provide breast milk by expressing			
	☐	I planned short-term breastfeeding only			
	☐	I changed my mind, stopped breastfeeding and changed to formula			
	☐	I felt I had no other option at the time			
	☐	Other (please specify)			
Q4	**During the first seven days did you know about the feeding methods listed**				

	below? (Tick all that you knew about.)			
	☐	**Syringe** only (baby fed with syringe only)	☐	**Syringe and finger feeding** (baby sucks on adult finger whilst being fed milk with syringe)
	☐	**Feed tube** + finger feeding (baby sucks on adult finger with feed tube and syringe)	☐	**Cup** (medicine cup, other baby cup)
	☐	**Bottle** with regular teat	☐	**Bottle** with wide neck teat (own, eg. avent or other brand)
	☐	**Supply line** at breast (fine feed tube supplies extra milk, taped to mothers breast)	☐	**Nipple Shield** (thin silicone shield placed over mothers nipple during feed)
Q5	**Would you have preferred to try any of the feeding methods?**			
	☐	**Yes** (tick all that apply)	☐	**No**
	☐	**Syringe** only	☐	**Syringe and finger feeding**
	☐	**Feed tube** + finger feeding	☐	**Cup**
	☐	**Bottle** regular narrow teat	☐	**Bottle** with wide neck teat
	☐	**Supply line**	☐	**Nipple Shield**
Your answers to questions 6-10 will help us understand connections between things that happened at or around the time of birth, and breastfeeding or use of other feeding methods.				
Q6	**What type of delivery did you have with this current baby:**			
	☐	Vaginal – spontaneous	☐	Vaginal – assisted (vacuum or forceps)
	☐	Caesarean – planned	☐	Caesarean – unplanned

Q7	**During the birth did you have:**			
	(Tick all that apply)			
	☐	No pain relief	☐	Gas / Nitrous oxide
	☐	Pethidine injection	☐	Epidural
	☐	General anaesthetic	☐	Don't know
Q8	**Is your baby a boy or a girl?**	☐	Boy	☐ Girl
Q9	**In the immediate 2 hours following birth, was your infant placed skin-to-skin on your chest?**			
	☐ **Yes**	☐	No	☐ Don't know
Q10	**What was your baby's birth weight?**			
	☐	2500g – 2999g	☐	3000g – 3499g
	☐	3500g – 3999g	☐	4000g – 4499g
	☐	4500g – 4999g	☐	If you don't know in grams, please state pounds and ounces_____

Your answers to the following six questions will help us understand the connection between a mother's breastfeeding confidence and her past experience.					
Q11	**How many live birth children have you had (including this baby)?**				
	☐ One	☐ Two	☐ Three	☐ Four	☐ Five or more
Q12	**Have you breastfed a baby before this one?**				
	☐ Yes	☐ No			
Q13	**Have you expressed breast milk for a baby before this one?**				
	☐ Yes	☐ No			
Q14	**For each baby, in order from youngest to oldest, how long did you breastfeed (or express breast milk)?**				
	(Current Baby = **youngest child**)				
	DAYS ☐ 1	☐ 2	☐ 3	☐ 4	☐ 5 ☐ 6 ☐ 7
	If you are continuing to breastfeed beyond day 7, please tick 7.				
	2nd youngest				
	☐ up to 1 week		☐ over 1-6 weeks		
	☐ over 6 weeks to 3 months		☐ over 3 months to six months		
	☐ over six months				
	3rd youngest				
	☐ up to 1 week		☐ over 1-6 weeks		
	☐ over 6 weeks to 3 months		☐ over 3 months to six months		
	☐ over six months				
	4th youngest				
	☐ up to 1 week		☐ over 1-6 weeks		
	☐ over 6 weeks to 3 months		☐ over 3 months to six months		
	☐ over six months				
	5th oldest				

	☐ up to 1 week		☐ over 1-6 weeks			
	☐ over 6 weeks to 3 months		☐ over 3 months to six months			
	☐ over six months					
Q15	**Please rate your breastfeeding education for this baby:(including your own prior experience)**					
	(both before and during hospital stay)					
	For each item, rate on a scale of 1-5 how useful you think this was, or circle not applicable if you did not have any breastfeeding education from that source.					
	N/A = Not Applicable					
	1 = not at all useful					
	2 = not very useful					
	3 = sometimes useful					
	4 = useful					
	5 = very useful					
	Own prior experience N/A	**1**	**2**	**3**	**4**	**5**
	Own reading, books, internet N/A	**1**	**2**	**3**	**4**	**5**
	Hospital literature N/A	**1**	**2**	**3**	**4**	**5**
	Midwife N/A	**1**	**2**	**3**	**4**	**5**
	Doctor N/A	**1**	**2**	**3**	**4**	**5**
	Lactation Consultant N/A	**1**	**2**	**3**	**4**	**5**
	Classes, prior to birth N/A	**1**	**2**	**3**	**4**	**5**
Q16	**Please rate support received by you during your breastfeeding experience so far:**					
	For each item, rate on a scale of 1-5 how useful you think this was, or circle not applicable if you did not have any breastfeeding support from that source.					
	N/A = Not Applicable					
	1 = not at all useful					
	2 = not very useful					
	3 = sometimes useful					
	4 = useful					
	5 = very useful					

	Partner N/A	**1**	**2**	**3**	**4**	**5**
	Parents N/A	**1**	**2**	**3**	**4**	**5**
	Other family N/A	**1**	**2**	**3**	**4**	**5**
	Friends N/A	**1**	**2**	**3**	**4**	**5**
	Midwife N/A	**1**	**2**	**3**	**4**	**5**
	Lactation Consultant N/A	**1**	**2**	**3**	**4**	**5**
	Obstetrician N/A	**1**	**2**	**3**	**4**	**5**
	General Practitioner N/A	**1**	**2**	**3**	**4**	**5**

PART B You're nearly finished!

Breastfeeding Self-Efficacy Scale – Short Form

This section of the questionnaire contained the fourteen item Breastfeeding Self-Efficacy Scale – Short Form. Slight changes were made to the wording in order to change it from present tense to past tense. For example, "I can always….." was changed to "I could always….."

The Breastfeeding Self-Efficacy Scale – Short Form is the intellectual property of Dr Cindy-Lee Dennis. Requests to use the scale can be directed to:

Cindy-Lee Dennis, PhD
Associate Professor in Nursing and Medicine, Dept. of Psychiatry;
Canada Research Chair in Perinatal Community Health; Shirley Brown Chair in Women's Mental Health Research, Women's College Research Institute; Director, Mothering Transitions Research Program;
www.cindyleedennis.ca

cindylee.dennis@utoronto.ca

University of Toronto
Lawrence S. Bloomberg Faculty of Nursing
155 College St
Toronto, Ontario
Canada M5T 1P8
Tel: (416) 946-8608
Fax: (416) 978-8222

PART C

The questions below have been shown in previous studies to affect breastfeeding rates. It is important that we can show this information with our research results for comparison to those previous studies. We understand that this is very personal information, but assure you that your responses are confidential and can in no way be traced to your name or other identifying information.			
Q31	What is your age?		
Q32	What is your level of education?		
	☐	Grade 10	
	☐	Grade 12	
	☐	TAFE	
	☐	University	
	☐	Post graduate or higher	
Q33	What is your current marital status?		
	☐	Single	
	☐	Living with Partner	
	☐	Married	
	☐	Widowed	
	☐	Divorced	
Q34	What is your annual combined household income?		
	☐	Below $50, 000	
	☐	$50, 000 – $75, 000	
	☐	$75, 000 – $100, 000	
	☐	Over $100, 000	

Thankyou for taking the time to fill out this questionnaire.

Your assistance with this research is genuinely appreciated.

Please return it in the reply paid envelope.

Appendix 4

Participant information sheet

PARTICIPANT INFORMATION for QUT RESEARCH PROJECT

"Breastfeeding Confidence and Alternate Feeding Techniques"

Research Team Contacts

Researcher	Principal Supervisor
Frances Keemer RN, RM, B Sc (Nursing), Grad Dip (Midwifery), Current student- Masters Applied Science (Research)	Dr Jennie Barr, PhD BN (Hons) RN RM Women's Health strand Coordinator
31380229 or 0406259166 Email: frances.keemer@qut.edu.au	31385951 and 31383814 Email: j.barr@qut.edu.au

DESCRIPTION

The purpose of this research is to find out if there is a relationship between mothers self-confidence with breastfeeding, and techniques used to help her with breastfeeding if it was difficult. Some reasons alternative techniques may be necessary are sore nipples, breast engorgement, or the baby is unable to latch and get a whole feed. Sometimes the baby needs a little help temporarily until able to get a whole feed by themselves. The research team requests your assistance because your recent experiences with breastfeeding make your input very valuable. If you did not experience any breastfeeding problems, your participation is also very valuable. The receipt of this survey is the only time the researcher will contact you.

ABOUT THE RESEARCHER

This study is one being conducted by Frances Keemer RN, RM (Registered Nurse and Midwife). Frances is one of the midwives at The Wesley Hospital. The study is part of Frances' studies for Masters of Applied Science (Research) at the School of Nursing, Queensland University of Technology (QUT) at Kelvin Grove. The study is being supervised by Dr Jennieffer Barr, and Professor Patsy Yates from the School of Nursing at QUT.

PARTICIPATION

You are under no obligation to return this survey or answer any question in the survey that you do not wish to. We understand that you may be tired and busy with your new baby. If you would like to return the survey in a few weeks time, that is OK. It is important that your privacy is respected so there are no details on the survey about whom you are or where you live. However, as the survey is completely anonymous, with no way to identify who filled it out, we regret that it cannot be

retrieved at a later date if you change your mind about your survey information being used.

Please be assured that return of the survey is not compulsory, and that participation or refusal to be involved will not influence current and future access to services provided by the Wesley Hospital or QUT.

The survey is about 4 pages long. It will take about 30 minutes to complete. We will ask some questions to find out your level of self-confidence with breastfeeding, and then ask if you used any other ways to feed your baby if you had trouble breastfeeding in the first week. You are under no obligation to complete a question that you would prefer not to answer.

EXPECTED BENEFITS
It is expected that this project will not benefit you directly. However, it may benefit future mothers and their babies who may experience breastfeeding difficulties.
RISKS
There are no anticipated risks with this research.
If you feel that being asked to discuss your breastfeeding experiences in this research was distressing, QUT will provide counselling services to help you if required. This is free of charge and available to anyone who participates in this research

Counselling services at Kelvin Grove campus are situated on the same level as the bookshop and above the cafeteria in C Block on Victoria Park Rd.
http://www.counselling.qut.edu.au/

Should you wish to access this service please contact the Clinic Receptionist of the QUT Psychology Clinic on 3138 4578. Please indicate to the receptionist that you are a research participant.

CONFIDENTIALITY
All comments and responses are anonymous and will be treated confidentially. The names of individual persons are not required in any of the responses.
Consent to Participate
The return of the completed questionnaire is accepted as an indication of your consent to participate in this project.
If you do not want to participate, simply do not return the survey.
Questions / further information about the project
Please contact the researcher team members named above to have any questions answered or if you require further information about the project.
Concerns / complaints regarding the conduct of the project
QUT is committed to researcher integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the project you may contact the QUT Research Ethics Officer on 3138 2340 or ethicscontact@qut.edu.au. The Research Ethics Officer is not connected with the research project and can facilitate a resolution to your concern in an impartial manner.

Appendix 5

Cover letter

Leaders in nursing education for 30 years 1978 - 2008 QUT

Frances Keemer
C-Queensland University of Technology
School of Nursing
Victoria Park Rd
Kelvin Grove QLD 4059
Email: frances.keemer@qut.edu.au
Ph: 0406259166

Dear

I would like to invite you to participate in a breastfeeding research project. Your experiences are very valuable and can help other mothers in the future achieve their goal of breastfeeding. Would you consider sharing your experiences with us?

Enclosed is a breastfeeding confidence questionnaire, study information sheet and reply paid envelope. If you would like to participate, fill out the questionnaire and return it. If you would rather not, that is OK. I understand you may be tired or busy.

I wish you and your family all the best for the future,

Sincerely,

Frances Keemer, RN, RM
19/02/09

Appendix 6

Ethics approval UnitingCare Health

UnitingCare Health

ABN: 87 842 457 440

Human Research Ethics Committee

1st Floor Moorlands House, The Wesley Hospital
451 Coronation Drive, Auchenflower Q 4066

PO Box 499 Toowong Q 4066
Phone: 3232 7500 Facsimile: 3232 7109
Email: ethics@uchealth.com.au

3rd September 2008

Please quote our reference: 200837

Ms Frances Keemer
QUT School of Nursing c/o Dr Barr
Victoria Park Road
KELVIN GROVE QLD 4059

Dear Ms Keemer

RESEARCH PROPOSAL: *Breastfeeding self-efficacy and related use of alternative infant feeding techniques*

I am pleased to advise that the UnitingCare Health Human Research Ethics Committee has reviewed the abovenamed research proposal and, at its meeting on 28th August 2008, granted ethical approval, subject to clarification as requested by the Committee to the Patient Information Sheet and Consent Form. Thank you for your response to those requirements. I am now able to confirm approval. It is noted that the Director of Nursing has endorsed your project.

The Ethics Committee believes it would be preferable to make a personal approach to proposed participants while they are still in hospital. Some might consider access to patient information for a research mailout inconsistent with patient privacy.

It is a strict condition of approval that any departure from the protocol detailed in the proposal submitted for approval be reported immediately to the Committee. If there is any change to the status of the project, this should be reported also.

Approval for the project is given subject to your agreement to UnitingCare Health requirements for the monitoring of research, which have been based on the Australian Health Ethics Committee guidelines, a copy of which is enclosed. Please note the requirement to submit a report annually or at the completion of the project, as appropriate.

With best wishes

Yours sincerely

Douglas Killer MBBS FRACP
Executive Officer

Appendix 7

Ethics approval Queensland University of Technology

----- Original Message -----
From: "Research Ethics" <ethicscontact@qut.edu.au>
To: "Ms Frances Keemer" <f.keemer@student.qut.edu.au>
Cc: "Ms Janette Lamb" <jd.lamb@qut.edu.au>
Sent: Friday, October 24, 2008 10:39 AM
Subject: Ethics Application Approval -- 0800000784

> Dear Ms Frances Keemer
>
> Re: Breastfeeding self-efficacy and related use of alternative infant
> feeding techniques
>
> This email is to advise that your application has been reviewed and
> confirmed as meeting the requirements of the National Statement on Ethical
> Conduct in Human Research. Your ethics approval number is 0800000784.
> Please quote this number in all future correspondence.
>
> Whilst the data collection of your project has received ethical clearance,
> the decision to commence and authority to commence may be dependant on
> factors beyond the remit of the ethics review process. For example, your
> research may need ethics clearance from other organisations or permissions
> from other organisations to access staff. Therefore the proposed data
> collection should not commence until you have satisfied these
> requirements.
>
> If you require a formal approval certificate, please respond via reply
> email and one will be issued.
>
> Decisions related to Low Risk ethical review are subject to ratification
> at the next available Committee meeting. You will only be contacted again in
> relation to this matter if the Committee raises any additional questions
> or concerns.
>
> This project has been awarded ethical clearance until 24/10/2011 and a
> progress report must be submitted for an active ethical clearance at least
> once every twelve months. Researchers who fail to submit an appropriate
> progress report may have their ethical clearance revoked and/or the
> ethical clearances of other projects suspended. When your project has been
> completed please advise us by email at your earliest convenience.
>
> Please do not hesitate to contact the unit if you have any queries.
>
> Regards
>
> Research Ethics Unit | Office of Research
> O Block Podium | Gardens Point Campus
> p +61 7 3138 5123 | f +61 7 3138 1304
> e ethicscontact@qut.edu.au
> w http://www.research.qut.edu.au/ethics/
>
>
>
>

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